Multiple Perspectives on Interaction

Second Language Research in Honor of Susan M. Gass

Edited by Alison Mackey ■ Charlene Polio

MULTIPLE PERSPECTIVES ON INTERACTION

"*Multiple Perspectives on Interaction* is a fitting tribute to Susan Gass's continuing career which has involved multiple contributions to SLA theory and research over the past three decades. Alison Mackey and Charlene Polio have assembled a strong line-up of contributors to interactionist scholarship, one of several domains in which Gass has long been a major force. This is a 'research tradition' in Laudan's terms, but as the theoretical discussions and empirical studies in this volume show, one that is of increasing interest to scholars with a diverse range of positions on SLA research methods and the proper scope of inquiry. The book is likely to be of value to an equally broad range of readers."

—Michael H. Long, University of Maryland

"This collection of research reviews, theoretical arguments, and empirical studies truly lives up to its title. The many views of interaction that Susan Gass has originated, acknowledged, and incorporated into her work are fully represented throughout its chapters. Editors Mackey and Polio have brought together world-renowned experts on psycho- and sociolinguistic, cognitive, affective, socio-cultural, and pedagogical approaches to the study of SLA. Together, they lay out their theoretical frameworks in ways that speak to Gass's interaction approach and draw from their own studies to support their points. In keeping with Gass's trademark clarity and accessibility, the chapters are written with elegance, studded with citations, and brimming with tables, transcripts, definitions, and examples. Their substance and scope reveal the extent to which Gass's contributions on input and interaction have continued to address SLA theory, expand its research methodology, inform educational policy, practice, and technology, and challenge the field toward new and necessary directions."

—Teresa Pica, University of Pennsylvania

This collection in honor of Susan M. Gass focuses on interaction in second language acquisition from multiple perspectives. It includes contributions from many international experts in the field of SLA, providing new insights, explanations, discussion, and suggestions for further research. This state of the art volume provides an enriching discussion of how the interaction research tradition is viewed in a wide range of different approaches to learning and teaching second languages.

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INTRODUCTION

Alison Mackey and Charlene Polio

According to Susan M. Gass, her interest in language learning was sparked (or perhaps provoked) most intensely when, without any formal background in language pedagogy, she found herself teaching Italian to a lively assortment of thirty very different 6-year-olds, ranging from true beginners to bilinguals. Sue, as she is widely known, had already been quite interested in language for many years—as a high school student living in Italy, as an undergraduate at the University of California, Berkeley, and as a graduate student at Middlebury College in Vermont, where she completed an MA in Italian. But when she returned to Italy to work as a teacher, she realized (despite, or perhaps because of, the rather tricky nature of her teaching context) that language learning was something she needed to understand better. Hence, it was back to California, where she enrolled in the linguistics program at UCLA. There she completed her MA and began coursework toward a Ph.D. Moving to the Midwest in 1975, she continued her studies at Indiana University, and, although no courses in second language learning existed then, her interest in applied linguistics was sparked through a course on language testing. And so it began. Her dissertation on transfer and cross-linguistic universals in second language acquisition was among the first to consider learners' interlanguages as natural languages in their own right and SLA processes as consistent across languages, that is, not simply the result of transferring particular habits. Her research, the results of which were published in *Language Learning* in 1979, not only went beyond the current thinking at the time, but also represented one of the first endeavors in this area that genuinely applied linguistic theory. A natural next step for Sue, as has been the case throughout her career, was to explore applications of the theory to questions of effective pedagogy; she conducted an important classroom study (1982) which demonstrated learners' ability to generalize instruction from one type of relative clause to another, in effect taking advantage of implicational relationships to go beyond what was explicitly taught. Undeniably, her early work in applied linguistics was groundbreaking for the field.

Meanwhile, at UCLA, Evelyn Hatch was arguing for the importance of studying input to and interaction with second language learners (Hatch, 1978a, 1978b; Wagner-Gough & Hatch, 1975). Hatch was suggesting that second language learning developed from "learning how to carry on conversations, learning how to communicate" (Hatch, 1978a, p. 63), and her then-student, Michael H. Long, was beginning to explore native–nonnative interaction theoretically and empirically. As part of his dissertation work, Long documented the modifications to conversational structure (e.g., repetitions, elaborations, clarification requests) that might help to make language more comprehensible in interactions with nonnative speakers, challenging Stephen Krashen's notion that comprehensible input itself was necessary and sufficient for SLA to take place (Long, 1981, 1983). Sue had not had the opportunity to study with Evelyn Hatch while a student in the linguistics department at UCLA, but she became interested in this early work on interaction when she was researching and publishing in the areas of universals and processing (Gass, 1982, 1984a, 1984b; Gass & Ard, 1980). In a move that was (and has continued to be) typical of her career, she embarked upon a prolific line of research in this new area.

For her first major contributions to interaction research, Susan Gass collaborated with Evangeline Varonis, publishing several studies on nonnative-speaker comprehensibility. In this research (Gass & Varonis, 1982, 1985; Varonis & Gass, 1982), they examined variables such as familiarity with the topic of discussion and with nonnative accents, using both naturally occurring and experimentally manipulated data to investigate native speakers' ability to understand learners' speech. After proposing an influential and often-cited model of negotiation in Varonis and Gass (1985), she proceeded to explore variables still considered critical in interaction research today, including task characteristics (Gass & Varonis, 1985), interlocutor and task familiarity (Plough & Gass, 1993), and gender (Gass & Varonis, 1986). By this time, Sue had taken up a position in Ann Arbor, near her hometown of Detroit, at the University of Michigan and, together with Carolyn Madden in 1983, organized the tenth Conference on Applied Linguistics, entitled "Language Input: Learners' Use and Integration of Language in Context." The purpose of the meeting was "to develop a cohesive theoretical framework within which input studies could be conducted" (Gass & Madden, 1985, p. v), and it resulted in an edited volume that marked a significant turning point in the field. In addition to several studies addressing various interactional processes, it included Merrill Swain's seminal (1985) paper arguing for the importance of output, which has since become a vital part of the interaction approach.

Susan Gass's research, along with other work being done at the time (e.g., Pica, Young, & Doughty, 1987), focused on describing interaction

and demonstrating how interactional modifications made language more comprehensible. However, despite a large number of empirical studies exploring the ways in which learners restructured their language production toward greater accuracy and complexity during interactions, the role of interaction in the actual internalization of L2 knowledge was not yet clear (Sato, 1986), and researchers started to look for additional processes that could make L2 forms salient and directly affect learning. In this context, Gass and Varonis's (1985) suggestion that instances of noncomprehension and concomitant negotiations for meaning could serve to focus learners' attention on problematic aspects of their interlanguage was an important one. An innovative study, published by Gass and Varonis in 1994, was able to demonstrate that negotiation did have a positive influence on learners' language production in immediately subsequent interactions, thereby planting the seed for other researchers to begin demonstrating relationships with longer-term development. Thinking in a similar way in the same year, and also pointing out that the link between negotiation and acquisition had not yet been fully established, Teresa Pica (1994) outlined a variety of ways in which negotiation might bring about helpful reformulations and segmentations of language, contributing significantly to the theoretical rationale for the benefits of negotiated interaction. Since then, of course, many studies have investigated this link with mostly positive results. (See Keck, Iberri-Shea, Tracy-Ventura, & Wa-Mbaleka, 2006 and Mackey & Goo, 2007, for reviews.)

Over the past decade, Susan Gass has continued to conduct empirical research that refines our understanding of the relationships among various aspects of interaction and SLA, investigating, for example, how interaction can make learners' speech more comprehensible to native speakers (Polio & Gass, 1998), how learners perceive implicit feedback (Mackey, Gass, & McDonough, 2000), how the effects of attention are related to learning (Gass, Svetics, & Lemelin, 2003), how the ordering of input and interaction can affect the learning of different areas of language (Gass & Alvarez-Torres, 2005), how pre-service and experienced teachers perceive interactions with nonnative speakers (Polio, Gass, & Chapin, 2006), and how heritage and nonheritage learners perceive interactional feedback (Gass & Lewis, 2007).

In addition to carrying out and interpreting the results of these empirical studies, Susan Gass has also written extensively on the relationships between the interaction approach and other theoretical approaches to SLA. Drawing on her work on language universals, for instance, she has stated that there is "nothing incompatible with arguments that language is constrained by universals (innate or otherwise) and that language is shaped by interactions" (Gass, 1997, p. 161); universals may limit learners' choices regarding what is linguistically possible, while interaction helps them to make those choices. Sue has also engaged with critics of the

interaction approach who have suggested that cognitively based interaction approaches are not compatible with discourse-oriented approaches. For example, she concluded a well-known commentary (Gass, 1998) by arguing that it is possible to investigate language both as a social phenomenon and as an abstract entity residing in the individual; these views of language are not incompatible, but rather simply differ in focus. In general, her perspective has been that SLA in fact *must* be interdisciplinary in order to progress as a field, and she has repeatedly made a point of outlining ways in which different research areas can be integrated through a sharing of insights among theoretical, applied, psycho-, socio-, and neurolinguists, and, of course, language teachers and language professionals (Gass, 1988, 1993, 1995, 2004).

In her (1988, 1997) multi-level framework Susan Gass applied this interdisciplinary spirit to her own work where she tried to specify, for example, which stages in the acquisitional process of converting apperceived input into language production abilities might be more or less influenced by affective as opposed to linguistic factors. In other lines of work discussing interaction in a broader context, she has related interaction research to emergentist approaches by acknowledging that frequency may affect how input becomes intake (Gass & Mackey, 2002). More recently, in 2004, Sue examined data from the perspective of conversation analysis and showed that although the interaction approach (being ultimately concerned with learning) does not focus on exactly the same issues, it might benefit from some of the richness embodied in conversation analysis transcripts. In a similar line of interest, she has co-authored and co-edited several books and papers on interlanguage pragmatics, discourse, and cross-cultural communication (Gass & Houck, 1999; Gass, Madden, Preston, & Selinker, 1989; Gass & Neu, 1996; Houck & Gass, 1996, 1997). And, of course, Sue has taken pains to lay out how language teachers can integrate theory and practice through task-based approaches to language learning (Crookes & Gass, 1993a, 1993b) and how they can make use of SLA research in selecting and evaluating classroom practices (Gass, 1995).

Finally, it would be impossible not to mention Susan Gass's contributions to the field of SLA through her work on research methodology (Gass, 1993, 1994, 2001; Gass & Houck, 1996), including three recent books (Gass & Mackey, 2000, 2007b; Mackey & Gass, 2005). Her work on methodologies in SLA, such as stimulated recall, has been hailed as influential in encouraging other researchers to investigate learners' perceptions (e.g., Adams, 2003; Egi, 2007; Gass & Lewis, 2007; Mackey, Gass, & McDonough, 2000; Nabei & Swain, 2002). Her critiques of specific techniques, such as acceptability judgments (Gass, 1994) and sentence-matching tasks (Gass, 2001), have highlighted important considerations in using such methods. And in an article Sue wrote with

Charlene Polio a decade ago, they called for more uniformity and detail in the reporting of research in the field across all methods and techniques (Polio & Gass, 1997).

As recent overviews of the interaction approach have pointed out (Gass & Mackey, 2006, 2007a), although the set of hypotheses associated with interaction research are not claimed to constitute a complete causal theory of SLA, they have evolved to become more theory-like (particularly in combination), and are compatible with other theories. We have attempted, in Figure I.1, to graphically represent the major tenets of the interaction approach, as outlined by Gass and Mackey (2006, 2007a), and as an introduction to the multiple perspectives represented in this volume. This figure shows that social factors, such as motivation, can affect learners' access to feedback, input, and output. Furthermore, social factors can cause learners to pay more or less attention to features of the input. At the same time, a learner's individual cognitive factors such as developmental level and working memory can also influence the feedback, input, and output available to that learner. These cognitive factors are central in determining the amount and type of attention that learners pay to the feedback, input, and output that is available. These processes may result in some type of learning, sometimes indicated by small (not necessarily targetlike) changes in production or differences in

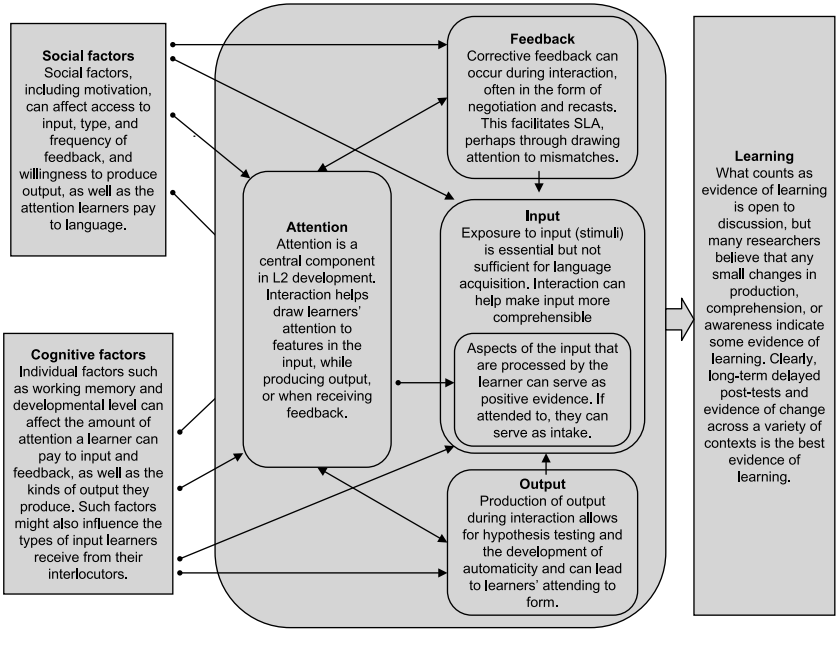

Figure I.1

comprehension or awareness. Nevertheless, long-term changes as measured by delayed posttests, for example, are ultimately the best evidence of learning.

All these developments have undoubtedly broadened the scope and scale of our understanding of how interaction affects second language acquisition. Interaction research has taken a tremendous leap from its beginnings in the early 1980s to its current stage of maturity. Interaction researchers today focus on complex, multifaceted aspects of interaction, and L2 learning relationships. The current volume reflects and furthers these current theoretical positions and research efforts, for which Sue's research has paved the way.

This volume represents an attempt to honor Sue's work showing the breadth and depth of the interaction approach, which represents one of her most influential lines of research, particularly when viewed from multiple perspectives. We begin with two theoretical chapters, both of which illustrate how the interaction approach is compatible with other theories and approaches. Ellis discusses how cognitive, associative networks are regulated by contextual factors, namely, interaction, and Tarone argues that social factors influence attention, input, output, and feedback, as indicated in Figure I.1, using empirical studies to convincingly support this idea.

These two theory chapters are followed by four empirical studies. First, Brooks and Swain examine interaction in a collaborative writing task, taking a sociocultural view of interaction. Next, two studies examine tasks, an important component of interaction research in both dyads and classrooms and, as mentioned above, another area where Gass made an initial and significant contribution (Crookes & Gass, 1993a, 1993b). First, Bygate and Samuda explore the concept of pedagogic tasks by evaluating them with regard to communicative pressure, and then Dörnyei and Tseng examine tasks with regard to a learner's motivation to engage in them. These studies are followed by a chapter where Oliver examines features of interaction in a lesser researched group in SLA, young children. She too discusses the influence of tasks on interaction.

The last four chapters examine interaction in specific contexts. Lightbown and Spada review classroom-based research carried out within the interaction approach and compare it to laboratory-based studies. Loewen also examines interaction in the classroom by delving further into one specific type of feedback, multi-move recasts. The last two chapters extend the interaction approach to synchronous computer-mediated communication. Smith examines how to best capture computer-mediated exchanges to analyze within the framework of the interaction approach, and Ortega finishes the empirical work in the book by reviewing recent research in CALL and its relation to theories in the fields of communication and information and communication technologies, providing a truly new perspective on interaction. We end the book with a commentary by

Jenefer Philp, who looks forward to future research, perspectives, and implications of the interaction approach.

We have prepared a volume that showcases how interaction research has matured and prospered since its inception, fostering examination of various aspects of our understanding of how interaction facilitates L2 development. The research of Susan M. Gass is indisputably center stage to this agenda. She laid an important foundation for this work, and has made important contributions to every facet of the field. Research has yet to achieve a complete understanding of what interaction can offer L2 learners and how interaction interacts with other factors to impact the efficacy of interaction on L2 learning. We have no doubt that we will be hearing more about this from Sue in the future.

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1

THE PSYCHOLINGUISTICS OF THE INTERACTION APPROACH[1]

Nick Ellis

Second language acquisition (SLA) has been an independent research discipline since the late 1970s, and Sue Gass has been a leading figure throughout its evolution. The first issue of *Studies in Second Language Acquisition (SSLA)* was published in 1978. Sue's PhD thesis "An investigation of syntactic transfer in adult second language acquisition" was completed in 1979 and published as an article in *Language Learning* in the same year. *Second language acquisition: An introductory course* (Gass & Selinker, 1994) is for many *the* standard introductory text. Sue has been associate editor of *SSLA* for longer than I can remember, an active member of the American Association for Applied Linguistics since its inception in 1977 (president in 1987), and is currently the president of the International Association for Applied Linguistics (AILA). Sue's influence can be seen throughout the field. Yet, for me, her most profound contribution is her program of research into the interaction approach. It was Pit Corder (1967), a founding father of applied linguistics, who famously identified the divorce of input from intake in adult language learning. It was Mike Long in his PhD thesis *Input, interaction, and second language acquisition* (1980) who proposed that they may be brought back together through interaction. Sue's work over the last 20 years has persuasively realized the details of this reconciliation (Gass, 1997, 2002, 2003; Gass & Mackey, 2007; Gass, Mackey, & Pica, 1998; Gass & Varonis, 1994; Mackey, 1999; Mackey & Gass, 2006).

There has been a sad but notable coolness too between first and second language acquisition research on and off over this period. Perhaps SLA felt a need to assert its new-found independence. Perhaps child language research and psycholinguistics were too set in their ways, paying little attention to their prior partner. Interaction approach research within SLA has not had a marked impact upon mainstream psycholinguistics,

as I believe it should have done. The two fields have independently been recognizing the errors of their old ways and slowly opening up to new influences, expanding their perspectives, and gaining richer understandings as a result. They have so much in common, they really should get back together again.

A marriage counselor might turn to one of the partners at this point and give them uninterrupted time to explain their perspective on things. I believe this is what Alison Mackey and Charlene Polio intended by asking me here to present a psycholinguistic perspective on the need for an interaction approach, and I thank them for the opportunity.

I will begin with associative and cognitive accounts of language acquisition as the learning of form–meaning pairings, and connectionist analyses of how linguistic generalizations emerge from the patterns latent in a learner's usage history. Let me call these foundations good old-fashioned psycholinguistics (GOP) where, in caricature, the learner is an associative network, a mechanistic processor of information, relatively unembodied, unconscious, monologic, unsituated, asocial, uncultured, and untutored. However incomplete an account, there is much of language and its acquisition that is understandable in these terms. GOP is a necessary, but insufficient, part of the language story. I will outline its utility. The remainder of this chapter will then consider several limitations of GOP, and how these necessitate the introduction of additional factors to a psycholinguistic model of language acquisition. I sketch out what is incremented at each iteration as we take this associative network and imagine it: embodied in human form, perceiving the world accordingly, its cognition bounded by learned attention and its goals necessarily satisfied rather than optimized (Simon, 1957), imbued with consciousness and attentional focus, and dynamically situated in dialogue, its feedback, and the social co-construction of form and meaning. Current child language acquisition research emphasizes how language learning is "socially gated" (Kuhl, 2004) in the same way that interaction approach research has persuaded SLA that "conversation is not only a medium of practice; it is also the means by which learning takes place" (Gass, 1997, p. 104).

Language Acquisition as the Learning of Form–Function Mappings

Saussure (1916) proposed that language comprises linguistic signs, the signifiers of linguistic form and their associated signifieds, the functions, concepts, or meanings. In such a view, language acquisition is the learning of mappings between form and function, and can be accordingly investigated following domain-general approaches to human learning: *associative* (the types of learning first analyzed within the behaviorist tradition of the 1950s, e.g., for L1 Skinner [1957], for L2 Lado [1964]),

cognitive (the wider range of learning processes studied within cognitive psychology of the 1970s, including more conscious, explicit, deductive, or tutored processes, e.g., for L1 Slobin [1992], for L2 McLaughlin [1987], Andersen [1993]), and *connectionist* (the patterns and associations that emerge from the statistical regularities in the summed experience of form–meaning patterns, as explored in the parallel distributed processing and competition model studies of the 1980s and 1990s, e.g., for L1 Elman [1990; Elman et al., 1996], for L2 MacWhinney [1987a, 1987b], Ellis & Schmidt [1998]). The inheritors[2] of these approaches as applied to the domain-specific problem space of languages are current cognitive, linguistic, and functional theories of language (e.g., for L1 Barlow & Kemmer [2000], Croft & Cruise [2004], Langacker [1987], for L2 Robinson & Ellis [2008b]), particularly Construction Grammar approaches which view language learning as the learning of *constructions* (Bybee, 2007; Croft, 2001; Goldberg, 2003, 2006).

Construction Grammar

Constructions, the basic units of language representation, are form–meaning mappings, conventionalized in the speech community, and entrenched as language knowledge in the learner's mind. They (a) may be complex, as in [Det Noun] or simple, as in [Noun], (b) may represent complex structure above the word level, as in [Adj Noun] or below the word level, as in [NounStem-PL], (c) may be schematic, as in [Det Noun] or specific, as in [the US]. Morphology, syntax, and lexicon are uniformly represented in construction grammar. Constructions are symbolic: in addition to specifying the utterance's defining morphological, syntactic, and lexical form, a construction also specifies the semantic, pragmatic, and discourse functions that are associated with it. Constructions form a structured inventory (Langacker, 1987) of a speaker's knowledge, usually described in terms of a semantic network, where schematic constructions are abstracted over less schematic ones which are inferred inductively by the speaker in acquisition. Consider the caused motion construction, (e.g., X causes Y to move Z path/loc [Subj V Obj Oblpath/loc]). This construction clearly exists independently of particular verbs, hence the meaning of "Tom sneezed the paper napkin across the table" is readily intelligible, despite "sneeze" being usually intransitive. Although abstract constructions have schematic meaning like this, there is a close relationship between the types of verb that typically appear within them (in this case *put*, *get*, *take*, *push*, etc.), hence the meaning of the construction as a whole is inducible from the lexical items which have been experienced within it.

Constructions are learned from language use, from engaging in communication. *Usage-based theories* of language acquisition hold that an

individual's creative linguistic competence emerges from the collaboration of the memories of all of the utterances in their entire history of language use and from the frequency-biased abstraction of regularities within them. *Psycholinguistic* analyses demonstrate that fluent language users are sensitive to the relative probabilities of occurrence of different constructions in the speech stream (Bod, Hay, & Jannedy, 2003; Bybee & Hopper, 2001; N. C. Ellis, 2002a, 2002b; Jurafsky, 2002; Jurafsky & Martin, 2000). Through experience, a learner's perceptual system becomes tuned to expect constructions according to their probability of occurrence in the input.

The Associative and Cognitive Learning of Constructions

The learner's initial noticing of a new word can result in an explicit memory that binds its features into a unitary representation, such as phonological onset-rime sequence "wʌn" or the orthographic sequence "one". As a result of this, a detector unit for that word is consolidated in the learner's perception system which can subsequently signal the word's presence, or "fire", whenever its features play out in time in the input. Every detector has a set resting level of activation, and some threshold level which, when exceeded, will cause the detector to fire. When the component features are present in the environment, they send activation to the detector that adds to its resting level, increasing it; if this increase is sufficient to bring the level above threshold, the detector fires. With each firing of the detector, the new resting level is slightly higher than the old one—the detector is said to be *primed*. This means it will need less activation from the environment in order to reach threshold and fire the next time that feature occurs. Priming events sum to lifespan-practice effects: features that occur frequently acquire chronically high resting levels. Their resting level of activity is heightened by the memory of repeated prior activations. Thus our pattern-recognition units for higher-frequency constructions require less evidence from the sensory data before they reach the threshold necessary for firing.

The same is true for the strength of the mappings from form to interpretation. Each time "wʌn" is properly interpreted as "one", the strength of this connection is incremented. Each time "wʌn" signals "won", this is tallied too, as are the less frequent occasions when it forewarns of "wonderland". Thus the strengths of form–meaning associations are summed over experience. The resultant network of associations, a semantic network comprising the structured inventory of a speaker's knowledge of their language, is so tuned that the spread of activation upon hearing the formal cue "wʌn" reflects prior probabilities.

There are many additional factors that qualify this simple picture: The

relationship between frequency of usage and activation threshold is not linear, but follows the "power law of practice" whereby the effects of practice are greatest at early stages of learning but eventually reach asymptote. The amount of learning induced from an experience of a form–function association depends upon the salience of the form and the functional importance of the interpretation. The learning of a form–function association is interfered with if the learner already knows another form which cues that interpretation (e.g., *Yesterday* I walk*ed*), or another interpretation for an ambiguous form (e.g., the definite article in English being used for both specific and generic reference). A construction may provide a partial specification of the structure of an utterance, and hence an utterance's structure is specified by a number of distinct constructions which must be collectively interpreted. Some cues are much more reliable signals of an interpretation than others. It is not just first-order probabilities that are important, it is sequential ones too, because context qualifies interpretation, with cues combining according to Bayesian probability theory: thus, for example, the interpretation of "wʌn" in the context "Alice in wʌn . . ." is already clear. And so on.

Yet, despite these complexities, psycholinguistic research demonstrates that a theory of language learning requires an understanding of the associative learning of representations that reflect the probabilities of occurrence of form–function mappings. Learners have to figure language out: their task is, in essence, to learn the probability of an interpretation given a formal cue in a particular context, a mapping from form to meaning conditioned by context. This figuring is achieved, and communication optimized, by learning mechanisms that are sensitive to the *frequency*, *recency*, and *context* of constructions (Christiansen & Chater, 2001; N. C. Ellis, 2002a, 2002b; Elman et al., 1996; MacWhinney, 1999).

Abstraction and Generalization

Memorization of previously experienced constructions is just the beginning. Language involves more than the use of formulas, the economic recycling of constructions that have been memorized from prior use (N. C. Ellis, 1996; Pawley & Syder, 1983; Sinclair, 1991). We are not limited to these specifics in our language processing. Some constructions are a little more open in scope, like the slot-and-frame greeting pattern ["Good" + (time-of-day)] which generates examples like "Good morning", and "Good afternoon". Others still are abstract, broad-ranging, and generative, such as the schemata that represent more complex morphological (e.g., [NounStem-PL]), syntactic (e.g., [Adj Noun]), and rhetorical (e.g., situation → problem → solution → evaluation) patterns. Usage-based theories investigate how the acquisition of these productive patterns, generative schema, and other rule-like regularities of language involves

generalization from exemplars experienced in usage. The necessary generalization comes from frequency-biased abstraction of regularities: exemplars of similar type (e.g., [plural + "cat" = "cat-s"], [plural + "dog" = "dog-s"], [plural + "elephant" = "elephant-s"], . . .) resonate, and from their shared properties emerge schematic constructions [plural + NounStem = NounStem-s]. Thus the systematicities and rule-like processes of language emerge as prototypes or schema, as frequency-tuned conspiracies of instances, as attractors which drive the default case, in the same ways as for the other categories by which we come to know the world.

Connectionist models of language acquisition investigate the representations that result when simple associative learning mechanisms are exposed to complex language evidence. Connectionist simulations are data-rich and process-light: massively parallel systems of artificial neurons use simple learning processes to statistically abstract information from masses of input data as generalizations from the stored exemplars. It is important that the input data is representative of learners' usage history, which is why connectionist and other input-influenced research rests heavily upon the proper empirical descriptions of *corpus linguistics*. Connectionist simulations show how the default or prototype case emerges as the prominent underlying structural regularity in the whole problem space, and how minority subpatterns of inflection regularity (e.g., [past tense + "swim" / past tense + "ring" / past tense + "bring" /. . ./ past tense + "spling" = ?]) also emerge as smaller, less powerful attractors; less powerful because they have fewer friends and many more enemies, yet powerful enough nevertheless to attract friends that are structurally just like them. *Connectionist* approaches to first and second language (Christiansen & Chater, 2001; N. C. Ellis, 1998; Elman et al., 1996; Rumelhart & McClelland, 1986), and *competition model* investigations of language learning and processing (Bates & MacWhinney, 1987; MacWhinney, 1987b, 1997) investigate how regularities of form–function mappings emerge from the patterns latent in the summed exemplars of language usage, as sampled and described by *Corpus Linguistics* (Biber, Conrad, & Reppen, 1998; Sampson, 2001; Sinclair, 1991).

In all of these investigations, it is clear that frequency of occurrence is an important causal factor—frequency of form (N. C. Ellis, 2002a), frequency and contingency of mapping (N. C. Ellis, 2006a, 2006b), frequency of co-occurrence (N. C. Ellis, 1996; N. C. Ellis, Frey, & Jalkanen, 2007a, 2007b; N. C. Ellis & Simpson-Vlach, in preparation; N. C. Ellis, Simpson-Vlach, & Maynard, in preparation), and type and token frequency (Bybee & Hopper, 2001; N. C. Ellis, 2002a, 2008, in press; N. C. Ellis & Ferreira-Junior, in press) with token frequency of instances of a specific construction contributing to its entrenchment, routinization, and speed of access in language learning and use; and type frequency, the number of different instances which conform to schematic construction,

contributing to its productivity, generalizability, and schematicity. These effects of frequency are a clear testament to usage-based models of language acquisition (N. C. Ellis, 2008c, 2006c). We learn language from using language.

The foundations of GOP are laid. But the language learner in this account is an associative network, a mechanistic processor of information to be exposed to frequency-representative corpora of language. GOP oversimplifies both the learner (as unembodied, unconscious, monologic, autistic, unsituated, uncultured, asocial, and untutored) and the mechanisms of the interaction approach (Gass, 1997, chapter 5; Gass & Mackey, 2007; Gass & Varonis, 1994; Long, 1996; Mackey, 2007, in preparation) which holds that what is important in interaction is not simply language usage, but negotiation, with participants' attention being focused on resolving a communication problem and thus "connecting input, internal learner capacities, particularly selective attention, and output in productive ways" (Long, 1996, p. 452). What of the rest? What of meaning, embodiment, attention, consciousness, dialogue and dialectic, situated, cultured, social and tutored interaction?

Cognitive Linguistics, Meaning, and Embodiment

First, the meaning pole of form–meaning associations—what of "meaning"? While the above GOP-style analyses of the acquisition and processing of linguistic signs explored meaning with atomic representations, using either symbolic representations in artificial intelligence models investigating spreading activation in semantic networks or production systems (Dijkstra & de Smedt, 1996), or localist representations in connectionist models (Christiansen & Chater, 2001), there is clearly a lot more to meaning than that. Cognitive linguistics (Croft & Cruise, 2004; Langacker, 1987, 2000; Robinson & Ellis, 2008b; Taylor, 2002) provides detailed qualitative analyses of the ways in which language is grounded in our experience and our physical embodiment, which represents the world in a very particular way. The meaning of the words of a given language, and how they can be used in combination, depends on the perception and categorization of the real world around us. Since we constantly observe and play an active role in this world, we know a great deal about the entities of which it consists. This experience and familiarity is reflected in the nature of language. Ultimately, everything we know is organized and related to our other knowledge in some meaningful way, and everything we perceive is affected by our perceptual apparatus and our perceptual history.

Language reflects this embodiment and this experience. Consider, for example, the meanings of verbs like *push*, *shove*, *pull*, *hold*, and so on, and similar words from other languages. Theoretical understanding of the

differences between these words cannot be forthcoming without inclusion of a model of high-level motor control—hand posture, joint motions, force, aspect and goals are all relevant to these linguistic distinctions (Bailey, 1997; Feldman, 2006; Lakoff & Johnson, 1999). These sensorimotor features are part of our embodiment, they structure our concepts, they play out in time.

Consider too the meanings of spatial language. These are not the simple sum that results from addition of fixed meanings given by prepositions for "where" an object is, to the meanings of other elements in the sentence describing "what" is being located. Spatial language understanding is firmly grounded in the visual processing system as it relates to motor action (Coventry & Garrod, 2004; Regier & Carlson, 2002), the multiple constraints relating to object knowledge, dynamic-kinematic routines, and functional geometric analyses. Meanings are embodied and dynamic (Spivey, 2006); they are flexibly constructed on-line. Meanings like this cannot simply be taught by L2 rules and learned by rote; they can only be learned in situated action.

Embodiment, Interaction, and Speech Perception

Next the form pole of form–meaning associations. Linguistic input is embodied too. Speech is spoken by speakers, and we usually perceive it as such, multimodally. The McGurk effect (McGurk & MacDonald, 1976) is a classic demonstration of this perceptual phenomenon: when a video of one phoneme's production is dubbed with a sound-recording of a different phoneme being spoken, the perceived phoneme is often a third, intermediate phoneme. For example, a visual /ga/ combined with a heard /ba/ is often heard as /da/. The effect is very robust; knowledge about it as an illusion seems to have little effect on one's perception of it. Thus speech perception involves information from more than just the acoustic modality.

This applies to language learning too. We do not usually learn language from the airwaves; we learn to comprehend speech as spoken by speakers, and there is considerable research demonstrating that we learn embodied speech in social interaction more easily than we do the acoustic signals of recorded speech.

Firstly, the effects of embodiment on the learning of the signal. Animated embodied speech provides a richer, more learnable signal (for review, Massaro, Cohen, Tabain, Beskow, & Clark, in press). Hardison (2002) found somewhat better learning of /r/ and /l/ by Japanese and Korean speakers when training involved a frontal view of the talker than simply auditory speech. Massaro and Light (2003) evaluated a computer instruction system, Baldi, for teaching nonnative phonetic contrasts, by comparing instruction illustrating the internal articulatory processes of

the oral cavity versus instruction providing just the normal view of the tutor's face. Eleven Japanese speakers of English as a second language were bimodally trained under both instruction methods to identify and produce American English /r/ and /l/ in a within-subject design. Speech identification and production improved under both training methods, and generalization tests showed that this learning transferred to the production of new words. Massaro's work shows that the human face presents visual information during speech production that is critically important for effective communication and learning. While the voice alone is usually adequate for communication between fluent native speakers, visual information from movements of the lips, tongue, and jaws enhance the perception of the message for learners, both adults learning a second language and L1 children with severe or profound hearing loss.

Secondly, the additional effects of social interaction. Kuhl, Tsao, and Liu (2003) showed that infants older than 9 months could learn novel phonetic discriminations from exposure to foreign language with contingent social interaction but not from simple language exposure alone. Nine-month-old American infants were exposed to Mandarin Chinese in twelve 25-minute live or televised sessions. After exposure, infants in the Mandarin exposure groups and those in the English control groups were tested on a Mandarin phonetic contrast using a head-turn technique. Children in the live exposure group showed phonetic learning whereas those in TV- or audio-only groups did not.

Infant-directed speech (or "motherese") might assist infants in learning speech sounds because of social scaffolding and the capture of the child's attention by the adult, but also because it exaggerates relevant features and contrasts in the input.

Evidence for the effects of social feedback and interactional synchrony upon the quantity and quality of utterances of young infants comes from Goldstein, King, and West (2003). Mothers' responsiveness to their infants' vocalizations was manipulated after a baseline period of normal interaction: Half of the mothers were instructed to respond immediately to their infants' vocalizations by smiling, moving closer to, and touching their infants: these were the "contingent condition" (CC) mothers. The other half of the mothers were "yoked controls" (YC) in that their reactions were identical, but timed (by the experimenter's instructions) to coincide with vocalizations of infants in the CC group. Infants in the CC group produced more vocalizations than infants in the YC group, and their vocalizations were more mature and adult-like.

There is substantial evidence that "motherese" provides input that is exaggerated in perceptually relevant ways. Fernald and Kuhl (1987) showed that, when compared to adult-directed speech, infant-directed speech is slower, has a higher average pitch, and contains exaggerated pitch contours. In a cross-linguistic study, Kuhl. (1997) performed acoustic analyses

of English, Russian, and Swedish women when they spoke to another adult or to their young infants to show that vowel sounds (the /i/ in "see", the /a/ in "saw" and the /u/ in "Sue") in infant-directed speech were more clearly articulated. Women from all three countries exaggerated the acoustic components of vowels, "stretching" the formant frequencies, in infant-directed, as opposed to adult-directed, speech. This acoustic stretching makes the vowels contained in "motherese" more distinct, and this additional speech clarity in turn aids learner speech discrimination—mothers who stretched their vowels to a greater degree had infants who are better able to hear subtle distinctions in speech (Liu, Kuhl, & Tsao, 2003).

Thus infant-directed speech has three main roles: it attracts attention through higher pitch, it conveys emotional affect, and it conveys language-specific phonological information through vowel hyperarticulation. Recent research shows that foreigner directed speech (FDS), the speech natives direct at nonnative learners, likewise promotes speech clarity. Knoll and Uther (2004) compared British English speech directed to first language English learners (infants), and to second language English learners (adult foreigners) as populations with similar linguistic but dissimilar affective needs. Their analyses showed that vowels were equivalently hyperarticulated in infant- and foreigner-directed speech, but that pitch was higher in speech to infants than to foreigners or adult British controls and that positive affect was highest in infant-directed and lowest in foreigner-directed speech. They conclude that there are linguistic modifications in both infant- and foreigner-directed speech that are didactically oriented, and these linguistic modifications are independent of vocal pitch and affective valence. In a parallel study comparing the acoustics of real and imaginary foreigner-directed speech, Scarborough, Olga, Hall-Lew, Zhao, and Brenier (2007) showed that speakers adjusted their conversational tempo according to the status of their listeners, talking more slowly to foreigners than to native speakers and producing longer vowels. Thus FDS is an acoustically distinct speech style from standard native-directed speech and its adjustments are consistent with those seen in other listener-directed speech styles: speakers produce a signal that is clearer and easier to process when speaking to listeners who may have had extra processing difficulties due to limited language experience. In these ways the input to the form layer of the associative network is socially gated (Gass, 1997, chapter 3).

Communicating Meaning—Referential Indeterminacy and Intention Reading

Meaning is an essentially individual and private phenomenon; another's cognition and consciousness is internal and unseeable. So how can a

language learner come to intuit the meanings and intentions of a conversation partner, thus to determine the mappings between language form and meaning? Even when the learner shares the "here and now", the same physical context, with an animated and constructive conversation partner, even then, as Quine (1960) demonstrated with his "gavagai" parable, referential indeterminacy is a fundamental problem. Single words cannot simply be paired with experiences because they confront experience in clusters. Consider a learner of English, child or adult, on a country walk while their conversation partner whispers, "I wonder if we'll see some gavagai today." The learner's reasoning about the meaning of "gavagai" is likely constrained by the constructions they know, their knowledge of grammatical categories and frames (Brent, 1994; Gleitman, 1990; Maratsos, 1982; Tomasello, 2003), and thus processes of *syntactic bootstrapping* (Gleitman, 1990) might suggest that "gavagai" is a noun. But what is the referent? They might look up to see across a field an animal hopping close to a ditch . . ., mushrooms, cowpats, acorns, long grass, thistles . . . a rich and complex scene. And just what might "gavagai" be? Other things being equal, a good bet might be to translate the word as "rabbit", this search for the correct referent being speeded by various attention-focusing general word-learning heuristics: the tendency to believe (1) that new words often apply to whole objects (the whole object constraint), (2) that they more likely refer to things for which a name is not already known (the mutual exclusivity constraint), (3) that they more often relate to things distinguished by shape or function rather than by color or texture, and the like (Bloom, 2000; Golinkoff, 1992; Golinkoff, Mervis, & Hirsh-Pasek, 1994; Gopnik & Meltzoff, 1997; Markman, 1989). These all help. But there is no one clearly correct interpretation; it could be that "gavagai" actually refers to "fluffy cotton tail," or "long ears," or "softness," or "undetached rabbit-part," given that any experience that makes the use of "rabbit" appropriate makes these other meanings appropriate too. Referential indeterminacy entails that the learner can only make a guess at the intended meaning. The quality of the guess is determined by the quality of the conversational interaction, the degree to which the conversation partner makes things clear, by pointing, with eyes, gesture, or language, and the degree to which speaker and listener negotiate meaning.

Reading the interlocutor's intention in dyadic situated interaction is therefore key in the acquisition of L1. Over the first two years of life, infants develop their capabilities of attention detection (gaze following), attention manipulation (directive pointing), intention understanding (the realization that others are goal-directed), and social coordination with shared intentionality (engaging in joint activities with shared interest, negotiating meanings), and there is considerable current research focusing upon the centrality of these processes in child language acquisition (Tomasello, 1999, 2001; Tomasello, Carpenter, Call, Behne, & Moll,

2005). Traditional GOP took little account that the associative network is gated by social gaze and joint attention (Emery, 2000). However, there are now the beginnings of computational simulations of word learning which examine the influence of inferring interlocutors' referential intentions from their body movements at early stages of lexical acquisition. By testing human participants and comparing their performances in different learning conditions, Chen, Ballard, and Aslin (2005) demonstrated that embodied intentions facilitate both word discovery and word–meaning association and present a computational model that can identify the sound patterns of individual words from continuous speech, using nonlinguistic contextual information, and employ eye movements as deictic references to discover word–meaning associations. This is the first model of word learning that not only learns lexical items from raw multisensory signals to closely resemble infant language development from natural environments, but also explores the computational role of social cognitive skills in lexical acquisition.

Analyses of classroom, mother–child, and native speaker (NS)–NNS interactions demonstrate how conversation partners scaffold the acquisition of novel vocabulary and other constructions by focusing attention on perceptual referents or shades of meaning and their corresponding linguistic forms (Baldwin, 1996; Chun, Day, Chenoweth, & Luppescu, 1982; R. Ellis, 2000; Gass, 1997; Gelman, Coley, Rosengren, Hartman, & Pappas, 1998; Long, 1983; Oliver, 1995; Tomasello, 1999; Tomasello & Akhtar, 2000). The interlocutor has various means of making the input more comprehensible: (a) by modifying speech, (b) by providing linguistic and extralinguistic context, (c) by orienting the communication to the "here and now", and (d) by modifying the interactional structure of the conversation (Long, 1982). Learners search for meanings, and their conversation partners, as language tutors, try to spotlight the relevant alternatives: "notice this," they say in their deictic words and actions. Socially scaffolded "noticing" (Schmidt, 1990, 1993, 2001) solves Quine's (1960) problem of "referential indeterminacy." In these ways the input to the meaning layer of the associative network is socially gated.

Embodiment, Interaction, and Language Understanding—Construal and Attention

But language does more than select out particular things in the world. Constructions are conventionalized linguistic means for presenting different interpretations or construals of an event. They structure concepts and window attention to aspects of experience through the options specific languages make available to speakers (Talmy, 2000a, 2000b). The different degrees of salience or prominence of elements involved in situations that we wish to describe affect the selection of subject, object,

adverbials, and other clause arrangement. Figure/ground segregation and perspective taking, processes of vision and attention, are mirrored in language and have systematic relations with syntactic structure. Thus a theory of language must properly reflect the ways in which human vision and spatial representations are explored, manipulated, cropped, and zoomed, and run in time like movies under attentional control. In language production, what we express reflects which parts of an event attract our attention; depending on how we direct our attention, we can select and highlight different aspects of the frame, thus arriving at different linguistic expressions. The prominence of particular aspects of the scene and the perspective of the internal observer (i.e., the attentional focus of the speaker and the intended attentional focus of the listener) are key elements in determining regularities of association between elements of visuo-spatial experience and elements of phonological form. In language comprehension, abstract linguistic constructions (like simple locatives, datives, and passives) serve as a "zoom lens" for the listener, guiding their attention to a particular perspective on a scene while backgrounding other aspects (Croft, 2001; Croft & Cruise, 2004; Langacker, 1987, 1999; Taylor, 2002).

Embodiment and social interaction are crucial to the learner's realization of the intended construals of situations, and hence of the proper interpretations of linguistic signs. In a speech situation, a hearer may attend to the linguistic expression produced by a speaker, to the conceptual content represented by that expression, and to the context at hand. But not all of this material appears uniformly in the foreground of the hearer's attention. Rather, various portions or aspects of the expression, content, and context have different degrees of salience. Such differences are only partly due to any intrinsically greater interest of certain elements over others. More fundamentally, language has an extensive system that assigns different degrees of salience to the parts of an expression, reference, or context. Talmy (2000a, 2000b) analyzes how the attentional system of language includes some fifty basic factors, its "building blocks." Each factor involves a particular linguistic mechanism that increases or decreases attention on a certain type of linguistic entity. Although able to act alone, the basic factors also regularly combine and interact to produce further attentional effects. Thus, several factors can converge on the same linguistic entity to reinforce a particular level of salience, making it especially high or especially low. Or two factors can conflict in their attentional effects, with the resolution usually being either that one factor overrides the other, or that the hearer's attention is divided or wavers between the two claims on it. Or a number of factors can combine in the production of higher-level attentional patterns, such as that of figure-ground assignment, or that of maintaining a single attentional target through a discourse. Learning a language involves the

learning of these various attention-directing mechanisms of language, and this, in turn, rests upon L1 learners' developing attentional systems and L2 learners' attentional biases.

Cross-linguistic research shows how different languages lead speakers to prioritize different aspects of events in narrative discourse (Berman & Slobin, 1994). Because languages achieve these attention-directing outcomes in different ways, such cross-linguistic differences must affect L2 learning, making it easier where languages use them in the same way, and more difficult when they use them differently. To the extent that the constructions in L2 are similar to those of L1, L1 constructions can serve as the basis for the L2 constructions, but, because even similar constructions across languages differ in detail, the acquisition of the L2 pattern in all its detail is hindered by the L1 pattern (Odlin, 1989; Robinson & Ellis, 2008b).

Languages lead their speakers to experience different "thinking for speaking," and thus to construe experience in different ways (Slobin, 1996). Learning another language involves learning how to construe the world like natives of the L2, "rethinking for speaking" (Robinson & Ellis, 2008a). Thus cognitive linguistics emphasizes how language is learned from participatory experience of processing language during embodied interaction in social contexts where individually desired nonlinguistic outcomes (e.g., a cup of tea) are goals to be achieved by communicating intentions, concepts, and meaning with others. An understanding of participation in situated action is thus essential to the understanding of meaning and the acquisition of linguistic constructions in L1 and L2. Nobody can really understand the meaning of a British "cup of tea" without going through the ritual.

Attention affects our understanding and construal of situations. Conceptual relevance determines the salience of events and their features. Language can bring particular elements into attentional focus and background others. We do not perceive the world; we perceive an attended subset of it. The intake is far less than the available input (Corder, 1973; Gass, 1997), and this is true both for the form layer of the associative network and for the meaning layer. The inputs to our associative networks are attentionally-gated, and what is attended is negotiated in the dynamics of conversational interaction.

Learned Attention, Interference, and Transfer

Associative learning provides the rational mechanisms for first language acquisition from input-analysis and usage (N. C. Ellis, 2006a), allowing just about every human being to acquire fluency in their native tongue. Yet although second language learners too are surrounded by language, the level of ultimate attainment for even the most diligent L2 learner is

usually considerably below what a child L1 acquirer achieves, with some naturalistic L2 acquirers only acquiring a "Basic Variety" characterized by pragmatic word order and minimal morphology (Klein & Purdue, 1992). In this Basic Variety, most lexical items stem from the target language, but they are uninflected. "There is no functional morphology. By far most lexical items correspond to nouns, verbs and adverbs; closed-class items, in particular determiners, subordinating elements, and prepositions, are rare, if present at all" (Klein, 1998, p. 544). "Note that there is no functional inflection whatsoever: no tense, no aspect, no mood, no agreement, no casemarking, no gender assignment" (Klein, 1998, p. 545).

Associative learning underpins these difficulties. The Rescorla–Wagner (1972) model, a formula summarizing the results of thousands of psychological investigations of animal and human learning, states that the amount of learning induced from an experience of a cue–outcome association depends crucially upon the salience of the cue and the importance of the outcome. Low salience cues are poorly learned.

The more frequent words tend to be the shortest ones in the language. Zipf (1949) summarized this in the *principle of least effort*—speakers want to minimize articulatory effort and hence encourage brevity and phonological reduction. And it is the grammatical functors, the closed class words, that are most frequent words of the language. The top twenty most frequent words of English are *the, of, and, a, in, to, it, is, to, was, I, for, that, you, he, be, with, on, by, at* (Leech, Rayson, & Wilson, 2001). More than half of English spontaneous speech consists of functors such as these. These are the "little words" of the language which, because of their high frequency of usage, have become phonologically eroded and homonymous. The low salience of grammatical functors, the low contingency of their form–function mappings, and adult acquirers' learned attentional biases and L1-tuned automatized processing of language result in their not being implicitly learned by many naturalistic learners whose attentional focus is on communication (N. C. Ellis, 2006a, 2006b, 2007b, 2008a, 2008b). The form input to the associative network is attentionally gated, and it fails to acquire these grammatical functors because of their low salience.

Exploiting Attentional Gating—Form-Focused SLA

But the attentional gates of the network can also be manipulated. Interactional or pedagogical reactions to nonnativelike utterances can serve as dialectic forces to pull SLA out of the attractor state of the Basic Variety. When an interaction-partner or instructor intentionally brings additional evidence to the attention of the learner by some means of form-focussed instruction (Doughty & Williams, 1998; Spada, 1997) or consciousness-raising (Sharwood Smith, 1981), this can help the learner

to "notice" relevant aspects of linguistic form or form–function mapping (Schmidt, 2001). Terrell (1991) characterized explicit grammar instruction as the use of instructional strategies to draw the students' attention to, or focus on, form and/or structure, with instruction targeted at increasing the salience of inflections and other commonly ignored features by firstly pointing them out and explaining their structure, and secondly providing meaningful input that contains many instances of the same grammatical meaning–form relationship. "Processing instruction" (Van Patten, 1996) similarly aims to alter learners' default processing strategies, to change the ways in which they attend to input data, thus to maximize the amount of intake of data to occur in L2 acquisition. SLA can thus be freed from the bounds of L1-induced selective attention by some means of focus on form that is socially provided (Gass, 1997, 2002, 2003; Gass & Mackey, 2007; Lantolf & Thorne, 2006; Long, 1991; Pica, 1988, 1994) and that recruits the learner's explicit conscious processing. Form-focused instruction like this does result in more accurate SLA. Reviews of the experimental and quasi-experimental investigations into the effectiveness of explicit learning and L2 instruction (N. C. Ellis, 2005a; N. C. Ellis & Laporte, 1997; Spada, 1997), particularly the comprehensive meta-analysis of Norris and Ortega (2000) that summarized the findings from forty-nine unique sample experimental and quasi-experimental investigations into the effectiveness of L2 instruction, demonstrate that form-focused L2 instruction results in large target-oriented gains, that explicit types of instruction are more effective than implicit types, and that the effectiveness of L2 instruction is durable.

Consciousness and Learning

Form-focused instruction pulls learners out of their implicit habits, their automatized routines, by recruiting consciousness. Habits are implicitly controlled attractor states. We never think of walking until it breaks down; as we start to stumble then the feeling of falling is the negative evidence that recruits conscious control. We rarely think about driving until it breaks down; as the clutch grinds, or the child runs into the road, these are the times when we become aware of the need to escape automatized routines. "The more novelty we encounter, the more conscious involvement is needed for successful learning and problem-solving" (Baars, 1997a, p. 303). So for language too: at each point in our history of language usage, the sample of language to which we have been exposed serves as the database from which we have induced our current model of how language operates—our *modus operandi* is based on estimates of the workings of the whole that we have determined from analysis of our sample of usage (N. C. Ellis, in press). We operate according to these hypotheses until we receive negative evidence that we have erred in our analysis. Our

consciousness is raised and the tension between our implicitly controlled system and the evidence of overgeneralization to which we have been made aware serves as the interface allowing system change (N. C. Ellis, 2005a).

What is elected to consciousness affects learning. Consciousness is the publicity organ of the brain. It is a facility for accessing, disseminating, and exchanging information and for exercising global coordination and control: consciousness is the interface (N. C. Ellis, 2005a). "Paying attention—becoming conscious of some material—seems to be the sovereign remedy for learning anything, applicable to many very different kinds of information. It is the universal solvent of the mind" (Baars, 1997b, section 5). Learning is dynamic; it takes place during processing, as Hebb (1949), Craik & Lockhart (1972), Pienemann (1998), and O'Grady (2003) have all reminded us from their neural, cognitive, and linguistic perspectives. There are different forms of language learning: broadly, the implicit tallying and chunking that take place during usage (N. C. Ellis, 2002a, 2002b) and the explicit learning in the classroom that follows communication breakdown (N. C. Ellis, 2005a, sections 3–4). Implicit learning from usage occurs largely within modality and involves the priming or chunking of representations or routines within a module, with abstract schema and constructions emerging from the conspiracy of memorized instances. It is the means of tuning our zombie agents, the menagerie of specialized sensori-motor processors that carry out routine operations in the absence of direct conscious sensation or control. It is largely automatized. It operates in parallel. In contrast, conscious processing is spread wide over the brain and unifies otherwise disparate areas in a synchronized focus of activity. Conscious activity affords much more scope for focused long-range association and influence than does implicit learning. It brings about a whole new level of potential associations. It operates serially.

Consciousness too is dynamic; it is perhaps the prototype example of an emergent phenomenon: the stream of consciousness is one of ever-changing states, each cued by prior state and perceptual context, the units of consciousness being identifiable as patterns of brain synchrony in time. The dynamics of language learning are inextricably linked to the dynamics of consciousness, in neural activity and in the social world as well. Input to the associative network is gated by consciousness.

Dialogue and Dialectics

Language use and consciousness are both socially emergent too. Language use, social roles, language learning, and conscious experience are all socially situated, negotiated, scaffolded, and guided. They emerge in the dynamic play of social intercourse. Our expectations, systematized and

automatized by prior experience, provide the thesis, our model of language, and we speak accordingly. If intelligibly and appropriately done, we get one type of social reaction, and conversation focuses further on the intended message, meaning, and communication. If not, we may get another type of social reaction that helpfully focuses our attention on what we do not yet know how to do (Gass, 1997, 2002, 2003; Gass & Mackey, 2007; Long, 1982; Mackey, 2007, in preparation). Through the provision of negative feedback, be it a clarification request or possibly a recast, some dialectic, an antithesis which contradicts or negates our thesis, our model of language, and the tension between the two, being resolved by means of synthesis, promotes the development of our language resources.

The usual social-interactional or pedagogical reactions to nonnative-like utterances involve an interaction-partner or instructor bringing additional evidence to the attention of the learner by some clarification request, or negative feedback, or correction, or focus-on-form, or explicit instruction, recruiting consciousness to overcome the implicit routines that are non-optimal for L2 (N. C. Ellis, 2005a; Gass, 1997, chapters 5 & 6). Learning is ever thus. It takes place in a social context, involving action, reaction, collaborative interaction, intersubjectivity, and mutually assisted performance (Donato, 1994; Lantolf, 2006; Lantolf & Appel, 1994; Lantolf & Pavlenko, 1995; Lantolf & Thorne, 2006; Ricento, 1995; van Geert, 1994). Speech, speakers, and social relationships are inseparable (Norton, 1997). Activity theory emphasizes how individual learning is an emergent, holistic property of a dynamic system comprising many influences, social, individual, and contextual (Lantolf & Appel, 1994). Action provides a context within which the individual and society, mental functioning, and sociocultural context can be understood as interrelated moments (Wertsch, 1998; Wertsch, Del Rio, & Alvarez, 1995). Uttering invokes feedback that is socially provided (Tarone, 1997) and that recruits the learner's consciousness. Indeed consciousness itself is an emergent end product of socialization (Vygotsky, 1980; Wertsch, 1985). The associative network is culturally gated.

Keck, Iberri-Shea, Tracy, and Wa-Mbaleka (2006) synthesized the findings of the last twenty-five years of experimental studies investigating whether interaction facilitates the SLA of specific linguistic structures. Their meta-analysis showed that treatment groups involving negotiated interactions substantially outperformed control groups with large effect sizes in both grammar and lexis on both immediate and delayed posttests. Their analysis of the moderating variables additionally demonstrated that, as Loschsky and Bley-Vroman (1993) initially proposed, communication tasks in which the target form was essential for effective completion yielded larger effects than tasks in which the target form was useful but not required. The first conclusion then is that successful usage of a construction that is essential for communication promotes acquisition;

if that construction is initially unknown by the learner, interaction with a native speaker can help shape it, scaffolding its use and acquisition by allowing the learner to consciously notice and explore its form. But there is more to their analysis. The comprehensible output hypothesis (Swain, 1985, 1993, 1995, 1998) proposed that in addition to comprehensible input, comprehensible output contributes towards L2 acquisition because learners make their output more comprehensible if obliged to do so by the demands of communication. Eight of the unique sample studies in the meta-analysis of Keck et al. (2006) involved pushed output, where participants were required to attempt production of target features, often because they played the role of information-holders in jigsaw, information-gap, or narrative tasks. On immediate posttests, the tasks involving pushed output produced larger effect sizes (d = 1.05) than those without (d = 0.61). Taking these findings together, this meta-analysis demonstrates the ways in which conscious learning, recruited in social negotiations that scaffold successful learner comprehension and, particularly, production, promotes the acquisition of targeted linguistic constructions.

Conclusions

I started with a good old-fashioned psycholinguistic (GOP) analysis of language acquisition as the associative and cognitive processes of learning linguistic constructions as form–meaning pairings, and connectionist accounts of how linguistic generalizations emerge in associative networks from the patterns latent in a learner's usage history. But today's psycholinguistics, let us call it a modern augmented psycholinguistics (MAP), realizes that these associative networks are multiply embedded—they are embodied, attentionally- and socially-gated, conscious, dialogic, interactive, situated, and cultured. Language use, language learning, and conscious experience are all socially situated, negotiated, scaffolded, and guided. Language is constructed in social interaction.

It is difficult to analyze all of these components at once with the same rigor that is possible in a more focused attack, and hence they do not come to the fore in all computational and corpus linguistic psycholinguistic research. Yet they do feature. Krushke's (1992, 1996; Kruschke & Johansen, 1999) computational models of associative learning include mechanisms of attention where each cue is gated by an attentional strength, total attention is limited in capacity, and the attention allocated to a cue affects both the associability of the cue and the influence of the cue on response generation. Thus, an exemplar unit does not record the raw stimulus, but the *stimulus as perceived*. Chen, Ballard, and Aslin's (2005) connectionist model of word learning, already mentioned, has elements of joint attention guided by gaze-following. There is considerable

work on the ways that the constructions used by one speaker affect the use and availability of the same constructions in their conversation partner by syntactic priming (Bock & Griffin, 2000; Boyland & Anderson, 1998; McDonough, 2006; McDonough & Mackey, 2006), and much of Pickering's research (Branigan, Pickering, McLean, & Cleland, 2007; Frisson, Rayner, & Pickering, 2005; Pickering, 2006; Pickering, Branigan, Cleland, & Stewart, 2000; Pickering & Garrod, 2006; Schoonbaert, Hartsuiker, & Pickering, 2007) concerning the "dance of dialogue" is an explicit effort towards a new dialogic psycholinguistics.

The associative networks underpinning psycholinguistics are no more incommensurate with social action than are those underpinning human motor action and their integrated reflexes. As Sir Charles Sherrington, Nobel Laureate for his work on reciprocal innervation and inhibition in the neural networks of the spinal cord, put it: "If it is for mind that we are searching the brain, then we are supposing the brain to be much more than a telephone-exchange. We are supposing it as a telephone-exchange along with the subscribers as well" (Sherrington, 1941, p. 282).

A socioculturalist writing such a chapter would have started, I guess, with the necessity of interaction itself. Then, they too must surely have realized the insufficiencies of such beginnings. Socio-cultural processes, like associative and cognitive ones, are domain-general. They ignore the centrality of domain-specific problem spaces and causal frameworks. Without the details of psycholinguistic analysis, any understanding of language must be incomplete. A driving force of the interaction approach, as clearly exemplified in Gass (1997), is its dynamic integration of the social, psycholinguistic, and cognitive forces in SLA.

Domain-specific analyses are insufficient, and ever will be. Language is a distributed emergent phenomenon. People and language create each other, grow from each other, and change and act under the influence of each other. Language and cognition are mutually inextricable; they determine each other. Language has come to represent the world as we know it; it is grounded in our perceptual experience. Language is used to organize, process, and convey information, from one person to another, from one embodied mind to another. Learning language involves determining structure from usage and this, like learning about all other aspects of the world, involves the full scope of cognition: the remembering of utterances and episodes, the categorization of experience, the determination of patterns among and between stimuli, the generalization of conceptual schema and prototypes from exemplars, and the use of cognitive models, metaphors, analogies, and images in thinking. Language is used to focus the listener's attention to the world; it can foreground different elements in the theatre of consciousness to potentially relate many different stories and perspectives about the same scene. What is attended is learned, and so attention controls the acquisition of language itself. The

functions of language in discourse determine its usage and learning. Language use, language change, language acquisition, and language structure are similarly inseparable. There is nothing that so well characterizes human social action as language.

Cognition, consciousness, experience, embodiment, brain, self, and human interaction, society, culture, and history are all inextricably intertwined in rich, complex, and dynamic ways in language. We cannot understand language unless we have a good interaction approach. But not just social interaction. We require additional perspectives on dynamic interactions at all levels, perspectives provided by approaches such as Emergentism (Bybee, 2005; Bybee & Hopper, 2001; N. C. Ellis, 1998; N. C. Ellis & Larsen Freeman, 2006a, 2006b; Elman et al., 1996; MacWhinney, 1999), Chaos Complexity Theory (Holland, 1992, 1998; Larsen-Freeman, 1997; Larsen-Freeman & Cameron, in press), and Dynamic Systems Theory (de Bot, Lowie, & Verspoor, 2007; N. C. Ellis, 2007a, 2008a; Port & Van Gelder, 1995; Spivey, 2006; Thelen & Smith, 1994; van Geert, 1991).

Notes

1 This chapter is based upon a presentation at AAAL 2007 in the symposium "Multiple Perspectives on Interaction in SLA" organized by Susan Gass and Alison Mackey. A more visual summary in PowerPoint form is available at http://web.mac.com/ncellis/Nick_Ellis/Presentations.html.

2 Some cognitive linguists might balk at this attribution of lineage, not because of the roots in structuralist linguistics and in cognitive psychology, but because of the implied degree of resemblance. As in Golding (1955), there has been considerable evolution between ancestor and descendant.

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2

A VARIATIONIST PERSPECTIVE ON THE INTERACTION APPROACH[1]

Elaine Tarone

There is a growing recognition of the need to expand the theoretical scope and the database of SLA research, including using the interaction approach, to move beyond a narrowly cognitive orientation to include the impact of social factors on cognition. So, for example, a collection of papers in a special issue of the *Modern Language Journal* that is dedicated to exploring the topic was published in December 2007. In April 2007, leading researchers gathered in an international conference to discuss the social and cognitive aspects of second language learning and teaching at The University of Auckland, New Zealand, to result in an edited volume on the same topic. Work relating the social and the cognitive in SLA promises both to enlarge a database on learner language which has been too narrowly focused on educated learners in schools and academia (Bigelow & Tarone, 2004; Tarone & Bigelow, 2005), and to expand the theoretical scope of SLA.

The learner language database includes almost no data[2] from uneducated or illiterate L2 learners (though there are actually a great many such L2 learners worldwide), and so SLA researchers can assert little about their oral L2 processing and acquisition. New research suggests that the processes of SLA may be altered by the individual characteristics of these different populations. Studies in new social contexts, replicating some of the excellent studies carried out in traditional contexts using the interaction approach, promise to yield many new insights. One such study replicating Philp's (2003) university study in the interaction analysis tradition, showed that literacy level significantly affected L2 learners' accurate recall of oral recasts (Bigelow, delMas, Hansen, & Tarone, 2006). More such replications with nontraditional learners are needed to expand the body of research findings on learner language.

The argument for expanding SLA theory also begins with the recognition that theoreticians cannot develop a solid theory of the human capacity for SLA without good data from humans in a wide range of social and educational contexts. As already pointed out, SLA research studies, particularly studies of adolescents and adults, have been carried out almost exclusively in school and university contexts—typically either the classroom or the laboratory. As theoretical interest in such core theoretical constructs as attention, input, output, and corrective feedback has grown, researchers have focused almost exclusively on the way these constructs function within a population of educated adult learners in university settings. They have almost never examined the way these constructs function for adult L2 speakers *outside* school or university settings, in such social settings as the service encounter, the factory floor, the white collar office, the interview (e.g., doctor–patient, formal radio or television), or the potluck supper. Indeed, Long (1998) has argued on the basis of his theory that the cognitive processes of SLA are completely unaffected by social contextual variables:

> Remove a learner from the social setting, and the L2 grammar does not change or disappear. Change the social setting altogether, e.g., from street to classroom, or from a foreign to a second language environment, and, as far as we know, the way the learner acquires does not change much either, as suggested, e.g., by a comparison of error types, developmental sequences, processing constraints, and other aspects of the acquisition process in and out of classrooms. (p. 93)

If Long's statement above is correct, then there is no need to compare learner performance in different social contexts. However, no empirical evidence is cited to support Long's claim. Quite the contrary. Long asserts that it is up to other researchers to prove he is wrong. Long's statement thus actually functions as a set of hypotheses that should be tested in SLA research as we move beyond the pale of academia. Does the way the learner acquires an L2 in and out of classrooms change if we look at specific aspects of the acquisition process? Specifically, in considering the role of social context in the interaction approach to SLA, do constructs that are central to the interaction approach—constructs such as attention, input, output, and corrective feedback—function the same, or differently, in classroom vs. non-academic contexts?

This chapter takes the position that these constructs should be viewed, not as solely cognitive, but as sociocognitive, in that social setting influences all of them: attention, input, output (including sequences of L2 development), and corrective feedback. The chapter will focus on two central tenets of the interaction approach, as summarized by Mackey

and Gass (2006), to explore ways that variationist research and theory can improve our understanding of the intricate interrelationships among social context, cognition, and the development of a linguistic system in SLA. I hope to show the relevance of a variationist perspective for research using the interaction approach.

In the discussion below, I follow R. Ellis (2007b) in returning to a central distinction about sociolinguistic research that was made originally by Fasold (1984, 1990)—the distinction between the sociolinguistics of society (using language as a starting point for examining societal issues) and the sociolinguistics of language (examining the impact of social factors on the way language is used). As Ellis (2007b) points out, both types of sociolinguistics have generated research in SLA. Language socialization studies in SLA (usefully described in Duff, 2007) derive from the approach used in the sociolinguistics of society, whereas variation studies in SLA draw upon scholarship in the sociolinguistics of language (cf. Tarone, 2007a, 2007b). It is the latter discipline (the sociolinguistics of language, or variationist linguistics) I will rely on in discussing the tenets of the interaction approach. The two tenets of the interaction approach, as articulated by Mackey and Gass (2006) are:

1. Attention (and noticing) is a central component in development. Some acquisition happens incidentally, but some type of focus on form is necessary for certain types of learning.
2. There is a link between interaction and learning with a focus on three major components of interaction: exposure (input), production (output), and feedback.

I will argue first that attention is not just a cognitive process, but rather is sociocognitive in nature, in that social factors such as audience and formality of the social context affect the amount of attention paid to language form (and by extension to "certain types of learning"). Then, I will cite research showing that social context affects the input, output, and corrective feedback provided in SLA. Because social context demonstrably has an impact on attention, input, output, and feedback, it will be important for researchers in the interaction approach to expand their theory to take account of it and to more systematically control and manipulate social contextual variables in order to improve our understanding of their impact on cognition in SLA.

Attention and Social Context

Attention to language form is not just a central construct in the interaction approach of SLA; it is also a central construct in sociolinguistics. Indeed, for several decades now, attention to language form and the social factors that differentially direct that attention has been the subject of theoretical and empirical study in sociolinguistics (e.g., Bell, 1984; Labov, 1972). SLA scholars in general, and especially those using the interaction approach, can benefit from considering the insights gained in this well-established, related field of study.

In 1972, Labov proposed the Observer's Paradox, which is now a foundation of research on the sociolinguistics of language. The paradox, originally applied to the speech of monolinguals who may or may not be bi-dialectal, consists of the following axioms:

- Every speaker produces a range of speech styles.
- These speech styles can be ranged on a continuum based on the amount of attention paid to speech.
- The speech style produced when the speaker pays least attention to speech is the most systematic style. Referred to as the "vernacular" style, this is the unmonitored speech style used in meaning-focused communication.
- When speakers are observed by researchers, they pay attention to their speech, and incorporate elements of more formal speech styles in an unsystematic manner.
- The "paradox": researchers want to study the vernacular, but the act of observation causes the speaker to style-shift away from the vernacular.

In 1979, I postulated that these same dynamics must also apply to the use of interlanguage (Tarone, 1979). Learners' interlanguage is best conceptualized as a set of speech styles; the speech style produced when the learner is focused on meaning (the "vernacular" style) contains a different set of forms from the speech style produced by that same learner when focused on form (the "careful" style). Empirical, quantitative research studies by numerous variationist SLA scholars, a body of research summarized in Tarone (1988), clearly supported this view of the nature of learner language. The language forms learners produce change when those learners shift their attention from meaning to form or back again. As a consequence, second-language learners may be consciously aware only of the forms they produce in their most careful style. Their most casual interlanguage style, the one used when focused entirely on meaning, is characterized by unconscious processing, and so second-language learners may be completely unaware of the L2 forms they produce

when they are focused on meaning. For example, in a recent conversation I had with an EFL speaker in Taiwan, I noticed that she was using a topicalized form in her conversation with me, as in, "My friends, they don't talk like that." When I pointed this out to her, however, she was surprised and embarrassed; she was not consciously aware that she was using that construction. Indeed, her conscious reaction was that the construction was incorrect. In other words, her casual interlanguage style was characterized by unconscious processing, and resulted in her use of speech forms perfectly appropriate to her casual style, that she would never produce in her more conscious, careful speech style.

The interaction approach, in arguing for the centrality of attention to language form as a factor in language learning, would probably find this work on interlanguage variation supportive of a view of attention as an essentially psycholinguistic construct. But they should know that scholars in sociolinguistics have found Labov's (1972) conceptualization of attention and its role in variation to be inadequate. Bell (1984) convincingly argues that attention in and of itself cannot be a root *cause* of style shifting. Attention can only be an intermediary cognitive process, because what attention gets focused on is directed in turn by other factors—namely, social factors in the speaking situation. The most influential of these social factors, Bell argues, is the interlocutor—the addressee and other participants in the speech event. Bell shows that the cause of shifts of attention from one form to another, or from form to meaning, must be a set of social factors and, most centrally, the internalized social factor of *audience*. Bell defines audience as the interlocutor as well as a widening ring of participants, who may or may not be physically present at the time of speaking.

Speech accommodation theory (SAT) (Beebe & Giles, 1984) describes the dynamics of a speaker's accommodation to the speech patterns of others in a way that is entirely supportive of Bell's style axiom. Accommodation is defined as a strategy of identification with the communicative norms of some reference group. A series of studies carried out by Beebe and her colleagues in the 1980s (e.g., Beebe, 1980; Beebe & Zuengler, 1983; Beebe & Takahashi, 1989) assembled an impressive body of quantitative evidence supportive of SAT, showing how L2 learners shifted their language patterns to become more similar to the patterns used by those with whom they were speaking. So, for example, Thai speakers were shown to use more Thai pronunciation variants when speaking with Thai interlocutors, and more Chinese variants when speaking with Chinese interlocutors. This is a process SAT calls "convergence."

Interestingly, both Bell (1984) and SAT scholars (Beebe & Giles, 1984) view *audience* as more than simply those who are physically present at the

time of speaking. Both define *audience* as including both those present and those absent at the time of speaking. Interestingly, in both theories, there is a postulated relationship between social context and cognition such that the speaker internalizes social representations of addressees who are associated with particular speech styles. So, for example, a teacher is associated with a standard, or formal, speech style, and an old friend with a vernacular speech style. On occasion, a speaker may produce an informal speech style in a formal context, by intentionally invoking an internalized audience other than the interlocutor who is physically present. In speech accommodation theory, therefore, accommodation consists of two processes, both convergence and divergence, the latter occurring when a speaker shifts in style away from an interlocutor who is physically present, and towards an absent interlocutor or group norm. An excellent example of divergence is documented by Rampton (1995), in his description of South Asian teenagers in a London classroom who consciously used *more* nonstandard *me no* variants in interactions with their English teacher in which she was trying to get them to produce the standard *I don't* variant. In interactions in other contexts, the same speakers were observed to use the *I don't* variant. They shifted to *me no* with their teacher, Rampton argued, as an expression of their resistance to mainstream culture and a sign of their identification with the South Asian speech community.

To summarize, we have seen that attention, the first core construct of the interaction approach which we have considered, is a construct which is sociocognitive in nature, not just cognitive. While attention obviously is a cognitive process, it is also a process whose focus is directed by social contextual factors such as audience and social setting. Cognitive representations of audience become associated with one or another speech style. In this way, speech production becomes, in Bell's (1984) terms, a matter of *audience design* or, in SAT terms, a process of convergence and divergence with the speech norms of an interlocutor. If all of this is the case, and if attention is indeed linked to "certain types of learning", as Mackey and Gass (2006) suggest, exactly *what* types of L2 learning might these be?

Here again, the discipline of sociolinguistics may be able to help us. In sociolinguistics, there are two fundamental types of language change over time, namely *change from above* and *change from below*[3] (Preston, 1989). *Change from above* is initiated by explicit language learning in the most careful speech style, when the speaker pays the most attention to form. In *change from above*, the innovation in the language system occurs first in the most careful style, and gradually spreads downward over time into less and less careful styles, arriving last in the least-monitored vernacular style. Many current SLA theories, particularly those which emphasize the necessity of attention to language form, model SLA as a

kind of *change from above*; these include theories which state that SLA cannot occur without conscious analysis of language forms in the zone of proximal development (ZPD[4]), or the noticing of the gap between IL and L2 language forms. But sociolinguistics tells us there is more than one kind of language change. In sociolinguistics, *change from below* is initiated by implicit language learning in the vernacular style, where attention is most focused on meaning rather than form; over time, the linguistic innovation gradually spreads upward into more and more careful styles, arriving last in the most careful speech style where the most attention is paid to language form. Preston (1989) predicts that SLA, as a form of language change, can also take the form of *change from below*.

It is interesting and instructive to note that over several decades of sociolinguistic research, both types of language change have been shown to occur in human society; they are not mutually exclusive processes. It is not unreasonable to suppose that the same two processes of language change over time occur when individuals acquire second languages. Explicit language learning may occur when a new L2 form is introduced into use in formal settings (e.g., classrooms) with conscious attention paid to language form; over time this form may gradually begin to be used by the learner in less and less careful (less-monitored) speech styles in less formal social settings (e.g., meaning-focused conversations with peers). Most current theories of SLA appear to assume and account for this kind of process of SLA: the interaction approach and the sociocultural approach both promote SLA by getting learners to pay attention to, or to analyze, language form. But L2 learners may also engage in implicit learning of language form. This would occur when a new L2 form is used first in informal settings where the learner's attention is focused entirely on meaning, and not the language forms being produced, and then the new form spreads over time to use in more and more formal settings, with a final appearance in the learner's most careful speech style. In such cases, learners may be oblivious to their own increasing use of the innovative form, and only become conscious of it when it begins to be used in the realm of conscious, or careful, language production.

In fact, *change from below* appears to be the process of second language acquisition employed in the acquisition of English questions by Bob, a 5-year-old Chinese learner of English L2 in Australia, carefully documented over a period of two and a half years (Liu, 1991; Tarone & Liu, 1995). Bob produced different levels of sentence complexity and different stages of questions in three different social settings, which were defined in terms of interlocutor and the topics Bob normally talked about with each interlocutor. The first, most formal, social setting occurred in Bob's interactions with his teacher in class, where he took few risks and tried to be accurate. A second, less formal, setting was Bob's interactions with his fellow students at desk work in class, which seems to have involved a

good deal of competitive banter about who was the best at what. The third, and most informal, setting was Bob's interactions at home, playing with the researcher. The researcher filled the role of "Chinese uncle"—described in Liu (1991) as someone a child can play with, tease, and argue with. He and Bob spent a good deal of time playing with Lego or coloring pictures, and their discourse focused on these activities. Examples of his discourse in these three settings are provided in Tarone and Liu (1995) and in Tarone (2007b).

Bob's patterns of language use shifted dramatically across these three settings. Tables 2.1 and 2.2 show that he initiated fewest turns and used the simplest syntax in the formal setting of interactions with his teacher, and used the most complex syntax in interactions in the informal setting, at home with the researcher.

Over time, Bob's stages of acquisition of English questions were related to these three social settings as well, and followed a class pattern of *change from below*. Almost every new stage of question first appeared at home, then at desk work, and last with the teacher. Innovation in question formation almost always occurred fastest in the informal, at-home social setting, and spread gradually to more formal social settings over the course of weeks, appearing last in the most formal classroom setting: conversations with the teacher. Indeed, Bob's teacher was always the last to know when Bob had moved to a new stage of question formation.

It is interesting in this particular case that these social settings also affected the order of Bob's acquisition of question stages. This is a particularly startling finding in view of the claim (Meisel, Clahsen, & Pienemann, 1981; Pienemann & Johnston, 1987) that question stages must always be acquired in a set order, from Stage 1 through 5, regardless

Table 2.1 Complex Structures Produced by Bob in Three Contexts

Context	*Number*	*Percentage*
With teacher	0	0%
With peers	40	18%
With researcher	177	82%

Table 2.2 A Comparison of Initiations and Responses in Three Contexts

Context	*Initiations*	*Responses*	*Total*
With teachers	74 (29%)	186 (71%)	260 (100%)
With peers	1798 (73%)	651 (27%)	2449 (100%)
With researcher	3497 (61%)	2219 (39%)	5716 (100%)

of social context. But, for Bob, Stage 4 and 5 questions appeared before Stage 3 questions. Stages 4 and 5 emerged at the informal at-home social setting in Sessions 23 and 24, but Stage 3 did not appear until Session 36, and then it was in the social setting of desk work with peers.

Clearly, something in these three different social settings affected Bob's cognitive processing and internalization of new L2 rules to such an extent that he acquired them out of their so-called universal order. It could be argued that *social role* was an important variable in this process, affecting Bob's willingness to take the risk of initiating utterances at all. Bob took few risks with his teacher; this seems to have been because Bob chose to perform the role of the obedient student in interactions with her in her role as the teacher, responding minimally and with simple syntax to her initiations in conversation. He initiated far more utterances, and produced more complex utterances with the researcher, playing his role of "nephew" to that of the researcher's "Chinese uncle." In interactions with his peers, Bob also initiated turns more than he did with the teacher; the boys' roles in this social context involved in a good deal of competition and jockeying for social position within the group.

We have seen that a sociolinguistic—specifically, a variationist—perspective on the construct of attention, a central construct for the interactionist approach, allows us to distinguish between two possible kinds of longitudinal process of acquisition—*change from above*, an explicit process of L2 development, initiated in formal contexts like the classroom where the learner's attention is focused on language form, and *change from below*, an implicit process of L2 development, initiated in casual contexts where the learner's attention is focused on meaning rather than language form. Empirical evidence demonstrates the existence of both kinds of L2 development, and more can be gathered to help us better understand how these two types of L2 development function in the social world of the learner.

Input, Output, and Corrective Feedback in Social Context

The second tenet of Mackey and Gass (2006) to be considered here is:

2. There is a link between interaction and learning with a focus on three major components of interaction: exposure (input), production (output), and feedback.

It is very clear that all three of these major components of interaction are affected in major ways by social contextual variables (Tarone, 2000, 2007a, 2007b, 2007c). First, the L2 input learners get is affected by social context. If decades of research on sociolinguistic variation have shown

anything at all, it is that speakers of any target language use different varieties of that language in the different social contexts in which it is spoken; a formal variety is appropriate in business meetings or classrooms, while a vernacular variety is used with friends in a bar. So social context affects the social variety of the L2 learners are exposed to. If learners are restricted to only one social context and need to learn varieties of L2 that are spoken in other social contexts, their overall SLA can be affected. Selinker & Douglas (1985) provide examples of university ESL students who have mastered the variety of academic English needed for interaction focused on their field of study, but not varieties needed for social interactions in other settings, such as cooking in the kitchen. In many cases, international students have simply not been exposed to such social settings where English is used. A similar situation occurs in language immersion classroom settings, where L2 input consists only of one (academic) variety; Tarone & Swain (1995) show that immersion learners' need to learn an unavailable variety of L2, namely, an age-appropriate vernacular variety of the L2, can cause them to refuse to use the L2 at all when talking to one another in immersion classrooms, and eventually results in spread of L1 use to inappropriate academic contexts.

Susan Gass has both carried out studies and written research reviews in the interaction approach that support the position that context has a major impact on input. For example, she conducted a study on the kinds of comprehensible input provided to L2 learners in a non-university social context (Varonis & Gass, 1985). The study asked whether native speaker interlocutors in a business context adjusted second-language input to suit the needs of L2 learners, in light of Long's claim that all types of interlocutors, regardless of social group membership, always adjust the language they address to L2 learners.[5] Varonis and Gass analyzed a long telephone conversation between a native speaker staffing a TV repair shop and an L2 learner who had called the repair shop mistakenly, believing that it was a TV sales shop. They found that, in that non-academic social context, the native speaker did *not* make the kinds of linguistic accommodations for the learner that had been made in academic contexts. The TV repair shop receptionist spoke rapidly, used contractions and idiomatic language, and did not show the conversational adjustments which Long (1983) claimed to occur regardless of social situation and interlocutor.[6] Gass's (1997) review of other studies on input, interaction, and second language learner also concluded:

> It would be too simplistic to assume that these integral parts of negotiation sequences occur without influence from the context in which they appear. To the contrary, many factors affect the structure of conversation.

Gass's conclusions are similar to those drawn more recently by Lafford (2006), in her report of the findings of her comprehensive review of SLA in study abroad vs. at home classroom settings. Lafford's conclusions apply more directly to SLA outcomes and tie these to the interaction between cognition and social contextual variables:

> It is not the context of learning alone, but rather individual learner perceptions of specific characteristics of the contexts (*setting, participants [status and roles], end/purpose, norms of interaction and interpretation*) that interact with cognitive factors (*controlled vs. automatic processing, working memory*) to account for differences in linguistic performance among L2 learners in classroom and study abroad contexts (p. 18).

So input, a central construct of the interaction approach, is clearly affected in nontrivial ways by social context.

The second construct of interest to the interaction approach, learner output—the spoken language forms produced by L2 learners—is also clearly affected by social context. In the first part of this chapter, we examined the predictions of (SAT), that L2 learners will make sensitive adjustments in their L2 speech production, either for accommodation or divergence, when they converse with different interlocutors. The predictions of SAT that the interlocutor will have a systematic impact on L2 use are borne out, for example, in Broner (2001). Her detailed quantitative VARBRUL[7] analysis of L2 learner discourse in a 5th grade Spanish immersion classroom showed conclusively that different interlocutors significantly influenced L2 learners' use of either L1 or L2, in an intricate and nuanced performance involving accommodation to some peers and divergence from others.

A large number of similar variationist SLA studies, many of them providing a VARBRUL analysis of the complex interaction between social context and specific L2 forms in learners' output, have now been conducted, documenting the variety of ways in which social contextual variables affect the production of L2 forms by L2 learners. Just a few of the more recent of these are Dewaele (2004), Gatbonton, Trofimovich, & Magid (2005), Geeslin (2003), Lybeck (2002), Regan (2004), Segalowitz & Freed (2004), Thomas (2004), and Uritescu, Mougeon, Rehner, & Nadasdi (2004). These studies demonstrate that statistical modeling of L2 learners' variable performance, using VARBRUL and other sophisticated statistical tools, can be extremely effective in documenting the way in which complex, interacting social contextual variables directly affect learners' use of specific interlanguage forms over time.

A detailed sociolinguistically based sociocognitive model of speech output for SLA has been developed by sociolinguists Dennis Preston and

Ralph Fasold (Fasold & Preston, in press; Preston, 2000, 2001). This model shows the intricate influences of social and linguistic contextual factors on L2 learner knowledge and output. The model posits a separate grammar for each language known, each of which has the capacity to systematically shift the frequency of production of specified variants of linguistic forms in response to diverse interlocutors and social contexts. Many of the dynamics discussed above with regard to attention, input, and output are incorporated in this model. For example, it is assumed in this model that some speaking styles of L1 are implicitly acquired, while others are formed through more explicit learning. In addition, some speech styles within each language are not as deeply embedded in cognition as others, meaning they are not as easily accessed; these styles require more conscious attention when they are used. In this model, the entire L2 knowledge base may also be less "deep" than the entire L1 knowledge base; the "depth" of the grammar knowledge base is characterized by relative uncertainty on the part of the speaker in using that knowledge base in speaking.

Finally, feedback, the third construct of interest to the interaction approach, is quite clearly affected by social context. The discussion of attention earlier in this chapter suggests that a centrally important factor related to the efficacy of feedback has to do with the source of the feedback—the interlocutor, and the learner's relationship to him/her. Just as learners converge in speech production with some interlocutors, and diverge from others, so also it must be assumed that feedback from some interlocutors is more socially valued by the learner than feedback from others. Specifically, one would expect that learners would value and attend to feedback the most when it comes from valued interlocutors with whom the learners converge in interaction. More research evidence is needed to explore the degree to which learners attend to feedback differentially when it comes from different interlocutors.

There is certainly evidence that the general factor of *social context* affects the degree to which learners notice corrective feedback. Kormos's (1999) review of findings of several studies on error detection and repair concludes that error detection depends not just on psycholinguistic factors like availability of attention, but also on factors of social context such as the "accuracy demand of the situation" and "various listener-based discourse constraints" (p. 324). Nicholas, Lightbown, and Spada (2001), in a review of research studies on L2 learners' awareness of negative feedback, also conclude that such awareness is affected differently by different social contexts:

> There are differences between the findings of laboratory and classroom studies, differences between primarily structure-focused and primarily content-focused classrooms, and differences

between observational studies of naturally occurring feedback patterns in classrooms and experimental studies that focus on specific linguistic features and feedback types (p. 751).

Conclusion

The interaction approach has generated a tremendous amount of knowledge about the processes of SLA. Based in a predominantly psycholinguistic model of learning, the interaction approach could still benefit from expansion in both theoretical scope and database, to take into account the impact of social context on those same cognitive processes upon which it has focused over the last two decades. There is ample evidence, cited above, that such an expansion, if it is informed by the insights and empirical evidence drawn from our neighbor discipline of variationist linguistics (the sociolinguistics of language) will be extremely rewarding. A sociolinguistic model of SLA such as that of Fasold and Preston (in press), that includes both cognitive and social processes and variables, can expand and improve the productive capacity of the interaction approach to SLA. The foundation laid by Susan Gass and her colleagues is very strong, and, if it does expand to help us explore the interaction of cognitive factors with sociolinguistic ones, should continue to provide the basis for productive research and new insights for many years to come.

Notes

1 An earlier version of this paper was presented as part of an invited colloquium, "Multiple Perspectives on Interaction in SLA", Sue Gass and Alison Mackey, organizers, at the annual conference of the American Association for Applied Linguistics, April 24, 2007, Costa Mesa, CA. I have benefited in my thinking for this paper from input from Rob Batstone, Rod Ellis, Dennis Preston, and George Yule. Errors and misapprehensions are my own, not theirs.

2 The two notable exceptions to this statement were the European Science Foundation Project (ESF), which examined the SLA of working class adult immigrants with limited education (Perdue, 1993), and the ZISA project (see, e.g., Meisel, Clahsen, & Pienemann, 1981), which tracked the SLA of two general groups of learners distinguished from one another by amount of previous education. It is fair to say that little has been published on the interlanguages of uneducated learners since the early 1980s.

3 The curious reader will find a succinct discussion of *change from above* and *change from below* as applicable to L2 learner language on pp. 143–144 of Preston (1989).

4 A thorough discussion of the ZPD in sociocultural theory can be found in Lantolf (2000).

5 ". . . linguistic and conversational adjustments . . . appear to be immune to differences among groups/types of learners" (Long, 1983, p. 184).

6 Bondevik's (1996) controlled study in a Minnesota electronics store drew very

similar conclusions. In this study, each of four salesmen failed on three different occasions to accommodate to different L2 learner listeners by making linguistic and conversational adjustments.

7 VARBRUL, or variable rule analysis, is a free statistical tool commonly used in quantitative sociolinguistic research to create a multivariate statistical model of a speaker's performance using stepwise logistic regression. See Young and Bayley (1996) for a detailed account of how to use VARBRUL for SLA research.

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3

LANGUAGING IN COLLABORATIVE WRITING

Creation of and Response to Expertise[1]

Lindsay Brooks and Merrill Swain

In this chapter we report on a study of interaction framed within a sociocultural theory of mind (SCT) perspective. This is not the framework within which Sue Gass ever conducted her research and writings. However, Sue's research and theoretical understanding of SLA, as represented in Gass (1997), has been foundational in this field. And it has been the basis for lively and stimulating discussions between Sue and the second author of this chapter. Furthermore, those discussions have been held in lively and stimulating settings such as Madrid and Beijing, providing each conversation with a particular sociocultural context that, for me (Merrill) at least, enhanced their memorability.

In this chapter, through the SCT framework and the view of the zone of proximal development (ZPD) as an activity emerging in interaction, we examine the impact of different sources of expertise on the process of second language learning. The learning in this study is revealed in the languaging (Swain, 2006) that occurs in a set of interactive activities in which four adult learners studying English as a Second Language (ESL) collaboratively produce written texts in pairs. We start with an overview of sociocultural theory and languaging, peer expertise, and the zone of proximal development, and we then move on to discuss reformulation as a mediational tool before presenting the study.

The interaction between learners working together in collaborative tasks can provide insight into their social and cognitive processes (Lantolf, 2000b; Wertsch, 1985) because the internalization of all cognitive processes (higher mental processes) is socially mediated, and development of these processes involves transformation of the interpsychological (social) to the intrapsychological (individual) plane. It is in the zone of proximal development (ZPD) (see below) that the social and individual come together (Daniels, 2005) and are transformed. The ZPD is also

where the signs (psychological tools such as speech) and tools (technical tools) function as mediational means (Daniels, 2005).

When second language learners use language as a cognitive tool to negotiate meaning and problem-solve, either in writing or in speaking, they are engaged in languaging, "a dynamic, never-ending process of using language to make meaning" (Swain, 2006, p. 96). Languaging is an activity that mediates cognition (thought). According to Vygotsky (1987), thought and language are inseparable and "the relationship of thought to word is not a thing but a process, a movement from thought to word and from word to thought" (p. 250). It follows that learners *engaged* in languaging about language shape their cognition and, thus, their learning (Swain, 2006). Whether learners *actually* learn involves their agency (Lantolf & Thorne, 2006) and the creation of a ZPD (Vygotsky, 1978). The ZPD determines "the potentials for instruction" (Vygotsky, 1987, p. 211) and the learners, as "agent(s)-acting-with-mediational means" (Wertsch, 1998),[2] interact in the ZPD. It is through this interaction that learners as agents respond to and create expertise.

Peer Expertise

The Vygotskian concept of the zone of proximal development characterizes the difference between what one can do individually and what one can accomplish with assistance from an expert. According to Vygotsky, in the context of young learners, ". . . with collaboration, direction or some kind of help the child is always able to do more and solve more difficult tasks that [*sic*] he can independently" (Vygotsky, 1987, p. 209). The ZPD is not static but is "created in the course of social interaction" (Tudge, 1999, p. 197) as the activity unfolds. In Vygotsky's writings the learners were children, while an adult or more competent peer customarily provided the expertise (Vygotsky, 1978). Hogan and Tudge (1999) maintain that, despite the fact that much of Vygotsky's research focused on adult-child interaction, his theory "has tremendous implications for our understanding of peer collaboration" (p. 40). Some researchers have extended the concept of ZPD to include peer–peer interaction between adults and more specifically, between adult second language learners (Donato, 1994; Ohta, 2000, 2001).

Within this broader understanding of the zone of proximal development, despite the fact that there is often no clear expert in peer interaction, the concept is still applicable (Ohta, 2001; Swain, 2000; Swain & Lapkin, 1998; van Lier, 1996; Wells, 1996). The ZPD may be "more appropriately conceived of as the collaborative construction of opportunities" (Lantolf, 2000a, p. 17) or, alternatively, "occasions for learning" (Swain & Lapkin, 1998). These occasions for learning can emerge in pairs (Antón & DiCamilla, 1998; Brooks, 1992; Ohta, 1995) doing collaborative

tasks. In collaborative writing, often the role of expert is fleeting and changing as the learners draw on their individual expertise to contribute to the co-construction of text or provide scaffolded help for their partners (Donato, 1994; Storch, 2002). For language learners, this interaction can push them to internalize new language abilities using language as a cognitive tool to mediate their linguistic problem-solving with peers.

In a longitudinal study of pairs of adult ESL students engaged in collaborative classroom-based writing activities, Storch (2002) examined the nature of pair interaction and classified the dyadic interactive patterns of ten pairs of learners in her study according to whether each pair adopted a collaborative, expert/novice, dominant/dominant, or dominant/passive orientation to the writing tasks. Storch represented these four interactional patterns visually by placing each of them in a quadrant with the horizontal axis a continuum of low to high equality and the vertical axis a continuum of low to high mutuality (see Damon & Phelps, 1989). She found that the most predominant pattern of interaction was collaborative (high mutuality and high equality) and the least was expert/novice (high mutuality, low equality), with only one pair characterized by this pattern. In the collaborative interactional pattern, the role of "expert" was fluid, with either peer taking on the role or, more often, "pool[ing] resources whenever uncertainties arose concerning language choices" (p. 147).

Storch also examined the dialogue of one pair from each of the four interactional patterns and looked for evidence of learning in subsequent tasks carried out individually. In classifying each instance according to whether there had been a transfer of knowledge, no transfer of knowledge, or a missed opportunity, she found that there were more instances of transfer of knowledge and fewer instances of missed opportunities in the collaborative and expert/novice patterns of interaction than in either the dominant/dominant or dominant/passive patterns. However, she also noted that of the instances classified as transfer of knowledge, ten were in the "wrong direction," in that incorrect resolutions in the pair work transferred to the individual performances. She suggested that a pedagogical implication is that teachers need to monitor collaborative work and provide additional assistance if needed to encourage learners' decisions to move in the "desired direction" (p. 146).

In her (2001) classroom corpus of adults learning Japanese, Ohta also found some instances of incorporation of incorrect utterances as a result of peer interaction but concluded that such rates were quite low. Another of Ohta's findings was that not only can less proficient peers benefit from interacting with more proficient peers, but the reverse is also true (see also Watanabe & Swain, 2007), and concludes that peer interaction promotes language learning.

Although peer–peer interaction can promote learning, there have been

some studies in first language (L1) contexts which show that students regress as a result of peer collaboration. Tudge (1990) conducted a study in which he paired children together depending on their predictions about a series of mathematical balance beam problems. As a pretest, different weights were placed at different distances from the fulcrum on a balance beam and children predicted the movement of the balance beam. The children's level of understanding was classified on a scale of six levels that described their degree of sophistication in making their predictions. In the treatment, there were four conditions: no partner, a partner who demonstrated the same level of understanding in the pretest, a less competent peer, and a more competent peer. For each problem the children predicted the movement of the balance beam. If in the paired conditions one of the children disagreed with the prediction, the partners had to discuss the prediction until they reached agreement. In the absence of feedback from the researcher or the materials (in this case, the balance beam), only those children paired with a more competent peer improved their solution to the problem as determined in a pre/posttest measure. However, the children considered to be more competent were more likely to regress in their thinking than were those in any of the other groups. Confidence, determined indirectly by the rules[3] that the children used in the pretest, was also found to influence whether children progressed or regressed after collaborating with a peer. Tudge used the same types of pairings to determine how the results would differ if the children received feedback from observing the materials (the balance beam). In this part of the study, after the children discussed their predictions, the supports holding the balance beam in place were removed. The children could then observe the results of their predictions. Tudge found that such feedback was as "effective as interpersonal assistance in promoting development within the zone of proximal development" (p. 166). This study is relevant to our study in that we are interested in whether different sources of expertise, including a typed reformulation of a collaboratively produced text, promote the development of the ZPD.

Reformulation

From the perspective of a sociocultural theory of mind, written texts and oral language act as tools to mediate learning and the social formation of ideas (Daniels, 2001). In the context of L2 learning, feedback in the form of instructional procedures can also assist learners in their language development (Ohta, 2001). In collaborative writing activities, such as in the present study, outsiders to the peer dyads can reformulate their text, changing any grammatical, lexical, coherence, or discourse nonstandard forms and, in so doing, provide expertise. The learners,

interacting with the reformulated text and each other, scaffold their language learning, creating their ZPD.

Reformulations of written texts are generally used to help language learners improve their writing skills through noticing differences between their own written output and that of a native speaker (Allwright, Woodley, & Allwright, 1988; Cohen, 1983; Sachs & Polio, 2007; Thornbury, 1997) and discussing those features. Allwright, Woodley, and Allwright (1988) describe the class discussion of the comparison between a student's text and that of the reformulation as the "cornerstone of the whole reformulation strategy" (p. 238). Through class discussion, teachers can assist learners in noticing the language in the reformulation and provide explanation and elaboration as to why changes were made to the original text (Hoffman, 1995). Similarly, group interaction with peers provides opportunities for learning and for deeper processing when noticing the changes made in the reformulated texts. Learners must not only notice the changes but also discuss them in order for reformulation as a method of feedback to be effective (Hoffman, 1995). In addition, in reformulation tasks, the quality of noticing may play an important role in terms of development of students' writing (Qi & Lapkin, 2001; Sachs & Polio, 2007).

Piper (1995) attempted to measure the quality of adult EFL students' utterances and the quantity of their oral contributions when they were comparing their texts to reformulated versions. She found that the students' use of "highly locally focused" comments, those that referred "to specific extracts from or features of a text" (p. 29) and their verbal contributions increased throughout the term as the students' exposure to the reformulation technique increased. However, Piper only provides two brief examples of students' utterances, so the exact quality of the interaction is not clear. Piper concludes that generally students' writing skills improved over the program although, as she concedes, many factors other than the use of reformulations may have contributed to this finding. One of the participants in her study complained of the extra time he was spending helping students in another English class which was not using reformulation as a feedback technique. Students were approaching him and others in the reformulation group with their writing drafts, because, as he said, "They think we're the experts" (p. 37).

In research with adult second language writers in a university French class, Schultz (1994) found that using reformulation techniques with class and group discussion to draw students' attention to style resulted in better sounding sentences, more grammatical accuracy, increased clarity of expression, and more sophisticated thinking. Hoffman (1995) conducted a study in which she compared the effects of types of teacher feedback on L2 students' writing. In the comparison group, each week the teacher provided feedback to the class on one student's written text by using

coded marking and written comments. The reformulation group received a reformulation of that same student's text. Both groups participated in a teacher-led class discussion about the texts and small group discussions. While the reformulation group did not improve as much as the comparison group in terms of fluency and text coherence, it showed similar gains to the comparison group in accuracy and overall quality. Hoffman concluded that reformulation as a technique of responding to student writing is beneficial in helping the learners improve their written texts.

In the present study, we use reformulation as a technique to prompt languaging about language. Learners comparing their own written text to a reformulation provide insight into the cognitive processes at work as they try to come to an understanding of why changes were made to their text. That is, through trying to mediate solutions to the language problems in their texts, the learners language about language and, as they do, we see learning in action.

The Research Questions

The research questions we address in the present study are: 1) What types of expertise emerge as learners engage in a set of collaborative activities? 2) How are the quantity and quality of types of expertise related?

Method

Participants

The participants in this study were four adult ESL learners who were at the time studying in an intensive English program. The first author of this paper had taught the students previously, but they were not in her class at the time she collected the data for the study. As collaborative learning involves respecting each other's perspectives (Stone, 1993), we wanted to choose participants who we knew would work well together and who had similar levels of language proficiency. All four participants had been in Canada for approximately seven months and were in their mid-20s. After finishing their studies, they hoped to be able to get jobs in which they used English once they returned to their home countries. Two of the participants were Japanese, and the other two were Korean. To ensure confidentiality, the four female participants will hereafter be referred to by their pseudonyms: Emi, Aya, Jinah, and Min-Hee. The four students were at an intermediate level of proficiency, as determined by their self-reported most recent Test of English for International Communication (TOEIC) scores, which ranged from 540 to 675. Emi's TOEIC score was the highest at 675; Jinah's was 650; Min-Hee and Aya had scores of 550 and 540 respectively.

Overview of Tasks

Working in pairs, the learners wrote a story collaboratively, compared the original story to a reformulation of it, and then interacted with the reformulator (first author) in an augmented stimulated recall about changes they had noticed in the reformulation. One week later the students were given back their original stories (the pretest) and asked to make any changes that they wished (the posttest).

The Collaborative Writing Task

For the writing task, the two students from the same language background were paired and given a picture prompt of "The Scene of the Crime" (see Appendix 3.1). The picture was open-ended, in that the participants could interpret the scene and co-construct the story in whatever direction their dialogue led them. In comparison to closed problems, open-ended problems afford greater opportunities for collaboration (Palincsar, Stevens, & Gavelek, 1989). The two students in each pair worked together to write a story explaining what had happened in the picture. Before starting to write, the students talked to plan their story, name the characters, and search for vocabulary (without the aid of a dictionary). Each pair produced one collaboratively written short story (see Appendices 3.2 and 3.3). They were told they had thirty minutes to complete the writing task but both pairs requested and were given more time. Their collaborative activity was videotaped and tape-recorded so that the dialogue and response to the writing task could be later analyzed. The participants were left alone in the classroom throughout their collaborative writing.

The Noticing Task

After each pair completed the writing task, they were given a short break during which time the first author reformulated their written text, changing all nontargetlike features. The students were then given the typed reformulation (see Appendices 3.2 and 3.3) and they were asked to discuss any changes that they noticed between their own text and the revised one. They were also asked to comment on why any changes might have been made. The students were videotaped and tape-recorded during the noticing task but were left alone with just the video camera and tape-recorder running.

The Augmented Stimulated Recall

Fifteen minutes later, after the students had finished, the researcher returned to the room and then, together with the students, viewed

the videotape of the noticing task. She stopped the video each time the students commented on differences between their text and the reformulation on the videotape, indicated through laughter or other nonverbal cues that they had noticed a difference, or when the students requested it because they had questions about the changes made in the reformulation. If the students could not answer their own questions and requested help from the researcher, the researcher responded. Because the researcher served this role, we are calling this session an augmented stimulated recall. The augmented stimulated recall was videotaped and tape-recorded.

The Posttest

One week after having completed the writing task, the noticing task, and the augmented stimulated recall, the students were given a typed copy of their collaboratively constructed original written text and they were asked individually to make any changes they wished by crossing out or adding to what they had written (see Appendices 3.4 and 3.5). This served as a posttest to see if the learners remembered any of the form or lexical items that had been discussed in either the noticing task or the augmented stimulated recall. In addition, in the posttest the students could have changed some of the language that they had discussed during the initial writing task or made other changes that had not been discussed.

Data Analysis

The dialogue produced during the collaborative writing task and during the noticing and augmented stimulated recall was transcribed and analyzed for instances of languaging. Analyses of the languaging also involved coding each instance as to whether it focused on form (including discourse, i.e., comments about the organization of the text) or lexis. As a coding check, another researcher with experience coding dialogue for instances of languaging independently coded the middle 20 percent of each of the transcripts. The two coders had an agreement of 92 percent.

To be classified, the instances of languaging did not have to result in a correct resolution. It is possible that the other- or self-correction could be either correct or incorrect or unresolved. Thus, for the analyses of the languaging that occurred during the initial writing task, the resolution of each was determined and categorized as correct, incorrect, or unresolved; these analyses were conducted in order to gain insight into peer–peer interaction and the expertise the learners were able to provide to each other. The languaging in the noticing task and the augmented stimulated recall was also coded as to type (form or lexis). Similarly, these analyses

were done to examine the languaging generated in response to the expertise of the reformulation and that of the researcher.

To determine whether the students learned through their languaging, we analyzed the posttests for the number and accuracy of the changes that the students made to their original text. In addition, through examining the languaging from the noticing and augmented stimulated recall, we coded each posttest change with regard to the source(s) of expertise: peer, reformulation, and/or researcher. In some cases, the students made changes to their posttests that were self-initiated and were not discussed in any of the prior tasks, and these were coded as "self" as the source of expertise. The posttest changes were scored as correct (targetlike) or incorrect (nontargetlike); the correct changes were coded for whether they matched or differed from the reformulation. The incorrect changes were coded using one of the following three categories: 1) identified only, in which case the students underlined or labeled the mistake in the posttest but made no attempt to correct it; 2) changed to less targetlike than their original attempt in writing the story or 3) changed to more targetlike than their original attempt, but still incorrect. In this study, targetlike is defined as any item that would be considered standard usage in the target language.

Results

The Collaborative Writing Task

In this section, we describe the interaction as the learners did their collaborative writing task. We then report the results of the analysis of the languaging that the learners engaged in as they interacted and made choices about what language to include as they co-constructed their stories.

As reported by the participants and as evidenced by the length of time they spent engaged in the activity, the collaborative writing task stimulated considerable dialogue. As Saunders (1989) also observed in his work on peer interaction and collaborative writing tasks, the interaction between "co-writers during idea generation [was] spontaneous, fast-paced, dialectic and wide ranging" (p. 105). Emi and Aya spent fourteen minutes discussing the story and then forty-five minutes on the writing process, which involved dialogue of 610 turns (6.1 words/turn). Jinah and Min-Hee spent about ten minutes preparing the story and then also about forty-five minutes writing and engaged in interaction 210 turns long (9.4 words/turn). Both pairs spent approximately the same time on task. Despite the differences in the number of turns, both pairs would be classified in the collaborative quadrant of Storch's (2002) dyadic interactional patterns. Their interaction during all the tasks was high in mutuality and equality,

with neither pair showing a *stable* expert/novice pattern (a point that we will return to later). With the exception of three brief lexical searches by Jinah and Min-Hee, all four participants at their own initiative used their L2 (English) throughout the activities.

In Aya and Emi's dialogue, there were ninety instances of languaging with a higher percentage relating to form than lexis (69 percent and 31 percent respectively). Jinah and Min-Hee had similar results, in that of their forty-four instances of languaging, a higher percentage focused on form than on lexical items (73 percent and 27 percent respectively).

Some researchers have argued that interactions between nonnative speakers may do little to increase accuracy in language use as such interactions may increase fluency but not necessarily accuracy (Ellis, 1988; Schmidt, 1992). However, other researchers such as Storch (2005) have shown that texts produced collaboratively by pairs are more accurate and complex than those produced individually. As indicated above, to investigate whether languaging enhanced accuracy, the instances of languaging were analyzed to determine if the exchanges between learners (or in some cases the self-regulated exchanges) resulted in a correct resolution to the problem, an incorrect resolution to the problem, or whether the problem was unresolved. This is in keeping with the notion of languaging being an activity to mediate problem-solving and make meaning (Swain, 2006). As shown in Table 3.1, many of the linguistic problems were resolved successfully or correctly, with Emi and Aya resolving 50 percent of their lexical problems successfully and 79 percent of their form-based problems correctly. Jinah and Min-Hee correctly resolved 83 percent and 81 percent of their lexis-based and form-based uncertainties respectively. These resolutions were dialogic in nature and may or may not have been realized in the written text. A count reveals that for Aya and Emi, 67 percent (N=60) of their ninety instances of languaging appeared in their written text and for Jinah and Min-Hee, 43 percent (N=19) of their forty-four instances of languaging during the writing task also appeared in their text.

Table 3.1 Resolution of Languaging During the Collaborative Writing Task

	Aya and Emi				*Jinah and Min-Hee*			
	Lexis-based		*Form-based*		*Lexis-based*		*Form-based*	
	N	%	*N*	%	*N*	%	*N*	%
Resolved correctly	14	50%	49	79%	10	83.3%	26	81%
Resolved incorrectly	4	14%	11	18%	1	8.3%	6	19%
Unresolved	10	36%	2	3%	1	8.3%	0	0%
Total number of instances	28	100%	62	100%	12	100%	32	100%

Maintaining (on the posttest) the correct form of items that had been questioned during the initial writing of their story suggests that the students did indeed help each other reach more advanced levels of language. As Aya and Emi wrote their story, forty-six of the total sixty instances of languaging that resulted in written text were resolved correctly. In the posttest, Emi maintained forty-five of these resolutions while Aya maintained forty-four, each making only one or two changes respectively to items that they had discussed and resolved correctly in their languaging during the writing task.[4] That is, Emi internalized 98 percent of their correct resolutions by the posttest while Aya internalized 96 percent, as evidenced by their not changing items that they had jointly discussed and resolved while writing their story. While Jinah and Min-Hee were jointly composing their story, ten of the nineteen instances of languaging which appeared in their writing were resolved correctly; each student maintained nine (90%) of these in her posttest.[5]

Linking Posttests to Sources of Expertise

In the posttests, the participants demonstrated that their joint activity in their ZPD led to more advanced levels of language by 1) maintaining items that they had questioned at the composing stage (see previous section) and 2) attempting to improve upon their original texts by trying to incorporate more targetlike or advanced structures (although not always successfully). In both instances, expertise, whether provided by the students to each other (through languaging) or by the reformulation or researcher, provided these opportunities for learning. In the next sections we give examples from the dialogue of the students illustrating expertise as offered by peer, text, and/or researcher.

Peer Only

That students maintained in their posttests their correct formulations of items that had been problematic at the composing stage, as evidenced by their languaging in the writing task, provides evidence of learning occurring through peer–peer interaction, with each student taking on the role of expert in different instances of languaging or even within the same instance of languaging. Many excerpts from the collaborative dialogues of these two pairs demonstrate that in their interaction they encountered problems in producing language, at both the lexical and syntactic levels. These problems were often resolved by their peer, who in the particular interaction could be said to be the more capable of the two, clearly a dynamic designation that can change from one episode to the next (Kowal & Swain, 1997) or within the same instance of languaging, as the following example demonstrates (see Appendix 3.6 for transcription conventions).

Example (1)

137. A: Two days ago the most rich.
138. E: I think "richest", rich is–
139. A: Ah yes, the richest.
140. E: Richest? Richest? Most rich guy?
141. A: "Two days ago" ugh! I don't remember.
142. E: Oh, so terrible our grammar. I think "richest" is okay.
143. A: The.
144. E: The, the, the, because in the world.
145. A: "The richest guy."

(from the Collaborative Writing Task)

In example 1, Emi corrects Aya's incorrect form of the superlative, which Aya then repeats. Emi then seems to try to "talk it through" (Swain & Lapkin, 2002) by saying both forms in turn 140. She chooses the correct form (turn 142), and in turn 144 attempts to explain why the superlative is needed ("because in the world") and Aya proceeds to write down the correct form in their story. In this example, Aya also provides assistance to Emi by reminding her of the need for the article "the" in the superlative form (initially in turn 139 and again in turn 143). Both learners provided specific expertise in resolving this linguistic problem, which appeared correctly in their story and, therefore, was not reformulated. Both Aya and Emi kept this superlative structure in their posttests.

Peer, Peer, Reformulation and Researcher

In their posttests, whether students changed or identified items that they thought were incorrect provides further evidence of their learning through the expertise in the multi-staged task, and, we would argue, particularly through the languaging that occurred in response to the different sources. Not only did the learners provide expertise to each other as they composed their stories, but also the participants may have discussed the reformulated version in the noticing task and again in the augmented stimulated recall. In these cases, the participants had four sources of expertise: 1) their peer (during the writing task); 2) their peer (during the noticing task); 3) the reformulation (during the noticing task), and 4) the researcher (during the augmented stimulated recall). In the following extended example, we examine the languaging in response to each of these sources of expertise.

In this excerpt, as Aya and Emi construct one of the sentences of their story during the writing stage, several linguistic problems arise, one of which is the use of "while" versus "during".

Example (2)

438. A: . . . While they were sleeping, Luis was killed.
439. E: Oh.
440. A: Something like that.
441. E: Ah! . . . While
442. A: While they were sleeping.
443. E: Sleeping.
444. A: Luis, is that second, second son?
445. E: Ah, no, suddenly
446. A: Ah, su- su- suddenly they found, they heard
447. E: Heard, the sound of gun?
448. A: Yes, yes, good.
449. E: Yes, uh, sleeping, the sound, sound of gun, sounds? . . . Ugh! The sound of **the** gun? **A** gun?
450. A: While they were sleeping, they heard sounds, heard or listen? Heard.
451. E: So while, while we can omit? We can't omit? During sleeping?
452. A: Mm hm, yeah, yeah, yeah.
453. E: Mm hm [erases what she had written and changes it to "During Sleeping"].

In this example Aya suggests the correct phrase "While they were sleeping" (turn 438), which Emi accepts and writes down in their story (turns 441–443). In turn 451 when Emi questions whether "While" can be omitted and the phrase reduced to "During sleeping", Aya agrees, so Emi changes the sentence, incorporating the incorrect form. During the noticing task, the pair discusses why the structure has been reformulated to "While sleeping," and they discuss this change again in the augmented stimulated recall with the researcher (see Table 3.2).

In their languaging during the noticing task in Table 3.2 neither Aya nor Emi is able to provide an explanation for the change from "during sleeping" to "while sleeping", although in this case Emi does attempt to provide expert assistance to her peer. In working through this problem, in turn 42, Emi recognizes that the reformulated version is a reduced adverb clause in that she expands "While sleeping" to "While they are sleeping." In that same turn she correctly says that a noun is needed after the preposition "during," but then she reaches a point where she realizes she needs outside expertise to resolve this linguistic problem and she says that she "will ask" the researcher. In the augmented stimulated recall, the pair was able to receive a brief explanation, albeit not a comprehensive one, of why "While sleeping" is correct. As evidenced by Emi's statement " 'while' is good" (turn 206), the students seemed to accept that

Table 3.2 Additional Expertise from Peer and Reformulation During the Noticing Session and Expertise from the Researcher During the Augmented Stimulated Recall

Aya and Emi's version:	*During sleeping*, they heard a cuples of sounds of gun from a living room.
Reformulation:	*While sleeping,* they were awoken when they heard a couple of gun sounds coming from the living room.

Peer and reformulation during noticing

34. E: We can't use "while".
35. A: Why?
36. E: Even if we omit, we can't change this one. Ah yes.
37. A: Really? I didn't know that. "While sleeping"—it's same meaning? During sleeping, while sleeping.
38. E: Yeah, yeah, yeah, yeah. But this is just I think, not, not, "while", we need a clause but just only- so that's why we need "while".
39. A: Oh.
40. E: "While" is-
41. A: Why omit, why?
42. E: While they are sleeping. This is, if we put sleepy, ah, no, no, no, it's—we need noun "during" I think. Ah, not con- so-
43. A: During the sleep? During sleep?
44. E: During a sleep? Sleep is also- it be noun. It become noun. It become—OK, I will ask. Could you check this?

[Later in the noticing while reviewing the changes made to their story]

92. A: I want to ask "while sleeping".
93. E: Yeah, yeah, yeah.
94. A: "While sleeping".

Researcher during augmented stimulated recall

189. A: Yeah, I don't know how to use "while" and "during".
190. R: What the difference is?
191. A: Yeah.
192. R: Do you know? [*turning to Emi*]
193. E: I think "while" is, after "while" we need a clause.
194. A: Subject.
195. E: But "during" is a preposition. Uh? During is a-
196. A: Like "because of" or something.
197. R: That's right. So after those words you need-
198. A + E: Noun or phrase.
199. R: That's right, exactly. Good. So I could say, during the winter or during winter, it is very cold. But after during you need something that has a specific length of time.
200. E: How about in this case, we can't use-
201. R: Can't use "during"? Um, no.
202. E: No.
203. R: No, because "sleeping" here, I'm using it as a verb, you could have said, or I could have changed it to "during the night".
204. E: Ah, "during the night".

(Continued overleaf)

Table 3.2 continued

205.	R:	Or "during"—but I probably would say "in".
206.	E:	"While" is good.
207.	R:	"In the night". I could have changed either "during" or "sleeping" but I chose to change it into a reduced clause.

"while" was better, so the researcher continued on with the next example of languaging during the noticing task on the videotape without finishing the grammatical explanation. Although it is not clear from the dialogue in Table 3.2 from the augmented stimulated recall whether Aya and Emi have internalized the rule about using "while" versus "during", it is clear from the posttests, as both Aya and Emi used the correct form.

Peer, Reformulation, and Researcher

Their peer, the reformulation, and the researcher as sources of expertise occurred in those instances in which the learners discussed changes that they observed in their text and the reformulation during the noticing stage, and then discussed these again during the augmented stimulated recall. The learners had not discussed these items while writing their stories and therefore, at least based on their interaction, there was no indication that they were problematic. It was the expertise from the reformulation that prompted the learners to realize that there was a problem and then try to resolve it through languaging as in the example in Table 3.3.

In the example of languaging during the noticing task in Table 3.3, at turn 18 Jinah appears to be using private speech[6] to work through why the change was made from the present perfect (has cheated) to the past perfect continuous (had been cheating). She quietly repeats three different verb tenses seemingly to herself. Private speech mediates language learning and it also represents the externalization of mental activity (Appel & Lantolf, 1994). Through Jinah's private speech, we can observe her cognitive processes of analyzing the verb tense and possibly rehearsing each tense to discover which one sounds correct and represents the meaning she intends. In turn 20, Jinah accepts the reformulated version and attempts an explanation that a tense indicating the "past past" is needed, although she gets the name of the tense incorrect (past present instead of past perfect). Min-Hee correctly draws attention to the fact that in the reformulation a continuous tense has been used (turn 21), but it is not evident whether she notices that the verb is in the past.

During the augmented stimulated recall, Jinah discusses with the researcher why the past verb tense is needed (turns 27–34), and in turn 35 Min-Hee corrects Jinah by pointing out that in their original text they

Table 3.3 Expertise from Peer and Reformulation and Researcher

Jinah and Min-Hee's version:	She can't use her legs and her husband *has cheated* on his wife for three years.
Reformulation:	Her husband *had been cheating* on his wife for three years.

Peer and reformulation during noticing

18. J: Do you know this vocabulary? "Her leg was paralyzed." Oh, I know this. This word, yeah but—"Her husband had been cheating . . . for three years." Long time [laughs]. "Cheating." Has been cheating on. Has. Has is different too. "Had been cheating on his wife for three years." Then, cheated on his wife, has cheated, had been cheating. Oh.
19. M: It's not finished.
20. J: I don't, I think, "had been cheating." I mean the time, the time we talk, we talked about this story, that was past and then we talked about past past so we had to use. Past present-
21. M: Continuing.
22. J: Continuing. "On his wife for three years. He planned to run away from his wife with his secret lover so he packed his- and all of his money." "Belongings."

Researcher during augmented stimulated recall

27. R: OK, so there you're talking about the verb tenses.
28. J: Yes, the verb tenses.
29. R: And are you clear? Were you thinking at the time yes, I understand why she changed it or were you still a bit confused?
30. J: I know what the difference between past perfect and past perfect continuous.
31. R: Uh huh. Past perfect continuous.
32. J: But yeah, I can't use. It's very difficult to use. When I write.
33. R: OK, and what verb tense had you two used?
34. J: We used past perfect.
35. M: Present perfect.
36. J: Oh, present perfect. You used past perfect continuous.
37. R: Yeah, because it's talking about the past and also-
38. J: Then we can't use past present, no, present perfect.
39. R: Not in this case because- again, because you're telling the story in the past and because at the beginning of your story the man is already dead.
40. J: Oh yeah.
41. R: Right, so the cheating is now finished [laughs] because he's dead. And also to keep it parallel. It's because again, your story is in the past. Does that make sense?
42. J: Yes.
43. R: And do you know why I used the past perfect continuous rather than past perfect there?
44. J: I'm not clear.
45. R: Not clear. Do you? [turning to Min-Hee]
46. M: I'm clear.
47. R: You're clear? Why do you think-

(Continued overleaf)

Table 3.3 continued

48.	M:	About continuous?
49.	R:	Yeah, why did I choose the continuous there?
50.	M:	For three years, then he cheating on his wife for three years-
51.	J:	He continued cheating.
52.	R:	Yeah, that's right. And also to get the idea that it just recently finished [laughs] because he's dead.
53.	J:	Oh yeah.
54.	R:	But if he hadn't died, we guess probably he would still be cheating, right? I guess so.

had used the present perfect, but she does not mention anything related to the past tense. She then attempts an explanation of why the continuous tense is needed (turn 50). Through examining these instances of languaging, we suggest that Jinah, with the expertise provided by her peer and the researcher, has paid attention to the entire verb tense, whereas Min-Hee has focused on the fact that the verb is in the continuous. The posttest results support this interpretation of the data as Jinah makes the correct change on her posttest to "had been cheating", while Min-Hee changes "has cheated" to the present perfect continuous "has been cheating", failing to use the past tense. The examples of languaging in Table 3.3 demonstrate that the nature of expertise is shifting and shared between peers, with Jinah providing expertise in the noticing task, Min-Hee correcting Jinah in the augmented stimulated recall, and then in turns 50–51 the learners pooling their knowledge to construct jointly an explanation of the use of the continuous tense. This shifting expertise is "re-sourced" by the reformulation and researcher.

Other Combinations of Sources of Expertise

In addition to the combinations of sources of expertise discussed above, there were other possible combinations: reformulation and researcher, peer and reformulation, reformulation only, and self. We have not included examples of these other combinations or included them in our posttest results, as in each of these categories the participants had two or fewer posttest changes. The small numbers of items in the posttests would have made examining relative success of the quantity and quality of sources of expertise problematic.

Posttest Results

Tracing back changes the learners made in their posttests to the different combinations of sources of expertise provides some insights into our

research questions. In their posttests, Aya and Emi made twenty-six and twenty-two changes respectively. Of Aya's changes, 73 percent (19) were correct while 82 percent (18) of Emi's were correct in that they either corresponded to the reformulation or were an acceptable alternative. Jinah and Min-Hee made twenty and twenty-two changes on the posttests; 80 percent (16) and 64 percent (14) of their respective answers were correct.[7] As indicated in the posttest results presented in Tables 3.4 and 3.5, when these posttest changes[8] (or maintenance of items discussed at the composing stage) are categorized according to accuracy and the sources of expertise, we can tease out the creation of ZPDs in response to each source of expertise for each item.

Peer Only

All four participants had 100 percent accuracy with their peers as the sole source of expertise, as evidenced by their not changing forms or lexical items that had been problematic at the writing stage. With the help of their peers, the learners were able to resolve their linguistic problems and maintain these correct resolutions when faced with the opportunity to make changes in the posttests. This suggests that at the writing stage, the learners created their initial ZPD(s) through their problem-solving activity. Further development of their ZPD awaited other expertise to help the learners advance in their language.

Peer, Reformulation, and Researcher

When this expertise was provided by the reformulation, discussed with a peer in the noticing stage and then discussed with the researcher during the augmented stimulated recall, Emi was 100 percent accurate on her posttest changes, Jinah was 83 percent accurate, and Aya and Min-Hee were 80 percent and 77 percent accurate respectively. After peer only expertise, this category of expertise was the most successful in terms of accuracy of posttest changes. The learners were able to note that the reformulation differed from their original text, possibly attempt an explanation, and then, with the researcher, further discuss the change. It is worth emphasizing that the researcher only elaborated on those linguistic problems the learners had already tried to solve and in some instances did solve in the noticing session, so the languaging in the peer interaction also helped mediate language learning. The combined effect of the expertise from all three sources was to help the learners further construct their ZPDs and therefore enable them to make changes to their written texts that would not have been possible without this activity of interaction with external assistance.

Table 3.4 Sources of Expertise and Posttest Results for Aya and Emi

	Correct			*Incorrect*			
Source(s) of Expertise	*Same as Reformulation*	*Different from Reformulation*	*Total Correct*	*Identified Only*	*Changed to Less Targetlike*	*Changed to More Targetlike*	*Total Incorrect*
			Aya				
Peer only	98% (44)	2% (1)	100% (45)	—	—	—	—
Peer + Reformulation + Researcher	70% (7)	10% (1)	80% (8)	10% (1)	—	10% (1)	20% (2)
Peer + Peer + Reformulation + Researcher	50% (5)	20% (2)	70% (7)	20% (2)	—	10% (1)	30% (3)
			Emi				
Peer only	100% (45)	—	100% (45)	—	—	—	—
Peer + Reformulation + Researcher	100% (6)	—	100% (6)	—	—	—	—
Peer + Peer + Reformulation + Researcher	55% (6)	9% (1)	64% (7)	18% (2)	—	18% (2)	36% (4)

Note: Numbers in parentheses indicate the number of items.

Table 3.5 Sources of Expertise and Posttest Results for Jinah and Min-Hee

	Correct			*Incorrect*			
Source(s) of Expertise	*Same as Reformulation*	*Different from Reformulation*	*Total Correct*	*Identified Only*	*Changed to Less Targetlike*	*Changed to More Targetlike*	*Total Incorrect*
			Jinah				
Peer only	100% (9)	—	100% (9)	—	—	—	—
Peer + Reformulation + Researcher	75% (9)	8% (1)	83% (10)	8% (1)	8% (1)	—	16% (2)
Peer + Peer + Reformulation + Researcher	20% (1)	40% (2)	60% (3)	20% (1)	20% (1)	—	40% (2)
			Min-Hee				
Peer only	100% (9)	—	100% (9)	—	—	—	—
Peer + Reformulation + Researcher	77% (10)	—	77% (10)	—	8% (1)	15% (2)	23% (3)
Peer + Peer + Reformulation + Researcher	40% (2)	—	40% (2)	40% (2)	20% (1)	—	60% (3)

Note: Numbers in parentheses indicate the number of items.

Peer, Peer, Reformulation and Researcher

Some of the changes that the learners made to their posttests were on items that, through their dialogue in the writing stage, the learners had indicated were problematic. Additional expertise at the noticing stage from their peer, as well as the expertise provided by the reformulation and the researcher, helped them resolve some of these linguistic difficulties, but with less accuracy than the previous feedback category (peer + reformulation + researcher). Of the changes Aya made that were traced back to the four sources of expertise (peer + peer + reformulation + researcher), 70 percent were correct, while 64 percent of Emi's changes were correct. Jinah and Min-Hee's posttest changes in this category of source of expertise were 60 percent and 40 percent accurate, respectively. Although the learners were able to internalize some of the forms and lexical items that at the writing stage they had struggled with, they had not yet had the opportunity to engage with the expertise needed to create the ZPD.

Changes in the Direction of the Target and Not in the Direction of the Target

For Aya and Emi, all of their incorrect changes on the posttests were either identified only or changed to more targetlike forms, suggesting that their ZPD was in the process of being developed. For example, Aya changed the incorrect phrase ". . . he and Mary are an affire" to ". . . he and Mary are having an afair", thereby making the verb more towards the targetlike past perfect continuous (were having) and the spelling of "afair" phonetically closer to the correct form "affair". In this example, she made two changes (which were counted as two posttest items), both of which indicated progress in her language learning, although she has not yet internalized the target form.

Not all of the incorrect changes were so close to the targetlike structures, however. Jinah and Min-Hee each made changes that were less targetlike than the original. For example, in attempting to incorporate the phrase "a pool of blood formed around him" as supplied by the reformulation, and as discussed in both the noticing and the augmented stimulated recall, Min-Hee wrote "form pool around blood", arguably a less targetlike form than the original "fell down with blood." In some cases, the students were only able to identify a structure or phrase of their original text as being incorrect but were unable to supply the correct form. For example, Emi crossed out the word "legacy" but she could not remember the word "estate", which had been provided in the reformulation.

Summary

Different sources of expertise emerged in our study. In examining the relative success with regard to the sources of expertise, those cells in Tables 3.4 and 3.5 in which there was only peer interaction resulted in the highest accuracy in the posttests. These were language problems that the learners questioned while composing the stories, languaged about creating a ZPD, resolved the problem, and maintained the solution in the posttest. In comparing the posttest results for those items in which there were three sources of expertise: a peer, the reformulation, and the researcher, with those in which there were four sources of expertise: twice from a peer (during the writing task and again in the noticing session), the reformulation, and the researcher, the former category was more successful in terms of the students' accuracy on the posttests. That is, the *more* sources of expertise, the *less* successful the learners were on their posttests. It is worth emphasizing that the researcher only elaborated on those linguistic problems the students had already tried to solve, and in some instances did solve, in the noticing session so the languaging in the peer interaction also helped mediate language learning. The posttest data show that the expertise, whether it emerged from the interaction between peers or in response to the reformulation or researcher, provided opportunities for learning.

Discussion

As the learners engaged in the collaborative activities in our study, depending on the learners' needs, different sources of expertise emerged, each in response to the learners' expanding ZPDs. Peers were the first sources of expertise, followed by a reformulation and interaction with a peer, and, finally, interaction with one of the researchers. Each successive layering of assistance or addition of mediation to the activity helped the participants construct a ZPD to resolve language difficulties that arose, though for some of the language problems the learners were unable to expand their ZPD with the expertise available.

The results show that peers were able to resolve most of their language problems themselves. Through examining the languaging of students as they tried to make meaning and problem-solve *as well as through tracing the changes made on the posttests back to the sources of expertise involved in the interaction*, we found that the most effective expertise emerged in interaction between peers. The metaphor of expertise emerging emphasizes its dynamic nature; the expertise shifts between the learners, with one or the other of each pair taking on the role of expert. Together the learners become "more expert," as evidenced by their correct resolutions to their language problems in the collaborative writing task and by improvements

on their original stories in the posttest. The emergent expertise is a function of the group (Lantolf, 2000b) as the pairs create and then interact in the group ZPD. For any given linguistic problem encountered, when no expert emerges in a pair of learners, that is, the group cannot construct the group ZPD, then other sources of expertise are necessary to generate the activity necessary to construct the ZPD.

When the learners used the reformulation as a mediational tool, which in turn prompted further languaging, they were able to create ZPDs that they were not able to in interacting with only a peer. However, when language problems still could not be resolved, one of the researchers joined the activity as another mediator and, together, the group attempted to construct a ZPD. In the posttest results, the language problems that the learners discussed as they interacted with each other, talked about again after seeing the reformulation, and finally had a chance to ask one of the researchers in the augmented stimulated recall were the least effectively resolved. These findings suggest that what is important for learning is not the *quantity* of sources of expertise but rather that for those language problems that are not yet within a learner's ZPD, it takes many sources (instructional moves) to construct a ZPD.

In our study, the *quality* of these sources was significant. Depending on where the learners were in their language development, different types of expertise were needed to create a ZPD (see Aljaafreh & Lantolf, 1994 for a discussion of different levels of feedback in the ZPD). However, our findings show that much of the expertise could and did emerge in pairs. The layering of different sources of expertise started with peers at the centre; the next was peers plus a reformulation, and then the last, peers, reformulation, and a researcher. For each language problem, each successive source of expertise helped create a ZPD. As a pedagogical model, this places learners as the first source of expertise rather than the teacher; when learners cannot create a ZPD through interacting with each other or with other forms of mediation such as a reformulation, then the teacher can participate in the activity needed to construct the ZPD. The group expertise emerges as these "agents-acting-with-mediational means" (Wertsch, 1998) interact.

Through this interaction, the learners reached more advanced levels of language. From an SCT perspective what a learner "is able to do in collaboration today he [*sic*] will be able to do independently tomorrow" (Vygotsky, 1987, p. 211). The posttest results support this. The reformulation and languaging in which the learners discussed the changes made to their texts resulted in a better performance and higher levels of language from all four learners, in that they all were able to make improvements to their original pieces of writing for those language difficulties in which they were able to create a ZPD. Since a learner's "capacity to benefit from certain kinds of interaction and mediation" is "afforded and constrained

by her or his ZPD" (Lantolf & Thorne, 2006, p. 266), the sources of expertise were requisite for prompting the languaging, an activity which created the learners' ZPD, giving rise to learning.

From an SCT perspective, learning is not development, but rather learning precedes development (Vygotsky, 1978). The creation of the ZPD and interaction within the ZPD makes it possible to identify the extent of development (Chaiklin, 2003) and what learning is necessary for development to occur. This varied for each language item. Just as the learners' expertise was shown to be shifting and dynamic, so too was the ZPD. Our results demonstrate that the less known the language item, the more sources of expertise and the more activity were needed to create the ZPD and move from the interpsychological (social) to the intrapsychological (individual). In some cases, peer interaction created enough expertise for internalization to occur, but in other cases more sources of expertise were needed. Since "the only 'good learning' is that which is in advance of development" (Vygotsky, 1978, p. 89) and since the learners in this study did reach more advanced levels of language, the languaging involved in the creation of and response to expertise, we argue, must have resulted in "good learning."

Notes

1 We would like to thank the Social Sciences and Humanities Council of Canada for their support of this study through Grant #410–2004–2099 to Merrill Swain. We also wish to thank our four participants for their time and their expertise.

2 By this, Wertsch is indicating that human activity is always mediated—by the availability and use of material tools (cultural artifacts) and cognitive tools (mental concepts). In other words, there is no such thing as free will.

3 Of the six levels or rules used to describe the children's level, three did not contain the sophistication to allow children to predict the movement of the balance beam with different arrangements of weights with confidence.

4 One item that Emi and Aya had resolved correctly at the writing stage and both changed in the posttests was reformulated to improve the sentence structure. The other item that Aya changed was considered as a self-initiated change in the discussion of the posttest data; it was resolved correctly and not reformulated.

5 The one item that Jinah and Min-Hee did not maintain on their posttests had been reformulated to improve the coherence of the story.

6 This appears to be an instance of private speech, because Jinah stares off into space while talking and her voice becomes quieter after she says "Has. Has is different too," and then tries out three verb tenses.

7 Each change that the students attempted was considered as one item on the posttests. However, this does not represent the total possible changes they could have made. Of the 53 changes made to Emi and Aya's text they noticed 37, while Jinah and Min-Hee noticed 33 of the 49 reformulations of their text.

8 Only sources of expertise which resulted in more than two items in the posttest have been included in Tables 3.4 and 3.5. This was done because the small

numbers would have made it problematic to examine relative success since one item or two items could result in 100% accuracy for the source(s) of expertise.

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Appendix 3.1—The Writing Prompt

Source: Balas, R. and D. Rice, *Qu'est-ce qui se passe?* Second edition. Copyright © 1984 by Houghton Mifflin Company. Used with permission.

Appendix 3.2—Aya and Emi's Writing

Aya and Emi's Original Story

Two days ago, the richest guy in the world, Sam Gates, who is president oill company died. After ferarl ceremoney, his family talked about regacy. However, they cold not make a decision. Therefore, his wife, Rinda, suggested that we should discuss again and then after a week, they met in her house. Even though they started to discuss it in the morning, they couldn't decide it. When the first son, Jimmy, saw the clock it was at 12:00 am, he said, "Why don't we talk about it tomorrow. Let's go to bed" and they agreed.

During sleeping, they heard a cuples of sounds of gun from a living room. When they woke up, Luis was killed. Mary, Luis's wife, called a police office. After one hour, two ditectives arrived at the house.

Accoding to investigation, Jimmy killed Luis because he and Mary are an affire. They also want to get all regacy. In addition, one daughter has

had so heavy sick and been in the bed for a long time. They knew she was going to die soon.

That is why Mary and Jimmy were arrested.

Reformulation of Aya and Emi's Story

Two days ago, Sam Gates, the richest guy in the world and the president of an oil company, died. After the funeral, his family talked about his estate. However, they could not make a decision about the arrangements. Therefore, his wife, Linda, suggested that they discuss the matter again at a later date. Then, after a week, they met in her house. Even though they started to discuss it in the morning, they couldn't agree. When the first son, Jimmy, saw the clock, it was 12 am. He said, "Why don't we talk about it tomorrow. Let's go to bed." The others agreed.

While sleeping, they were awoken when they heard a couple of gun sounds coming from the living room. When they got up, they saw that Luis had been killed. Mary, Luis's wife, called the police. After one hour, two detectives arrived at the house.

According to the investigation, Jimmy had killed Luis because Jimmy and Mary were having an affair. They also wanted to get all of Sam's estate so they wanted to kill one of his sons. In addition, one of Sam's daughters was very sick and had been in bed for a long time. Everyone knew that she was going to die soon and so Jimmy and Mary would have gotten more of Sam's estate.

That is why Mary and Jimmy were arrested.

Appendix 3.3—Jinah and Min-Hee's Writing

Jinah and Min-Hee's Original Story

He was succeed with his wife's money. His wife is very rich but she is handy-cap person for long time. She can't use her legs and he (her husband) has cheated on his wife for three years. Finally, he planed to run away with his secret lover from his wife and paked package including all his money. The day was that day to leave.

He had a dinner with his wife in the early everything and said good night. He told to his wife that he wanted to have some nightcap before he went to bed. So, his wife went to bed first. At that time, his lover was waiting for him at the out side and after an hour she came into the house and then she said, "We have to leave immediately. My husband seems to know our plan and chasing us. Let's hurry up!"

So, they was about to open the enterance door to get out. At that moment, his wife appeared with gun. She already knew everything. She shoot him and he fell down with blood.

The lover called cap and inspectores came to the house and started investigation.

Reformulation of Jinah and Min-Hee's Story

The dead man had become very successful because of his wife's money. His wife was very rich but she had been disabled for a long time. Her legs were paralyzed. Her husband had been cheating on his wife for three years. He planned to run away from his wife with his secret lover so he packed some of his belongings, including all of his money. The day of the murder was the day that he had planned to leave.

He had had dinner with his wife in the early evening and said good night to her. He told his wife that he wanted to have a nightcap before he went to bed. His wife went to bed first. At that time, his lover was waiting for him outside and, after an hour, she came into the house and said, "We have to leave immediately. My husband seems to know our plan and he will follow us. Let's hurry up!"

They were about to open the front door to go outside. At that moment, his wife appeared with a gun. She already knew everything. She shot him and he fell down and a pool of blood formed around him.

The lover called the cops and the police officers came to the house and started the investigation.

Appendix 3.4—Aya's and Emi's Posttests

Posttest—Aya

Two days ago, Sam Gates, the richest guy in the world, and president oill company, died. After ferarl [*she circled "ferarl" and wrote "spelling mistake"*], his family talked about legacy (a____). However, they could not agree. Then, his wife Linda suggested that we should discuss again and then after a week, they met in her house. Even though they started to discuss it in the morning, they couldn't decide. When the first son, Jimmy, saw the clock it was 12:00 am. He said, "Why don't we talk about it tomorrow. Let's go to bed" and they agreed.

While sleeping, they heard a cuples of gun sounds come from living room. When they woke up, they saw Luis was killed. Mary, Luis's wife, called police. After one hour, two ditectives arrived at the house.

Accoding to investigation, Jimmy killed Luis because he and Mary are having an afair. They also want to get all of regacy [*she circled "regacy" and wrote "spelling"*]. In addition, one daughter has had very sick and been in bed for a long time. They knew she was going to die soon.

(indicates here between the paragraphs that there should be another sentence before the final paragraph)

That is why Mary and Jimmy were arrested.

Posttest—Emi

Two days ago, the richest guy in the world, Sam Gates, president oill company, died. After the feneral his family talked about e_____. However, they cold not make a decision. Therefore, his wife, Linda, suggested that we discuss again then after, they met in her house. Even though they started to discuss ~~it~~ in the morning, they couldn't agree. When the first son, Jimmy, saw the clock it was 12:00 am. He said, "Why don't we talk about it tomorrow. Let's go to bed" and they agreed.

While sleeping, they heard a cuples of gun-sounds coming from a living room. When they woke up, Luis was killed. Mary, Luis's wife, called the police. After one hour, two ditectives arrived at the house.

According to investigation, Jimmy killed Luis because he and Mary have an affire. They also want to get all ~~regacy~~ [*she crossed out "regacy"*]. In addition, one daughter has had very sick and been in bed for a long time. They knew she was going to die soon.

That is why Mary and Jimmy were arrested.

Appendix 3.5—Jinah and Min-Hee's Posttests

Posttest—Jinah

He was succeed with his wife's money. His wife is very rich but she is paralized for long time. She can't use her legs* and he (her husband) had been cheating on his wife for three years. Finally, he planed to run away with his secret lover from his wife and paked package including all his money. The day was the day that murder.

He had had a dinner with his wife in the early everything and said good night. He told his wife that he wanted to have a nightcap before he went to bed. So, his wife went to bed first. At that time, his lover was waiting for him outside and after an hour she came into the house and then she said, "We have to leave immediately. My husband seems to know our plan and is following us. Let's hurry up!"

So, they were about to open the front door to go out. At that moment, his wife appeared with a gun. She already knew everything. She shot him and he fell down form pool around blood.

The lover called cap and police officers came to the house and started investigation.

* *Note*: Underlined text shows what the students underlined in their posttests.

Posttest—Min-Hee

The deadman succeed by his wife's money. His wife was very rich but she was handy-cap person for long time. She anabled and he (her husband) has been cheating on his wife for three years. Finally, he planed to run away with his secret lover from his wife and paked belongings including all of his money. The day was that day to leave.

He had had a dinner with his wife in the early everything and said good night. He told to his wife that he wanted to have a nightcap before he went to bed. So, his wife went to bed first. At that time, his lover was waiting for him at the outside and after an hour she came into the house and then she said, "We have to leave immediately. My husband seems to know our plan and will follow us. Let's hurry up!"

So, they were about to outside of house. At that moment, his wife appeared with a gun. She already knew everything. She shoot him and he fell down form pool around blood.

The lover called cops and the polices came to the house and started investigation.

Appendix 3.6—Transcription Conventions

[ ]	Commentary
. . .	Pauses
–	Incomplete utterance
" "	Utterance read from a text
bold	Emphasis

* *Note*: Underlined text shows what the students underlined in their posttests.

4

CREATING PRESSURE IN TASK PEDAGOGY

The Joint Roles of Field, Purpose, and Engagement within the Interaction Approach

Martin Bygate and Virginia Samuda

Susan Gass concludes her 1997 book *Input, Interaction and the Language Learner* with an epilogue—"Classroom implications and applications"—in which she makes a case for the role of tasks in harnessing input and interaction in the classroom. In this chapter, we take Gass's 1997 epilogue as a springboard for exploring the range of roles tasks play in interactive learning, and a number of issues that are brought into focus by taking a closer look at "task" as a pedagogic construct.

In a more recent formulation, Gass and Mackey (2007) note that "the interaction approach considers exposure to language (input), production of language (output), and feedback on production (through interaction) as constructs that are important for understanding how second language learning takes place" (pp. 3–4). They cite Gass's (2003) earlier account of the field as exploring the view that "language learning is stimulated by communicative pressure and examin[ing] the relationship between communication and acquisition and the mechanisms (e.g., noticing, attention) that mediate between them" (p. 224). Feedback is seen "as double-pronged in the sense that the intent of the provider of feedback and the interpretation of the receiver of feedback are both important. From the perspective of second language acquisition, interpretation is a crucial piece of the puzzle in understanding interaction-driven learning" (Gass & Mackey, 2007, p. 12).

Fundamentally the interaction approach is concerned with learning through communication. This is a version of what educationists have widely referred to as *learning by doing*. As the French educationist Freinet (1956) famously noted, "*c'est en marchant que l'enfant apprend à marcher,*

c'est en parlant qu'il apprend à parler, c'est en dessinant qu'il apprend à dessiner" ("it's by walking that children learn to walk, by speaking that they learn to speak, and by drawing that they learn to draw" [p. 86]). In a similar vein, if children can learn their first language much as they learn anything else, with purposeful engagement with those around them mediating the identification and mastery of the structures of language (an argument developed by many including Bruner, 1983; Peters, 1983; Skinner, 1957; Tomasello, 2003; and Wells, 1981), then maybe this can help to explain some, or possibly all, of how a second language needs to be learnt. This of course was one of the driving insights behind the communicative language teaching movement (e.g., Brumfit & Johnson, 1979; Widdowson, 1978).

There are however two potential risks beneath the surface of the communicative movement which, by extension, threaten the use of pedagogical tasks, and this is the focus of this chapter. For although we know that learning can occur through communication—for instance, as Tomasello (2003) argues, children learn their first language through communication—it does not follow that communication and the learning of language are the same thing. Nor does communication entail language learning. This is because language learning implies change in a learner's use of language, whereas communication does not. Hence it cannot be the case that a communicative event necessarily leads to any language learning. It follows from this that if communication is necessary for learning, the communicative events that learners engage in must, necessarily, be structured and conducted so as to add to them a learning dimension, an ingredient which will push learning forward. Satisfactory communication per se cannot suffice: we are seeking something more, that is, communication-for-learning. This has been an abiding concern for specialists in instructed language development for some considerable time (e.g., Ellis, 1994; Gass, 1997; George, 1972; Long, 1983; Schmidt, 1990; Skehan, 1998; Swain, 1985; VanPatten, 1996; Widdowson, 1978 inter alia).

The fallacy that communication entails learning may be partly derived from Krashen's naturalistic input hypothesis, and more broadly from a belief that SLA can function much like first language acquisition (FLA). *However*, in FLA it is evident that the conditions for daily communication are significantly different from those in most classrooms. Children spend their time principally attuned to perceiving, understanding, and mastering the basic elements of their environments. All kinds of perceptual details loom large in the child's awareness, in which language rapidly takes center stage. In the early years, children's sensitivity to the minute by minute minutiae of language is vast. Furthermore, children's need to identify with and/or acculturate to those around them gives the details of language a powerful social boost. In addition to these basic psychosocial conditions, children receive huge amounts of exposure, much of it

structured to facilitate understanding and involvement in daily life. Language is an essential sociocognitive tool, to which children are maximally sensitive, and which is calibrated by those around them in order to ensure their rapid sociocognitive adaptation.

In other words, much early child communication can indeed be equated with learning. However most of these conditions cannot be reproduced in educational contexts. Hence the question of how we can most effectively use communication for classroom language learning becomes central. More precisely, what *kinds* of communication are pedagogically productive, and *how* are they most effectively conducted. Susan Gass has brought to this debate a preoccupation with understanding the details of how communication can be structured to engage learning in educational contexts.

A key characteristic of the discourse associated with the interaction approach is pressure. Output has a role to play here, in the sense that "learners need to be pushed to make use of their resources; they need to have their linguistic abilities stretched to the fullest; they need to reflect on their output and consider ways of modifying it to enhance comprehensibility, appropriateness, and accuracy" (Swain, 1993, pp. 160–161, in Gass and Mackey, 2007); "language learning is stimulated by communicative pressure" (Gass, 2003, p. 224), "learners need to be pushed [. . .] they need to have their linguistic abilities stretched to their fullest" (Swain, 1993, pp. 160–161), with talk generating signals of "perceived comprehension [. . .] provoking adjustments to linguistic form, conversational structure, message content, or all three" (Long, 1996, pp. 418). It would be wrong to be misled by the apparently mechanistic vocabulary ("pressure", "provoking adjustments"), use of the passive ("is stimulated by", "to be pushed", "to have their [. . .] abilities stretched"), and their associations with the functional behaviourism outlined by Skinner (1975), where infants learn language by trying to make successful pragmatic utterances. The fact is that in second language classroom contexts "pressure" needs to be brought to bear on communication in numerous ways, both overtly and covertly, if it is to lead to learning. In developing the interaction hypothesis, Gass's focus has been on ensuring overt interpersonal interaction through tasks as a way of creating that pressure. It is our purpose here to consider how the interaction hypothesis intersects with the use of pedagogical tasks.

There are a number of documented examples that suggest absence of some form of communicative pressure can have negative long-term educational consequences. The case of the Canadian immersion programs (Swain, 1985) for instance is widely cited in this regard. Learners who are not pressured into working with the language seem not to grapple with the finer details of the way it works and fail to develop the related linguistic capacities. A similar phenomenon has been found in interaction between teachers and English as additional language (EAL, the UK term

for ELL) students in mainstream classes. In a study of secondary level classrooms in the UK, Cameron, Moon, and Bygate (1996) found that learners and teachers were observed jointly to lower the stakes during teacher–class interaction: students avoided responding to questions, so teachers then asked simpler and simpler questions until students could provide at least a minimum answer, with the teacher then doing more and more of the work to provide the target answer. The data offered little evidence that the students had understood, that they were confident that they had understood, or that the teachers themselves were confident that the students had understood. Rather than the students being drawn into working with language to express or request clarification of meanings, they were opting out, leaving the teacher to do both the cognitive and the language work. This would appear to bode ill both for the students' language development and for their subject learning.

In this kind of classroom interaction, we would probably agree that part of the reason for lack of pressure is that neither student nor teacher is properly negotiating meaning. But here we come up against the tension between pedagogic interaction, which by definition must involve some kind of pressure (Dewey, 1910), and non-pedagogic social interaction, in which pressure is not a necessary element. As Aston (1986) points out, negotiation of meaning can be tedious, disruptive, or simply socially dispreferred, to the extent that it involves interrupting speakers and the flow of the discourse. Hence appreciation by teachers and students of the value of negotiated interaction and a willingness to use it are clearly important. It is not enough to set up an interactive classroom activity: something more is needed. Teacher educators often typically look at three issues: what the teacher is wanting the students to do (the nature of the activity); what the teacher wants to achieve (the intended outcome and pedagogical purpose); and how far teacher and learners actually engage in doing it (their degree of engagement). These questions apply to all types of pedagogical activity. One of the possible ways for promoting productive communication is through the use of pedagogic tasks. By "task" we refer to a kind of pedagogic activity which requires communicative language use, in order to achieve a pragmatic outcome other than to practice or learn language, but with the overall aim of promoting language development. This definition includes written and oral, and monologic and dialogic activities (for a fuller definition see Samuda and Bygate, 2008).

The use of pedagogic tasks has been one of the themes of Gass's own research in terms of the kinds of interaction they typically promote. However if tasks are to be used in classrooms to enable communication-for-learning, their propensity to foster interaction needs to be considered from a wider perspective, both in terms of their internal characteristics and their contexts of use. The question is, what are some of the conditions for productive task interaction?

The aim of this chapter is to tease apart some of the conditions which we might need to investigate in order to answer this question. In the following section we consider more fully some of the reasons why task interaction may fail to engage learning. In section 2 we examine three dimensions of tasks that might help to address the problem both in terms of research and in terms of classroom implementation. Section 3 exemplifies the concepts by applying them to samples of data from two different tasks. We conclude by suggesting some additional hypotheses for investigation within applications of the interaction approach to the pedagogic use of tasks.

When Interaction Fails to Fire

In much of the research to date, tasks have been used as tools for eliciting interactional data. Many of the tasks that have been investigated are drawn from pedagogic sources: Spot the difference; Describe and draw; Describe and label; Problem-solving; Picture story (see for example Ellis, 2001; Gass & Varonis, 1985; Pica, Kanagy, & Falodun, 1993; Skehan, 2001). But although these resemble tasks commonly used in communicatively oriented classrooms, the primary research focus has tended not to be on task pedagogy per se, but on elements of performance made salient through the use of tasks. For the most part, this work has been carried out in laboratory rather than classroom settings, although Gass, Mackey, and Ross-Feldman (2005) have recently argued that the conditions under which many laboratory-based studies have been carried out are comparable with classroom contexts. However, as with any pedagogical activity in any domain of the curriculum, tasks can be more or less engaging for those involved in carrying them out. Cameron et al. (1996) reported a group of students working on a joint planning task in which the planning was anything but joint: one student took control, interpreted the task to the other members of the group, decided who should do what, told them to work in parallel, and assessed whether they had done the job correctly or not. The interaction the teacher may have intended in setting the task had no chance of materializing if the students were not willing or able to engage.

Of course tasks are never teacher- or student-proof, and engagement can never be guaranteed. Breen (1989) (see also Coughlan and Duff, 1994; Mori, 2002) pointed out that tasks will always be transformed as learners engage with them. But what Cameron et al. (1996) felt they had observed was not the intrinsic weakness of tasks per se, or an unmotivating task failing to mobilize engagement, but rather a failure on the part of the teacher and possibly the task designer to involve the students in the task as planned. Learning from what happened, it was reasonable to hope that on another occasion the group could indeed be mobilized to work in a

different way. In other words, while tasks are not student-proof, perhaps there are issues of design and implementation that need addressing once tasks are brought into the classroom arena. The reasons for this are worth unravelling.

As Gass herself has argued, one of the main pedagogical justifications for using tasks is that they can draw learners into types of interaction that are thought to be useful for promoting second language acquisition, leading learners to focus on particular elements of language for which they are acquisition-ready (Mackey, 1999). The logic of using tasks for these purposes however is that the tasks themselves provide a motivation for that interaction: that is, both the interaction and the elements of language that are focused on make sense only because they contribute to the achievement of the whole task. Interaction may be important, but it depends on the motivational power of the task as a whole. And tasks will lose this motivating power if they are seen as little more than a pretext for a particular type of interaction, or for attending to some target vocabulary and grammar: the tasks need to be seen as interesting to the students in their own right. Otherwise what is the pay-off for working one's way through the different phases of a task if all that really matters is the target lexico-grammar, or some hoped-for negotiation for meaning moves? Hence the need for task pedagogy to consider not just the interactive processes, or indeed the language features to be targeted, but also the transparency (from a student's perspective) of the potential learning experience afforded by the task as a whole.

Another possible reason for a task misfiring can be the lack of a clear relationship between the processes of a task and an intended target outcome (in terms say of a completed story, a report, a completed chart, an array of pictures, or a particular individual or group decision). Lack of a clear overall task outcome can lead students to find themselves attending to meanings and forms and interacting but without any obvious reason—leading to interaction for its own sake. For example, discussion tasks can fail to engage if students have no sense of what hangs on their discussion. Equally—the converse of a perceived lack of purpose—a desire to achieve the task outcome can dominate students' attention to the point of assuming greater importance than the processes of exploring alternative meanings, forms, and pathways to completing the task. As a result, students can cut corners in order to complete the task. Both these kinds of misfire can reflect a lack of calibration between the intended task outcome and what can be called the "task-in-process": the outcome matters, since it contributes to justifying the activity, but so too do the pathways for achieving the outcome. Somehow a balance is needed between the importance of the target outcome and the importance of the activity involved in achieving it. The combination of the meanings, forms, and interaction involved in the processes of completing the task, and the

target outcomes of the task we will refer to in what follows as the "field" of the task. Exploration of pedagogical tasks needs to take account of the field students cover in working through a task to its completion.

But there is a further potential problem, for irrespective of the clarity of the intended task outcome tasks do not float freely: they are selected by teachers to fulfil a pedagogical purpose, and so are only worth the learners' effort to the extent that they are seen by the learners as contributing to their learning. A picture differences task may have a clear target outcome, but unless both outcome and process have some pedagogical status, recognized by students and teacher, the task may fail to motivate. The implication of this is that for the study of the use of pedagogical tasks to have genuine pedagogic resonance, something more is needed than the task as designed—tasks need to be considered within the context of *their* pedagogical purpose, as understood by students as well as their teachers.

However, even if the field of a task and the pedagogic purpose for carrying it out are clear, the task can still misfire if it does not recruit the learners' own engagement. No matter how well structured a task in terms of field, and how purposeful the teacher may be in implementing it, its impact will depend on the learners endorsing the activity, and engaging with it in a meaningful way. That is, crucially the learners need to be actively involved in the task.

Hence if tasks are to be used to stimulate pedagogically valuable interaction in the classroom rather than interaction for its own sake, we need to take account of these three important interlocking dimensions: 1) the complex *field* made up of concepts, language, and discourse that the task engages; 2) the pedagogic *purposes* for which the task is used; and 3) the *engagement* of learners in carrying it out. In the next section we consider each of these in turn.

Three Conditions for Getting Task Interaction to Fire

As established so far, we are making a case here for field, purpose, and engagement as conditions that are necessary for interaction likely to be pedagogically beneficial for learning.

Field

Our first dimension, "field", reflects the fact that any task must have some kind of content—basically the discourse, and what the discourse is about. In order to avoid seeing tasks as pre-ordained containers, we are referring to discourse coverage as the "field" of the task. We envisage this as comprising both referential (cf. Yule, 1997) and pragmatic (cf. Rose & Kasper, 2001) meanings. We use the term "field" to refer to the array of

conceptual, linguistic, and discourse meanings and structures which a participant weaves together and manages in the execution of a task. "Field" represents the sum of the experiences involved in carrying out a task as a whole.

As such, the term can help reflect a similarity between the capacities underlying language tasks and those underlying other skills. A cook can be thought of as managing the field of ingredients, utensils, and processes involved in preparing a particular recipe. In order to bring the recipe into reality, a cook needs to actualize the relevant "field"—conceptualize, combine, plan, and use. A chess player is likely to activate a "field" in assessing the state of a game of chess: s/he would need to have a grasp of the different roles of the pieces, how they can combine, draw on this knowledge to judge the effect in a particular array, and anticipate future moves. Similarly, someone preparing to carry out an institutional review will need to handle, coordinate, and integrate the field of topics, documents, investigation, and reporting procedures relevant to the enquiry. Handling discourse can be seen in the same way: when describing a place, telling a story, making an invitation, or discussing and finding a solution to a problem, we need to manage the relevant field of concepts and meanings. "Field" is used here then to identify the set of concepts and linguistic meanings which language users need to manipulate in order to manage a particular speech event. It is the field which provides the main anchor or reference point against which the learners' input, output, and feedback are interpreted, formulated, and negotiated.

The construct of "field" includes four main elements:

a) the array of personal real world concepts relevant for handling a given task. For instance, in a map task this includes understanding of how maps work, what the symbols conventionally mean, and the geographical realities they relate to.
b) the linguistic meanings that learners need to engage with—referential, metaphorical, pragmatic, or discoursal, all of which will inevitably have some kind of socio-cultural value (cf. Lantolf, 2000).
c) the lexico-grammatical options for formulating relevant messages, which learners need to work with and select from.
d) the sense of the intended overall outcome, and of how the procedures developed by the learners during the task relate to that intended outcome. This is a pragmatic dimension of the field, which will be generated as learners work through a task, and which is likely to be stored for future use. If a task is conceptualized as consisting of the four ingredients, namely data, problem, operations, and outcome (see Samuda, 2001), this fourth element encompasses the strategic and interactive procedures involved in the operations. This includes the ways in which participants use each others' contributions to complete

the task. We note in passing that this definition accounts for all kinds of tasks, both dialogic and non-dialogic.

Seen from this perspective the learners' and teachers' sense of field can be expected to evolve inevitably as they work through a task, generating a sense of the relationship between the parts of the task and the whole. The phases of a task are therefore important stages, not only in achieving the overall goal, but in enabling learners to build up what we might call a "schematic sense of field," encompassing its different aspects—real world concepts, linguistic meanings, lexico-grammatical formulations, and means and ends. By the end of a task, we would anticipate learners having a fuller understanding of the different aspects than at the beginning. In particular, we might hope that learners emerge from a task with an enhanced sense of the linguistic meanings and of the lexico-grammatical options that were needed during the process or in formulating or presenting the outcomes and their relative utility.

The notion of field outlined here is consistent with thinking in a range of areas. For instance the study of expertise focuses on the online capacities of experts to manage particular task demands (e.g., Ericsson, 1996). In general education, tasks are seen as engaging learners' holistic processing of a topic field (e.g., Ainley et al., 2004). The construct echoes the notion of "format" proposed by Bruner (1983) to describe recurring canonically structured everyday speech events which children typically encounter during their early years. Support for the construct can also be found within sociolinguistics, for instance in the work of Labov (e.g., Linde & Labov, 1975), and in Hymes's inclusive framework for describing speech events. Within the research into language learning tasks, the construct finds support in Robinson's (2001, 2007) work on task complexity, in Brown and Yule's (1983) proposals for analyzing the schematic structure of oral language tasks, and in Nunan's (2004) approach to task-based syllabus design.

Field as outlined here, then, is a socio-psychological construct which emerges through socially mediated interaction with one or more tasks. As a socio-psychological construct, learners will inevitably construct and experience their own field for a given task slightly differently. Seen from a pedagogical perspective, we assume that for a given task different learners' fields will have at least some features in common, enabling teachers and learners to work jointly on pedagogically relevant aspects of the task.

How does this relate to L2 learning? The inclusive nature of the construct suggests a range of ways in which the notion of field could be particularly useful in opening up the potential contributions a task might have for a student's learning. For instance, assuming the student develops the sense of the field of a task, it becomes possible to consider critically how this aspect of a particular task can contribute to a student's overall

language development. Some attention has been given to this (notably Robinson's 2001, 2007 work in studying issues of task sequencing). However, on the whole researchers have not focussed much on the ways in which the field of a given task can be exploited to promote language learning. Discussing learning in other domains, Ericsson and Hastie (1994) point out that learning is not always best achieved through spontaneously occurring events, whether in play or at work. For instance, amateur golfers are unlikely to progress much if they limit their learning opportunities to casual rounds of golf with friends. In the same vein, learning new routines at work can be difficult, given the lack of time to explore alternative ways of doing things. The problem is that whether at work or at play, new challenges arise too unsystematically, with the same learning opportunity only occurring by chance, against a background of pressure for immediate performance. An everyday analogy can be found in the common experience of assembling flat pack items of furniture. Frequent users of flat packs are most likely to find themselves assembling items with very different component parts and varying fixing procedures. The effect is that successful assembly of one item can be scant preparation for assembling the next. After assembling a dozen or so different items, learner-users are likely to find themselves barely more capable of putting the items together than they were at the beginning. However, if the items were selected to ensure that over a period of time they all had a similar internal structure and similar assembly operations, there would be a far greater chance of learning—both of the structure of the whole, and of the detailed interrelationship and fixing procedures of the parts.

For pedagogical purposes, tasks then need to be selected and sequenced with an eye to the internal composition of the "whole," for instance of the linguistic meanings and lexico-grammatical parts which are likely to be useful. To this end, taking account of the "fields" of the different tasks might enable us to maximize the overall learning opportunities, and minimize or avoid incoherence between tasks. Working with a task over a period of time, through a series of phases for instance, may be expected to encourage and enable learners to explore the field of the task and improve their control of different aspects of it as they work through it (see for instance Bygate and Samuda, 2005). Similarly, reworking a similar task, or variations on a given task, or working with tasks with some element of internal or external repetition designed into them (Bygate, 2006) might be expected to enable learners to develop their control of different aspects of the field. For instance, learners might improve their conceptual organization, their lexico-grammatical accessing, or their management of the relevant discourse patterns (including, for example, their use of negotiation for meaning moves). Field also comes into play across extended sequences of linked tasks, characteristic of project work (Beckett & Miller, 2006; Legutke & Thomas, 1991). One implication of

this perspective is that the field of a task involves more than just interaction patterns, and indeed that tasks (especially but not exclusively reading, writing, and listening tasks) may well not be overtly dialogic, as illustrated further in our example 2 below.

Field, then, is important. On its own, however, it cannot provide an adequate reference point for the participants in the speech event. It is the necessary backdrop as it were against which utterances are shaped and reshaped. But the content itself cannot be properly managed unless it is perceived as relevant for some overriding *purpose*. This is the focus of the next section.

Purpose

Purpose is an essential part of the composition of a task. For instance, if, as noted earlier, students do a picture differences task, the processes of carrying it out—processes such as verbally identifying the presence or absence of features in the pictures, identifying different arrays or attributes of elements, jointly interpreting whatever has been identified, and if necessary aggregating progress—are only motivated by the purpose of achieving the outcome of successfully finding the differences. That is, the means–end structure of the task motivates and makes relevant the linguistic meanings and formulations required for its completion. It is this that gives the students' utterances a pragmatic orientation—concepts have to be engaged, meanings identified, and lexico-grammatical formulations selected. The intended task outcome motivates language which can enable its completion. Hence it would be misleading to focus entirely on the task as process. For example, we risk distorting the concept of task to focus solely on the different internal qualities of task types, rather in the way earlier methodologies distinguished between different types of exercise or drill. Rather, we need to keep in view the nature and status of the intended outcome of the task and its capacity to act as motivation for the language use needed to achieve the outcomes. Without purpose, the language use risks becoming just an exercise in form: it is the interlocutors' purpose which provides the basis for selection of elements from the field. This is not to deny the importance of working on form before, after, or even during the task, but only to assert that the task must involve the purposeful use of form.

Take for example the purpose of recounting an important life experience, like how a person first met their life partner or best friend: the speaker is likely to highlight just the relevant elements of time and place. Similarly, in describing a route across a map, speakers will select what they judge to be key, and ignore what is not. That is, pragmatic purpose is the reference point. Indeed, as Wilkes-Gibbes (1997) has shown, listeners will adjust their listening to their own pragmatic ends, picking up or

ignoring details in light of their purpose, so that the participants' individual pragmatic purposes will impact on the quality of the interaction. In other words, in actual language use, we shape the "field" to meet our discourse purposes.

However, purpose extends beyond the immediate intended outcomes of the individual participants. This is because, as in most domains, in classroom contexts the participants' purposes are embedded in other purposes. Hence the immediate purposes are themselves affected by the value of the target outcome, and from this perspective we cannot take for granted students' perceptions of a task. In other words, the outcome of a task is itself one in a chain of further purposes. So in addition to a communication product, the outcomes from a task serve to fulfil a longer term pedagogic purpose: the pay-off for students in completing a task is that the outcomes can be worked with in subsequent activities. The importance of this is not to be underestimated. Garrett and Shortall (2002) report that Brazilian students of English considered student-centered activities more fun, but of little value, when compared with teacher-centered activities. If this is how students perceive activities, the use of tasks in pair or group work starts with an inbuilt disadvantage. Van den Branden (2006), on the other hand, reports very positive student evaluation of tasks, but perhaps significantly this is underpinned by the learners' positive perceptions of them as valuable for learning.

Dewey (1910) recognized the importance of a pay-off for engagement in skill-based activities: overt and executive activities, as he referred to them, were valuable, but their value would be jeopardized unless they were used with a pedagogical purpose, and not simply as the basis for activity for its own sake. In line with this perception, Morrow and Johnson (1980) proposed that the value of tasks would be enhanced in learners' eyes if they systematically prepared the way for a subsequent activity, creating a link between activities, one task being motivated by its role in preparing for the next, a relationship which they termed "task dependency." An external purpose of this sort is likely to counter students' perceptions of tasks as being fun but of little value. Finally the external purpose in using a task can derive from its role within a single lesson. For example, Samuda (2001) described the implementation of a task ("Things in pockets") which a teacher deliberately uses to set up a context and a need for attention to and use of a language area—modality—which the teacher wished to prioritize. Here task engagement was likely to be enhanced by the students' perception of the task as useful for their participation in the lesson and for their learning beyond the task. The implication then is that the quality of task interaction will be partly a function of the students' appreciation of its pedagogical purpose.

Engagement

The reason the dimension of discourse purpose is important for the use of tasks in language pedagogy is that it provides the basis for the mutual *engagement* in the discourse of both for speaker and listener, which is the third aspect of tasks we wish to discuss. The notion of engagement is one which Plough and Gass (1993) introduced into the study of tasks when discussing the difference between performances on familiar and unfamiliar tasks. Task novelty, they suggest, is a potentially important catalyst for student engagement. Consideration of engagement turns attention from the task as designed to the issue of how far students engage with the goals of the task: that is, do they endorse its aims and grapple with the resources that are available in order to complete it? Let us consider this in a little more detail.

It is perfectly common for a task to have "field" coverage, and to provide a purpose, yet fail to recruit learners' commitment to carrying it out. In this regard, tasks are rather like any other pedagogical activity. The piece of music put in front of a music student, a recipe given to an apprentice chef, a book to be read in a literature class, a wood- or metalwork task set for a craft student, even an athletics activity—whatever the field and purpose, a student can always be imagined who would be indifferent to the challenge. So it would be foolish to assume that tasks can be so designed that they will inevitably succeed in engaging all learners' interest, whoever and wherever the learners and teachers might be. The pedagogical purpose, the target outcomes of the task, and the field itself all have to be recognized by teacher and students if they are to spark. In this sense, however good and relevant the design, learners and teachers have to interact imaginatively and practically with the construct of any given task if they are to make it work. Learner engagement is crucial, but cannot be designed into activities.

As we have seen, an assumption underlying the interaction approach is that in cases of doubt or uncertainty the learners' interlocutor will seek clarification or confirmation of meanings. This implies that the speakers will be committed to getting their messages across to their interlocutors—that is, to things like attending to the comprehensibility of what they are saying and checking that the listener is indeed understanding their intentions. Yet the level of commitment needed for this to happen cannot be taken for granted. This point has been made in various ways by different writers. As noted above, Aston (1986) remarked that if negotiation for meaning is to be a significant site for learning, learners will need to be able to tolerate being interrupted, and will need to be sanguine about interrupting others. And all the more so if they know understanding is possible despite linguistic error. Aston argued that as a result learners would generally avoid "trouble-shooting" more than absolutely necessary.

So for negotiation for meaning for instance to occur, it is essential that all parties do in fact accept the purposes behind the task. Without this, the potential for negotiation procedures will at best be achieved only intermittently. Hence it is not enough for the task rubric or instructions to specify an intended outcome: it is essential that students adopt the target outcome as their own. That is, the discourse moves undertaken on a task depend on the *mutual* engagement of all parties. But again this cannot necessarily be relied on. Thus, within an interaction approach, it is clearly not sufficient for the learners to have a general communicative goal: the interlocutors also need to have accepted a purpose for listening and providing feedback—indeed, a purpose for being an interlocutor.

Engagement then is important: it makes a difference whether or not the interlocutors' purposes are shared or, as Widdowson (1983) puts it, whether convergence between interlocutors is sought. This applies whatever the focus of the interaction—an expression of thanks for something, or sympathy over something, an invitation to an event, an account of one's state of health, a story, or an explanation about how something works or why something happened. Engagement is clearly an essential reference point for the participants' listening, reading, speaking, or writing. It is also important for most learning activities, and essential for any kind of activity that might be termed *holistic*, amongst which are what are termed *tasks*.

Summary

Thus far we have sought to argue that to advance the study of interaction within pedagogical tasks, it is becoming necessary to consider extending the framework of enquiry. We started from the central concern of the interaction approach of how to bring pressure to bear on task communication in order for students' communication to engage with language learning processes. The approach we suggest is to consider pedagogic pressure in terms of three factors, all of which are needed because, we argue, they work together. Field represents the aspects of a task which students can be expected to focus on through engaging interactively with a task—the focus of the pressure. Without field there is nothing to focus on, and without focus there is no pressure. In contrast, the concept of purpose provides a motivation for the focus. Without purpose, why focus? Hence focus and purpose give purchase to each other. On its own, neither creates the pressure. But jointly they can. From this, we suggest that the key element of engagement can only arise from the interplay of purpose and field. Together the three dimensions may enable us to extend our notions of how interaction can impact on language learning, and the conditions under which it operates in the classroom use of tasks. In addition, we argue that they can enable pressure to be productively

exerted within the context of "noninteractive" tasks, implying that tasks can be used profitably beyond the terms of the interaction hypothesis.

In the next section we draw on extracts from two tasks to illustrate the potential value of extending the interaction research agenda along these lines, and to show some ways in which our three dimensions can be operationalized in the context of data analysis. We conclude with some tentative hypotheses for further investigation.

Applications to Data Samples

In this section, we analyze two data samples, one of task talk taken from a scheduled lesson within a taught program, and the second of task talk taken from a laboratory-type study, in some ways representative of many of the studies of task interaction to date. Both extracts come from data which were collected for other studies. Our purpose here is to illustrate the three concepts of field, purpose, and engagement in relation to the construct of task, in the process to show how they can be operationalized for empirical data analysis and consider how they relate to the interaction hypothesis. The first task, a dialogic opinion gap task, illustrates how field, purpose, and engagement can help to understand the generation of a rich interactive sequence, despite the fact that the task does not conform to the specifications of a required information exchange task, one of the task types seen as optimum for encouraging the use of interactional talk. The second task, a monologic task, demonstrates how field, purpose, and engagement can also operate productively in terms of their learning potential within the context of non-dialogic tasks.

Sample Task (1)

Throughout the first extract throughout the 31 turns, a group of four students are jointly exploring the sequencing of four ambiguous photographs in order to work out a possible account of what they represent. The students (two female and two male) were in their early to mid-20s, and of mixed proficiency levels, two from Latin America (Venezuela and Chile) and two from Asia (Singapore and Japan). They were participating in a short pre-sessional course in the UK. The high intermediate students were "P" (female from Chile) and "S" (male from Singapore), the low intermediate students were "N" (female from Venezuela) and "H" (male from Japan). The task entailed coming up with a plausible mutually agreed story based on a set of four ambiguous photographs. The students had been given the following instructions:

> Agree on a story based on these four ambiguous photographs. You will work in groups of four, but first look at the photos by

> yourself and decide on a possible sequence of actions; then with your group, share your ideas and come up with an account of what happened.

Note that all students can see all four pictures, so that the dynamic for this task proceeds from the ambiguity in the pictures, the need to imagine an interpretation, and the likely need to resolve any opinion gaps emerging between the four.

The transcript for a section of the task can be found in Table 4.1. The extract comes from a phase of the task where the students are signalling the need to reach consensus in order to agree on an outcome. The following sections consider the extract in terms of field, purpose, and engagement.

Field. We propose that the construct of field can be accessed via a content, discourse, and process analysis of the transcript data. So for instance, the sample extract of data shows that the task engages the group in a field which involves interpretation and description (and also description followed by subsequent interpretation) of people's movements around a space (walking, moving around, changing places or positions, going round a circle, meeting at a point, moving to a position, continuing their journey in turns 1, 20, 21, 24, and 30), their physical postures (turning around, turning 160 or 180 degrees in turns 20 and 24), their expression (staring in turns 9–20, 27), reference to the location of the pictures (the street, a town square in turns 1 and 21), and speculating about what the people were doing (picking up a coin in turn 25, looking at each other in turns 24 and 27). Underlying this we can infer the fairly detailed visual scanning by the participants of the contents of the photographs, not to be neglected, since that constitutes work needed to carry out the task, and is therefore available for subsequent exploitation during the task, in a post-task debriefing and discussion or in a follow-up activity. Part of the field also includes the interactive negotiation of meanings, for instance, the exchange sequences explaining the notion of "staring" and the word "eyesight" (turns 9–20), and checking the accounts of the various movements around the space. The field also though includes the task enactment processes in which individuals verbalize an account, seek ratification or otherwise by other members of the group, and manage the processes of mutual comprehension. These aspects of field are represented by the expository turns, by the positive and negative backchannels from other interlocutors (for example turns 2 and 5), and by the requests for repetition or recapitulation (turns 4 and 8).

Emerging from this there is then a range of field elements which the students have worked with which are open to exploitation in this and subsequent pedagogical activities. This ranges from the information internalized from the pictures, through the lexico-grammatical expressions, to

Table 4.1 Task 1 transcript

1	S:	they look at each other then turn around that's what people do in the street. if for example I saw you dressed in a strange way I would turn around and look at you that's why they switch at their positions
2	P:	we have to decide one this I think is right mmm?
3	N:	yes I
4	P:	would you repeat
5	N:	yeah very good very good I agree with
6	P:	you do as well?
7	H:	I do yes
8	P:	could you repeat
9	S:	they both look at each other *(to self)* stare look at
10	P:	they look at each other yeah
11	S:	with strange eyesight
12	P:	uh?
13	S:	with strange something peculiar eyesight
14	P:	I know what is peculiar but I don't understand your idea
15	S:	*(writing)* eyesight
16	P:	ah eyesight
17	H:	what does it mean?
18	P:	*(mimes)* eyesight when you look
19	H:	ah
20	S:	eyesight yeah (.) and then turn around (.) so that's why they switch at their positions
21	P:	B took the coin and they continued walking round the square and they meet again in the same place
22	S:	no no no
23	P:	yeah because they meet here at the same point
24	S:	what I meant was not that what I said was after B pick up the coin and they look at each other and then turn 160 180 degrees after they continued on their way you see A is walking in the same direction as B
25	P:	What do you mean? He pick the coin?
26	S:	yeah
27	P:	they looked at each other
28	S:	yeah
29	P:	and?
30	S:	and then turn to turn *(louder)* and B moved to this position *(points to picture)* and A moved to this point *(points to picture)* after that they continue their journey
31	P:	but it doesn't (.) any meaning

the various discourse patterns used to manage the groups' joint handling of the task, and their mutual understanding.

Purpose. Their exploration of the field however is not for its own sake: rather, it is intended to serve the overall purpose of finding a meaningful sequence for the pictures, and explaining the sequence to others. For example, a fairly standard example of negotiation of meaning arises in turns 11–20, around the word "eyesight." In one sense this sequence of

turns can be read as a classic relatively localized repair side-sequence aimed at achieving mutual comprehension.

However the sequence does not occur just for its own sake, but in service of the higher purpose of elucidating the ways in which the two people in the pictures are looking at each other. This in turn is expected to contribute to achieving the task objectives. Utterances then are embedded in sequences; and these in turn are embedded within local purposes (describing the events), which are themselves set within the overall purpose of the task.

This embeddedness is nicely illustrated in the sequence from turn 21 to the end. Through this sequence, S attempts an account of what he thinks the two people were doing. P listens attentively, checking her understanding as S proceeds, and then closes the sequence by making explicit the functionality of the speech event that they are all participating in and evaluating it accordingly—"but it doesn't (.) any meaning." The speakers' use of language is not just an exercise in expression, but serves the purpose of solving the problem of providing an adequate explanation. To that end, the speakers struggle for expression, and the listeners concentrate in order to understand: without that struggle or concentration, the task would not "work"—and, for that matter, nor would the students. The impact of that struggle extends well beyond canonical negotiation for meaning sequences, into the students' estimates of what meanings to express and how to express them, engaging not just the selection of individual lexico-grammatical units, but their effective combination. Thus turns 24 and 25 do not so much focus on the overt negotiation of lexical items, but fundamentally on mapping a meaning onto the pictures, and on conveying this through the juxtaposition of words that are not in themselves problematic. Issues of communication are not so much related to problems of the *code*, for instance of knowing the standard meaning of the word *eyesight* in English. Rather they are concerned with issues of contextual construal (Croft & Cruse, 2004), that is, how the word *eyesight* might be used strategically in the context of the particular task to achieve a locally constructed meaning. Overall it is the purpose of achieving a meaningful outcome in relation to which this crafting of speech and its comprehension take place. The purpose acts as a reference point for the students' construction of their web of words.

Engagement. The terms *struggle* and *concentration* used above reflect the aspect of engagement. Our example 1 illustrates this facet. Sequences such as the ten turns from turns 11–20, which focus on clarifying the phrase "with strange eyesight," could tax the patience of some if they occurred too frequently (illustrating Aston's [1986] point that negotiation can be troublesome, discussed earlier). In our sample extract, speakers then move into another 12-turn sequence, similarly devoted to clarifying students' intended meaning. These 22 turns—with the concluding turns

signaling fairly transparently that the speakers have understood each other but have differences of interpretation of what the photos represent—provide some evidence that this particular group is committed to completing the task. Engagement here is not an issue. Elsewhere it might be though, and in using—and studying the use of—tasks in real world classrooms (of which this extract is an example), the dimension of engagement cannot be ignored.

Sample Task 2

In the Tom and Jerry stories (see Bygate, 1996, 2001) students are recorded recounting a video sequence from Tom and Jerry cartoons. The original purpose of the data collection was to investigate the impact of the repetition of the performance of an oral task. The sample consists of two retellings by the same speaker of the same video sequence, ten weeks apart. On each occasion, the student watched the short extract, and then recounted the episode. The task was not part of a teaching program; there was no preparation prior to the student receiving the instructions, and there was no follow-up. The task is a one-way monologic task, in which speakers are required first to watch a short video sequence, and then, converting the visual information into verbal format, retell it from memory.

As we will see, the task lacks a pedagogically motivated outcome specification which it would need for use in classroom contexts. Furthermore, as noted earlier, this is a monologic task, so it is not overtly interactive. However it does nonetheless show some features which are relevant to our purpose. For one thing, overtly monologic tasks are needed within classroom contexts: many reading and writing tasks are typically overtly monologic. Also, monologic tasks can be valuable both in preparing for and building on dialogic activities, since they require the use of sustained stretches of uninterrupted discourse. More importantly for our current argument, the roles of field, purpose, and engagement are likely to lead to communicative engagement with the language even within monologic tasks. Hence studying the pedagogical dimensions of monologic communicative talk may help to better understand the relationship between interactional talk and other kinds of task-based learning. It is also perhaps worth noting though that the performance was elicited under similar conditions to much of the research carried out by Gass and her colleagues: task is used to elicit and explore interlanguage talk, not primarily as a pedagogic construct.

The precise operation of the task—called here a Tom and Jerry narrative task—was as follows. Without any preparation other than an initial briefing, students were shown a short cartoon video containing action but no dialogue, lasting roughly ninety seconds. They were then asked to recount the episode so that a listener could retell it afterwards. Ten weeks

later without prior warning the students were asked to repeat the task—watching the video a second time, and then retelling the narrative.

Although not constructed here for pedagogical purposes, we are considering this task since it nonetheless contains the essential ingredients that we noted earlier in the chapter: data, problem, operations, and outcome. However the context within which the task was used and the conditions under which it was enacted (although there is an active listener, the listener has not been given a purposeful role), means the task is obviously closer to a testing or research task than a pedagogic one. The same task, however, could be used in a pedagogic context, although to fulfil a pedagogic function a teacher would need to compensate for the lack of specified outcome for engaging with the task. The teacher would probably also need to introduce into the activity an interlocutor along with a purpose for their participation. Nevertheless, even as it stands, the task is valuable in illustrating elements of field, purpose, and engagement. In particular, in what follows we build on the analysis used for task 1 to show how a similar dynamic develops around the learners' need a) to use world knowledge to understand what is going on in the video, b) to recognize and identify relevant meanings, and c) to articulate them. That is, even in noninteractive tasks, students can still be significantly engaged in working with language within communication.

Field. To start with, as can be seen in Table 4.2, the speaker has a clearly defined field to work with. These include the following elements: the protagonists (*cat, mouse, housekeeper*), locations (*kitchen, shelf, wall, ceiling, floor, corner, bottom*), and associated prepositions or adverbs of location and direction (*all over, near, down, on, up, in, on, with*), props (*dishes, cups, plates, tail, bowl of milk*), and a sequence of motivated events (*run, drop, throw, break, kick, shout, punish*). In addition, there is evidence that the speaker is also working with more subtle aspects of the narrative. One aspect of this concerns the interpretation of intention, cause, and effect. Evidence for this is found in the use of words and phrases like, at time 1: "*want*", "*in order to*", "*so*" (notably six uses at time 1), "*prevent*", "*try*", and at time 2: "*in order to*", "*realize*", "*prevent*", "*busy*", "*so*". Some of the intentions are relatively complex. Consider the following chains of intentions and consequences, some of them marked by the word "so": "*so j- er tom has to (,) h her:m (,) prevent them from falling on the on the floor (,) and er prevent them from breaking hh and er so: he's trying to: take them*" (time 1); and "*he gives tom a good kick and er so er (,) so tom starts shouting so he attracts hh er the housekeeper*" (time 2).

There is also evidence that the speaker uses some form of comparison or analogy in order to represent what is happening. This is evidenced in the italicized elements of expressions such as "*uses the tail as a springboard*", "*a piece of wood that runs all over the walls*", "*in order to catch the attention of*", the "*housekeeper*" or "*landlady*", "*splashes in the dish full of milk*" (= as

Table 4.2 Task 2 transcript

Time 1 (T1)

1. (1.5) hh and then he goes on (2.0) in a mm (,) a piece of wood that runs all over the the room (,) near the ceiling
2. and er hh (,) he wants to (,) make noise in order to (,) attract er (,)hh the landlady
3. and erm (,) hh (,) all so all the: (,) the dishes and the cup erm and the cups (disposed) on this mm mm mm wood bar hh (1.0) er fall down (,)
4. no he make (,) this dishes and cup all fe- fall down
5. so j- er tom has to (,) hh er:m (,) prevent them from falling on the on the floor (,) and er prevent them from breaking hh and er so: (,) he's trying to: (laughs) to take them
6. hh and in the end he (,) jerry er tom is in a corner (,) hh and er he has all these dishes piled up (,) hh
7. and er tom is erm (,) no who is? the mouse anyway is (laughs) o- on the top
8. (,) hh so: (,) he again (,) he mm he springs (1.0) uses again (,) the tail as a springboard
9. then he splashes in a (,) in a mm (,) dish full of milk (,) hh and erm (,)
10. he splashes all the milk on erm tom hh er
11. (,) hh but landlady (,) has heard (1.0) the noise so he's c- she's coming hh and er
12. (1.5) ah yes (,) er he makes space on his bottom on er (laughs) tom bottom (,) and kicks him hh so (,) he has to shout (,)

Time 2 (T2 10 weeks later)

1. (,) he's th- thrown up (2.5) in er in the air hh and er he lands on: a piece of wood (,) that runs (,) all over the walls in this in this er room hh and er
2. in order to (,) catch the attention of ah hh of the housekeeper
3. hh er he starts throwing (,) down (,) all the plates (,) erm on this on this er piece of wood hh
4. and er jerry er and tom hh er starts realises er realised this then st- starts er piling piling (,) these dishes up hh in order not to (,) prevent them (,) from falling er so from fr- from crashing
5. hh but erm (1.0) so (,) tom is busy e:rm to er to hold this all this erm dishes hh and
6. er (,) er jerry er (,) erm jum- jumps on him hh and er uses his tail (,) as a springboard
7. and splashes in hh and he splashes in in er the milk bowl hh and so starts er swimming in this in this bowl and erm:
8. he er after hh he splashes tom with all this milk and er (1.0)
9. he gives e:rm he gives tom a good kick and er so er (,) so tom starts shouting so he attracts hh er the housekeeper hh (,)

in a swimming pool). Some of these analogies result in what have been identified as communication strategies ("*runs all over*", "*landlady*").

This material all needs to be kept in mind, marshaled, and appropriate lexico-grammatical formulations found to express it. Using this way of analyzing the data across the two elicitations demonstrates, in addition, the robustness of the individual speaker's field construction over time: it is noticeable how much of the speaker's initial selection of narrative

material is reproduced on the second (unprepared) occasion ten weeks later. Even more striking is the extent to which the speaker engages the same or very similar phrases to represent the same concepts at time 1 and time 2 ("*piece of wood*"; "*all over the room*" vs. "*all over the walls*"; "*prevent them from falling*"; "*he has all these dishes piled up*" vs. "*to hold all these dishes*"; "*uses again the tail as a springboard*" vs. "*uses his tail (,) as a springboard*"; "*he splashes in a dish full of milk*" vs. "*he splashes in in er the milk bowl*"; "*kicks him*" vs. "*gives tom a good kick*"; "*so he has to shout*" vs. "*so 'tom' starts shouting*"). The conceptual and lexico-grammatical similarity of the two versions suggests that the original working field constructed by the speaker may remain available for access on the second occasion. It is worth noting that other speakers seemed to have employed their own somewhat different combinations of selections across the two versions, but within the same conceptual field. This suggests a robustness of field for exploring task talk, both of a single speaker at different times and of different speakers on the same occasion. Findings of commonalities of field both for a given speaker and across speakers are of clear potential pedagogical interest.

Purpose: Turning to the issue of purpose, the speaker's talk is clearly being shaped to meet the overriding pragmatic objective of providing an accurate account of what they had seen. This is particularly noticeable in the work the speaker puts into shaping their utterances through various kinds of complex paraphrase, or via rephrasings. For instance, in utterance 1: "*and then he goes on (2.0) in a mm (,) a piece of wood that runs all over the room (,) near the ceiling*", in order to express the meaning of "shelf," the speaker pauses four times, uses a pragmatic hyponym ("*a piece of wood*"), with a post modifying relative construction, plus an additional clarifying prepositional phrase to indicate the relative height of the shelf. The speaker clearly judges utterance 3 as not doing the job, so in order to achieve their purpose replaces it with utterance 4: "*no he make (,) this dishes and cup all fe- fall down*." Similarly, the speaker rephrases the first part of utterance 8: "*he springs (1.0) uses again (,) the tail as a springboard*". And in utterance 12 the speaker once again rephrases: "*he makes space on his bottom on er (laughs) tom bottom*" (meaning that the mouse parted the cat's fur, so that the kick would be properly felt). The various complex expressions or rephrasings make clear that the speaker is working with the field to achieve a pragmatic purpose. Additional evidence can be found in the various false starts throughout the two versions.

Engagement. Finally, although it is difficult to assess the speaker's level of engagement on the basis of the available data, nevertheless the extent of the conceptual and linguistic work reported in the previous paragraph, and in particular the determined use of rephrasing to achieve their various sub-goals utterance by utterance suggests that the speaker was working at a high level of individual engagement. Additional evidence can be

adduced in the lack of obvious instances of message abandonment, and in the regular occurrences of self-correction (e.g., time 1, utterances 3, 6, 7, 8, 11, 12, and time 2, utterances 4 [twice], 5, 6).

Arguably then, although this task would need adapting for use as a genuine pedagogic tool, the data nonetheless provide evidence to support the claim that field, purpose, and engagement can all contribute to creating potentially productive pressure on the learner's use of language.

Some Conclusions

In this paper our concern has been to identify ways in which Gass's perspective on the value of interaction can itself usefully interact with the construct of pedagogic task. In particular, we suggest that the concepts of field, purpose, and engagement can be usefully drawn on to investigate the key issue of pressure, which Gass has worked constructively to add to the applied linguistic research agenda and to explore.

We have argued that field represents the overall content that the pressure can be used to focus on. Without a focus of this kind, the pressure cannot work. Field represents what becomes accessible to students through work on task, in terms of the representation they construct, through the dynamics of the different phases as they proceed from initial instruction to conclusion. Field brings together a rich range of learning potential; but unless this potential is recognized pressure will not be brought to bear on these dimensions, and the potential is wasted. At the same time, we have argued that in order to account for pressure within pedagogic contexts we can also benefit from widening our focus to include the purposes of the speakers, as well as the pedagogic purpose of both students and teacher in using the task. Neglecting the dimension of purpose suggests unwarranted assumptions about how interaction works, both in general, and in the context of the processes of task-oriented discourse. It also ignores the potential within the relationship between task as construct and the classroom as the context within which it is used. Thirdly, we argue that in order to consider more fully the dynamics of task interaction we may need to take into account the nature and degree of learners' and teachers' ongoing engagement in the task in action. We have attempted to show through samples of task data how the three concepts can be seen to function to create pressure on communication and some ways in which the concepts can be applied in data analysis, and how they may contribute more generally to creating the conditions for learning through tasks. From this perspective, interaction can be seen as one, but not necessarily the sole, process capable of promoting communication-for-learning, which, we argue, depends for its realization on the pressure jointly generated by these three underlying attributes. The insights derived from Susan Gass's work have been instrumental in the development of this perspective on tasks.

These directions suggest a number of further important pedagogical themes for empirical research:

1 interaction is one of various task-based processes which can contribute to second language development, given the presence of appropriate pressure on communication;
2 engagement in pedagogic tasks engages learners in the activation of "fields" relevant for their respective purposes;
3 a task-related "field" will include relevant conceptual knowledge, linguistic meanings, discourse patterns, and lexico-grammatical formulations;
4 engagement in a task primes learners for the learning of any of the various aspects of the "field" activated in response to the task;
5 classroom use of task interaction depends on and is influenced by task purpose;
6 to function in classroom contexts, pedagogic tasks must be embedded within a pedagogical purpose;
7 pedagogic uses of interactive tasks can include their exploitation to contribute to a range of second language learning processes including: awareness raising; the creation of a sense of need; exploratory learning; feature sharing; negotiation for meaning; schematic structuring; the development of strategic routines; discourse embedding; discourse development; automation;
8 pedagogical effectiveness of interaction depends on learner engagement.

The key issue is harnessing interaction to promote learning. The philosopher A.C. Grayling (2006) recently noted that in any sphere of activity action is generally crucial for learning, and that learning and action feed on each other:

> Some say that when the quest for knowledge is carried too far it paralyses action; but this mistakes a crucial point, which is that there is something greater than either knowledge or action, and that is understanding, which grows from the conjuncture of both; and which prompts the need for both in its turn (p. 96).

Susan M. Gass has always made clear that the purpose of interaction is the promotion of learning, and that empirical SLA research should be relatable to the realities of classroom practices. Seen from the perspective of the development of the pedagogical use of tasks, in our view the three concepts of field, purpose, and engagement provide a potentially productive frame for contextualizing the interaction hypothesis within the dynamics of second language education.

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5

MOTIVATIONAL PROCESSING IN INTERACTIONAL TASKS

Zoltán Dörnyei and Wen-Ta Tseng

There is a substantial body of research focusing on the linguistic analysis of language learner output in interactional tasks (as attested to by many contributions in this volume), but relatively less attention has been paid in the past to examining the psychological processes underlying student performance in interactive activities. This paper intends to add to this latter body of research by providing an analysis of one of the key learner aspects of interactional task performance, the under-researched issue of learners' motivation to engage in the task. We will first review three motivational studies that have specifically focused on analyzing dyadic interactions, and then present the results of an empirical investigation examining motivational task appraisal. Although this study does not specifically focus on dyadic interaction but rather on the more general question on how performance, appraisal, and control are linked in language learners' perceptions, we believe that some of the results can be meaningfully generalized to interactional tasks.

Our findings point to the conclusion that motivation in interactional tasks is closely related to the participants' appraisal and noticing capacity, which in turn form a relevant link to the interaction hypothesis (Gass & Mackey, 2006, 2007), as indicated by Gass's (2003, p. 224) definition: "[t]he input and interaction approach takes as its starting point the assumption that language learning is stimulated by communicative pressure, and examines the relationship between communication and acquisition and the mechanisms (e.g., noticing, attention) that mediate between them." Our study aims at furthering our understanding about the mediating role of appraisal in the learners' interactional competence, thus creating a direct link with the work of Susan Gass. Interestingly, task motivation is related to Sue's work in yet another way: In 1993, she was one of the first scholars in the L2 field to highlight the significance of interlocutor familiarity in understanding the course of interaction (Plough & Gass, 1993) and, as we will see in the following review of the relevant motivation

literature, interlocutor familiarity has turned out to be an important component of the motivational construct underlying interactional tasks.

Task Motivation

As described by Dörnyei (2002, 2005) in more detail, the construct of task motivation has traditionally been seen as a combination of generalized and situation-specific motives (Julkunen, 1989), corresponding to the traditional distinction between *trait* and *state* motivation. According to Tremblay, Goldberg, and Gardner (1995), the former involves stable and enduring dispositions, the latter transitory and temporary responses or conditions. At first sight, this dichotomy makes good sense: It is highly likely that, when confronted with a particular task, a learner will be motivated both by generalized, task-independent factors (e.g., overall interest in the subject matter) and situation-specific, task-dependent factors (e.g., the challenging nature of the task or the influence of the interlocutors). Task motivation would then be a composite of these two motivational sources (cf. Julkunen, 2001).

While the trait/state motivation dichotomy appears to be a logical and parsimonious construct, in a paper specifically devoted to the analysis of the motivational characteristics of language learning tasks, Dörnyei (2002) proposed that task motivation may be more complex than a mere composite of generalized and situation-specific motives, because on-task behavior is embedded in a series of what can be called *actional contexts* (e.g., taking up the study of a particular L2, going to a specific school, attending a particular class), each of which exerts a certain amount of unique motivational influence. That is, engaging in a specific task will activate a number of different levels of related motivational mindsets, or *contingencies*, associated with the various actional contexts, resulting in complex interferences between these parallel contingencies. As a result, we can expect to find various dynamic motivational processes underlying task completion. This is the point when the understanding of task motivation becomes relevant to the understanding of dyadic interaction, because interaction, by definition, is a dynamic interplay between two participants, and the language product of this dynamic interplay, the verbal output, will be influenced not only by linguistic factors but also by the dynamics of motivational task processing.

As a starting point in exploring the motivational basis of language learning tasks (e.g., various communicative activities such as role-plays or oral argumentative tasks in which students have to argue about something and come to an agreement), let us consider a relatively simple construct of the motivational processing model suggested by Dörnyei (2002, 2005) (see Figure 5.1). He proposed that the complex of motivational mindsets and contingencies activated during task performance feed into a dynamic

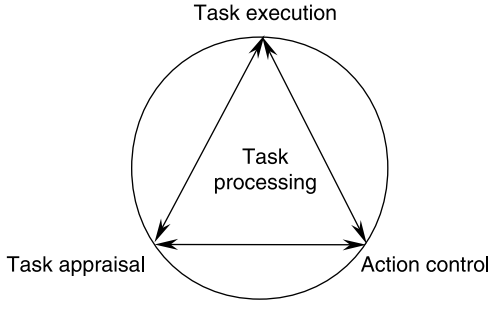


Figure 5.1 Schematic Representation of the Three Mechanisms Making Up the Motivational Task-processing System

task processing system which consists of three interrelated mechanisms: *task execution*, *task appraisal*, and *action control*. In practical terms, these involve the students' continuous monitoring and evaluating how well they are doing in a task, and making possible amendments if something seems to be going amiss. More specifically:

- *Task execution* refers to the learners' engagement in task-supportive learning behaviors in accordance with the action plan that was either provided by the teacher (through the task instructions) or drawn up by the student or the task team. In other words, this is the level of actual "learning."
- *Task appraisal* refers to the learner's continuous processing of the multitude of stimuli coming from the environment regarding the progress made toward the action outcome, comparing the actual performance with the predicted or hoped-for one or with the likely performance that alternative action sequences would offer.
- *Action control* processes denote self-regulatory mechanisms that are called into force in order to enhance, scaffold, or protect learning-specific action; active use of such mechanisms may "save" the action when ongoing monitoring reveals that progress is slowing, halting, or backsliding.

This tripartite model, then, suggests that the quality and quantity of any task outcome will be determined by the interplay of the three components. Following Winne and Marx's (1989) reasoning, Dörnyei (2002, 2005) proposed that negative signals from the appraisal system concerning task execution trigger the need to activate action control strategies and, if appropriate schemata are available, certain mental or behavioral adjustments are made and the motivational level necessary for sustaining action is restored. Let us look at an example: Ben, an advanced language

learner with well-developed task-processing mechanisms, is taking part in an L2 debate. He is continuously aware of his own progress, and at one point he notices that his concentration is flagging. This recognition of the problem initiates in Ben a search in his repertoire of relevant action control or self-motivating strategies. If he finds a way that would help him to re-focus his attention (e.g., reminding himself of the significance of doing the task well or, more generally, of becoming competent in the L2), then he executes this strategy as part of his troubleshooting, and restores in this way the necessary attention level. Thus, the smooth operation of the motivational task-processing system is expected to maintain constructive control over Ben's actions throughout the duration of the task.

With regard to the dynamics of interactional tasks in particular, a series of studies by Dörnyei and Kormos (2000; Dörnyei, 2002; Kormos & Dörnyei, 2004) offer some further insights. Dörnyei and Kormos (2000) explored various motivational and socio-dynamic variables underlying student performance in argumentative communicative L2 tasks performed in dyads. They found that the three most important motivational variables affecting task performance were the students' *attitudes toward the L2 tasks* they were undertaking, their *attitudes toward the L2 course* in general, and finally their level of *linguistic self-confidence*. Thus, the authors concluded, the study underscored the importance of situation-specific motives (as two of the three factors with the greatest impact were task-related variables). Interestingly, the students' L1 willingness to communicate (WTC), which was also measured, played a significant positive role only with the students with high task motivation; that is, WTC only made a difference among those who were taking the participation in the task sufficiently seriously.

Dörnyei and Kormos (2000) also administered an L1 version of the learning task (i.e., a very similar task which students had to perform in Hungarian) to the same student sample. They found that it was those learners who did not particularly like the English classes and did not see much point in learning English in general who appeared to be more active in the L1 task than their motivated peers. It is as if they had sensed that finally there was a chance for them to participate in a class that normally was not their forte. The research paradigm also included three standard sociometric questions examining the interrelationship between the learners (e.g., "If you received three tickets to the cinema, which two of your groupmates would you invite?"), and based on the answers the researchers computed a measure of the relationship between the two members of each dyad performing the task. Surprisingly, in the L2 task this variable did not have any significant impact on the students' performance, but in the L1 task the dyads who produced significantly more speech (i.e., chatted more freely) were those where there was a mutual friendship relationship. These contrasting results raise an important question: Why

did the interpersonal relationship between the communication partners have no detectable influence on the speakers' performance in the L2 task? That is, what was it about the L2 task that overrode the interpersonal relationship effect which was clearly manifested in the L1 task? The authors proposed two related reasons:

- When the medium of the communication is an L2, this poses the challenge of having to express one's thoughts using a limited linguistic code and to decode the interlocutor's meaning from the often imprecise/incorrect verbalizations. This challenge creates an emotional state which is different from the communication mode in one's mother tongue and which may modify one's perceptions of the latent sociolinguistic features/constraints of the interaction (such as friendship, power, or gender relations).
- The communicative task used in the study was a common communicative learning task—a moderately life-like make-believe situation—in which students were assumed to adopt a *learning mode*, that is, to pretend to take the pseudo-communication seriously. In language classes we can often observe the existence of such a learning mode, for example when certain traditional, non-authentic L2 activities require the participants to produce often bizarre, highly artificial interactions with little or no real communicative meaning, and yet motivated learners do not seem to have any problem acting out their parts. The Dörnyei and Kormos (2000) study showed that, although one of the main purposes of communicative language tasks is to reduce the artificial nature of the communicative situation, these instructional tasks cannot fully eliminate the "learning mode" in order to produce genuinely authentic interaction. In contrast, when the language of the task was changed into the students' mother tongue, the "learning" element naturally disappeared and the students behaved normally.

Dörnyei (2002) re-analyzed the Dörnyei and Kormos (2000) dataset to examine the motivational impact of the communication partner on the speaker's task performance. That such an influence exists was a logical assumption because two interacting people affect each other in many ways (see Plough & Gass, 1993), and this was also in accordance with Dörnyei's general conception of the dynamic, negotiated nature of task motivation described earlier. The analysis produced strong evidence that the interlocutor's motivational disposition is indeed related to the other speaker's performance, particularly on the number of turns produced. The strongest impact was observed in pairs where Speaker A originally had a low level of task attitudes but Speaker B was more motivated and acted as a "pulling power."

Thus, the results pointed to the conclusion that task motivation is

co-constructed by task participants. To test this, Dörnyei computed correlations between motivation and task performance at the dyad level, that is, by pooling the data for the two members of each dyad (e.g., the sum of the two members' scores on self-confidence was correlated with the total number of words the two members produced together). Multiple correlations indicated that all the motivational variables together explained 72 percent of the variance in the dyad's total speech size (i.e., total number of words produced) and 69 percent of the variance in the number of turns generated. These coefficients were over 30 percent higher than the corresponding figures at the individual level, which provides strong support for the thesis of motivational co-construction. Furthermore, when the variance explained by WTC was added to the variance explained by the motivational measures, it was found that 76 percent of the variance in speech size and 81 percent of the variance in the number of turns were explained by the individual difference variables. These unusually high figures mean that at the dyad level the motivational variables accompanied by the L1 WTC personality trait (i.e., talkativeness) do an excellent job in explaining the bulk of the variance in task engagement.

Kormos and Dörnyei (2004) performed yet another analysis of the original Dörnyei and Kormos (2000) dataset. This time their objective was to go beyond merely examining task performance in terms of quantitative measures of task engagement (i.e., number of words and turns produced) and to also analyze more qualitative aspects of task performance as measured by accuracy, grammatical complexity, lexical richness, and the argumentation structure of the students' output. That is, the authors wanted to see how motivational factors were linked to how people interacted with each other, and not just how much language they produced.

The study produced two main new findings. The first finding was a negative one: The overall impact of the motivational variables on the quality of the produced language was relatively low, although the learners' general attitudes towards the L2 course had a significant positive relationship with the accuracy of the speech produced. In other words, while motivation seemed to be closely related to the degree of the students' active engagement in a task, it had only a rather weak link with the quality of the language outcome. This would suggest that the quality of interaction is a function of linguistic variables related to various aspects of the speakers' communicative competence, which is, of course, good news, since it indirectly supports the basic assumption underlying communicative language teaching that focused language instruction can improve the quality of L2 communication.

Although it was by and large true in the study that the relationship between motivation and the quality of argumentation was limited, the second main finding of the Kormos and Dörnyei (2004) investigation concerned a notable exception to this: the number of counterarguments

was significantly affected (r = .62) by task attitudes among those students who took the task seriously: Participants with a favorable attitude to the task were more willing to express disagreement with their partners' view than students who were not that keen on the task. This is an important finding, because counterarguments are at the heart of argumentation: They are the main instigators of real negotiation, and therefore the observed strong link extends the claim made by Dörnyei and Kormos (2000) and Dörnyei (2002) that motivation influences *general* learner engagement by showing that it also affects specific, *task-appropriate* engagement. In this respect, the study highlighted again that low-motivated students can be pulled along by their more highly motivated interlocutors, as attested to by the strong correlation (r = .68) between the interlocutor's task attitudes and the number of arguments produced by those students who originally did not take the task seriously.

Although the findings of the three studies reported above are not conclusive, they seem to support the conception of "motivational processing" during task completion. We do find interferences between various levels of motivation (e.g., when certain factors only operate if they are accompanied by high task-attitudes), and in communicative L2 tasks the interlocutors' motivational disposition turns out to be a significant factor, affecting the speaker's appraisal and action control processes. Thus, task motivation needs to be considered within a larger context of dynamically interacting synchronic and diachronic variation.

In the rest of the chapter we first present empirical data (derived from a vocabulary learning study) to validate the general task processing system described earlier, using structural equation modeling, a technique that can produce various goodness of fit indices about models submitted to analysis. Our analysis also includes the comparison of novice and expert learners' motivational processing to see whether learners who have succeeded in reaching the expert level are characterized, on average, with more efficient task processing skills. On the basis of the results, we examine how the proposed model can be extended to apply to interactional tasks, with an emphasis on how learner involvement in interactional tasks is co-constructed at several levels (e.g., discourse level and motivational level). Finally, we make suggestions for future research possibilities which employ a dynamic, process-oriented research paradigm to study the psychological basis of L2 interaction.

Method

Participants

The participants included 259 (130 male, 129 female) Mandarin-speaking learners of English: forty-nine students from a Taiwanese university,

and 210 students from a Chinese university. All were undergraduate freshmen majoring in a wide range of disciplines, including business and management, geology, chemical engineering, computer science, and applied foreign languages. Before participating in the study, the two groups of learners had received English education for more than six years. All the students were approximately at the same level, with a vocabulary size of about 4,000 word families (as shown by the vocabulary tests taken by the participants).

Instruments

The three latent variables in the model were assessed by a number of self-report measures: task execution was operationalized as *Vocabulary Learning Achievement* and *Strategic Learning* to depict both the outcome and process of task execution. Action control was operationalized as *Self-regulatory Capacity*. Appraisal was assessed by four scales, *Satisfaction*, *Helplessness*, *Skillfulness*, and *Self-efficacy*. The details of the indictors are as follows (for a summary, see Table 5.1):

- *Vocabulary Learning Achievement* was measured both in terms of the size and depth aspects to generate a comprehensive profile of vocabulary knowledge. Size was indicated by the combined scores of the 2,000, 3,000, and 5,000 levels from Schmitt, Schmitt, and Clapham's (2001) Vocabulary Levels Test (VLT). Depth was indicated by the combined scores of a collocation test, a polysemy test, and prompted productive written form test (for more details see Tseng & Schmitt, in press).
- *Strategic Learning* covers both the quantity and the quality dimensions of strategic learning behaviors (for more details see Tseng & Schmitt, 2008). The quantity dimension, referred to as *Strategic Vocabulary Learning Involvement*, was assessed by 22 items using a rating scale ranging from 1 = "Never" to 7 = "Always," whereas the quality dimension, referred to as *Mastery of Vocabulary Learning Tactics*, involved thirty-two items using a rating scale, ranging from 1 = "Never Used" to 5 = "Yes, and with lots of mastery."
- *Self-regulatory Capacity* was assessed using a self-report questionnaire, the Self-regulatory Capacity in Vocabulary Learning scale developed by Tseng, Dörnyei, and Schmitt (2006). Based on Dörnyei's (2001) system of motivational self-regulation, this battery involves five subscales: (1) commitment control, (2) metacognitive control, (3) satiation control, (4) emotion control, and (5) environmental control, and uses six-point Likert-scales ranging from 1 = "strongly disagree" to 6 = "strongly agree."
- *Appraisal* was operationalized by four scales involving twenty-eight

Table 5.1 Summary of the Measures of the Hypothesized Model

Latent Variables	*Indicators*	*Number of Items*	*Scales*
TASK EXECUTION	Vocabulary Achievement	2	• Size of Vocabulary Knowledge: 2000, 3000 and 5000 levels tests • Depth of Vocabulary Knowledge: collocation, polysemy and written form tests
	Strategic Learning	2	• Strategic Vocabulary Learning Involvement: 7-point Likert-scale ranging from 1 = "Never" to 7 = "Always" • Mastery of Vocabulary Learning Tactics: 5-point Likert-scale ranging from 1 = "Never Used" to 5 = "Yes, and with lots of mastery"
ACTION CONTROL	Commitment Control	4	6-point Likert-scale ranging from 1 = "strongly disagree" to 6 = "strongly agree"
	Metacognitive Control	4	
	Satiation Control	4	
	Emotion Control	4	
	Environment Control	4	
APPRAISAL	Satisfaction	8	6-point Likert-scale ranging from 1 = "strongly disagree" to 6 = "strongly agree"
	Skillfulness	4	
	Helplessness	6	
	Self-efficacy	10	

Likert-type items (ranging from 1 = "strongly disagree" to 6 = "strongly agree"): *Satisfaction*, *Helplessness*, *Skillfulness*, and *Self-efficacy*. Satisfaction, helplessness, and skillfulness are concerned with the specific appraisal regarding the actual use of learning tactics, whereas self-efficacy is associated with the appraisal of vocabulary learning in general (for more details see Tseng & Schmitt, 2008). This helps generate a comprehensive profile of appraisal measurements in terms of both specific and general perspectives.

Procedures

A pilot study was carried out and, as a result, amendments were made to various measures. The main study was administered in early December, 2004. The procedures used for participant recruitment and administration of the study in both Chinese and Taiwanese research sites were the same.

First, the purpose of the questionnaire was explained to the participants, and consent forms collected. When the participants completed the entire study, Chinese participants received 10 Renminbi, and Taiwanese participants received 150 New Taiwan dollars for joining the project.

Data Analysis

The data were analyzed by means of structural equation modeling (SEM), using Amos 4.0. SEM is a complex statistical procedure used to interpret the relationship among several variables within a single framework. Its strength is that we can specify directional paths (i.e., cause–effect relationships) between the variables and SEM evaluates the feasibility of these. Thus, the procedure makes it possible to test cause–effect relationships based on correlational data, which correlation analysis cannot provide, thereby combining in effect the versatility of correlation analysis and the causal validity of experimental research (see Dörnyei, 2007).

With regard to the technical details of the analysis, in order to identify the hypothesized model, the paths between strategic learning and task execution, satisfaction and appraisal, and commitment control and action control were fixed to 1 to establish the scales of the three latent variables. With 11 factor indicators, the number of data points (variances and covariances) in the hypothesized model were $[11*(11+1)]/2 = 66$, and the hypothesized model included a total of twenty-five parameters (eleven unfixed path coefficients, eleven measurement error variances, and three residual error terms). Therefore, the hypothesized model could be identified and tested with 41 degrees of freedom ($66 - 25 = 41$).

After making some modifications on the model so that appropriate goodness of fit indices could be obtained, we compared two subsamples, novice and expert learners. Based on their Vocabulary Learning Achievement, the participants were divided into three groups: high, intermediate, and low achievement vocabulary learners, with 86, 87, and 86 subjects, respectively. In the current study, low-achievers comprised the novice group and high-achievers the expert group (the intermediate achievers were excluded from this analysis).

Results

Figure 5.2 presents the schematic representation of the proposed model of motivational task processing. As can be seen, in order to operationalize Dörnyei's model described above (and schematically presented in Figure 5.1), we hypothesized three causal links between three latent variables in a circular manner: First, learners appraise the quality of task execution, then this appraisal leads to action control decisions, which feed back to further task execution.

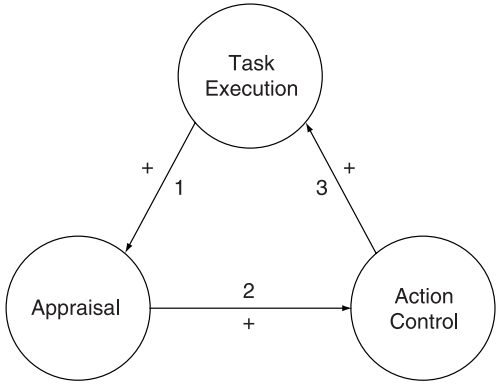


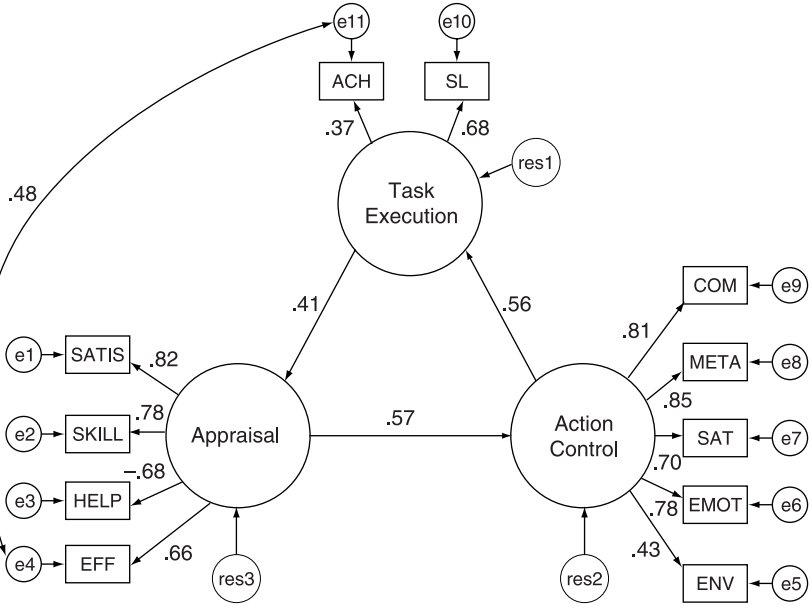
Figure 5.2 The Hypothesized Structural Equation Diagram of Motivational Processing

The first step of the analysis involved computing goodness of fit indices for the proposed model. At this point we found that the results of model evaluation did not support the suitability of the hypothesized model [$\chi^2 = 184.09$ ($df = 41$, $p < .01$), goodness of fit index (GFI) = .90, adjusted goodness of fit index (AGFI) = .83, comparative fit index (CFI) = .89, Tucker-Lewis index (TLI) = .85, incremental fit index (IFI) = .89, normed incremental fit index (NFI) = .86, root mean square error of approximation (RMSEA) = .12]: Of the several different goodness of fit indices only the GFI reached the threshold of acceptability. To improve the model, we executed the Lagrange multiplier test (Kaplan, 2001), and the results showed that by allowing an error correlation between vocabulary learning achievement and vocabulary learning efficacy we can obtain substantially improved data fit. This error correlation makes theoretical sense inasmuch as the literature has shown that self-efficacy beliefs and academic achievement are significantly correlated (Pintrich & De Groot, 1990); therefore, we modified the model accordingly (see Figure 5.3).

Table 5.2 shows that five of the eight structural model fit indices computed supported the suitability of the modified model. The three fit indices which did not meet the acceptable fit thresholds (χ^2/df, AGFI, and RMSEA) all approached those thresholds. In SEM, it is not uncommon for some indices not to conform fully to the majority trend even with

Table 5.2 Model Fit Indices for the Hypothesized Model

Model Fit Indices							
χ^2/df	GFI	AGFI	CFI	TLI	IFI	NFI	RMSEA
3.29	.92	.87	.93	.90	.93	.90	.09



SATIS = Satisfaction; **SKILL** = Skillfulness; **HELP** = Helplessness; **EFF** = Self-efficacy; **COM** = Commitment Control; **META** = Metacognitive Control; **SAT** = Satiation Control; **EMOT** = Emotion Control; **ENV** = Environment Control; **ACH** = Vocabulary Learning Achievement; **SL** = Strategic Learning

Figure 5.3 The Final Modified Model

adequate models, so we would suggest that the hypothesized model has a good overall fit with the empirical data.

Expert Versus Novice Models

A useful feature of recent versions of most SEM software is that it allows for relatively easy multigroup comparisons. Having validated our proposed model for the whole learner sample, let us now examine whether there are any differences in terms of motivational processing between successful (i.e., expert) and novice vocabulary learners. As described in the Data Analysis section, for this purpose we compare the bottom and top thirds of the learner distribution based on their vocabulary learning achievement scores.

Figures 5.4 and 5.5 present the two—expert and novice—models. In multigroup comparisons, AMOS generates a joint set of goodness of fit indices for the two sub-models, and although the various indices are somewhat lower than for the whole sample, several indices, including

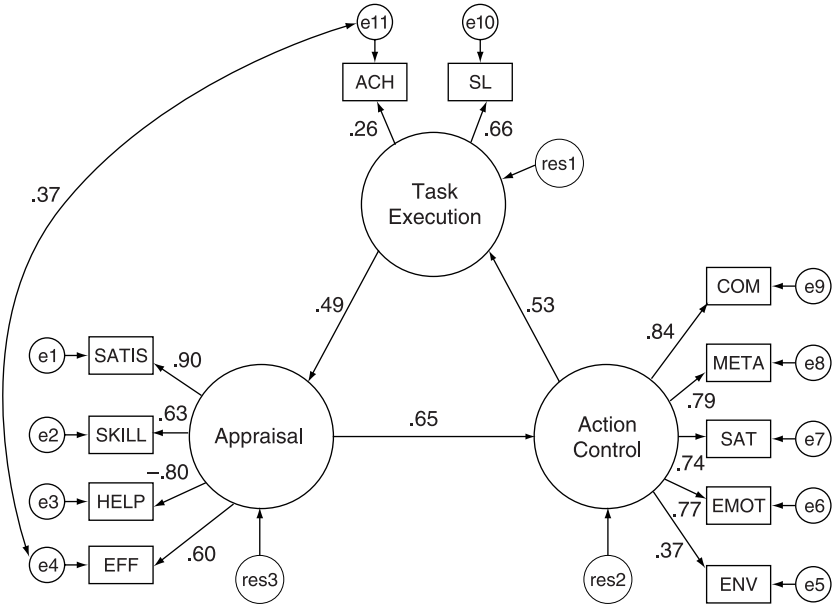


Figure 5.4 The Outcome Model for Expert Learners

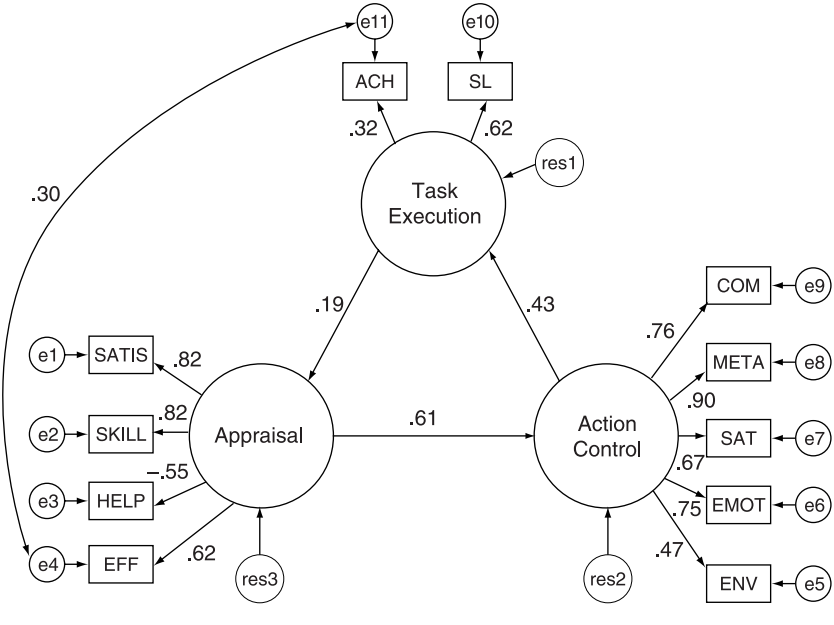


Figure 5.5 The Outcome Model for Novice Learners

the crucial χ^2/df ratio, suggest that the two models can be empirically supported (χ^2/df = 1.98, CFI = .93, IFI = .92, RMSEA = .07).

The comparison of the expert and the novice models reveals one major difference regarding task-motivation processing: There is a significant difference in the path from task execution to appraisal in the two models. For novice vocabulary learners, the appraisal process is much less a function of the actual process and outcome of task execution (path coefficient = .19, squared path loading = .04) than it is for high achievers (path coefficient = .49, squared path loading = .24)—the squared path loadings indicate that the effect of this causal path for expert vocabulary learners was six times stronger than that for their novice counterparts!

How can we interpret this substantial difference? In accordance with the causal logic of SEM, the comparison suggests that novice learners do not base their appraisal sufficiently on the reality of the execution process, that is, they fall short of the mark in properly monitoring and evaluating their learning activity/outcomes relative to the expert learners. This means that their appraisal is out of line, and therefore it simply cannot facilitate the activation of effective action control mechanisms to enhance, scaffold, or protect learning-specific action, even though these novice learners would be in dire need of those. Thus, the achievement–evaluation mismatch leads to a downward spiral, which is in stark contrast to the motivational processing of expert learners, for whom—as the data suggest—the appraisal system works effectively and who can therefore activate task-appropriate action control mechanisms to further increase the effectiveness of their learning process.

Discussion

The analysis of the data has shown that it is reasonable to assume a circular process of motivational task processing in which appropriate signals from the appraisal system concerning task execution trigger the need to activate relevant action control strategies, which in turn further facilitate the execution process. That is, the first finding of this study is that Dörnyei's broad model presented in Figures 5.1 and 5.2 has received empirical validation.

The subsequent comparison of novice and expert learners produced a very interesting difference. Although the circular task-processing model was validated in both subgroups, the novice model revealed a serious "spanner in the works," that is, a mismatch between the task execution process and the appraisal of the quality of this process and its outcome by novice learners: Whereas expert learners were found to be competent in appraising their ongoing achievement and identifying areas in their learning that needed to be adjusted or improved, novice learners seemed to fall short of this evaluation and could not, in turn, activate necessary

scaffolding strategies. This is in line with Mayer's (1999) general assertion that "[e]xperts and novices may differ *quantitatively*—in terms of how much they know—as well as *qualitatively*—in terms of what they know" (p. 240).

At this point we need to be cautious not to over-interpret the data. The rather heterogeneous sample does not make it absolutely clear whether a learner is categorized as novice because he/she is unsuccessful or because he/she is still at the beginning stage of the learning process. Although the fact that all the participants had received a minimum of six years' L2 instruction would suggest that the learners in the novice group were definitely not high achievers, there may be several external factors (e.g., insufficient quality of instruction) contributing to their lower mastery level besides shortcomings in their motivational processing system. However, the observed trend seems to be sufficiently strong and straightforward (i.e., the execution–appraisal link presents the only substantial difference between the two groups) to generate certain hypotheses that will need to be tested by further research. We would propose, therefore, that a potential trouble spot in vocabulary learning (and in SLA in general) is the learners' inadequacy in making realistic and sufficiently specific appraisal of their progress, which prevents them from activating relevant and effective action control strategies that could amend or compensate for any shortcomings.

What are the implications of these findings for dyadic interaction? We saw in the review of the Dörnyei and Kormos studies (Dörnyei & Kormos, 2000; Dörnyei, 2002; Kormos & Dörnyei, 2004) that a prominent motivational feature of these interactions is the co-constructive nature of the underlying psychological process, which reflects well the similarly co-constructive nature of the linguistic process of the actual interaction. Such a dynamic, co-constructive process requires a great deal of sensitivity to the communication partner, to the turn-taking process itself, and to the various features of the jointly constructed discourse—that is, it requires carrying out ongoing evaluation at various levels. Thus, in order to manage the dynamics of dyadic interaction well and make the most of the negotiation process (of both form and meaning), learners need to have the capacity for well-functioning appraisal. Our data indicate that some novice learners have problems with the appraisal process in general, which suggests that they will be unable to participate fully and effectively in dyadic interactions. For example, they may not benefit from their interlocutors' affective "pulling power" or they may not be aware of the manifold cues that govern smooth turn-taking, and we can also speculate that these learners will also be slower to pick up on corrective feedback of various types.

In addition, the process of appraising one's learning process and outcomes is conceptually linked to the process of noticing and, more

generally, to exerting focused attention in the self-evaluation process. It is therefore tempting to go even one step further in our generalization and suggest that any deficiencies in the appraisal system might be linked to problems with noticing and attention in general, which have of course been seen as a key process underlying successful SLA (e.g., Schmidt, 1995, 2001). Thus, we believe that it is not too much of an exaggeration to propose that the quality of motivational task processing is indicative of the quality of the SLA process. In this way, future research might meaningfully relate motivational task-processing to issues related to attention, noticing as well as implicit/explicit or incidental/intentional learning (e.g., DeKeyser, 2003; Ellis, 2006; Hulstijn, 2003; Hulstijn & Ellis, 2005). As pointed out in the introduction of this paper, such issues are closely related to the interaction hypothesis (Gass & Mackey, 2006, 2007) as they belong to the mediating factors between communication and acquisition; therefore the study of task motivation in interactional contexts is in many ways the logical extension of Susan Gass's work. This is particularly true of the examination of the central role of interlocutor familiarity, with Sue being one of the very first scholars in second language studies to highlight the significance of this influence (Plough & Gass, 1993).

Conclusion

Despite the fact that the analyses in the current study were based on cross-sectional rather than longitudinal data, the proposed model represents a snapshot of the ongoing dynamics of the task-motivation process, and our results serve as a heuristic point of departure in the understanding of how the dynamics of task-motivation unfolds over time. Our findings indicate that some novice learners have problems with appropriately monitoring and appraising their ongoing task execution process, which in turn prevents them from activating the right sort of action control mechanisms to scaffold their learning. We assume that the significant difference found between novice and expert learners in this respect is due to the fact that novice learners with appraisal deficiencies are less likely to reach more advanced stages than their peers for whom the appraisal system is effective in producing task-appropriate appraisal signals. On the basis of this we propose that what originally looked like a primarily motivational issue may have broader implications, because problems with one's appraisal capacity can be related to the more general factors of attention and noticing, thus potentially informing any future discussions of implicit versus explicit or incidental versus intentional learning. There is no doubt that further, more elaborate, and focused studies are needed to examine the validity of this claim, but the possibility is certainly exciting enough to warrant such investigations.

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6

HOW YOUNG IS TOO YOUNG?

Investigating Negotiation of Meaning and Feedback in Children Aged Five to Seven Years

Rhonda Oliver

Today there is a considerable body of evidence demonstrating the importance of interaction in the process of second language acquisition (see Mackey & Goo, 2007; Keck, Iberri-Shea, Tracy, & Wa-Mbaleka, 2006, for their meta-analyses of the work undertaken in this area). In fact, so large is this body of evidence that the interaction hypothesis, the premise on which much of this work is based, has emerged as a dominant paradigm in the field (Byrnes, 2005). As Gass and Mackey (2006) suggest, "it is now commonly accepted . . . that there is a robust connection between interaction and learning" (p. 176).

However, in the period predating the mid-1980s, the emphasis in the field of second language acquisition research was on the input provided to learners. Today the necessity of input is without dispute—it is now widely accepted that learners must have information (i.e., understandable input) about the target language in order to acquire it, and, hence, "comprehensible input" (Krashen, 1985) is viewed as an essential component in the acquisition equation.

Whilst input may be considered as a necessary component of the acquisition process, the question of its sufficiency lies at the root of the different theoretical explanations about how second acquisition language occurs (Long, 1996). Many researchers contend that what is also necessary is for learners to be active participants in the course of attaining input (e.g., Gass & Varonis, 1985b; Hatch, 1983; Long, 1981, 1983) and that this occurs when they are involved in interaction with others.

The reputed utility of interaction is multifaceted. During conversational interaction learners have the opportunity to actively elicit input uniquely modified for their individual circumstances (Johnson Nystrom, 1983; Long, 1981, 1983; Parker & Chaudron, 1987; Pica, Kanagy, & Falodun,

1993). This may occur through that interactional process referred to as "negotiation for meaning," a term first coined by Long in the early 1980s (e.g., Long, 1980, 1981)—a construct which has been investigated by a number of researchers since then (e.g., Gass & Varonis, 1984, 1985a, 1985b; Oliver, 1998, 2002; Pica & Doughty, 1985).

As well as attaining input, through interaction learners produce comprehensible output, that is, they modify their own contributions to a conversation in order to make themselves understood. When they do so, learners move along their language learning continuum so that their interlanguage becomes more targetlike in form (Long, 1990; Pica, 1987, 1991, 1992). Thus through this process learners are able to test out their hypotheses about the target language (Gass & Varonis, 1994; Pica, Holliday, Lewis, & Morgenthaler, 1989; Swain, 1985, 1995, 2005).

Also through the process of interaction learners may be the recipients of corrective feedback, in its numerous forms, in response to their output. When this occurs learners have the opportunity to compare the difference between this feedback and what they have produced, undertaking what has been described as "noticing the gap," which in turn increases their awareness of the form of the target language (Schmidt and Frota, 1986). As such, interaction serves as an important priming device (Gass, 1997) in the acquisition process—helping learners to be ready for acquisition to occur. Therefore, it can be seen that the usefulness of interaction comes about because it provides opportunities for input, output, feedback, and attention to form—conditions that are believed to facilitate second language acquisition (Gass & Mackey, 2006).

Because of their apparent contribution to the acquisition process, the research described in this chapter is particularly concerned with two of the interactional elements outlined above, namely negotiation for meaning and corrective feedback. Although numerous studies have been undertaken on both these of features (see Mackey & Goo, 2007 and Mackey, 2007 for a review), in the main they have focussed on the occurrence and contribution of these to acquisition in adult learners. Even when such research has been undertaken with children, the participants have tended to be in the pre-adolescent age range (e.g., Lyster, 1998; Lyster & Ranta, 1997; Mackey & Oliver, 2002; Oliver, 1995, 1998, 2000, 2002). The current study explores these features in the context of younger second language acquirers, namely those in their first years of formal schooling, having ages ranging from five to seven years. Thus this study extends a line of research investigating interaction patterns of older children and adults (Mackey, Oliver, & Leeman, 2003; Oliver, 1995, 1998, 2002), work that has been inspired by pioneers in this field, including Sue Gass and her colleagues.

Negotiation for Meaning

Central to the concept of negotiation for meaning is that it is co-operative interaction that enables interlocutors to develop mutual understanding as they work together to overcome communication breakdown. By engaging in such negotiation it is hypothesized that learners are able to transform what is initially incomprehensible to them into comprehensible input (e.g., Pica, 1987, 1992; Varonis & Gass, 1985). Thus there are two important aspects to the process of negotiation for meaning, the first being that it is a joint undertaking (Tarone, 1981), and the second that learners are actively involved in this process of making meaning (Gass & Varonis, 1985a; Pica, Kanagy, & Falodun, 1993).

Negotiation for meaning has been described as the "side sequence" of a conversation as it is tangential to the main focus of the conversation (Deen & van Hout, 1991; Gass & Varonis, 1985a). In fact, Varonis and Gass (1985) describe it as the vertical "pushdown" from the horizontal flow of a conversation and show how interlocutors "pop" back to the conversation when the communication problem has been resolved. Most importantly it has been heralded as the distinguishing feature between interactive and non-interactive input (Gass & Varonis, 1994). If interaction is as vital to acquisition as suggested, then negotiation is a most crucial aspect of the process.

Varonis and Gass (1985) describe a model of negotiation which consists of four parts, namely triggers, indicators, responses, and reactions to the responses. However, more commonly negotiation research has described discourse strategies including clarification requests, confirmation checks, comprehension checks, and repetition (e.g., Long, 1981, 1983; Mackey, 1999; Mackey & Philp, 1998; Oliver, 1998, 2000, 2002; Pica, 1987, 1992; Pica, Holliday, Lewis, & Morgenthaler, 1989). The following examples, all taken from the current data, illustrate these:

Clarification requests—strategies used by the listener to clarify what the speaker has said, including the use of statements such as "I don't understand", wh-questions, yes-no questions and tag questions:

(1)	*NS*	*NNS*
	Just down to her shoulders?	
		She–she has–no . . .
		What?
		What did you say?

Confirmation checks—strategies used by the listener to establish that they have correctly heard and understood what has just been said. They often involve repetition accompanied by rising intonation:

(2) *NNS* *NNS*

In a corner

Corner?

Yes

Comprehension checks—strategies, often in the form of a question (e.g., "Do you understand?"), used by the speaker to check that the preceding utterance was understood by the listener. They may also involve self-repetition coupled with rising intonation:

(3) *NNS*

Up there is cupboard . . .
Up there.
You know what's cupboard is?

Self-repetition is undertaken by the speaker and may include partial, exact, and expanded repetitions of lexical items. In this study utterances are only deemed to be repetitive if they occur within five speaking turns:

(4) *NNS*

Draw boy and girl
Boy and girl (Partial)

(5) *NNS*

Cup?
Cup? (Complete)
Cup is go in the left side in the – um . . . (Expanded)

Other-repetition is done when the listener repeats, partially, exactly, or in an expanded form the lexical items used by their partner, again within five speaking turns:

(6) *NNS* *NNS*

There was a sun.

Sun? (Partial)

(7) *NNS* *NS*

Up the table.

Up on the eating table. (Expanded)

Because of the apparent usefulness of negotiation for meaning to the acquisition process, various studies have been undertaken to determine which conditions are most conducive to such interaction occurring. This

has included examining the characteristics of the learners involved in the interaction—for instance, teachers with their students, students working together, or learners working with native speakers (e.g., Gass & Varonis, 1985a; Pica & Doughty, 1985; Varonis & Gass, 1985; Yule & MacDonald, 1990). With regard to the latter, consideration has been given to the role of the various speakers such as novice–expert and information giver–receiver (e.g., Storch, 2001). The current research is particularly concerned with exploring the effect of pairing native and nonnative speaking peers together. At the same time, based on the findings from previous adult research (e.g., Deen & van Hout, 1991; Varonis & Gass, 1985; Yule & MacDonald, 1990) show that different outcomes occur according to who holds and who conveys the information, in this study, the roles of the various speakers were carefully controlled. Therefore when the NS–NNS pairings undertook the one-way task, the NNS always held the information.

By its very nature negotiation for meaning is that interactional feature concerned with meaning making. However, some researchers raise the possibility that negotiation can occur without true understanding, and thus without the opportunity for learning (Mackey, Gass, & McDonough, 2000). In addition, although there are opportunities for "noticing the gap," attention to form is very much incidental to the process of negotiating meaning. In contrast, when corrective feedback is given to learners, that is, when an indication is given that there is something problematic with their preceding utterance, it provides them with information about the semantic and structural relationships of the target language (Pica, 1991, 1992). As such it provides useful input to learners about what is possible and acceptable in the target language (Long, 1996). It should be noted, however, that whilst corrective feedback provides information that may be of potential use, the learner may not use or in fact notice it. In this way the potential utility of corrective feedback, like that of negotiation for meaning, is very much determined by the learners.

Corrective Feedback

Corrective feedback may be provided implicitly or explicitly, although the latter is rare in conversational interactions outside the classroom because it contravenes the rules of politeness. However, in the classroom, explicit corrective feedback may be provided, and in fact is considered desirable by some learners (particularly adult language students; Schulz, 2001). In the classroom, corrective feedback may also be provided by way of metalinguistic commentary (Oliver & Mackey, 2003), in which explanation is provided about why something is unacceptable.

In terms of implicit corrective feedback, corrective feedback may take the form of negotiation strategies, including confirmation checks,

clarifications requests, and repetition. (It cannot be provided by way of a comprehension check, another negotiation for meaning strategy, as these are made by the speaker, not the listener and as such are not corrective.) As such there is a considerable overlap between negotiation for meaning and corrective feedback. In fact, example 7 shown above is described as "other repetition," part of the process of the interlocutors working to develop mutual understanding through negotiating meaning. It could be equally described as a recast, an implicit form of feedback.

Recasts are an interactional feature that were first described in the first language acquisition literature (Farrar, 1990), but since the mid-1990s have received considerable attention in the SLA literature (e.g., Braidi, 2002; Lyster, 1998; Lyster & Ranta, 1997; Mackey, 1999; Mackey & Philp, 1998; Mackey, Gass, & McDonough, 2000; Oliver, 1995). Recasts are described as a "redisplay" of the learner's utterance, where the structure is reformulated but where the central meaning remains unchanged, as in the example below.

(8)	*NNS*	*NS*
	There's more grass.	
	[whole over] than more.	
		There's more grass than the tree?
	Yep.	

It is proposed that the utility of recasts comes from the opportunity for comparison: learners are able to compare their own production with that provided by way of this form of feedback. At the same time, the cognitive load required for this comparison is reduced because the meaning of the feedback is the learner's own (i.e., because it was originally their utterance they already know the meaning and therefore they have the attentional space to focus on form).

Recasts may occur in the form of a confirmation check (such as the example shown in example 8 above), but when this occurs there is less opportunity for learner uptake, as the most appropriate response is simply to confirm or negate what has been said. However, recasts may also appear in an alternative form, such as in the example shown below.

(9)	*NNS*	*NS*
	Put in the table.	
		On the table.
	And put knife-.	

In this case the recast provides corrective feedback, a model of the target

prepositional item, and the opportunity for learner uptake (even though in this instance this does not occur).

From the examples and description provided thus far, it is apparent that negotiation for meaning and corrective feedback can be represented as intersecting rather than overlapping constructs: Some corrective feedback may occur in the form of negotiation strategies and some negotiation strategies provide corrective feedback. However, there are aspects of negotiation that lie outside the parameters of corrective feedback, and similarly there are many features of corrective feedback that do not include negotiation strategies. For these reasons in the current research the findings for these two constructs are presented separately.

Native and Nonnative Pairings

It has long been acknowledged that peers are an important source of input in the process of second language acquisition (Gass & Varonis, 1985a; Hatch, 1983). Perhaps because of this ESL teachers working with children often lament that their students lack practice interacting with their native-speaking peers. This situation may occur because of the lack of availability of a sufficient number of native-speaking peers (based on the nature of the school population or the rigidity of class timetables etc.) or possibly because of a lack of willingness on behalf of mainstream (i.e., non-ESL) teachers to engage in such collaboration. If it is found that the interlocutor's language background (in terms of native/nonnativeness) makes little difference to the interaction that does occur, then ESL teachers can be reassured that their students are not being disadvantaged. However, if it is found that the native/nonnativeness of pairings affects the interaction that does occur in this age group, then this will present educators with important evidence to consider with respect to their current pedagogical practices. Thus, one goal of the current research is to examine the pattern of interaction when child language learners aged five to seven years work with each other and with native speakers (i.e., NNS–NNS and NS–NNS).

Tasks

Much of the interactional research that has been undertaken thus far has occurred through the use of tasks (e.g., Gass & Alvarez-Torres, 2005; Gass & Varonis, 1984, 1985a, 1985b; Mackey, Gass, & McDonough, 2000). According to one definition (Pica, Kanagy, & Falodun, 1993) tasks are communication activities that the participants must carry out in order to achieve a predetermined goal. Tasks have also become a common activity in language classes, including in child ESL contexts. The predominant use of tasks, both for research and pedagogy, has occurred because they promote interaction and therefore opportunities for learners to receive

comprehensible input and to produce comprehensible output, conditions believed to be facilitative of language learning. Some, such as Bygate, Skehan, and Swain (2001), also contend that tasks can provide opportunity for feedback and that, when it occurs, it does so in such a way that draws learners' attention to particular salient features of the target language. For these reasons, this study also uses tasks to stimulate interaction between students aged five to seven years. It then investigates the nature of this interaction in ways outlined above (i.e., for evidence of negotiation of meaning and of corrective feedback).

Young Learners

As already noted, most interactional research has been undertaken with adults. At the same time, whilst the role of age in the process of second language acquisition is yet to be fully established, it is clear that there are differences in the way children and adults acquire a second language. It is also possible that the way children and adults interact when learning a second language will also differ. For example, Plough and Gass (1993) indicate with respect to negotiation for meaning, there is an effect for age of the participants possibly because of their inherent differences. This was borne out in a study by Scarcella and Higa (1981) of adult–child and adult–adolescent dyads. They found that greater modification was provided by adult NSs to child NNSs, than to adolescent NNSs. With respect to children interacting with each other, Oliver (1998) found that children are able to negotiate for meaning with each other and use a variety of strategies to do so. However, when compared with adult studies the findings showed proportional differences in the use of particular strategies. A similar difference also emerged in relation to corrective feedback for children and adults (e.g., Oliver, 2000; also see Oliver, 1995 and a replication of this with adults by Braidi, 2002). Such differences were also found in a study by Mackey, Oliver, and Leeman (2003) in which the pattern of interactions of adults and that of children were studied and directly compared. Together the results of these various studies highlight the problem of generalizing the results of one age cohort and applying it without consideration to another.

Given that children in their first years of schooling are at a different stage of development from those in their pre-adolescent years, it seems equally dangerous to assume that younger child second language learners will interact in the same way as older children. In terms of their psychological, social, emotional, and physical development, children under the age of eight are vastly different from those who have already entered and/or are beginning to leave their middle childhood years. Even if we simply consider their level of first language acquisition, it is clear that children aged five to seven are different beings from an older cohort of children. If Plough and Gass (1993) are correct that the inherent difference of learners,

based on their age, affects interaction, it seems likely that this should also apply to older and younger children. Therefore, this study seeks to address this issue.

Research Questions

In this chapter the following research questions are addressed:

1. Do 5- to 7-year-old second language learners of English working with peers on communication tasks a) negotiate for meaning, and b) provide and use corrective feedback?
2. If yes, is the pattern of interaction for negotiation and corrective feedback similar to that found in studies of older learners?
3. What is the effect of the nature of the pairings (i.e., NS–NNS and NNS–NNS dyads) on the pattern of interaction for negotiation and corrective feedback?

Method

Participants

Thirty-two children aged 5–7 years participated in this study; of these eight were NS of English and twenty-four were NNS from a range of first language backgrounds. The eight native speakers were students in the mainstream classes of the two schools where the NNS attended special intensive English as a second language (ESL) classes. These ESL classes are provided for newly arrived to Australia, non-English-speaking children. The children were randomly paired to form eight NNS–NNS and eight NS–NNS dyads, with an equal number of male–male and female–female pairs in each group.

Materials

Two tasks were used in this research. They were selected on the basis that they were similar to the type of commercially available materials used in many child ESL classrooms. To allow for comparison, they were the same as those used in previous research undertaken with older children (Oliver, 1998, 2002). The one-way task consisted of a simple black outline picture which one of partners described to the other to draw. In the NS–NNS pairings the NNS held the information and provided this to their partner. In the NNS–NNS one of the pair was randomly assigned to have this role. The two-way task was a jigsaw task. Each of the partners had half of the items in place on a black outline drawing of a kitchen. The items missing from their picture were in position only on their partner's kitchen outline.

The partners took it in turns to describe where the missing items should be located.

Procedure

Data were collected in a laboratory type setting, in this case in a small teaching space away from the main classroom. Each pair was separately audio-recorded completing the tasks. When undertaking the tasks each pair of students sat at desks facing each other. Between the pair was a barrier of such a height that allowed them to see each other's faces, but not their partner's task sheets. The researcher or a trained assistant sat at one end of the desk observing the interaction. On occasions it was necessary to help these students undertake the tasks, such as by prompting one of the pair to commence or continue the task by asking their peer a question. However, wherever possible, researcher participation was avoided. Before each task a set of instructions was given to the pair outlining what needed to be done—a script was used to maintain consistency. Up to half an hour was allowed for the completion of each task, though this age group rarely spent this long. Once each task was completed the barrier was briefly removed so that the pairs could see their partner's task sheet.

The children completed the one-way and two-way tasks in a counter balanced design (see Figure 6.1 below).

Analysis

The audio-recordings of the one-way and two-way task were transcribed in conventional English orthography. After a second person checked these for accuracy, the first 100 utterances for each task were coded. The coding was undertaken in two parts, firstly for instances of negotiation for meaning and then in terms of the provision and use of corrective feedback. Based on a 25 percent sample of the data, interrater reliability (using simple percentage agreement) was 95 percent overall for the first measure and 96 percent for the second.

Gender	Task Order	NNS–NNS	NS–NNS
Male	1 way – 2 way	2 pairs	2 pairs
	2 way – 1 way	2 pairs	2 pairs
Female	1 way – 2 way	2 pairs	2 pairs
	2 way – 1 way	2 pairs	2 pairs

Figure 6.1 Research design

i) Negotiation for Meaning

The coding for negotiation for meaning in this study was the same as that used in previous studies of older children and adults (Oliver, 1998, 2002), which in turn are based on those developed previously by others (e.g., Long, 1980, 1983a; Pica & Doughty, 1985). They included:

1. clarification requests;
2. confirmation checks;
3. comprehension checks;
4. self-repetition;
5. other-repetition.

Once the data were coded according to these definitions and checked by a second person, the mean and standard deviation of each were calculated. A comparison was then undertaken using an ANOVA procedure to determine if any differences existed according to the nature of the pairing.

ii) Corrective Feedback

Following the procedure undertaken in earlier studies with older children and with adults (Oliver, 1995, 2000; Mackey, Oliver, & Leeman, 2003) the coding of this part of the study was undertaken in three stages. First, each utterance was classified as being targetlike or nontargetlike (as corrective feedback can only occur in response to nontargetlike utterances). Next the responses to just the nontargetlike utterances were considered. These were coded according to whether or not corrective feedback was provided and, if so, the form in which it was provided (either a recast or through negotiation for meaning). The definitions of negotiation strategies followed the same as those outlined earlier described in section i) above. Recasts were those responses to a learner's utterance where the structure was reformulated but where the central meaning remained unchanged (see examples 8 and 9 above). The final stage of the coding involved determining whether or not the interlocutor who produced the original nontargetlike utterance modified their output in response to the feedback they received, and whether in fact they had the opportunity to do so. Only the immediate reaction of the learner was considered; that is the learners needed to modify their production in their subsequent turn. Although this is a stringent measure, and conceivably underestimates uptake, this coding is consistent with previous studies (e.g., Mackey, Oliver, & Leeman, 2003) and it allows for comparisons to be made.

An example of a learner modifying output in response to corrective feedback is the following:

(10)

NNS	*NNS*
Next to [wall].	
	What?
Next to the wall.	

In contrast, an example where a learner is provided with feedback but does not modify output is as follows (note in this example it is more appropriate to simply answer yes than it is to modify output):

(11)

NNS	*NS*
There's more grass.	
[Whole over] than more.	
	There's more grass than the tree?
Yep.	

There are also times when a learner is unable to modify output because his or her partner does not provide the chance to do so, in this case adding further information after providing the initial recast, e.g.,

(12)

NNS	*NS*
Um – un – the un the place?	
	Under the cup- board. Stuck up on the wall.
Right stuck on the wall.	

As these were categorical data the analysis comparing the interaction for the two types of pairing (NNS–NNS and NS–NNS) were undertaken using chi-square procedures. Difference between the cells was further identified using Haberman residuals (significance lying outside –2< and >2).

Findings

In the following the results for the two constructs, negotiation for meaning and corrective feedback, are presented and discussed in turn. The discussion includes a comparison of the current results with those found in previous studies undertaken with older children and adults.

Negotiation for Meaning

The results showed that the children in this study aged five to seven years, like their older counterparts, can and indeed do negotiate for meaning

with their peers. Further, they use the same types of strategies in their interactional exchanges as have been found in earlier studies undertaken with older children (Oliver, 1998, 2002). In fact, when a direct comparison is made between the results of the current and previous studies there are startling similarities (see Table 6.1).

Specifically the results of the mean percentage of clarification requests, confirmation checks, and self-repetition for the learners in this study where the learners were aged five to seven years are almost identical to those found in a previous study (Oliver, 1998), where the learners were aged eight to thirteen years. Thus there appears to be little difference according to age, at least with respect to these particular strategies. An interesting aspect of these three strategies is that they all involve the learners seeming to make the meaning clear for themselves, rather than for their partners. When they use these strategies they are either clarifying or confirming in their own minds what they have heard, or they are repeating their own words.

In contrast, when the interaction involves consideration of the other person there appears to be a small degree of difference according to age. Specifically, there were even fewer comprehension checks made by these younger child learners than were indicated in the results from a previous study of older children, which in turn showed a result much lower than had been found for adult learners (see Oliver, 1998 for a discussion). Similarly there was a lower percentage of "other-repetition" by the younger children than occurred with the older children. Comprehension checks are strategies in which learners seek to verify whether their partners understand what they have said, that is to check that they are jointly sharing meaning in the exchange. "Other-repetition," as the name suggests, is the use of another's production, and this requires the listener to pay careful attention to what is said. These differences according to age may reflect the egocentric nature of the younger learners, as has been reported in the first language acquisition literature (e.g., Schober-Peterson

Table 6.1 Mean Percentage of Negotiation Strategies Used by Child Dyads

	Younger children		*Older children**	
Strategy	*M*	*SD*	*M*	*SD*
Clarification Requests	5.81%	3.66	5.71	3.5
Confirmation checks	5.04%	3.88	5.72%	2.93
Comprehension checks	0.19%	0.40	0.86%	1.00
Self-repetition	23.32%	7.61	23.98%	5.75
Other-repetition	16.59	7.20	23.62%	6.83

* From Oliver (1998)

& Johnson, 1991; Surian, 1991). That is to say, these younger learners are more concerned with self and less concerned with "other" than are their older counterparts, and thus these results may reflect their psycho-social stage of development.

Although not apparent in the numerical results, the way these younger learners actually carried out the tasks also appears to reflect their stage of development. In particular, a qualitative examination of the transcripts showed that they were less constrained by the strictures of the tasks. For example, in the following transcript, two learners successfully negotiate which item to place (the loaf of bread) and where it should be located (on the table). Despite the protracted exchange and the correct identification and apparent understanding of these lexical items, the NNS (1) who does not hold the information finally ignores his partner's directions and simply places the item where he chooses.

(13)	*NNS* (1)	*NNS* (2)
	Put in the – the–	
		Pick up what? A bread?
	Huh?	
		Pick up a bread?
	Um bread? No I don't have a bread. Have you a – oh sorry. *(Locates picture of bread)* Um put it where?	
		In the bread.
	Huh?	
		In the table. Table.
	No I want to put in the – in the bread I like here. (*Points to a different position for the bread*).	

Similarly in the one-way task, the learners giving directions for what their partners should draw were not constrained by what appeared on their task sheet. From what they said, it was clear that they did not feel compelled to describe what they could see in front of them—some grass, the sun, a tree and the two stick figures holding hands and flying a kite. They added to this and invented their own descriptions and instructed their partners to draw other items including an "aeroplane flying in the sky" and a "house with a chimney and smoke" and "a dog." They also

missed or gave just the barest description of some of the items that did exist on their task sheet. Such misrepresentations never occurred in previous studies with older participants, suggesting that these younger learners are less concerned with "truth." Again this result is supported in the first language acquisition literature where it has been found that young children will invent a solution (Attieh, 2002) to overcome ambiguities in interaction. Such exchanges also add support to the suggestion made previously that taking the perspective of "other" through the sharing of information appears to be less important for this younger age group. In fact, although these younger learners interact in seemingly collaborative ways, it is also clear from their responses that some could complete the task, at least in a superficial way, without any real sharing of information.

NS–NNS and NNS–NNS Pairings

When the nature of the pairing is considered, the results show that there are only two strategies where there are any significant differences: the NNS–NNS pairs had a higher mean both for clarification requests and for self-repetition (see Table 6.2). Again these results are similar to the results found with older learners. In fact, once again the means in the current study, when compared to those of earlier research undertaken with older children (Oliver, 1998) are startling in their similarity (i.e., mean clarification requests: NNS–NNS younger—7.34, older—7.71; NNS–NS younger—4.28, older—3.97; mean self-repetition: NNS–NNS younger—27.03, older—26.98; NNS–NS young—19.61, older—19.62). However, whereas the previous study with older children found significant differences for the other three negotiation strategies, this was not the case with these younger learners in the present study. It is particularly interesting to see that two of these strategies that were not significantly different for the two types of pairings are those concerned with "other"—as described above. Thus it would seem that at times age mediates the effect of pairing

Table 6.2 Negotiation Strategies Used by Child Dyads Aged 5 to 7 Years

	NNS–NNS		*NNS–NS*	
Strategy	*M*	*SD*	*M*	*SD*
Clarification Requests	7.34*	3.62	4.28*	3.10
Confirmation checks	4.53	3.50	5.55	4.28
Comprehension checks	0.25	0.45	0.12	0.34
Self-repetition	27.03**	7.13	19.61**	6.29
Other-repetition	16.83	6.20	16.36	8.29

* $p < 0.05$, ** $p < 0.01$

on the process of negotiation of meaning. This adds further support to the claim that the learners' stage of development affects the interaction that occurs.

Negative Feedback

The first stage of determining the provision and use of negative feedback required an examination of the data to determine how many of the utterances were nontargetlike. It was found that just a little over one-third of the utterances produced by the participants in this study fell into this category. Further, a comparison of proportion of the nontargetlike utterances produced by learners in the NNS–NNS (35.94%) and the NNS–NS (34.05%) pairs did not show any significant difference.

Provision of Feedback

In response to these nontargetlike utterances, the results show that these young learners were able to provide their partners with corrective feedback. The combined scores of recasts and negotiation showed that they did so in the proportions of approximately 42 percent (NNS–NNS) and 35 percent (NNS–NS). These results are similar to those of older children (39% and 42%) and adults (32% and 47%) (Mackey, Oliver, & Leeman, 2003). As is the case with previous studies, for these younger learners the two types of dyads provided feedback in significantly different ways (χ^2 (2, N = 358) = 18.55, p < 0.001), as shown in Table 6.3 below.

It can be seen that for these young learners the NNS–NNS were twice as likely to negotiate with their partners as the NNS–NS dyads. Conversely the NNS–NS dyads provided corrective feedback in the form of a recast twice as many times as did the NNS–NNS dyads. This may have occurred because of the proficiency demands of these forms of feedback. Negotiation strategies do not require a reformulation of nontarget into targetlike forms in the same way that recasts do. Because of the NSs' proficiency NNS–NS dyads may be better placed to produce recasts. At the same time, because negotiation strategies involve the joint construction

Table 6.3 Response Turns of Young Children to Corrective Feedback: Comparing NNS–NNS and NNS–NS Dyads

Corrective feedback	*NNS–NNS*	*NNS–NS*
Recast	6.52*	14.37*
Negotiate	35.87*	17.24*
Not provided	57.61*	68.39*

χ^2 (2, N = 358) = 18.55, p < 0.001
* Haberman adjusted residual –2< or >2

of meaning to overcome communication breakdown, the similarly lower levels of proficiency of NNS partners may be more conducive of this form of feedback than is the case for NNS–NS pairings, where the NSs are possibly more capable of making meaning and understanding their partner, even in this context where the partners are aged only five to seven years.

Modified Output

The results show that the immediate reaction of these young learners to corrective feedback provided by their age-matched peers did include modified output (NNS–NNS: 23% and NNS–NS: 36%) (see Table 6.4 below). Again the results compare favourably with those found in the study by Mackey, Oliver, and Leeman (2003), although somewhat surprisingly the results are more similar to those found for adults (25% and 34%) than for older children (41% and 27%). Also, as with the adults in this previous study, there was not an overall significant difference according to the nature of the pairings (χ^2 [2, N = 133] = 5.14, n.s.), even though the Haberman residuals indicate a significant difference for "no modified output" cells. Why there should be more similarity between younger children and adults than between younger and older children is unclear. However, again the results highlight the effect of age on interactional processes.

Therefore, from this study it is apparent that even young children aged five to seven years are able to negotiate for meaning, and to provide and use corrective feedback when interacting with their peers. There were many quantitative similarities between the results of the current study and those found in research undertaken with older children. In fact, in the case of corrective feedback and the resulting modified output, there were similarities between the current results and those found for adults in the study by Mackey, Oliver, and Leeman (2003).

Despite these similarities, the results suggest that the stage of development of these younger learners impacts on the nature of the interaction. In terms of the quantitative results, where the negotiation for meaning

Table 6.4 Modified Output in Reaction to Corrective Feedback by Young Children: Comparing NNS–NNS and NNS–NS Dyads

Modified output	*NNS–NNS*	*NNS–NS*
Yes	23.08	36.36
No	74.36*	56.36*
No chance	2.56	7.27

χ^2 (2, N = 133) = 5.14, n.s
* Haberman adjusted residual –2< or >2

was concerned with "self" (e.g., self-repetition, clarification requests, and confirmation checks) there were many similarities with the results obtained with older learners. In contrast, when the negotiation concerned "other" (e.g., using comprehension checks or repeating other), these younger learners were much less likely than their older counterparts to use such strategies, perhaps reflecting their egocentric nature. In addition, there appear to be qualitative differences in the interaction of younger and older learners. In particular this relates to the flexibility and truthfulness with which younger children approach the tasks. Unlike older children and adults, the younger learners in this study were much more likely to please themselves about how they completed the set task. They seemed less bound by the content and strictures of the task.

Despite this, these younger learners still engaged in those interactional features deemed to be facilitative of language acquisition: they provided each other with comprehensible input, modified their output, provided feedback, and in doing so paid attention to form. Therefore, from a pedagogical perspective, tasks that require learners to work with peers are useful activities to employ in the classroom, even when the learners are quite young and in their first years of schooling. However, the way younger learners approach language tasks needs to be considered. For example, teachers may need to build into the task creative rather than set solutions.

There were some differences in the interaction according to the nature of pairings, specifically whether they were NNS–NNS or NNS–NS dyads. It must be noted, however, that these differences were proportional, rather than categorical. Regardless of whether the pairs consisted of two learners or a learner working with a native-speaker, the dyads still negotiated with each other and provided and used corrective feedback. In relation to negotiation for meaning, unlike with older children (as per Oliver, 1998) there were significant differences only for two of the strategies, namely clarification requests and self-repetition, suggesting that age may mediate the effect of pairing on the process of negotiation of meaning. With respect to corrective feedback it was the type of feedback provided that differed—learners were more likely to negotiate with each other, whereas recasts were more likely to occur in NNS–NS dyads—but the amount and the subsequent use of the feedback (in the form of modified output) were similar for the different pairings. Thus in terms of pedagogy teachers should feel reassured that use of communicative tasks in ESL classes, without the participation of mainstream NS students, is still a worthwhile activity, even for learners aged five to seven years. However, teachers may need to provide other forms of feedback that occur less in such dyads. Given the evidence of previous research, such as that by Lyster and Ranta (1997) where they found considerable provision of recasts in classrooms, this should be relatively easy to achieve.

The results of this study support claims made in earlier research (e.g., Plough and Gass, 1993) that the age of the learners involved and their inherent differences do affect the interaction that occurs. Despite the similarities there were also differences in the way that these young learners interacted when compared to their older counterparts, as indicated above, particularly with respect to how they approach the task. Again this points to the need to exercise caution when using the results obtained for one age cohort and applying these to another, particularly in terms of pedagogical approach, without due consideration for the stage of development of the learners involved.

Finally the findings of this study highlight the considerable contribution of Sue Gass's work to the field of second language acquisition research. In this case her pioneering work with adults has been applied to and extended in this investigation of child second language learners aged five to seven years. By using communicative tasks (such as those first used by Gass and others) it was found that this age group can and does interact in ways facilitative of second language acquisition (Gass & Mackey, 2006). Further, it was apparent that through interaction children of this age can become active participants in the course of attaining input (Gass & Varonis, 1985b), and they are able to provide interactive input (Gass & Varonis, 1994) for each other. They do so by engaging in such interactional moves as negotiating for meaning (e.g., Gass & Varonis, 1985a, 1985b; Varonis & Gass, 1985) and by providing and using corrective feedback (e.g., Mackey, Gass, & McDonough, 2000). Through interaction they also have the opportunity to produce output and to attend to form. In this way interaction equally serves as a priming device (Gass, 1997) for this age group as it does for older learners. At the same time, however, factors such as age (e.g., Plough & Gass, 1993) and nature of pairings (Gass & Varonis, 1985a, 1985b) impact on the pattern of interaction that does occur.

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7

INTERACTION RESEARCH IN SECOND/FOREIGN LANGUAGE CLASSROOMS

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In this chapter we examine the history and evolution of research based on the interaction hypothesis in relation to the second/foreign language (L2) classroom. We describe the early days of interaction research, its descriptive nature, and how it was related to the communicative and content-based language teaching approaches that were being developed at the time. We also discuss the laboratory-based nature of this research and how its findings compare with the early classroom-based *interaction analysis* research with regard to specific features (especially negotiation for meaning). Moving to the present day, we examine how the revised interaction hypothesis, with its emphasis on *noticing* and the role of corrective feedback, has brought *instructed SLA* research and *interaction-based* research closer together—at least with regard to some of the questions being asked. One example of this is the increased attention given to examining the effects of corrective feedback (especially recasts) on L2 learning in both research domains. Different findings emerging from investigations of negotiation for meaning and recasts are discussed in terms of laboratory-based versus classroom-based research, varying activities/tasks in classrooms, foreign versus second language settings, and other factors that may influence learners' L2 use and development. Throughout the period covered by our review, Sue Gass has made substantial contributions to both theoretical and empirical work on interaction-based research in SLA.

Early Days of Interaction Research

From the 1970s to the mid-1990s, interaction-based research focused almost exclusively on *negotiation for meaning* and how it is accomplished in conversational interaction. Negotiation for meaning occurs when a

speaker's message is not clear or comprehensible to a listener. The lack of comprehension serves as a trigger for the listener to seek clarity through, for example, clarification requests or comprehension and confirmation checks. The prediction of the interaction hypothesis was that negotiation for meaning would lead to the acquisition of grammatical knowledge by L2 learners. It was hypothesized that second language learners, like first language learners, develop their knowledge about the structure of language by "doing conversations", as Evelyn Hatch put it (e.g., Hatch, 1978). A number of SLA researchers have carried out numerous studies of the ways in which second language learners interact with each other and with native speakers.

In the 1970s, observational studies based on discourse analysis provided descriptions of the conversations that second language learners engaged in with each other and with native speakers (see, e.g., articles in Hatch, 1978). Researchers found, among other things, that native speakers—including children—often adjust the complexity of their language in interaction with learners. These adjustments, including what is referred to as *simplified speech*, are features of "comprehensible input" (Krashen, 1985) that is, L2 input that learners can understand with the help of contextual cues, prior knowledge, gestures, etc., even though they would not be able to produce comparable language or even to say exactly how the language itself conveys the meaning. The interaction hypothesis was strongly influenced by Krashen's hypothesis that the availability of comprehensible input was the necessary and sufficient condition for second language acquisition. In its original formulation, the interaction hypothesis was primarily concerned with *how* the input becomes comprehensible, and features of interaction were considered more important than linguistic simplification for making input comprehensible (Long, 1981).

Most interaction-based L2 research in the early 1980s was descriptive and limited to the analysis of conversations that took place in special situations that were set up by the researcher (Long, 1983; Gass & Varonis, 1985b). A great deal of research was done to investigate conversational interactions between native speakers (NS) and nonnative speakers (NNS). Some studies also focused on NNS in interaction with other NNS, exploring the extent to which these conversations differed depending on variables such as task type (Duff, 1986; Long, 1981; Pica, Doughty, & Young, 1987) and contextual variables (Long, Adams, McLean, & Castaños, 1976), as well as learner characteristics such as proficiency level or gender (Gass & Varonis, 1986).

Studies investigating task type often examined conversational interaction in either one-way or two-way tasks. The former are tasks in which one of the speakers provides information to another; the latter are ones in which each speaker has different information that must be shared in order to solve a problem or to reach a goal. Several studies showed that

two-way tasks led to more conversational interaction and negotiation for meaning than interaction in one-way tasks (Gass & Varonis, 1985a; Long, 1981; Pica, Young, & Doughty, 1987).

In one of the earliest investigations of L2 learner interaction that touched on issues related to classroom contexts, features of L2 learner speech in teacher-fronted classrooms and group work were compared (Long et al., 1976). The results indicated that the learners not only produced a greater quantity of speech when interacting in group work, they also used a much greater variety of language functions (e.g., asking questions, seeking clarification, etc.). The group work component in the Long et al. study did not take place as an integral part of a lesson or unit in a classroom. Instead, learners were paired for these activities outside the classroom, leading some researchers to wonder whether there would be as much negotiation if the task were used within the context of a lesson. For example, Rulon & McCreary (1986) argued that if the dyadic tasks were contextualized, "the students' background knowledge of the topic would be activated, making them more familiar with the concepts and vocabulary of the task. Thus, the time spent negotiating meaning would be reduced and the possibility of discussing the content of the task would be increased, resulting in an effective use of discussion time" (Rulon & McCreary, 1986, p. 183).

Porter (1986) explored the kind of language L2 learners used when interacting in pairs with L2 learners at different levels of proficiency as well as with a native speaker. This study, also outside the classroom, was partially motivated by the concern that learners are likely to produce a greater number of errors when interacting with their peers than with the teacher or more proficient learners. The findings indicated that learners did not in fact produce more errors in interaction with their peers than when they engaged in interaction with more advanced nonnative speakers and native speakers. However, while learners received useful corrective feedback from the native and more advanced L2 learners, they could not provide each other with appropriate corrective feedback on form. Other studies exploring proficiency level in relation to the nature of interaction include one by Yule and MacDonald (1990). In a study of learner dyads outside the classroom setting, they found that if low proficiency learners played an active role when matched with high proficiency learners, more negotiation for meaning took place. When high proficiency learners played an active role there was a tendency for them to dominate the task and allow for little negotiation for meaning.[1]

While the results of the above studies have relevant and useful pedagogical implications, most of the research did not take place in L2 classrooms. Virtually all of the observations involved interactions between dyads in specially arranged sessions (often referred to as *laboratory settings*)

rather than in ongoing classroom activities. Indeed, in a 1991 review of classroom-oriented research in SLA, Nunan reported that only fifteen of fifty widely cited classroom-oriented studies were actually carried out in authentic language classrooms. He argues, "If context is important to research outcomes, then we need far more of these classroom-based, as opposed to classroom-oriented studies" (Nunan, 1991, p. 103). Classroom-based studies are most likely to lead to a better understanding about the kind of interaction that occurs in classrooms where the teacher is the only proficient speaker and interacts with a large number of learners, and where dyadic interaction—if it occurs—involves pairs of learners in a variety of contextualized activity types.

As indicated above, the *interaction hypothesis* as proposed by Long (1983) affirmed Krashen's (1985) hypothesis that access to comprehensible input is a primary contributor to L2 learning and suggested that certain interaction features make linguistic input more comprehensible to L2 learners. A series of studies in the mid-1980s were carried out to investigate these hypotheses, and the earliest ones focused more on comprehensible input than on interaction. For example, Chaudron (1983) and Long (1985) carried out research in which different versions of academic lectures were prepared (i.e. a native-speaker version and a simplified/modified version) and read to different groups of L2 learners. Students who heard the simplified version performed much better on comprehension questions than those who heard the native-speaker version, thus supporting Krashen's comprehensible input hypothesis. This led to subsequent studies in which both input and interaction were manipulated. Studies comparing L2 learners' listening comprehension reported that opportunities for learners to interact while listening to unmodified input led to better comprehension than when learners listened to simplified texts but *without* interaction opportunities. (Pica, Young, & Doughty, 1987), thus supporting the interaction hypothesis.

Classroom-based Studies

Even though the early research based on the interaction hypothesis was mainly done outside the classroom, its suggestion that languages are learned primarily through participation in conversations was consistent with new developments in second language pedagogy in the 1980s. Communicative language teaching (CLT) had begun to replace more structure-based types of instruction. In some contexts, the strong version of CLT (Howatt, 1984), with its emphasis on meaningful interaction, especially among students in pairs or groups, fit well with the interaction hypothesis as it was formulated at the time. The strong version of CLT often meant that the teacher paid little or no attention to language form, emphasizing instead the importance of spontaneous language use and

the sharing of information between teachers and learners and among learners.

Even in the earliest days of interaction studies, some researchers were interested in investigating interaction in the classroom. Much of the classroom-based research was carried out within what Craig Chaudron (1988) and others called *interaction analysis*, an approach to research within the larger domain of L2 classroom-based research. This approach involves the systematic observation of teacher and student linguistic (and other) behaviors in the classroom. Several instruments for observation and analysis were developed for L2 classrooms (Allen, Fröhlich, & Spada, 1984; Fanselow, 1977; Mitchell, Parkinson, & Johnstone, 1981; Spada & Fröhlich, 1995; Ullman & Geva, 1983). These schemes differ widely in terms of scope and depth, and many of them were adapted from observation instruments used in first language classrooms (e.g., Flanders, 1960; Moskowitz, 1967), but all were designed to investigate the patterns of interaction in the classroom.

Interaction analysis was particularly interesting for researchers who had become disillusioned with *global method-comparison studies* which sought to compare different teaching methods or approaches on a large scale. Some of these projects involved hundreds or even thousands of students who were learning foreign languages in programs that were based on different pedagogical methods. The results of these studies were usually frustratingly inconclusive, showing no significant difference between teaching methods such as *audio-lingual* and *cognitive code* which were assumed to be quite different from each other (e.g., Chastain, 1969; Smith, 1970). Researchers influenced by second language acquisition research findings and by the interaction hypothesis suggested that these inconclusive results might be due to the fact that the global method comparison studies did not include systematic observation of teacher and learner behaviors. It was the absence of detailed information about classroom teaching and learning that led Long (1980) to refer to the classroom as a *black box*, as mysterious and uncharted as Chomsky's *language acquisition device* in the human mind.

In the 1980s and 1990s many studies provided detailed and systematic descriptions of what actually goes on inside the *black box* of the second language classroom. Research in the interaction analysis framework was intended to investigate not only how learners negotiate for meaning but also many other features of both a linguistic and pedagogical nature. This included research on question types (Long & Sato, 1983), turn-allocation (Seliger, 1977), wait time (White & Lightbown, 1984), corrective feedback (Chaudron, 1977), language choice (Duff & Polio, 1990; Polio & Duff, 1994), the extent to which classrooms conformed to the principles of CLT (Fröhlich, Spada, & Allen, 1985), and how teachers modified their speech to adjust to the perceived needs of second language

learners (Chaudron, 1983). These descriptive studies shifted the focus away from the *product* of classroom learning—as measured by achievement or proficiency tests—and moved it to the *processes* that were present in classroom interaction.

Interaction analysis produced a rich literature documenting classroom processes, but these process-oriented studies of classroom interaction also had their limitations. First, like the early *laboratory studies* based on the interaction hypothesis, they were primarily descriptive. Although the research provided more and more information about what was actually happening in classrooms, there was a lack of theoretical motivation for assuming that the particular instructional processes being described were predictors of language development in any context. Of course, at that time there had been little research to identify the interaction variables that were good predictors of specific aspects of language development. There was a need for research that could discover relationships between instructional processes and L2 learning outcomes. Thus, there was a call for more *process/product* research, where *product* referred not to test scores or global proficiency measures but to how characteristics of students' interlanguage changed when they engaged in different types of pedagogical interactions (see Long, 1985).

Around the same time (the mid-to-late 1980s) serious concerns were being raised about the strong version of CLT and the claim that an exclusive focus on meaning in L2 classrooms was sufficient to bring learners to high levels of linguistic and communicative ability. The call for more attention to language form in L2 instruction resulted in over two decades of classroom research investigating the effects of form-focused instruction and corrective feedback on L2 learning (e.g., Day & Shapson, 1991; Doughty, 1991; Harley, 1989; Lightbown & Spada, 1990; Spada, 1987). Although not all of this work was done with explicit reference to the interaction hypothesis, the field that has come to be called *instructed SLA research* was certainly influenced by it (Norris & Ortega, 2000; Ortega, 2007).

One study that explicitly examined negotiation for meaning in classroom settings led to questions about whether negotiation for meaning occurred often enough in the classroom setting to be a significant contributor to L2 acquisition. Foster (1998) reported on a study in which she found relatively little evidence of negotiation for meaning among an international group of young adult learners of English in classes in the UK. Similar findings were reported in a more recent study—again looking at pairs of learners participating in activities within their regular classes in either English as a second language or Japanese as a foreign language (Foster & Ohta, 2005).

In studies looking at negotiation for meaning between teachers and students, Pica (2002) observed only a small amount of negotiation for

meaning in content-based adult ESL classrooms. Musumeci (1996) reported that teachers in content-based classes of Italian as a foreign language viewed negotiation for meaning more as a *social* than *teaching* strategy. They saw negotiation for meaning as a way "to help the student get through the exchange as painlessly as possible" (p. 316). Lyster (2007) argued that "[t]eacher student interaction has a clearly pedagogical focus relating not only to the exchange of comprehensible messages, but also to formal accuracy, academic achievement, and literacy development" (Lyster, 2007, p. 105). However, as Lyster's observations of teacher/student interactions in French immersion classrooms showed, students do not always recognize the *linguistic* or *corrective* focus of teachers' comments, but focus instead on the meaning they express.

In response to the different findings obtained about opportunities for negotiation for meaning and the role it may play in laboratory and classroom contexts, Gass, Mackey, and Ross-Feldman (2005) compared the interaction of pairs of university students of Spanish as a foreign language on tasks that were carried out either in classrooms or in laboratories. They found few differences in interactional patterns in the two contexts. Instead, the differences they found appeared to be related to the type of tasks learners were engaged in. However, in a recent meta-analysis of twenty-eight studies investigating the relationship between interaction and SLA in both classroom and laboratory settings, Mackey and Goo (in press) report that the laboratory studies consistently showed larger effects for interaction, suggesting that "the quantity and quality and often dyadic context for the provision of interactional treatments in laboratory settings may have contributed to the significant difference in the efficacy of interactional treatments on learner development between the two settings" (Mackey & Goo, 2007, p. 443). In the same meta-analysis, the researchers report that the interaction groups consistently outperformed comparison and control groups who did not engage in interaction and negotiation for meaning opportunities. However, only eight of the studies in their sample administered delayed posttests and thus, as Mackey and Goo point out, we do not know whether the positive effects were long lasting. Furthermore, most of the studies were laboratory studies conducted in contexts where English is a *foreign* language and where students have few opportunities to use their L2 in interaction outside the classroom.

It is difficult to know why some researchers have found different patterns of interaction in language classrooms from those in laboratory settings, while others have found patterns that are similar. What is clear is that more studies are needed in both contexts to determine how the characteristics of context (foreign language versus second language), setting (laboratory versus classroom), and task type (one-way versus two-way,

open versus closed, etc.) are more likely to lead to negotiation for meaning and, eventually, to more and more durable learning.

Revised Interaction Hypothesis

In 1996, Long proposed a revised version of the interaction hypothesis that brought instructed SLA research and interaction-based research closer together—at least in terms of some of the questions being asked. The revised interaction hypothesis also motivated a great deal of research—research that began to directly investigate the effects of conversational interaction on L2 learning. Prior to this, in a 1994 review on research on negotiation, Pica called for more outcome-based research stating that "most [negotiation] research has taken a process approach toward characterizing L2 learning through negotiation, but if negotiation's role in learning is to be tested more fully, an outcome approach will be necessary as well" (Pica, 1994, p. 519). It seems that call was heard because over ten years later in another review of interaction research Mackey (2007) states that more than forty empirical studies have investigated the relationship between interaction and SLA to date.

As evident in the quotation below, the revised interaction hypothesis gives more importance to individual cognitive processing (in particular to *noticing* specific language features in the input and the role of corrective feedback) than did the original version of the interaction hypothesis with its emphasis on negotiation for meaning.

> Environmental contributions to acquisition are mediated by selective attention and the learner's developing L2 processing capacity, and these resources are brought together most usefully, although not exclusively, during negotiation for meaning. Negative feedback obtained during negotiation work or elsewhere may be facilitative of L2 development, at least for vocabulary, morphology, and language-specific syntax, and essential for learning certain specifiable L1–L2 contrasts (Long, 1996, p. 417).

Based on this revised interaction hypothesis, corrective feedback has received a great deal of attention in both classroom and laboratory studies. Much of this research has focused on recasts. There are many different definitions of recasts, but all include two elements—maintaining the learner's intended meaning and correcting errors. L2 researchers typically define recasts as "utterances that repeat a learner's incorrect utterance, making only the changes necessary to produce a correct utterance, without changing the meaning" (Nicholas, Lightbown, & Spada, 2001, p. 732), as in example (1).

Example (1)
NNS: The boy have many flowers in the basket.
NS: Yes, the boy has many flowers in the basket.
(Nicholas, Lightbown, & Spada, 2001, p. 721).

Recasts are the most frequently occurring type of interactional feedback in a wide variety of second and foreign language classrooms (Chaudron, 1977; Lyster & Ranta, 1997; Sheen, 2004; Ohta, 2000; Loewen, 2004).[2] In most studies, recasts have also been shown to lead to the least uptake (defined as a range of possible learner responses provided immediately after teacher feedback). Uptake is often considered to be an indication that the student to whose error the teacher is responding has noticed that the teacher's response is focused on language *form* rather than language *meaning* (Lyster, 1998; Mori, 2002; Sheen, 2006).

A number of experimental studies of recasts carried out in laboratory contexts have found recasts to be effective in drawing learners' attention to differences between their original utterance and the recast. Furthermore, laboratory studies have shown that negotiation with recasts leads to more L2 development than negotiation without recasts. This has been observed with a number of different language features (Long et al., 1998; Mackey & Philp, 1998; Han, 2002; Iwashita, 2003; Leeman, 2003). While the results of the laboratory studies suggest a positive role for recasts in L2 development, Long notes that they are "differentially frequent and effective depending on setting, learner age, proficiency, and type of L2 structure . . . as well as developmental stage and task" (Long, 2007, p. 115). In his review of research on recasts, the only classroom studies Long (2007) refers to are either descriptive (e.g., Doughty, 1991; Ellis, Basturkmen, & Loewen, 2001; Lyster & Ranta, 1997) and/or compare the effects of recasts to no corrective feedback (Doughty & Varela, 1998).[3] He does not include any reference to recent quasi-experimental research in L2 classrooms that compares the effects of recasts with other types of corrective feedback on L2 learning.

While few classroom-based quasi-experimental studies have been done, three recent studies have compared learning outcomes associated with recasts with those associated with other types of corrective feedback. These are presented in Table 7.1. All of them report that recasts are less

Table 7.1 Quasi-Experimental Studies Comparing the Effects of Recasts with Different Types of Corrective Feedback on L2 Development

STUDY	*FINDINGS*
Lyster, 2004	Prompts > Recasts
Ammar & Spada, 2006	Prompts > Recasts
Ellis, Loewen, & Erlam, 2006	Metalinguistic feedback > Recasts

effective than other types of corrective feedback, not only in eliciting uptake but also in promoting learning.

Lyster (2004) investigated the differential effects of prompts and recasts on the development of grammatical gender by French immersion learners. Prompts, unlike recasts, do not provide learners with a correct model but, instead, push learners to self-correct by using phrases like "What did you just say?" or "Can you repeat that?". Lyster's results indicated that the prompt group significantly outperformed the comparison group (which received no special feedback treatment) on all language measures, while the recast group outperformed the comparison group on only some of the measures. In a study with young L2 learners of English, Ammar (2003) and Ammar and Spada (2006) investigated the effects of recasts and prompts on the development of possessive determiners in English. Overall, the group receiving prompts outperformed the recast group on written and oral posttests. It was also observed that prompts were particularly effective for low proficiency learners whereas higher proficiency learners benefited from both prompts and recasts. Similarly, in a classroom study of adult ESL learners, Ellis, Loewen, and Erlam (2006) compared the effects of recasts versus a particular type of prompt (i.e. meta-linguistic feedback) on students' use of the simple past tense in English. They found superior effects for meta-linguistic feedback compared with recasts on delayed posttesting. Although these represent a small group of classroom studies, they suggest that recasts, effective as they are in laboratory studies, may be less effective in classrooms, especially those where the overall pedagogic focus includes a primary emphasis on content-based teaching and learning.

The results of the studies comparing the effects of prompts and recasts are consistent with the output hypothesis proposed by Swain (1985) and the notion that when learners produce language (e.g., via prompts) they process language more deeply, and in ways they do not when they focus on the meaning conveyed by the correct models (e.g., recasts) that they are exposed to. Like the interaction hypothesis, Swain's early work on the output hypothesis was influenced by cognitive theory. Her later work, informed by sociocultural theory, remains central to interaction-based research, particularly in terms of the notion that learners can help each other discover or notice language features that they did not previously use easily or at all (Swain & Lapkin, 2002). As with the early interaction research, this line of research has not yet demonstrated how these learner/learner interactions contribute to learning in the long term (Shehadeh, 2002; Mackey & Goo, 2007). Rather, the focus has been on the extent to which learners' attention is drawn to language features that they need to understand or use as they work together on a task. One exception to this is a study by Bitchener (2004) in which pre-intermediate learners of L2 English interacted in pairs on two different types of tasks.

Bitchener found that learners did a considerable amount of negotiation for meaning on lexical items and that, when their negotiation led to a correct resolution, they were often able to use the correct language item when they repeated the task twelve weeks later.

The differential benefits for type of corrective feedback in the classroom and laboratory studies are not surprising. There are many reasons why we might expect the interactional patterns to be different in these settings. With the arrival of CLT in many classrooms in the early 1980s, particularly in North America, there was a distinct shift from an emphasis on learning language form to a focus on using language in the communication of meaning. This emphasis on meaning was even stronger in content-based instruction (CBI), where teachers were responsible for ensuring that students learned such subject matter as mathematics and social studies as well as the second language. Recasts are compatible with CLT and CBI because they permit teachers to provide feedback without interrupting the flow of communication.[4] This in turn permits learners to maintain their focus on meaning. However it is this very focus that may make it difficult for learners to notice when corrective feedback refers to language form or the ways in which language conveys a specific meaning rather than meaning in general. Furthermore, in CLT and CBI classrooms, recasts are often diffuse; that is, they do not target any particular error or error type, making it even more difficult for learners to know exactly what the teacher wishes to draw attention to. Such diffuse feedback also means that learners may get so few opportunities to notice any particular language feature that their interlanguage development is not affected by the feedback. In the laboratory context, learners are more likely to attend to language forms, given the nature of the setting, the one-on-one interaction, and the continuous recasting of only one or two linguistic forms (Nicholas, Lightbown, & Spada, 2001).

However, as noted above, differences in interaction patterns are not limited to classroom and laboratory comparisons. There are also differences in approaches to L2 teaching that can lead learners to notice and interpret teachers' corrective feedback in different ways. A recent study by Lyster and Mori (2006) compared learner uptake and repair following two types of corrective feedback (i.e. recasts and prompts) in Japanese immersion classrooms and French immersion classrooms. They found that while teachers in both classrooms used recasts more than any other type of corrective feedback, the Japanese learners almost always repaired their utterances after recasts, while the French immersion learners rarely did. Lyster and Mori attributed these findings to differences in the overall type of instruction provided in the two classroom settings. The instructional orientation in the Japanese classrooms was form-focused, whereas the instructional approach in the French immersion classrooms was meaning-focused. Therefore, the Japanese students had learned to be

attentive to form and thus noticed the corrective feedback component of a recast. The immersion students, on the other hand, were predisposed to be attentive to meaning, and thus were more likely to interpret a recast as confirmation of what they said. Lyster and Mori proposed the *counterbalance hypothesis*, suggesting that students will be more likely to attend to feedback that is atypical of the classroom interaction they are accustomed to.

Sheen (2004) reported similar findings in a study that compared teachers' corrective feedback and adult L2 learner uptake in four different instructional settings. She found that learner uptake in response to recasts was greater in contexts where the students' attention was typically oriented towards form rather than meaning. This appears to be consistent with the findings of Mackey and Goo's (2007) meta-analysis of interaction research. They observed that research conducted in *foreign* language contexts produced larger effect sizes for the benefits of interaction than research conducted in *second* language contexts. Students in foreign language contexts typically have few opportunities for interaction outside the classroom, and it is widely observed that foreign language instruction tends to be more form-based than second language instruction. The fact that 70 percent of the studies in the meta-analysis were conducted in foreign language contexts may have contributed to the finding of a positive effect for interaction overall. Most of these studies also took place outside classroom settings.

The importance of context *within* second language classrooms is further highlighted in Oliver and Mackey (2003) in their study of the interaction behavior of teachers and students in four ESL classrooms in Australia. The interaction contexts they examined in each class were described as 1) language focused, 2) content, 3) communication, and 4) management. Perhaps not surprisingly, they found that opportunities for feedback on learner errors were most frequent in communicative contexts, but the percentage of errors actually responded to by the teacher was greatest in explicit language-focused activities. They also found that learners were most likely to modify their output after feedback in the language-focused activities.

It is clear that context plays a crucial role, and that more studies are needed to investigate different features of interaction in different classroom settings and interactional episodes. But what is also needed is a closer look at how we define and operationalize different features of interaction. Recasts are a case in point. Sheen (2006) presents a taxonomy of different types of recasts that arose in communicative classrooms and examines the relationships between different characteristics of recasts and learner uptake. Among the contrasting types of recasts that she examined were declarative versus interrogative, reduced versus nonreduced, and single word or short phrase versus a longer phrase or clause.

She found that short, declarative, reduced, repeated, and single error focus recasts with substitutions were positively related to learner uptake and/or repair. One distinction that she mentions but did not examine was the suprasegmental aspect of recasts—emphatic stress on key items—which Chaudron (1977) pointed to as a distinguishing characteristic between what one might call an explicit recast versus an implicit recast. In fact, because many of the studies of recasts have been based on the analysis of written transcripts, it has often been difficult or impossible for researchers to adequately assess the possible effects of teachers' stress and intonation patterns (see Nicholas, Lightbown, & Spada, 2001).

A recent study used an innovative technique to explore learners' ability to interpret the intention of a teacher's feedback moves. Carpenter et al. (2006) designed a study that allowed advanced learners of L2 English to observe, on video, the corrective feedback of teachers in classrooms with other learners. The observers were asked to interpret each feedback move as a recast, a repetition, or as some other kind of interaction. Some of the video clips included the learner utterance that initiated the exchange; others were edited to include only the teacher's feedback move. The results suggested that, without hearing the erroneous utterance that triggered the feedback, the observers were not consistently able to distinguish between recasts and repetitions. In this study, the observers did not appear to be able to use nonverbal information such as stress and intonation as a way of determining which teacher feedback was corrective and which was simply confirming something a student had said. This research may provide further support for the relatively greater benefit of recasts for more advanced learners, who are better able to compare a student's utterance (including their own) with the teacher's responding one. A study with learners at different proficiency levels and with experience in different types of instructional contexts would provide valuable information about how these variables may influence learners' ability to identify recasts as corrective feedback.

Summary and Conclusions

It is clear that, before we can be confident about the benefits of particular types of interaction behaviors on L2 learning, there is a need for more research. While the Mackey and Goo (2007) meta-analysis indicates that interaction is better than no interaction, few studies have measured long-term effects.

We still have much to learn about the role of specific interaction features in L2 learning and how these interact with context (second and foreign language), setting (classroom and laboratory), pedagogical focus within classrooms (non-linguistic subject matter, classroom management, language, etc.), and specific language feature (grammar, lexis, pronunciation).

Furthermore, we have also seen how problems arise in interpreting the findings from studies that have not defined interaction features (e.g., recasts) in the same way. There is a need for more studies that not only define interactional features in the same way but also operationalize them in the same way.

The contexts and methodologies for data collection must also be carefully defined. For example, we know that different tasks can lead to different linguistic behaviors. Thus, studies of interaction need to ensure that tasks are consistent across laboratory and classroom contexts. Furthermore, because we have seen that learners at different levels of proficiency interact differently according to how pairs or groups are formed, learners' proficiency also needs to be taken into account in designing research.

Interaction-based SLA research has revealed that some aspects of language benefit more from interaction opportunities than others. In a historical review of the study of input/interaction and the effects of interaction on SLA, Gass (2003) concludes by saying that "[interaction] may be effective with low-level phenomena, such as pronunciation or basic meanings of lexical items. Future research will need to determine the long-term effects of interaction on different parts of language" (Gass, 2003, p. 248).

Since the early days of of SLA research over thirty years ago, there have been consistent calls for more replication studies and interaction-based SLA research is no exception (see Polio & Gass, 1997). There is a clear need for replication studies to investigate the effects of interaction with a greater variety of learners who differ not only in terms of language backgrounds but also in terms of language aptitude and attitudes toward the target language.

Finally, there is a need for far more classroom-based studies, especially in classrooms where the interactional features are fully integrated into the instructional program. This will permit a closer examination of how interaction features such as *negotiation for meaning* and *corrective feedback* contribute to L2 use and development when combined with the multitude of linguistic (and other) behaviors in real classroom settings.

Notes

1 In a more recent classroom-based study, Storch (2002) also observed different patterns of interaction among pairs of learners. She described the differences in terms of *equality* and *mutuality*. She found two types of inequality, describing one as *dominant/passive*, where the stronger learner took over the task, and the other as *novice/expert*, where the stronger learner worked with the weaker one to solve the problem. She found that while the novice/expert pairs were low on the *equality* measure, they were high on *mutuality*. The novice/expert pairs were able to retain the most knowledge that emerged during the interaction over time, while learners in the dominant/passive pairs retained the least.

2 Mackey, Polio, and McDonough (2004) found that preservice teachers did not recast as much as experienced teachers. In a dyadic laboratory session, however, Polio, Gass, and Chapin (2006) found that preservice teachers' recast rate was not significantly different from that of experienced teachers.
3 Long (2007) refers to Ishida (2002) as a classroom study. However, the interaction reported in that study occurred within "eight 30-minute semi-structured conversational sessions between each subject and the researcher" (Long, 2007, p. 92).
4 Note that Pica (2002) found few recasts in content classes for adult learners, perhaps because the students' turns were long and recasts would have interrupted them.

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8

RECASTS IN MULTIPLE RESPONSE FOCUS ON FORM EPISODES

Shawn Loewen

The interaction hypothesis (Long, 1991, 1996) has proven a fruitful approach to second language acquisition (SLA) as it has considered input, interaction, and output in relation to second language (L2) learning (Gass, 1997; Gass, 2003; Gass & Mackey, 2007). Early studies examining input and interaction considered ways in which native and nonnative speakers modified their speech, particularly in response to communication breakdowns (e.g., Gass & Varonis, 1985; Long, 1983; Varonis & Gass, 1985). In addition, a growing number of studies have investigated attention to linguistic items during interaction even when there has not been a breakdown in communication (e.g., Doughty & Williams, 1998; Ellis, 2001; Long & Robinson, 1998; Mackey, 1999; Mackey, Gass, & McDonough, 2000). This attention to language during interaction often provides corrective feedback for learners, which in turn "may help to make problematic aspects of learners' interlanguage salient and may give them additional opportunities to focus on their production or comprehension, thus promoting L2 development" (Gass & Mackey, 2007, p. 182).

One particular type of corrective feedback that continues to receive considerable attention is recasts (e.g., Carpenter, Jeon, MacGregor, & MacKey, 2006; Egi, 2007; Ellis, 2007; Ellis & Sheen, 2006; Hauser, 2005; Loewen & Nabei, 2007; Loewen & Philp, 2006; Long, 2007; McDonough & Mackey, 2006; Mackey & Goo, 2007; Rajagopalan, 2006; Revesz & Han, 2006; Sagarra, 2007; Sheen, 2006; Trofimovich, Ammar, & Gatbonton, 2007). As a result of this intense scrutiny, SLA researchers are refining their definitions of recasts and considering the characteristics of recasts more closely. This chapter contributes to this debate by carefully examining one specific type of recast, namely those that occur in extended negotiation sequences.

Because multiple definitions of recasts have been used, it is important to clearly define them. Ellis and Sheen (2006) provided a summary of

definitions, with two that are particularly illustrative of two main characteristics of recasts. First, Lyster and Ranta (1997) defined a recast as "the teacher's reformulation of all or part of the student's utterance, minus the error" (p. 46). Indeed, it is reformulation or correction that is at the heart of definitions of recasts in the L2 literature. However, Long's (2007) most recent definition, in a whole chapter devoted to recasts, is more extensive:

> A *corrective* recast may be defined as a reformulation of all or part of a learner's immediately preceding utterance in which one or more nontarget-like (lexical, grammatical, etc.) items is/are replaced by the corresponding target language form(s), and where, throughout the exchange, the focus of the interlocutors is on *meaning*, not language as object (original emphasis, p. 77).

While this definition maintains the centrality of reformulation, it also stipulates that interlocutors maintain a primary focus on meaning. However, the assessment of interlocutor focus is sometimes problematic without introspective measures such as stimulated recall (Gass & Mackey, 2000); therefore, this component will not be viewed as central to the operationalization of recasts in the current study since the data consist entirely of interactional discourse. Similar to Ellis and Sheen (2006), the present study uses Sheen's (2006) definition which is more detailed than Lyster and Ranta's (1997) but less restrictive than Long's (2007). Sheen (2006) defines a recast as consisting of "the teacher's reformulation of all or part of a student's utterance that contains at least one error within the context of a communicative activity in the classroom" (p. 365).

Having considered the central features of recasts, this paper next considers why they merit continued research energy. Long (1996) argues that recasts bring together input, learners' internal cognitive processes, and output in productive ways. In particular, recasts are supposed to do this implicitly because they do not interrupt the communicative flow of the interaction. Indeed, recasts have been shown to be effective in some contexts (e.g., Doughty & Varela, 1998; Long, Inagaki, & Ortega, 1998; Mackey & Philp, 1998). However, some researchers (e.g., Lyster, 1998) have been less optimistic about the effectiveness of recasts, given their ambiguous and implicit nature in classroom interaction. Some recent studies have suggested that other types of corrective feedback such as prompts, which withhold the correct form and instead allow the learner the opportunity to self-correct (Ammar & Spada, 2006; Lyster, 2004) or metalinguistic feedback (Ellis, Loewen, & Erlam, 2006) are as effective as, if not more so than, recasts. Nevertheless, a meta-analysis of corrective feedback by Russell and Spada (2006) did not find differences in the effectiveness of different types of responses to learner errors. Similarly,

Mackey and Goo (2007) in their meta-analysis urged caution in interpreting the larger effect sizes for recasts in comparison to negotiations and metalinguistic feedback due to the inclusion of only a small number of studies containing these treatment conditions.

While debate continues regarding the efficacy of recasts in comparison to other types of corrective feedback, other studies have started to question the monolithic nature of recasts and have delved into the various characteristics of recasts that can be altered while still maintaining a recast. Recent attempts at this include Sheen (2006) and Loewen and Philp (2006). Characteristics they have examined include the number of changes the recast makes from the erroneous utterance, whether the initial utterance is repeated in its entirety or is segmented, whether the recast has interrogative or declarative prosody, and whether the recast contains additional stress. In addition, those two studies have considered the number of response moves provided to a single erroneous linguistic item, which is the focus of the present study.

Recasts have typically been conceptualized and/or operationalized as short, one-turn response moves following a learner's erroneous utterance. However, several studies have acknowledged the existence of extended negotiation containing multiple response moves that include recasts. For example, Ellis, Basturkmen, and Loewen (2001), in their study of English L2 classes in New Zealand, made a distinction between simple and complex focus on form episodes (FFEs), with an FFE being defined as including all the discourse focusing on the targeted form. Simple FFEs were defined as those with one response move, and complex FFEs were defined as those with more than one response move. Example 1, from Ellis et al. (2001, p. 299), illustrates a simple FFE in which the teacher provides a single recast in response to the student's missing definite article.

Example (1) Simple
S: I was in pub.
T: in the pub? ← Recast
S: yeah and I was drinking beer with my friend

In example 2, taken from the current study since Ellis et al. (2001) did not provide an example of a complex FFE, the student is attempting to ask the teacher a question; however, before the student can finish her question, the teacher provides a recast that corrects the missing auxiliary. The student produces an acknowledgement token, and then the teacher repeats the recast a second time.

Example (2)
S: how you say
T: how do you say ← Recast

S: oh
T: how do you say ← Recast
S: how do you say sold the secret of the company or sold the secrets company

Although not investigating recasts alone, Ellis et al. (2001) found that eighty of the 429 FFEs (18.6%) in their data were complex. Additionally, successful uptake—student production of the correct form in response to teacher feedback (Lyster and Ranta, 1997)—was significantly more likely to occur in complex FFEs. Another study which has looked at multiple response moves was conducted by Braidi (2002). She made a distinction between one-signal and extended negotiated interactions. Following Pica (1988) and Varonis and Gass (1985), Braidi defined one-signal negotiated interactions as containing "only one signal of comprehension difficulty" (p. 14), whereas extended negotiated interactions included "more lengthy negotiations, in which the interlocutor signals lack of comprehension more than once" (p. 15). In her study of ten L1–L2 English-speaking dyads each involved in an hour of communicative tasks, she found that 10 percent of extended negotiations contained recasts. Sheen (2006), in a study of English L2 classrooms in New Zealand and Korea, also investigated extended negotiation sequences, using the terminology *multi-move recast* and *single-move recast*. Multi-move recasts were defined as "entail[ing] more than one teacher feedback move containing at least a single recast in a single teacher turn" (p. 371), while single-move recasts entailed only one teacher feedback move. Sheen additionally divided multi-move recasts into three categories: 1) corrective recasts in which the recast is preceded by a repetition of the error, 2) repeated recasts in which the recast is provided more than once, and 3) combination recasts in which the recast occurred with other types of corrective feedback, such as metalinguistic feedback, although excluding explicit correction. Sheen's results showed that 79 percent (n=233) of FFEs were single-move, while 21 percent (n=62) were multi-move. As for the categories of multi-move recasts, 10 percent (n=6) were corrective, 77 percent (n=48) were repeated, and 13 percent (n=8) were combination. Sheen also examined the relationship between number of response moves and repair (i.e., successful uptake). She found that single-move recasts had a repair rate of 74.2 percent, while multi-move recasts had a repair rate of 84.8 percent, a difference that was not significant. However, she pointed out that the subcategories of corrective recasts and combination recasts both had repair rates of 100 percent, while repeated recasts had a rate of 79.4 percent. Finally, Muranoi (2000), in an experimental study, found that what he termed interaction enhancement had a positive effect on the learning of English articles. The interaction enhancement occurred in response to learners' article errors and consisted of potentially two

requests for repetition followed by a corrective recast if learners were unsuccessful in providing the correct form. In addition, learners participated in a debriefing session focusing either on the target structure or meaning.

Given that multiple response FFEs involving recasts have been shown to exist in both classroom and laboratory interaction, it is important to investigate them further and consider their impact on L2 learning, particularly in comparison to single recasts. Therefore, the present study addressed the following four research questions:

1. How frequently do multiple response FFEs containing recasts occur in adult ESL classroom interaction?
2. How many and what types of response moves comprise the multiple response FFEs found in adult ESL classroom interaction?
3. Is there a difference between multiple and single response FFEs in terms of (a) the source and linguistic focus of the FFE, (b) successful uptake, and (c) accurate test scores?
4. Is there a difference between various types of multiple response FFEs in terms of (a) successful uptake and (b) accurate test scores?

Method

Context and Participants

The current data come from Loewen's (2002) study and consist of thirty-two hours of audio-recorded ESL classroom interaction. The participants included twelve teachers and 118 L2 learners of English in twelve different classes in a private language school in New Zealand. The teachers were all first language speakers of English, and they had an average of seven years of teaching experience, with a range from one to sixteen years. In addition, every teacher had some type of ESL teaching qualification, such as the Certificate in English Language Teaching for Adults or a Master of Arts in language teaching. Eight teachers were male and four were female. The students were from predominantly East Asian countries, such as Korea (32), PR China (32), Japan (17), Taiwan (11), Vietnam (10), and Thailand (5). Additionally, four students were from Switzerland, two from Germany, and one each from Indonesia, Brazil, Peru, and France. No other demographic information was collected from the students.

Procedure

For each class, the researcher observed four different meaning-focused lessons, which were defined as lessons in which the primary goal of the activity was to exchange information, rather than to learn about or

practice specific linguistic forms (Pica, Kanagy, & Falodun, 1993). Teachers were not told the specific focus of the study, nor were they given a definition of meaning-focused activities; instead they decided for themselves which activities they deemed meaning-focused and were thus appropriate for the researcher to observe. While most activities met the above criteria, there were 226 minutes of observation that the researcher determined were primarily focused on the practise of linguistic forms. These lessons were excluded from any subsequent analyses.

Each observation was audio-recorded with a wireless microphone attached to the teacher, allowing all teacher interaction with students to be audio-recorded. However, many of the observations included students working in pairs or small groups without the teacher, and it was not possible to record any student–student interaction when the teacher was not present. In addition to the observations, the researcher administered a series of individualized, tailor-made tests (Swain, 2001). Learners who received corrective feedback during classroom interaction were asked to correct the forms targeted in their FFEs. The tests were administered outside of class time, either one day or two weeks after the occurrence of an FFE. The test items were presented orally to the individual students, and their responses were audio-recorded (Loewen, 2005).

Coding

All focus on form episodes in the interaction were identified and transcribed. 1,373 FFEs were identified in total. These FFEs were coded for a variety of characteristics, based on the analysis by Ellis et al. (2001), including source, linguistic focus, uptake presence, and uptake success. Source was defined as the apparent cause or reason for the FFE; in other words did the FFE arise from an apparent breakdown in communication, in which case it was labeled *message-related*, or did the teacher appear to target the linguistic form simply for accuracy's sake even though no breakdown in communication had occurred, in which case it was labeled *code-related?* Linguistic focus was divided into the categories of *grammar*, *vocabulary*, and *pronunciation*. Uptake presence was coded as *uptake*, *no uptake*, or *no opportunity* depending on whether or not learners responded to the feedback in some way or whether they had no chance to do so. Uptake success was coded as *successful* or *unsuccessful* according to whether or not learners incorporated the correct forms into their own production (Loewen, 2004). Finally, the test responses of the learners who were involved in the FFEs were coded as either *correct*, indicating the provision of the targetlike form, or *incorrect*, indicating the provision of a nontargetlike form (Loewen, 2005). A random sample of 21 percent of the data was coded by a second rater, with the following kappa coefficients: source $\kappa = .68$, linguistic focus $\kappa = .84$, uptake presence $\kappa = .86$,

uptake success $\kappa = .90$, test scores $\kappa = .85$. Note that the lower agreement rate for source indicates the high inference nature of etically determining whether or not interlocutors understand one another (Foster & Ohta, 2005).

In addition to the previous coding categories, the multiple response FFEs involving recasts were identified among the 1,373 FFEs of the data set. An FFE was deemed to have multiple responses if it contained more than one feedback move in response to a learner error. Only those multiple response FFEs in which the final response move was a recast were included in this analysis, in order to maintain comparability with previous research that had coded only the final feedback move in complex or multi-move FFEs (e.g., Ellis et al., 2001). Building on Richards and Schmidt's (2002) definitions of *move* and *speech act*, a *response move* was operationalized as a functional unit of discourse which may be smaller than an utterance. Thus, multiple response moves were identified by their provision of additional or different corrective feedback, either by repetition of the recast or the combination of a recast and at least one other type of feedback. Multiple responses could occur in one utterance containing several response moves or over several utterances separated by other interlocutors' utterances. In addition to recasts, categories of feedback identified in previous research, including elicitations and metalinguistic feedback (Ellis, Loewen, & Erlam, 2006; Lyster & Ranta, 1997) were used. Consequently, the researcher created six descriptive coding categories that could be applied to the data regardless of the number of response moves in an FFE. However, the number of response moves in an FFE was still noted. A second rater coded forty-one (21%) randomly selected FFEs, with a resulting inter-rater reliability of $\kappa = .86$. Descriptions and illustrative examples of the coding categories follow.

Elicitation + Recast This category applied to FFEs in which the teacher first responded to an error with an elicitation move (also referred to as a prompt, e.g., Lyster, 2004) such as a clarification request or a repetition of the error. Any number of elicitation moves could be included in this category; however, the final response move in these sequences was always a recast. These FFEs gave the learners the opportunity to self-correct before the teacher provided the correct form.

An example of an elicitation + recast FFE is found in example 3 in which, while the teacher and student are conversing, the student pronounces *mad* as *mud* (line 1). The teacher responds with a clarification request in line 2, but this does not result in self-correction by the student. The teacher next repeats the incorrect word (another elicitation move); however, the student simply responds with an acknowledgement token. The teacher's next elicitation moves involve clarification requests to which the student replies with a synonym for the problematic word. At this point the teacher understands and provides a recast containing the

correct pronunciation which the student successfully uptakes. Thus, after a series of four elicitation moves, the student is still unable to correct her pronunciation and does so only after the provision of the teacher's recast.

Example (3) Elicitation + Recast
1 S: all the time I get mud
2 T: you get what?
3 S: mud
4 T: mud
5 S: yeah
6 T: what's mud? earth?
7 S: <crazy>
8 T: oh mad
9 S: yeah mad at

Multiple Recasts This category was used for all FFEs which contained two or more recasts and no other type of feedback. In these FFEs, students did not have the opportunity to self-correct, but they did receive the correct form more than once. In example 4, the student is talking to the teacher about a scenic temple near his hometown. During the description, the student has difficulty pronouncing *cliff*, producing two incorrect forms in lines 1 and 2. The teacher recasts the form in line 3, and the student does alter his pronunciation in line 4; however, the teacher still does not accept it as targetlike, recasting it twice more in lines 5 and 7. The student produces the correct form initially, but then reverts to his earlier, incorrect pronunciation. Thus, in this example, the teacher has provided three recasts for the learner.

Example (4) Multiple Recasts
1 S: and uh you can see some (.) do you know how ca- cheef near
2 the sea and there has got a <> chiff or
3 T: cliff
4 S: uh cluff yeah cluff
5 T: cliff
6 S: yeah and uh the
7 T: cliff
8 S: cliff cliff (.) cluff and uh some (.) okay some temple you know

Metalinguistic Feedback + Recast This category applied to FFEs which contained either an explicit indication that an error had occurred or some type of metalinguistic information about the nature of the error. While metalinguistic feedback as operationalized here does not provide the correct form for the learner, it does provide more explicit clues about the

error (Ellis et al., 2006), and for this reason it was decided not to include metalinguistic feedback with other types of elicitations such as clarification requests and repetitions. The example of metalinguistic feedback + recast in example 5 shows a student and teacher talking about a cigarette lighter that S recently bought that did not work. The student makes a lexical error in line 1. The teacher responds by providing metalinguistic information about the error, indicating the word class of the target structure. When the student does not self-correct, the teacher provides the correct form by means of a recast. Thus, this FFE consists of only two response moves, a metalinguistic response and a recast.

Example (5) Metalinguistic Feedback + Recast
1 S: uh didn't work well (.) it must be rip=ded rip=ded
2 T: so you need a noun now
3 S: it must be rip=ded
4 T: it must be a rip off

Combination Feedback + Recast The following category applied to FFEs in which the teacher employed at least two different types of feedback (i.e., elicitation, metalinguistic feedback, or recast) before providing the final recast. In example 6, the student is retelling a news story to the teacher. The student commits a lexical error, and it appears that the teacher's initial reaction is to recast the error; however, she stops herself, and instead provides metalinguistic information regarding the incorrect word in line 2. Following this move but in the same turn, the teacher attempts to elicit the correct form. When this elicitation fails, the teacher provides a synonym for the target word. The student uptakes this acceptable, but not targeted, word, and the teacher then provides a recast in line 4 which the student uptakes as well. Thus, this FFE demonstrates that teachers could combine different types of response moves before resorting to a recast.

Example (6) Combination Feedback + Recast
1 S: so the doctor uh wanted to pretend this bad situation so
2 T: to- not to pretend (.) to::: (.) to stop
3 S: to stop
4 T: to prevent
5 S: <brevent>
6 T: mhm

Segmented Recasts Another type of multiple response FFE observed in these data were what will be called segmented recasts. This term is used similar to Loewen and Philp's (2006) use of the term to refer to recasts which pinpoint the error by separating it from the rest of the student's utterance. In the case of the multiple response FFEs, however, this

segmentation occurred over several turns. In example 7, we see that the student had difficulty pronouncing *anesthetic*. The teacher initially recasts the entire word, but when the student cannot produce the entire word correctly (line 3), the teacher segments the word into disyllabic components (lines 4 and 6). This helps the student improve her pronunciation; however, the word still remained problematic for her.

While the segmenting of words for pronunciation was one use of segmented recasts, another use was to focus on an utterance that contained multiple errors. However, instead of targeting all of the errors with one recast, the teacher instead targeted one error first and then another.

Example (7) Segmented Recasts

1 S: during operation eh there mm the the surgeon did not use the uh um any assethetic
2 T: anesthetic
3 S: any assetetic
4 T: anes
5 S: anes
6 T: thetic
7 S: anes (.) suthetic
8 T: yep mhm
9 S: a- anesetic

Inaccurate Recasts Finally, in the data there were instances when the teacher got it wrong and provided a recast that did not reflect the student's intended meaning. These instances reflect Hauser's (2005) concern that teachers may not maintain learners' original meanings when providing corrective feedback. In example 8, the students were involved in an activity in which they read one of two different narratives and then told their story to a partner. During the activity, S1 mispronounces a word and S2 repeats the word with rising intonation. S1 repeats the word in line 3, and the teacher provides the word *occurred* in a recast (line 4). Through a series of negotiations, the teacher realizes that the word is *accurate*, not *occurred*, and provides the correct recast. Thus, in these inaccurate recasts, the teacher initially provides an erroneous recast, after which the correct target form is negotiated.

Example (8) Incorrect Recasts

1 S1: she still had not made um a aCYUrate
2 S2: aCYUrate?
3 S1: aCYUrate
4 T: occurred
5 S1: ah- ah-
6 T: is that the word

7 (T reads text)
8 T: ah ACcurate
9 S: ACcurate (.) mm uh die diag nosis

Analysis

The analysis of the data included frequency counts of the number of multiple response FFEs, the number of response moves within the FFEs, and the number of FFEs in each of the above-mentioned coding categories. In addition to those categories, the coding of uptake presence and uptake success from Loewen (2004) and accurate test scores from Loewen (2005) were used. Finally, chi-square analyses were performed to determine if there were significant relationships among the data. One assumption of chi-square is independence of data, meaning that each analyzed unit should contribute to only one cell (Field, 2005). In the present analysis, each FFE contributes to only one cell; however, the individual teachers and students may appear in multiple cells. As such the data are not independent; however, a more thorough investigation of the impact of the non-independence of the data suggested that the lack of independence did not appreciably affect the results (Loewen, 2002). Nevertheless, caution is always appropriate in interpreting statistical analyses when test assumptions have been violated.

Results

The first research question queried the existence of multiple response FFEs involving recasts in adult ESL classroom interaction. In the thirty-two hours of observed interaction, there were 1,373 FFEs. Of these, 365 were student-initiated, involving students raising questions about linguistic items, while 1,008 were reactive, occurring in response to a learner error and therefore potentially containing a recast. The analysis indicated 219 multiple response FFEs with recasts in the data, accounting for 22 percent of the reactive FFEs.

The second research question delves further into the nature of the multiple response FFEs, by asking how many response moves the teachers provided within the FFEs and what types of response these consisted of. The number of response moves within the multiple response FFEs ranged from two to sixteen, with an average of 3.5. FFEs with only two response moves made up 40 percent of the data, while those with three response moves made up another 27 percent. Table 8.1 shows the average number of response moves for each of the coding categories. Combination feedback + recast had the highest number of response moves, with an average of almost eight response moves per FFE, while multiple recasts had the lowest, with an average of less than three.

Table 8.1 Number of Response Moves

Category	*Average*
Elicitation + Recast	3
Multiple Recasts	2.4
Metalinguistic Feedback + Recast	3.9
Combination Feedback + Recast	7.7
Segmented Recasts	4
Incorrect Recasts	4.4

As for the types of responses in the multiple response FFEs, Table 8.2 shows that the most frequent category was elicitation + recast, accounting for almost 50 percent of the FFEs. The next most common category was multiple recasts with almost 25 percent. Metalinguistic feedback + recast and combination feedback + recast were similar with around 10 percent, and finally segmented and inaccurate recasts were fairly infrequent in the data.

The third research question enquired about the differences between multiple and single response FFEs in terms of the characteristics of the FFEs. Four characteristics were examined: source, linguistic focus, uptake presence, and uptake success. Results, shown in Table 8.3, indicated that while single response FFEs were overwhelmingly code-related (97.9%), multiple response FFEs were more frequently message-related (35.1%), a statistically significant difference, $\chi^2(1) = 149.68$, $p < .001$. This result indicates that multiple response FFEs were more likely to be associated with communication breakdowns. As for linguistic focus, both single and multiple response FFEs targeted vocabulary at about the same rate; however, there were differences between grammar and pronunciation. Multiple response FFEs occurred more frequently when the linguistic focus was pronunciation, while single response FFEs occurred more frequently with grammar. This difference was statistically significant, $\chi^2(2) = 31.06$, $p < .001$. For uptake presence, learners produced significantly higher rates of uptake in multiple response FFEs (90%) as compared to

Table 8.2 Types of Multiple Response FFEs

Category	*n*	*%*
Elicitation + Recast	105	47.9
Multiple Recasts	54	24.7
Metalinguistic Feedback + Recast	20	9.1
Combination Feedback + Recast	26	11.9
Segmented Recasts	9	4.1
Inaccurate Recasts	5	2.3

Table 8.3 Characteristics of Single and Multiple Response FFEs

		Single		*Multiple*	
		n	%	*n*	%
Source	Code-related	471	97.9	137	64.9
	Message-related	10	2.1	74	35.1
Linguistic Focus	Grammar	212	44.1	55	25.1
	Vocabulary	140	29.1	62	28.3
	Pronunciation	128	26.6	100	45.7
Uptake Presence	Uptake	293	60.8	197	90.0
	No Uptake	112	23.2	13	5.9
	No Opportunity	77	16.0	9	4.1
Uptake Success	Successful	171	62.6	146	80.2
	Unsuccessful	102	37.4	36	19.8
Test Score	Correct	57	43.5	31	40.3
	Incorrect	74	56.5	46	59.7

single response FFEs (60.8%), $\chi^2(2) = 60.88$, $p < .001$. Additionally, the rate of successful uptake for multi-move FFEs was significantly higher than for single-move FFEs, $\chi^2(1) = 15.97$, $p < .001$. Finally, as for accurate test scores, there was virtually no difference for single or multiple response FFEs, with both having accuracy rates of around 40%, $\chi^2(1) = .210$, $p < .647$.

The fourth research question investigated the relationship between the types of multiple response FFEs and two measures of effectiveness of focus on form: successful uptake and accurate test scores. Table 8.4 shows that elicitation + recast FFEs contained the lowest percentage of successful uptake at just below 70 percent. In contrast, the other types had successful uptake rates of 85 percent or higher. The results for accurate test scores are somewhat different. Here the FFE categories averaged around 40 percent, and while there is some variation in the frequencies for the different categories, the low number of frequencies suggests caution in interpreting the percentages. Thus, the results in Table 8.4 suggest that elicitations + recasts may be less likely to result in successful uptake, but there appears to be no considerable differences among most of the categories in terms of correct test scores.

Summary

A summary of the answers to the four research questions is provided. 1) Multiple response FFEs constituted approximately one quarter of the reactive FFEs in this classroom context. 2) When examining the number

Table 8.4 Multiple Response Type and Measures of Effectiveness

Category	*Uptake Success*				*Test Score*			
	Successful		*Unsuccessful*		*Correct*		*Incorrect*	
	n	%	*n*	%	*n*	%	*n*	%
Elicitation + Recast	60	69.8	26	30.2	14	40	21	60
Multiple Recasts	41	85.4	7	14.6	7	31.8	15	68.2
Metalinguistic Feedback + Recast	12	85.7	2	14.3	3	42.9	4	57.1
Combination Feedback + Recast	21	95.5	1	4.5	4	57.1	3	42.9
Segmented Recasts	8	100	0	0	3	75	1	25
Inaccurate Recasts	4	100	0	0	0	0	2	100

and types of response moves within multiple response FFEs, it was clear that two or three response moves was the norm and that most sequences consisted of either elicitations plus a recast or multiple recasts. 3) In comparison to single response FFEs, multiple response FFEs were more likely to result from a miscommunication, and often it seemed that this miscommunication was caused by difficulties with student pronunciation. Furthermore, multiple response FFEs contained more uptake and more successful uptake in comparison to single response FFEs. However, there was no difference in the accuracy scores for target structures in single or multiple response FFEs. 4) While multiple response FFEs with elicitations plus recast were somewhat less likely to contain successful uptake, there did not appear to be any difference among the various types of multiple response FFEs in terms of accurate test scores.

Discussion

Similar to other studies, the present data revealed that multiple response FFEs can and do occur in naturally-occurring classroom interaction. With 22 percent of reactive FFEs in the current study containing multiple response, the findings are very comparable to those of Ellis et al. (2001) and Sheen (2006), who found rates of 18.6 percent and 21 percent respectively. Together, these results suggest that focus on form is not necessarily a brief phenomenon. There may be several reasons for these longer sequences. First, negotiating meaning in the classroom may be a complex process, with interlocutors taking multiple turns to arrive at a common understanding. Second, when there is no breakdown in communication, teachers may still want to push students towards the correct

target forms (reminiscent of Swain's [1985, 1995, 2005] pushed output), and this process may take multiple turns as well. Since multiple response FFEs occur in the classroom, it is important to consider their impact in relation to other types of feedback, such as single response FFEs.

It was also clear from the data that multiple response FFEs differ in their composition, with elicitations plus recast being the most common (48%) and multiple recasts in second place (25%). These results differ from those of Sheen (2006) who found multiple recasts to be the overwhelming preference in her data (77%). In the current data set, teachers very often preferred to provide opportunities for students to self-correct. If students had been able to self-correct, the FFE would have (presumably) been a single response FFE, but since they did not do so the teacher provided the correct forms for them. Given that effectiveness of recasts and elicitations is currently a topic of debate (e.g., Long, 2007; Lyster, 2004), it is interesting to note that in the classroom teachers combine the two types of feedback, at least on occasion. Thus, in some instances, elicitations may not be sufficient to allow self-correction; learners may not have sufficient interlanguage knowledge and may need the teacher to provide the correct form. Since the current study has been primarily descriptive in nature, future research may wish to consider the impact of the combination of different types of feedback moves. In this regard, researchers may wish to consider Muranoi's (2000) use of interaction enhancement, which controlled the number and type of response moves provided to learners.

In comparing single and multiple response FFEs, it became apparent that more negotiation effort occurred when there was a breakdown in communication, which more often seemed to be caused by learners' pronunciation difficulties. In addition, multiple response FFEs were more likely to contain successful uptake, a finding which differed from Sheen (2006) in which there was no significant difference in the amount of successful uptake for single- versus multi-move FFEs. However, in the current study there was no difference in the accuracy scores of individualized, tailor-made tests. Thus, while student production of target-like forms is argued to be important (e.g., Loewen, 2005; Swain, 1995), the current study does not indicate that FFEs with successful uptake were more likely to also be accompanied by more accurate test production. One conclusion to take from such a finding is that different methods of measuring the effectiveness of focus on form (e.g., successful uptake versus test scores) may provide different information, and indeed the studies that have employed uptake as a measure of success have acknowledged its limitation as an indication of L2 learning. However, it is also possible that learners' knowledge of the structures targeted in single and multiple response FFEs varies. Learners may have latent or explicit knowledge of some of the structures targeted in single response FFEs which may help

them in subsequent test performance, while their prior knowledge of structures targeted in multiple response FFEs may be less developed or non-existent. This suggestion is speculative and warrants further investigation, perhaps through the use of pretesting or stimulated recall to determine learners' prior L2 knowledge. Another possible explanation is that more difficult and complex linguistic structures may require additional interactional attention, thereby resulting in multiple response FFEs. An analysis of the linguistic items targeted in both types of FFEs could assess this explanation; however, it is beyond the scope of the present study.

When considering the effectiveness of the different combination of feedback moves, the results are similar to those comparing single and multiple response FFEs. It appears that the elicitation plus recast FFEs were somewhat less likely to contain successful uptake; however, when considering the subsequent test scores, there did not appear to be any differences amongst the combinations.

Finally, the data also showed that teachers sometimes inaccurately recast students' errors. While such FFEs were the exception, they nevertheless did occur, although in this data set the errors were always negotiated successfully in the end. Such examples, however, suggest that concern about the maintenance of learners' meaning during recasts, which is a commonly accepted criterion of recasts, is not entirely misplaced (Hauser, 2005; Rajagopalan, 2006). In addition, this finding raises the somewhat neglected and slippery issue of the quality of feedback that teachers provide to learners. It is possible that multiple response FFEs occur because the initial feedback response, especially if it contains metalinguistic feedback, is not particularly instructive or insightful. A case in point occurs in example 5, in which the teacher's first response to the learner's statement *it must be rip=ded* is *so you need a noun now*. The opacity of the teacher's response is illustrated by a reviewer's comment: *What does the teacher mean by a noun in this context?* Indeed, the meaning of this feedback response does not seem entirely clear to the student (as evidenced by a repetition of the error), the researcher, or the reviewer. As such, it may be argued that this was not a good response. While numerous studies have investigated the effects of quantity and/or type of feedback, few studies to my knowledge have considered the impact of the quality of feedback, although at least one study has found teachers' level of experience to be an important variable in their use of corrective feedback options (Mackey, Polio, & McDonough, 2004).

While this study has provided some insight into the phenomenon of multiple response FFEs, it is also important to consider its limitations. First of all, the study provides mainly descriptive data about multiple response FFEs, with no attempt being made to systematically control the types of feedback given to students. Future research would do well to

investigate multiple response FFEs, particularly in quasi-experimental studies in which their effectiveness can be more closely examined. Another limitation is that this study only examined multiple response FFEs ending in recasts, although there were other multiple response FFEs in the data, many of them ending in elicitations. Description of all types of multiple response FFEs will allow for a more comprehensive investigation into the occurrence and effectiveness of such feedback in the L2 classroom.

In conclusion, this study has examined an under-investigated type of corrective feedback, and in so doing has raised additional questions for SLA researchers. Nevertheless, it appears that L2 teachers may be ahead of the research in using the multiple resources at their disposal and using them in quite sophisticated ways. If the goal of corrective feedback is to provide learners with just enough support to produce the correct form (similar to the regulatory scale for feedback in Aljaafreh & Lantolf, 1994), then these teachers were quite often doing just that. One final example illustrates this point. The student is retelling a narrative, and thus should be using the past perfect. In response to the student's error, the teacher begins with a clarification request. This does not elicit the correct response, so the teacher provides metalinguistic information regarding the nature of the error, namely the tense. This apparently still does not elicit the correct response, so the teacher tells the student what tense to use. Again there is still no successful uptake, so the teacher provides a recast which allows the student to produce the correct form. Through a series of focusing techniques, the teacher helps scaffold the student to the correct utterance.

Example (9)

1 S: she told us that was the (.) that she was having the time of her life
2 T: she- she told she said that what?
3 S: she said she said you are exciting
4 T: no no what tense are you [going to use
5 S: [<>
6 T: past perfect
7 S: she said she had the time of her life
8 T: she had had
9 S: she had had a time of her life he on the Greek island

The use of multiple response FFEs may not always be the most appropriate corrective feedback option. However, such responses may be an example of what Gass and Mackey (2007) are referring to when they say, "Through negotiation, input can be uniquely tailored to individual learners' particular strengths, weaknesses, and communicative needs, providing language that is in line with learners' developmental levels"

(p. 184). For this reason, and because multiple response FFEs occur in the L2 classroom, it is important to consider their nature and their impact on L2 learning.

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Appendix 8.1—Transcription Symbols

Symbol	*Meaning*
S	Student
T	Teacher
CAPITALS	Emphasis
<>	Inaudible
(.)	Micropause
<xxx>	Indeterminate speech
?	Rising intonation
=	Linked Speech
-	Interrupted Speech
:	Lengthening
(laugh)	Extra information
[	Overlapping Speech

9

REVEALING THE NATURE OF SCMC INTERACTION[1]

Bryan Smith

The proliferation of computer use in foreign and second language education over the last decade has brought with it an expansion of research into the area of computer-assisted language learning (CALL). During this time the field of CALL has witnessed the application of constructs from the interactionist approach to second language acquisition (SLA) pioneered by Susan M. Gass to explorations of the nature of computer-mediated communication (CMC). Likewise, a growing number of theoretically-driven explorations of SLA have been informed by findings from CALL and CMC. This nexus is not without its potential difficulties, however, as a wholesale application of SLA theory to CALL inquiry can be problematic (Chapelle, 1997). One extremely valuable line of SLA/CALL inquiry, however, is research that attempts to uncover which aspects of SLA theory can be most successfully applied to CALL research while simultaneously employing CALL in testing notions of current SLA theory. For example, there has been considerable attention paid recently in the CALL/CMC literature to the facility of CMC to amplify the role of negotiated interaction in focusing learners' attention on formal aspects of the linguistic input and output. Text-based chat has been suggested as a good venue for SLA inquiry since it seems to provide an increase in processing time and opportunity for learners to focus on form (Pellettieri, 1999; Shehadeh, 2001; Smith, 2004), which may lead to a heightened potential for noticing one's own errors. Many argue that the printed text may also add to the salience of input and output in general and the noticing of nontarget-like input and output in particular (Izumi, 2003; Salaberry, 2000; Sanz, 1997; Smith, 2004). Smith has also argued that a heightened saliency of linguistic input and output is a favorable byproduct of the CMC interface, with increased saliency due largely to the permanence of the written message.

Much of the current CALL/CMC research has been discussed in Ortega

(this volume). Recently, however, some have begun to question the value of much of the CALL research (Smith, 2008; Smith & Gorsuch, 2004); specifically, that which explores the nature of synchronous CMC (SCMC). The criticism is essentially as follows: most SCMC/SLA studies ask us to accept a static artifact of the SCMC interaction (the printed transcript) as the key piece of evidence or data in making claims about a dynamic process. Indeed, Smith and Gorsuch (2004) found that their chat transcripts failed to capture so much of the salient data as to render them limited in value. For example, they found that video screen capture files allowed a more complete record and clearer interpretation of what learners attended to and when, their communication strategy use, negotiation of meaning, and socio-pragmatic information. In terms of negotiation of meaning, Smith and Gorsuch found that several form-focused moves would have been innacurately coded as negotiation episodes where the video record showed them clearly to be preemptive input strategies (Long, 1983). This study was also unique in that it captured video and audio of the learners themselves while completing the tasks. This added dimension provided rich insights into how facial expressions, body language, and verbalizations can help us more accurately interpret synchronous written interaction.

Clearly this criticism is not limited to studies of SCMC interaction, but extends to interactionist research in general since in most cases researchers do not transcribe facial expressions and body language. Also, though some research has been carried out with the benefit of both audiotape-based transcripts and supporting videos, specific references to the video data in subsequent analyses are often omitted in the research reports. Notable exceptions from research on learner interaction that have used video records in meaningful ways include Carpenter, Jeon, MacGregor, and Mackey (2006); Gass and Houck (1999); and Oliver (1995).

More recently, Smith (2008) has called for CALL researchers to abandon the reliance on printed chat log files in favor of video screen capture files when attempting to interpret SCMC interactional data. Smith's results showed a fundamental difference in the interpretation of the chat interaction which varied as a function of the data collection and evaluation methods employed. Most striking was the amount of lost evidence of self-initiated self-repair (SISR), termed CMCovert by Smith (2008). This CMCovert self-repair data is that in which a SISR is executed but subsequently deleted by a learner before the final message is sent to the interlocutor. Smith argued that such data is important from an interactionist perspective on SLA as it may be considered evidence of noticing of preceding input as well as nontargetlike output, which is viewed by many as important for SLA (Izumi, 2003; Salaberry, 2000; Sanz, 1997; Smith, 2004). He suggests that relying on printed

transcripts alone may create the impression that learners do not self-correct very often in an SCMC environment—clearly a faulty conclusion. Indeed, the data showed that evaluating instances of self-correction on the basis of printed chatscripts alone leads to an underestimation by over eight-fold of the amount of self-correction that actually occurred. Whereas Smith (2008) was concerned only with instances of self-initiated self-repair, the present study re-examines the broader data set from that study, which includes all chatscripts and video screen capture records showing evidence of negotiated interaction. Thus, the data collection and analysis approach advocated in this chapter is important when examining SCMC interaction, in that it helps the researcher and consumer of the research to better investigate many of the key constructs of the interactionist approach in a CALL setting, including negotiated interaction (Gass & Mackey, 2007), attention to form (Doughty & Williams, 1998), linguistic output (Swain, 2005), and related phenomena.

Method

The purpose of the current study was to apply a new approach to capturing and analyzing task-based SCMC interaction data focusing specifically on several elements that are key to the interactionist approach to SLA. The single broad research question was, then: In what ways can a screen capture record of task-based SCMC interaction provide better insights into the nature of SCMC interaction than relying on hard copies of the chat transcripts alone?

Participants

Forty-six students took part in this study as part of their regularly scheduled German language course at a major southwestern university in the United States. As a required part of their course, students met once every other week in the foreign language micro-computing laboratory. Six CMC sessions were scheduled over the course of the semester. All students were either sophomore or junior undergraduates and all were native speakers of English. None were German majors. Their proficiency level and placement in the German sequence were determined by an in-house online placement test. All participants in the present study were characterized by the instructor of record as roughly at the ACTFL Novice-High proficiency level. All were familiar with the chat function in Blackboard, but they did complete one training session prior to data collection to ensure they were familiar with the general task type and procedures.

Materials

Paired participants completed one jigsaw task per session over the course of the semester, which resulted in a potential total of six tasks per student (assuming perfect attendance). Since all participants did not have perfect attendance during the study, pairs were randomly assigned as students entered the computer laboratory each day. Pairs were not necessarily matched from week to week. Though each task was slightly different, they all contained Pica, Kanagy, and Falodun's (1993) task features for jigsaw tasks. Jigsaw tasks were selected since they are argued to elicit a high degree of learner negotiation (Pica et al., 1993). Four of the six tasks were video-based, whereby one learner (learner A) viewed a two-minute dramatic video clip that corresponded to the week's assigned course content. The other learner (learner B) did not view this clip, but studied a series of eight stills from the same video clip, which were arranged in random order. The stills were such that a logical order was not discernable simply by examining the photos alone, but quickly and easily sequenced upon viewing the clip from which they were taken. The remaining two tasks were standard sequential ordering tasks, where learners each held three out-of-sequence pictures which, when put together, made up a logical story sequence. The video-based tasks were directly tied to the core content and textbook of the course and came from the ancillary DVD and workbook accompanying the main course textbook. Participants interacted with one another via the chat function in Blackboard Academic Suite™, and were assigned to one of various paired groups of two under Blackboard's communication tool, Virtual Classroom. The dynamic screen capture software Camtasia Studio 2 was installed on each of the computers used for this study. Camtasia Studio 2 has the capability of recording and creating a movie file of each participant's computer screen, allowing one to play back the session in its entirety.

Procedures

Participants were required to attend and participate in each session because they were built into the syllabus of the course. Participation in the study, per se, was purely voluntary, and students were made aware of their right to not have their data included in the research. The six CALL tasks described above were completed every other week during the middle part of the semester (over twelve weeks). Each class lasted approximately one hour. The average amount of time it took pairs to complete each task was just over twenty-five and one-half minutes as measured by the time stamp on the chat logs of the interactions. There is little work that explicitly examines the potential role of time on task in a CMC environment. One CMC study relevant to the interactionist approach found that time on

task did not have a significant effect on the learners' noticing of interactional feedback. However, they also report some anecdotal evidence from participants that suggests that increased time on task might negatively affect learners' level of attentiveness and alertness, thus potentially inhibiting noticing. There was no evidence from participants that they were fatigued by the duration of the task.

Data Analysis

All hard copies of the transcripts (n=94) were evaluated for instances of negotiated interaction. This resulted in a total of forty-five instances of negotiation across thirty-one chat transcripts. That is, out of the transcripts for the twenty-eight students completing the tasks described above there was evidence of negotiated interaction in thirty-one of ninety-four chat transcripts, or about one-third of them. Evaluating chat transcripts that contain negotiated interaction was seen as a good starting point for applying the video screen capture approach in the exploration of some of the key theoretical elements of the interactionist approach in a CMC context. These key elements include negotiation itself, attention, and learner output. Next, the corresponding Camtasia video file was viewed in its entirety for each corresponding transcript (n=31). Using the hard copy of the transcript as a starting point, each of these Camtasia Studio 2 chat transcripts (hereafter chatscript) was then transcribed and coded using the coding scheme proposed here (see Appendix 1; see Appendix 2 for annotations). This allowed for a direct comparison between the traditional record of the chat interaction and the proposed more comprehensive record. Finally, differences in the two versions of the chatscripts were evaluated in terms of identifying and interpreting the nature of the participants' negotiation, attention, and output. In this way the research question that sought to explore how the screen capture record provides better insights than traditional transcripts into the nature of SCMC interaction could be operationalized.

Results

Negotiation

The proposed approach to CMC data collection is perhaps more important for some areas of interactionist inquiry than others. For example, though the importance of capturing lost evidence of self-repair is hopefully clear, it is harder to imagine how negotiation routines might be lost in the same way. By definition, a negotiation episode requires acknowledged exchanges of information, which in a CMC context will normally appear in the chatlog. There are many potentially problematic issues that

may arise when relying on printed chatscripts alone when coding negotiation episodes. For example, relying on such static artifacts might lead us to fundamentally miscode some of the data. Smith and Gorsuch (2004) found that many language-related episodes that appeared on the surface to be negotiation routines were really preemptive input strategies (Long, 1983) disguised by the chat interface.

Coding

The data collection and analysis approach described above and in Appendix 1 is important when charting instances of negotiated chat interaction for several reasons. First, such an approach allows one to more accurately code the negotiation routine itself. Because of the nature of most chat interfaces, only one message at a time can traverse the system. Thus, messages that are essentially sent at the same time are ordered on the chat screen in the precise sequence they were accepted by the system. Time stamps alone are often insufficient for disentangling such messages since two messages may have identical time stamps yet are ordered in sequence. Further, the time stamps alone tell us nothing about messages in progress. This may result in a misleading appearance of the interactional sequences. Perhaps more important is the potential coding difficulty that occurs when one participant (participant A) begins a message and then the interlocutor (participant B) types and sends a message before participant A sends his/her original message. This often results in the appearance that participant A is responding to participant B when this is actually not the case at all. In the ensuing discussion of the various figures in this chapter, column A will normally reflect the proposed approach and coding scheme whereas column B reflects a traditional hard copy of the chat interaction. Figure 9.1 shows an example of this from the current data.

SCMC Chatscript **Column A**	**Hard copy of transcript** **Column B**
1a. Travis: Bild H - Der roten Mann ist lusting und hat den Pavarotti T-Shirt 10:05:21 <T> 2a. Theodore: lusting? 10:06:37 <I> 3a. Travis: Was Color T-shirt träge die junge Frau? Hat sie eine Sweater? 10:06:45 <embedded inquiry> 4a. Travis: Es tut mir leid. Nicht lustig, sondern glucklich 10:07:29 <R> 5a. Theodore: ja. das Sweater ist grey und sie hare ist [4a] ke~~n~~ien lange 10:08:00 <embedded response>	1b. Travis: Bild H - Der roten Mann ist lusting und hat den Pavarotti T-Shirt 10:05:21 <T> 2b. Theodore: lusting? 10:06:37 <I> 3b. Travis: Was Color T-shirt träge die junge Frau? Hat sie eine Sweater? 10:06:45 4b. Travis: Es tut mir leid. Nicht lustig, sondern glucklich 10:07:29 <R> 5b. Theodore: ja. das Sweater ist grey und sie hare ist keien lange 10:08:00 <RR>

Note. See Appendix 9.3 for English translations of each chatscript.

Figure 9.1 Focus on Form in SCMC

Coding: Negotiation Routines

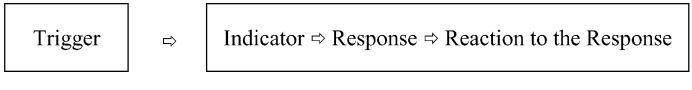
The model of negotiation of meaning first proposed by Varonis and Gass (1985) has proven durable for over twenty years and has guided in some way most of the research grounded in the interactionist approach, including much research into CMC interaction (see Figure 9.2). Indeed, though their model has been expanded for application to the CMC context (Smith, 2003), the fundamental structure of the original model remains unchanged.

When evaluating only the traditional hard copy of the transcript in Figure 9.1 (column B) one could easily code message 5b as a reaction to the response <RR>. At least, it would be reasonable to code the *ja* (yes) part of message 5b as such. That is, *ja* could function largely in the same way *ok* often functions. This is reasonable partly because of the thirty-one seconds between the end of message 4b and the end of message 5b. At the very least we would be unsure if *ja* is referring to the response <R> in message 4b or the second half of message 3b. However, with the benefit of the video record it becomes clear that *ja* must be a response to message 3a. It is impossible that *ja* refers to message 4a because we see that this message appears on the screen of Theodore after he has typed *ja*. Thus, in this case the proposed data collection and analysis approach removes some of the ambiguity in coding this exchange.

In Figure 9.3 we see that it would be reasonable to code the negotiation routine in column B as having a typical T-I-R-RR (see Figure 9.2) progression (messages 1b, 8b, 13b, and 14b). However, with the benefit of the video file of the exchange we can see that the proper coding must be T-I-R. That is, message 14b cannot be considered a reply to message 13b since it is clear from column A that most of message 13a was typed before receiving line 14a.

Split Negotiation Routines

It has been noted elsewhere that there is often a considerable delay between a trigger and indicator of non-understanding (Smith, 2003). The reason for this is the lack of strict turn adjacency in an SCMC context as compared with a face-to-face situation. The proposed methodological



Note. From "Non-Native/Non-Native Conversations: A Model for Negotiation of Meaning," by E. Varonis and S. Gass, 1985, *Applied Linguistics, 6, p.* 74. Copyright 1985 by *Applied Linguistics.* Reprinted with permission of Oxford University Press.

Figure 9.2 Original Model of Negotiated Interaction

SCMC Chatscript Column A	Hard copy of transcript Column B
1a. Pierre: er hat seine geschaft aufgeraumt 12:59:43	1b. Pierre: er hat seine geschaft aufgeraumt 12:59:43 <T>
2a. Pierre: bildung C er geht nach hause und seine garge ist nicht sauber 1:00:08	2b. Pierre: bildung C er geht nach hause und seine garge ist nicht sauber 1:00:08
3a. Daniel: D-Der man ging ins garage und es ist sehr schmusti~~v~~g 1:00:29	3b. Daniel: D-Der man ging ins garage und es ist sehr schmustig 1:00:29
4a. Daniel: E-er g~~ih~~eht raus deines zimme~~menr~~ 1:00:54	4b. Daniel: E-er geht raus deines zimmer 1:00:54
5a. Daniel: F-~~Er~~Das Garage ist sauber und er hat eine hacke im hand 1:01:15	5b. Daniel: F-Das Garage ist sauber und er hat eine hacke im hand 1:01:15
6a. Daniel: **in deiner hand 1:01:26	6b. Daniel: **in deiner hand 1:01:26
7a. Daniel: seiner* 1:01:31	7b. Daniel: seiner* 1:01:31
8a. Daniel: meine ist def seine geschaf~~ir~~ft? 1:02:19	8b. Daniel: seine geschaft? 1:02:19 <I>
9a. Daniel: ich habe kein geschaft nur ein garage und ein Bettzimmer. 1:02:36	9b. Daniel: ich habe kein geschaft nur ein garage und ein Bettzimmer. 1:02:36
10a. Daniel: bist du da? 1:03:39	10b. Daniel: bist du da? 1:03:39
11a. Pierre: ja 1:03:48	11b. Pierre: ja 1:03:48
12a. Daniel: k 1:03:52	12b. Daniel: k 1:03:52
13a. Pierre: ich weiss nicht ob ist eine geschaft abr da ist doch kein bett und uberall ist werkzeuge 1:04:19	13b. Pierre: ich weiss nicht ob ist eine geschaft abr da ist doch kein bett und uberall ist werkzeuge 1:04:19 <R>
14a. Daniel: ich galube dass der erste bild ~~der en~~as geschaft [13a] ers~~e~~te ist 1:04:32	14b. Daniel: ich galube dass der erste bild das geschaft erste ist 1:04:32 <RR>

Figure 9.3 Coding Negotiation Routines

approach can illustrate some of the underlying reasons behind such delays. In Figure 9.4, for example, we see that the seven lines separating the initial trigger in message 1b *schlief* (a form of the verb *to sleep*) and the indicator of non-understanding on the hard copy transcript (message 8b) does not capture an initial earlier attempt at this indicator. Message 5a shows Nigel struggling with the phrase *was bedeutet* (what does X mean?). He makes several attempts at spelling *bedeutet* arguably on his way to asking *was bedeutet schlief?* (what does slept mean?), only to abandon the entire message in favor of another topic. Thus, the delays in indicating non-understanding may have been largely overstated in previous research, or at least viewed in too categorical terms since as a rule we have not had the benefit of column A-type data. Second, deletions such as that in 5a may occur as a result of the interaction between one's (lower) proficiency level (or arguably keyboarding skill) and the acknowledged urgency to respond in SCMC interaction (Zhao, Alvarez-Torres, Smith, & Tan, 2004). According to Zhao et al., "the recipient [of the message] may feel greater pressure to respond immediately in synchronous communication" (p. 26). Thus, there may only be a very limited amount of time one feels able to invest in form-focused episodes, given the pressure to reply to incoming messages. Future research could test this possibility directly.

SCMC Chatscript Column A	Hard copy of transcript Column B
1a. Tim: C: der man im blau schlief am stuhl 1:08:11 <T>	1b. Tim: C: der man im blau schlief am stuhl 1:08:11 <T>
2a. Nigel: H Blauedn Mann ist links und Roten Mann ist rechts [1a] und blauen Mann hat das Papier 1:08:22	2b. Nigel: H Blauedn Mann ist links und Roten Mann ist rechts und blauen Mann hat das Papier 1:08:22
3a. Nigel: In alles sind sie auf ein Stuhl 1:08:43	3b. Nigel: In alles sind sie auf ein Stuhl 1:08:43
4a. Tim: d: Die manner sitzen am Stuhl und der man im blau lass ein zeitung/buch 1:08:45	4b. Tim: d: Die manner sitzen am Stuhl und der man im blau lass ein zeitung/buch 1:08:45
5a. Nigel: Was bed~~ue u eitet~~ uited t~~A~~ Ich glaube A ist erste und du? 1:09:55	5b. Nigel: Ich glaube A ist erste und du? 1:09:55
6a. Tim: ya 1:10:09	6b. Tim: ya 1:10:09
7a. Nigel: Ist B am ~~en~~ Ende? 1:10:14	7b. Nigel: Ist B am Ende? 1:10:14
8a. Nigel: was beduetet schlief? 1:10:34 <I>	8b. Nigel: was beduetet schlief? 1:10:34 <I>
9a. Tim: B oder c ist am ende 1:10:35	9b. Tim: B oder c ist am ende 1:10:35
10a. Nigel: In A ist der blauen oder roten Mann links? 1:11:12	10b. Nigel: In A ist der blauen oder roten Mann links? 1:11:12
11a. Tim: ich glaube der man im rot ist bose und er steht auf and ging dann der man im blau schlaft am stuhl 1:11:34 <R>	11b. Tim: ich glaube der man im rot ist bose und er steht auf and ging dann der man im blau schlaft am stuhl 1:11:34 <R>
12a. Tim: der man in rot ist am links 1:12:01	12b. Tim: der man in rot ist am links 1:12:01
13a. Nigel: Im F [12a] der roten ~~man~~ Mann ist bose auch 1:12:15	13b. Nigel: Im F der roten Mann ist bose auch 1:12:15

Figure 9.4 Accounting for Split Negotiation Delays

In contrast to this notion of delayed indicators of non-understanding is the idea that the SCMC interface may *interfere* in some way with the flow of the negotiation process. In Figure 9.5 we see that there is some delay in the trigger and indicator of non-understanding. Upon closer examination, however, we see that the initial attempt at an indicator was almost immediate and that the incoming message of the interlocutor

SCMC Chatscript Column A	Hard copy of transcript Column B
1a. Brian: Die Maedchen mit blonde Haare sagte >>ich habe ein Baerenhunger<< 1:13:44 <T>	1b. Brian: Die Maedchen mit blonde Haare sagte >>ich habe ein Baerenhunger<< 1:13:44 <T>
2x. Kade: ~~ke~~ weisst du, was ~~ba~~ Baerenhunger ist? ~~we es~~ das ~~wo~~ Wort wasr auch auf mei [2a]	
2a. Brian: Der Man sagte >>ich mochte Schnitzel und Wurst<< 1:14:34	2b. Brian: Der Man sagte >>ich mochte Schnitzel und Wurst<< 1:14:34
3a. Kade: ok 1:14:46	3b. Kade: ok 1:14:46
4a. Kade: weisst du, was Baerenhunger ist? 1:15:02 <I>	4b. Kade: weisst du, was Baerenhunger ist? 1:15:02 <I>
5a. Brian: hunger of a bear 1:15:13 <R>	5b. Brian: hunger of a bear 1:15:13 <R>
6a. Kade: danke 1:15:23 <RR>	6b. Kade: danke 1:15:23 <RR>

Figure 9.5 Interference with the Negotiation Process

caused Kade to abandon that inquiry (message 2x) in order to acknowledge Brian's message 2a. Afterwards the negotiation episode progresses as normal. Though Kade in this case was persistent and returned to the negotiation routine later this may not always be possible in synchronous exchanges. There is CMC research that indicates that learners occasionally do abandon negotiation routines once begun or acknowledged, though this seems to occur in a very small percentage (6%) of the cases (Smith, 2003). A methodology such as the one advocated here will allow us to sufficiently explore under what conditions learners begin then abandon negotiation routines. Similarly, Figure 9.6 shows that Jason was in the process of asking for assistance regarding the verb *to run* (laufen) in German (message 2a) when Amy's message 1a came in. This not only interrupts Jason's request for assistance, but also prompts a

SCMC Chatscript Column A	Hard copy of transcript Column B
1a. Amy : G: Mann hat [forgot] dein Ausweis 12:10:20 <T>	1b. Amy : G: Mann hat [forgot] dein Ausweis 12:10:20
2a. Jason : Wie sagt man [1a] "run" auf Deutsch Ausweis? 12:10:52 <I>	2b. Jason : Ausweis? 12:10:52
3a. Amy : ID/ passport 12:11:00 <R>	3b. Amy : ID/ passport 12:11:00
4a. Jason : danke 12:11:05 <RR>	4b. Jason : danke 12:11:05
5a. Jason : Ok im C... 12:11:22	5b. Jason : Ok im C... 12:11:22
6a. Jason : ~~Der Mann~~ Wie sagt man, "run"auf Deutsch? 12:11:45 <Request for assistance>	6b. Jason : Wie sagt man, "run"auf Deutsch? 12:11:45
7a. Amy : laufen, ich denke 12:11:58 <R>	7b. Amy : laufen, ich denke 12:11:58
8a. Jason : ok 12:12:04 <RR>	8b. Jason : ok 12:12:04
9a. Jason : Der Mann laufen [away from] der Tisch 12:12:26 <Uptake>	9b. Jason : Der Mann laufen [away from] der Tisch 12:12:26
10a. Amy : denn D,A,B.....C? 12:12:54	10b. Amy : denn D,A,B.....C? 12:12:54
11x. Jason: So der Mann [[10a]	
11a. Jason : Ja 12:13:01	11b. Jason : Ja 12:13:01
12a. Amy : D,A,B.....G,C 12:13:35	12b. Amy : D,A,B.....G,C 12:13:35
13a. Jason: Der Mann ist deiner Ausweis [12a] Wie viele [pictures] hast Sie? <uptake>12:14:08	13b. Jason : Wie viel [pictures] hast Sie? 12:14:08
14a. Amy : 4 12:14:18	14b. Amy : 4 12:14:18
14x. Jason: Scheisess [15a]	
15a. Amy : picture = Bild 12:14:31	15b. Amy : picture = Bild 12:14:31
16a. Jason : danke 12:14:37 .	16b. Jason : danke 12:14:37
17a. Jason : So, der Mann [forgot] deiner Ausweis, ~~Ja?~~ ja? 12:15:03 <uptake>	17b. Jason : So, der Mann [forgot] deiner Ausweis, ja? 12:15:03
18a. Amy : Ja, im G 12:15:12	18b. Amy : Ja, im G 12:15:12
19a. Amy : D,A,B,H,F,E,G,C??? 12:15:53	19b. Amy : D,A,B,H,F,E,G,C??? 12:15:53
20a. Jason : Ich denke G, D, B, A, H, F, E, C 12:16:38	20b. Jason : Ich denke G, D, B, A, H, F, E, C 12:16:38
21a. Amy : warum G erste? 12:16:53	21b. Amy : warum G erste? 12:16:53
22a. Jason : Ich weiss nicht 12:17:13	22b. Jason : Ich weiss nicht 12:17:13
23a. Amy : H,E,F,G 12:21:54	23b. Amy : H,E,F,G 12:21:54
24a. Amy : und du? 12:21:58	24b. Amy : und du? 12:21:58
25a. Jason : Ich weiss dein Bild nicht 12:23:05 <uptake>	25b. Jason : Ich weiss dein Bild nicht 12:23:05

Figure 9.6 Interruptions Influencing Indicators of Non-understanding

new indicator of non-understanding and subsequent negotiation routine of the target word *der Ausweis* (identification/identity card). Jason does return to his initial question about the verb *to run* (message 6a) perhaps because of the relative speed with which the meaning of *Ausweis* was resolved.

Heightened Attention to Form

Many have argued that text-based chat is a good venue for exploring focus on form. (Pellettieri, 1999; Shehadeh, 2001; Smith, 2004). Returning to Figure 9.1 above we see a prototypical negotiation routine, albeit with an embedded inquiry and response. This short exchange shows how the nature of SCMC itself, being visual (the typed word) as well as more permanent and, thus, perhaps more salient than spoken interaction, elicits a form-focused episode (FFE) where there may have been none in a similar face-to-face exchange. For example, the trigger *lusting* (an attempt at the German *lustig* or funny) may not have occurred in a face-to-face exchange. Though there is no direct evidence for this, the word *lustig* is quite common for this level of GFL student and it seems unlikely that one would mispronounce it, at least not in the same way as it appears in line 1a and 2a. Not only does the indicator of non-understanding draw Travis's attention to the faulty spelling of *lustig*, but it also seems to highlight the fact that there is indeed a more appropriate/precise word to express his intended meaning, for example, *glücklich* (happy), about which he already seems to have some knowledge.

Output

Modified output, which was first argued by Swain (1985) to be key in SLA, is now considered by most to be a fundamental construct in the interactionist approach (Gass & Mackey, 2007). Swain's comprehensible output hypothesis (2005) claims that "the act of producing language (speaking or writing) constitutes, under certain circumstances, part of the process of second language learning" (p. 471). One aspect of the output hypothesis argues that actively producing the target language can enhance the noticing of learners' own errors as well as possibly directing their attention to the relevant input from their interlocutor, which ultimately aids in generating new or consolidating existing linguistic knowledge (Swain, 2005).

The proposed approach to collecting and evaluating SCMC interaction captures an important aspect of learner output, which more traditional approaches to SCMC data collection have largely missed. Figure 9.7 illustrates how we may miss the important role of output in focusing learners'

SCMC Chatscript Column A	Hard copy of transcript Column B
1a. Kade: ok das ist so wie photo D von mir 1:08:57 2a. Derek: Die menner mit dem ~~Rose~~ ros Hemd ist die ~~T~~ Zetiung [1a] [zu] halten [+]. 1:09:23 3a. Derek: die manner sind look wie sagt man ~~looki~~ to look at? 1:10:12 4a. Kade: shen 1:10:37 5a. Kade: sehen** 1:10:40 6a. Kade: oder sieht etwas an 1:10:50 7a. Kade: ok im welches photo nehmt den mann mit der rosa hemd die zeitung 1:12:14 8a. Derek: die man~~ne~~ [6a] ~~e~~ ~~ist~~ ~~an~~ ~~a~~ sie[~~g~~]t ~~ht~~ [-] ~~e~~ ~~die~~ der Man in der ~~Rose hemd~~ rose Hemd ist~~t~~ sh~~ie~~ght an~~d~~ dieser man mit dem blau Hemd.[7a] 1:12:15	1b. Kade: ok das ist so wie photo D von mir Mar 7, 2006 1:08:57 2b. Derek: Die menner mit dem ros Hemd ist die Zeitung zu halten. 1:09:23 3b. Derek: wie sagt man to look at? 1:10:12 4b. Kade: shen 1:10:37 5b. Kade: sehen** 1:10:40 6b. Kade: oder sieht etwas an 1:10:50 7b. Kade: ok im welches photo nehmt den mann mit der rosa hemd die zeitung 1:12:14 8b. Derek: der Man in der rose Hemd sieht an dieser man mit dem blau Hemd. 1:12:15

Figure 9.7 Capturing Output in SCMC

attention on form if we rely purely on printed transcripts of SCMC interaction. Figure 9.7 shows several examples of attention to form that can be attributed to a combination of output, negotiated interaction, and the nature of CMC itself.

Beginning in line 2a we see an acknowledgment by the learner that whereas nouns do require capitalization in German adjectives do not. It seems the intention of the learner in message 2a is to say something like *The man (or men) with the pink shirt is holding the newspaper*. In this case it seems that one of two things is happening; either the learner mistypes *Rose* with a capital "R" (a momentary lapse), or he has some initial interference from his default conceptualization of *Rose* as a German noun (rose the flower) rather than *rosa* the adjective (pink, or rose-colored). The former seems unlikely since it has been well established in the CMC literature that learners typically reduce the amount of capitalization in CMC. What is most likely happening from a psycholinguistic perspective is that the learner is having some interference from his knowledge of rose in his native language (English) as either a noun or an adjective (color) as well as his knowledge that one must capitalize nouns in German. This results in the initial intended choice of *Rosa*, which is immediately changed to lower case (but leaving off the required "a" at the end). Message 3a seems to be an attempt to force an English present continuous construction *The man is looking at* word-for-word into German, and this soon breaks down. He quickly turns to a request for assistance in line 3a with *wie sagt man* . . . (how do you say . . .) and ultimately notices that he needs to request the infinitive form. In lines 4a–6a Kade provides a response which Derek attempts to use in message 8a. It is also interesting to note that in message 8a Derek again capitalizes and subsequently

corrects his spelling of *Rose* and also edits his initial attempt at the word *Hemd* (shirt) toward more targetlike usage. Though still unclear on the difference in German between *die Rose* (rose in English) and *rosa* (pink in English) this exchange shows many instances of self-initiated focus on form that would have gone undetected when evaluating hard copies of the transcripts alone.

It seems, then, that Derek has some developing knowledge of the categorical rule in German regarding the capitalization of nouns, (i.e., declarative knowledge) but has not acquired the ability to apply those rules in real time communication (i.e., procedural knowledge). In this case the advantage of seeing the deletions is that they provide insight into those rules that are fully automatized. Looking only at the final version of the interaction in Figure 9.7, one may think that he more solidly knows the rule of noun capitalization than he actually does. Seeing how he arrived at his final version (the deletions) shows that he is still working on these rules. This exchange also illustrates how negotiation episodes that initially have a lexical focus essentially may end up also aiding the grammatical development of the target learner.

Attention to Form: Salience and Permanence

Linguistic input has been argued to be potentially more salient in an SCMC environment (Izumi, 2003; Sanz, 1997; Smith, 2004). Warschauer (1999) reports noticing common Hawaiian words in oral conversation that he had never caught and attributes this to having noticed them for the first time in computer-mediated writing. Salaberry (2000) reports that a change in developmental stages in the Spanish verbal past ending was identified earlier in CMC compared to face-to-face interaction. Thus, heightened saliency may be a favorable byproduct of the CMC interaction with increased saliency due arguably to the permanence of the message. This relative permanence of the written word on a learner's chat screen has also been associated with a purported increase in processing time one has when reading (and responding to) messages from one's interlocutor in the SCMC environment.

Attention to Form: Self-initiated Self-repair

Self-initiated self-repair (SISR) occurs "when a learner corrects his or her own utterance without being prompted to do so by another person" (Foster & Ohta, 2005, p. 420). In SCMC one sees SISR in essentially three environments. First, SISR may occur after the message is essentially complete but before it is sent. Second, it may be executed very close to the time the problematic word or phrase is typed. And third, SISR may occur after the message has been sent to the interlocutor, such as in line

SCMC Chatscript Column A	Hard copy of transcript Column B
1a. Amy: Man hat Schinken und pomme frites	1b. Amy: Man hat Schinken und pomme frites
2a. Amy: Helg hat menu 67 oder 76?	2b. Amy: Helg hat menu 67 oder 76?
3a. Casey: Erst sitzen die Luete un[d] sprechen [~~sie?~~] oder sehen sie [1a] die Speisekarte erst? [+] [2a] [-]	3b. Casey: erst sitzen die Luete und sprechen oder sehen sie die Speisekarts erst?
4a. Amy: ?	4b. Amy: ?
5a. Casey Will: OK... Die Leute sitezen ~~an~~ und sprechen... richtig? 12:19:58	5b. Casey Will: OK... Die Leute sitezen und sprechen... richtig? 12:19:58
6a. Amy : Ja 12:20:06	6b. Amy : Ja 12:20:06
7a. Amy : mit Speisekarte 12:20:15	7b. Amy : mit Speisekarte 12:20:15
8a. Amy : drei leute 12:20:19	8b. Amy : drei leute 12:20:19
9a. Casey: D~~an~~,en Die Leute [6a] sehen die papier mit [7a] Esse[8a] sehen Speisekarte richtig? 12:20:36	9b. Casey Will: Den, Die Leute sehen Speisekarte rightig? 12:20:36
10a. Amy : Ja 12:20:42	10b. Amy : Ja 12:20:42
11a. Casey Will: Denn, Helga sagt "da oder da 12:20:58	11b. Casey Will: Denn, Helga sagt "da oder da 12:20:58

Figure 9.8 Self-initiated Self-repair in SCMC

5b in Figure 9.7 above. However, the current discussion will concern only that SISR that occurs before the message is sent and is, therefore, invisible to traditional means of evaluating chat transcripts. An example of this type of repair is found in Figure 9.8 (message 3a). As seen by the location of the brackets as well as the fact that there are no strike-throughs without brackets we see that Casey types his message in its entirety before going back to insert a "d" in the word *und* (and) as well as deleting the first occurrence of the word *sie* (they). I argue that this noticing is facilitated by the fact that the message is permanent and he catches these problems while reviewing his message. There are many similar occurrences in the data which suggest this is a very common phenomenon. In contrast, many instances of SISR are more immediate in nature; occurring right at the point the error is made. Put broadly, these SISRs are normally lexical or grammatical in nature and may be error repairs, appropriateness repairs, or abandonments made by the learner.

It seems that such immediate SISRs may be more a function of salience. For example, in Figure 9.4 above lines 5a, 7a, and 13a clearly show a focus on form by Nigel. Two of these instances have to do with the required capitalization of German nouns, whereas one focuses on the proper form of *bedeuten* (to mean) (messages 7a & 13a), which the learner eventually abandons (message 5a). Message 1a in Figure 9.9. shows the same type of immediate SISR and focus on form (FOF), but rather than focusing on a mistake or error this FOF may be said to concern the

SCMC Chatscript Column A	Hard copy of transcript Column B
1a. Casey: Die Ordnung ist veieli~~e~~icht G▌ begg~~i~~innt v~~e~~ieleicht mit G? 12:10:45	1b. Casey: Die Ordnung beginnt vieleicht mit G? 12:10:45
2a. Becky: ja D und F sind in Garage E ist in schlafenzimmer, Ich denke, dass he Mullshippe zu bekommen ins shlafenzimmer 1:03:13 3a. Becky: gehen 1:03:37 4a. Sara: A – der Mann hat ~~die~~ das [~~C~~] [2a] Dreirad in Hande [-] und [3a] der Schneeschieber und er ist sauber 1:03:58	2b. Becky: ja D und F sind in Garage E ist in schlafenzimmer, Ich denke, dass he Mullshippe zu bekommen ins shlafenzimmer 1:03:13 3b. Becky: gehen 1:03:37 4b. Sara: A - der Mann hat das Dreirad in Hande und der Schneeschieber und er ist sauber 1:03:58

Figure 9.9 Focus on Forms in SCMC

appropriateness of the word choice and expression. In contrast, message 4a shows an immediate (and successful) repair of the article from *die* to *das* as well as a slightly delayed deletion of a stray "C". These examples confirm that FOF in the SCMC environment is not limited to lexical form, but includes grammatical form as well. Again, all of these examples would have gone undocumented by using printed transcripts alone when analyzing the interaction.

SCMC and Negative Effects on Attention

Though there is much evidence that CMC interaction may enhance attention in a variety of ways, it is sometimes the case that this interface seems to have a *negative* effect on attention. Smith (2008), in his discussion of SISR in the SCMC environment has pointed out that some self-repairs result in the deletion of the entire message composed (but not sent) up to that point and that without a video screen capture record there is little chance of being able to analyze such constructions. These deletions normally occur after a message from the interlocutor comes in mid-way through a message being composed. In these cases we can say that the CMC interface itself has a deflecting effect on the learner's attention, in that it is often the case that the message abandoned is never revisited. Perhaps this is due to the urgency to respond in this environment noted by Zhao et al. (2004). Figure 9.10 shows one example of such abandonment due to incoming messages. Though the interrupting message (3a) triggers a successful negotiation routine, Daniel never seems to return to the question started in 2x. A similar exchange is found in message 15a–22a where an inquiry by Jordan in message 15a causes the abandonment of the first half of message 16a and results in a successful negotiation routine.

SCMC Chatscript Column A	Hard copy of transcript Column B
1a. Sara: has hast du dann 1:22:35	1b. Sara: has hast du dann 1:22:35
2x. Daniel: hast du ein bild mit [1a] der man [2a]▌	
2a. Sara: welche buschtabe ist das? 1:22:43	2b. Sara: welche buschtabe ist das? 1:22:43
3a. Daniel: buschtabe? 1:22:54	3b. Daniel: buschtabe? 1:22:54
4a. Sara: letter 1:22:57	4b. Sara: letter 1:22:57
5a. Daniel: ahh 1:23:01	5b. Daniel: ahh 1:23:01
6a. Daniel: ich ha~~v~~be es ni~~g~~cht 1:23:12	6b. Daniel: ich habe es nicht 1:23:12
7a. Sara: ich habe es auch nicht 1:23:21	7b. Sara: ich habe es auch nicht 1:23:21
8a. Daniel: ich habe dich nur gefragt 1:23:27	8b. Daniel: ich habe dich nur gefragt 1:23:27
9a. Daniel: okay 1:23:29	9b. Daniel: okay 1:23:29
10a. Daniel: dann 1:23:30	10b. Daniel: dann 1:23:30
11a. Daniel: … 1:23:31	11b. Daniel: ... 1:23:31
12a Sara: has du was mit die alte frau? 1:23:33	12b. Sara: has du was mit die alte frau? 1:23:33
13a. Sara: irgend was? 1:23:42	13b. Sara: irgend was? 1:23:42
14a. Daniel: der alte [12a] frau sollte der ers~~e~~te sa~~in~~ein [13a] 1:23:44	14b. Daniel: der alte frau sollt der erste sein 1:23:44
==========	==========
15a. Jordan : was tragt dieser Mann? 10:15:05	15b. Jordan : was tragt dieser Mann? 10:15:05
16a. Katarina: Das Essen kommen, un~~-dd~~ die Mädchen mit [15a] blonm▌ ~~Er trägt ein~~ Er trägt ein ~~S~~schwarzen Pulli und her hat…10:15:41	16b. Katarina : Er trägt ein schwarzen Pulli und her hat... 10:15:41
17a. Katarina : Speise? 10:15:46	17b. Katarina : Speise? 10:15:46
18a. Katarina : (glasses) 10:15:49	18b. Katarina : (glasses) 10:15:49
19a. Jordan : brille 10:15:55	19b. Jordan : brille 10:15:55
20a. Katarina : haha, brille. 10:15:58	20b. Katarina : haha, brille. 10:15:58
21a. Jordan : ah 10:15:59	21b. Jordan : ah 10:15:59
22a. Katarina : okay.. 10:16:02	22b. Katarina : okay.. 10:16:02

Figure 9.10 Message Abandonment in SCMC

Uptake

Lyster and Ranta (1997) define uptake as "a student's utterance that immediately follows the teacher's feedback and that constitutes a reaction in some way to the teacher's intention to draw attention to some aspect of the student's initial utterance" (p. 49). Ellis, Basturkmen, and Loewen (2001) take a broader perspective in acknowledging that uptake can occur even when the previous move did not involve corrective feedback, and may also reflect a response to a student- rather than teacher-initiated move. In the SCMC context, Smith (2005) uses Ellis et al.'s (2001) definition but allows for delayed uptake rather than restricting uptake to moves *immediately following* a feedback move. There is very little research on learner uptake in a CMC environment (Smith, 2005). That which does exist suggests that the construct of uptake is more complex in an electronic environment largely because of the noted delays in responses to incoming messages. This delay applies to uptake just the same as to the notions of turn adjacency and split negotiation routines noted by Smith (2004). Smith (2005) found learner uptake to be rare in the CMC environment. He argues that the electronic medium may not be

Negotiation structure	Uptake	No uptake	Total
T-I-R	0	10	10
T-I-R-RR	8	17	25
T-I-R-RR-C	0	4	4
T-I-R-RR-C-RC	1	3	4
Total	9	34	43

Note: Uptake refers to uptake where uptake is possible.

Figure 9.11 Uptake and Negotiation Routine Length

conducive to uptake because of the permanency of the interaction afforded by the visible transcript.

Given the amount of CMCovert interaction the current methodology illuminates, it might be expected that such interaction contains substantial learner uptake that earlier CMC studies did not pick up on due to methodological constraints. However, this does not seem to be the case. The present data support earlier findings regarding the lack of uptake in an SCMC environment (Smith, 2005). Figure 9.11 shows the amount of subsequent uptake of negotiated words. Since it could be argued that the appearance of learner uptake occurring after a negotiation routine might vary as a function of the length of this routine, the occurrence of uptake is cross-referenced with the length of the negotiation routine in Figure 9.11. In negotiation episodes where uptake was possible (n=43) we see no apparent relationship between the negotiation structure and the occurrence of uptake. There were only nine cases of learner uptake overall, with most of these occurring after negotiation routines that end with a reaction to the response. It is also worth noting that claims made by Smith (2003) regarding the nature of negotiation routines are partially supported by the present data. Over three-fourths of the negotiation routines went beyond the obligatory response phase (Varonis & Gass, 1985). This lends support to the idea that the reaction to the response phase is not so optional after all. Indeed, almost 20 percent of the negotiation routines went beyond the RR phase into a confirmation <C> or reconfirmation <RC> phase (Smith, 2003).

Of the nine instances of post-negotiation learner uptake there was only one instance where the video screen capture alone provided evidence of uptake. That is, there was only one instance where uptake occurred in a message that was deleted before being sent. This is shown in message 13a in Figure 9.6 above. In this case the target item *der Ausweise* (identification/identity card) was used then deleted by the learner, but was used again in line 17a. Indeed, this chatscript has many instances of uptake, which suggests that the occurrence of uptake in the CMC environment might be more of an individual discourse style or strategy that one employs, but clearly not one which is very common in general. In this

SCMC Chatscript Column A	Hard copy of transcript Column B
1a. Mary: In mein zweiten bild, der Mann dreht sich 12:02:03 <T>	1b. Mary: In mein zweiten bild, der Mann dreht sich 12:02:03
<23 messages of text>	<23 messages of text>
2a. Mary: In meine bilden Ich sehe kein Frau 12:08:21	2b. Mary: In meine bilden Ich sehe kein Frau 12:08:21
3a. Casey: ~~wie sag~~ was [2a] meinte ["]dreht sich" [+] 12:08:59	3b. Casey: was meinte "dreht sich" 12:08:59
4a. Mary: Auch, Ich sehe nur eine man in alle Bilden 12:09:08	4b. Mary: Auch, Ich sehe nur eine man in alle Bilden 12:09:08
5a. Mary: I denke dreht sicj means "to turn 12:09:30	5b. Mary: I denke dreht sicj means "to turn 12:09:30
6a. Casey: oh ok 12:09:37	6b. Casey: oh ok 12:09:37
7a. Casey: Die Ordnung ist v~~e~~iel~~i~~eicht G[redacted] beg~~gi~~innt v~~e~~ieleicht mit G? 12:10:45	7b. Casey: Die Ordnung beginnt vieleicht mit G? 12:10:45
8a. Mary: So, in meine Bilden, der Mann hat sein Portemonnai, dann er dreht sich, den er springt weg, dann er steht vore dem Schalter 12:10:47	8b. Mary: So, in meine Bilden, der Mann hat sein Portemonnai, dann er dreht sich, den er springt weg, dann er steht vore dem Schalter 12:10:47
<5 messages of text>	<5 messages of text>
9a. Casey: ok erst Steht der Mann vor Schalter, dann dreht er un springt weg, denn Die ~~frou~~ Fr~~o~~eau sagt "Mann heir ist ~~dein~~ Ihr Portmonnai" [(G)] d~~annde~~enn [+] H und E und F 12:15:10	9b. Casey: ok erst Steht der Mann vor Schalter, dann dreht er un springt weg, denn Die Frau sagt "Mann heir ist Ihr Portmonnai" (G)denn H und E und F 12:15:10
10a. Mary: Sounds good to me 12:15:31	10b. Mary: Sounds good to me 12:15:31
<3 messages of text>	<3 messages of text>
11a. Casey: steht, denn dreht, denn spring? 12:16:38	11b. Casey: steht, denn dreht, denn spring? 12:16:38
12a. Mary: Ja 12:16:50	12b. Mary: Ja 12:16:50

Figure 9.12 Uptake in SCMC

same exchange we see both immediate and delayed uptake by Jason. In message 9a he attempts to immediately use the target word in his description of a picture, whereas in line 25a he uses the target word after some delay between when his interlocutor volunteers the German equivalent of an English word he has just used (picture=*Bild* in message 15a).

Figure 9.12 further illustrates the possible individualistic nature of learner uptake in this environment. This example provides good illustrations of several points regarding SCMC interaction. First, line 1a contains a trigger of non-understanding *sich drehen* (to turn), which is also the focus of two instances of subsequent delayed uptake. Though imperfect in their form, the usage of *sich drehen* in messages 9a and 11a is appropriate and apparently successful. Since the initial indicator of non-understanding from the trigger in message 1a occurs twenty-four

SCMC Chatscript Column A	Hard copy of transcript Column B
1a. Tim: Im D tragt er ein anzug? 1:12:32	1b. Tim: Im D tragt er ein anzug? 1:12:32
2a. Nigel: Was ist anzug? 1:12:46	2b. Nigel: Was ist anzug? 1:12:46
3a. Tim: ein jacke und hemd und hose 1:13:12	3b. Tim: ein jacke und hemd und hose 1:13:12
4a. Nigel: Was ist thermosflasche?[3] 1:13:12	4b. Nigel: Was ist thermosflasche? 1:13:12
5a. Tim: ein tasse kaffee 1:14:03	5b. Tim: ein tasse kaffee 1:14:03
6a. Nigel: In D hat ~~er~~ [5a] er kein hemd und hose sondern Latzhose. 1:14:37	6b. Nigel: In D hat er kein hemd und hose sondern Latzhose. 1:14:37
7a. Tim: gut 1:15:17	7b. Tim: gut 1:15:17

Figure 9.13 No Uptake Where Uptake Is Expected

messages later, this exchange is also a good illustration of the notion of split negotiation routines first discussed in Smith (2003). It also illustrates several instances of focus on lexical and grammatical form, many of which are covert in that they never appear on the printed transcript. Examples of these can be seen in messages 7a and 9a respectively and would have gone undetected when relying on printed transcripts alone.

Finally, the SCMC record has several instances of "no uptake" where uptake might be expected. One clear example of this is found in Figure 9.13. In addition to being a fairly typical negotiation routine this excerpt shows a curious choice by Nigel to use the description of *Anzug* (suit) in line 6a/b that was part of the response in message 3a/b rather than the target word itself. Upon close examination of the video screen capture record of the interaction, however, it becomes clear that Nigel may have had a bit of difficulty locating the word *Anzug* on the screen and yet needed to respond in some way to that topic. The flow of incoming messages continued and the topic of *Anzug* seems in danger of being left behind. The video screen capture record shows that immediately after Nigel sends line 6a he cursors up and hovers at each previous occurrence of *Anzug*, beginning with the first two instances where Tim uses the word (17 and 14 messages before) as well as in line 1a below, where Nigel runs the cursor from left to right across the word as though reading. Thus the video record sheds some light on just why no uptake occurred in this case. One could argue that Nigel simply could not locate the word he was looking for in the time permitted by the SCMC medium, but used the first opportunity to review that item after sculpting some acceptable response.

Conclusion

SCMC interaction has shown itself to be a good vehicle for exploring the key tenets of the interactionist approach pioneered by Susan M. Gass amongst others (Long, 1996; Pica, 1994; Swain, 2005). CALL research informed by this theoretical perspective has revealed that a CALL environment is a favorable venue for further exploring many of these key

tenets, whereas for others the nature of many CALL environments poses unique methodological hurdles. A growing number of researchers in this sub-field of applied linguistics have begun to take on these challenges in reconciling CALL and SLA theory by isolating and systematically exploring those problematic methodological issues surrounding data collection and analysis of SCMC interaction data. In this chapter I have outlined one approach which I hope represents a step forward in this effort.

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Appendix 9.1: SCMC Coding Key

General guidelines:

1. Column B is simply the cut and pasted record from the hard copy of the chat log. Each message is numbered, but not each line of text (both columns).
2. Column A represents the perspective of the target learner and includes all of the data that appears in column B, but also the CMCovert data that does not appear in column B. Thus, column A provides a clearer indication of what the target learner typed and when as well as what s/he added, deleted, changed, etc. It also shows about when each incoming message from the interlocutor arrived on the screen. It is also important to include time stamps in both columns where possible.
3. Column A is transcribed by playing back the screen capture file and adapting the record from column B as required. The order of messages should reflect that in column B as closely as possible. This allows for clearer description and discussion. The suggested procedure is to simply copy and paste column B into column A and then edit column A as needed.

Codes:

~~Strikethrough~~

This indicates that these letters/words were immediately deleted by backspacing or highlighting and deleting.

Vertical bar with underlined text to the left▌

This indicates that all of the underlined text was deleted beginning with that immediately to the left of the vertical bar. This is necessary because it is often the case that larger stretches of deleted text also contain one or more individual deletions. Use this coding symbol under the following two conditions: 1. A stretch of discourse is deleted which contains one or more individual deletions; 2. A longer stretch of discourse or an entire message is deleted. This adds to the clarity in interpreting the printed chatscript.

Note: messages that have been entirely deleted are signified with the message number + x as in the following example from Figure 9.5.

> 2x. Kade: ~~ke~~ weisst du, was ~~ba~~ Baerenhunger ist? ~~we es~~ das ~~wo~~ Wort was~~r~~ auch auf mei [2a]▌(These deleted messages always appear in column A and they have no counterpart in column B)

[Brackets]

This signifies inserted or deleted text. Second and third occurrences of inserted or deleted material is signified with [[double]] and [[[triple]]] brackets respectively. Text in [brackets] **always** has a corresponding [+] or [–] symbol (see below).

[+] Brackets with plus sign

This represents the point in the discourse where additional message material was inserted. Second and third occurrences of inserted material are signified with double [[+]] and triple [[[+]]] brackets respectively.

[–] Brackets with minus sign

This represents the point in the discourse where material was deleted. Second and third occurrences of deleted material are signified with double [[–]] and triple [[[–]]] brackets respectively.

Appendix 9.2: Annotated CMCovert Transcript

SCMC Chatscript Column A	*Annotation*
1a. Kade: ok das ist so wie photo D von mir 1:08:57 2a. Derek: Die menner mit dem ~~Rose~~ ros Hemd ist die ~~T~~ Zetiung [1a] [zu] halten [+]. 1:09:23	1a–2a. Kade/Derek: The men with the Rose *(deletes the word Rose then continues)* ros Shir tis the T *(deletes the letter T then continues)* newspaper *[at this point line 1 appears on Derek's screen]* hold *[after typing "hold" the participant backspaces and types the word "zu" before the word "halten" to make an infinitive form]*.
3a. Derek: <u>die manner sind look</u>▮ wie sagt man ~~looki~~ to look at? 1:10:12	3a. Derek: the men are look (deletes the entire line then continues) how do you say "looki" (deletes the word looki then continues) "to look at?"
4a. Kade: shen 1:10:37	4a. Appears as in column A
5a. Kade: sehen** 1:10:40	5a. Appears as in column A
6a. Kade: oder sieht etwas an 1:10:50	6b. Appears as in column A

7a. Kade: ok im welches photo nehmt den mann mit der rosa hemd die zeitung 1:12:14	7b. Appears as in column A
8a. Derek: die man~~ne~~ [6a] ~~e ist an a~~ sie[g]~~t ht~~ [–] e~~die~~ der Man in der ~~Rose hemd~~ rose Hemd is~~tt~~ ~~shieght~~ an~~d~~ dieser man mit dem blau Hemd.[7a] 1:12:15	8a. Derek: the man *(line 6a appears on Brian's screen at this point)* e *(deletes "e")* is *(deletes "is")* an *(deletes "an")* a *(deletes "a" then continues) (attempts to spell the third person singular form of the verb sehen (sieht), but has difficulty typing siegt (deletes "t" then types* "ht" *- immediately deletes "ht" then backspaces to delete the "g" then continues on by typing* "e" *at the end of the word and immediately deletes it. He then deletes the entire word and continues on. He types* "die" *(feminine article) then immediately deletes it and continues* "the man in the Rose shirt" *(deletes "Rose shirt" and continues)* rose Shirt is *(spells "is" = ist correctly but deletes the t only to add it again immediately. Has difficulty spelling the word "sieht" once again adding an "h" and "g" which are both immediately deleted then continues. Types* "and" *then immediately deletes the "d" to make the separable prefix "an" for the verb "ansehen" then continues* "this man with the blue Shirt."

Appendix 9.3: English Translation of the Chatscripts

Only the hard copy version of each transcript is presented (column B)

English translation of Figure 9.1 transcript (column B)
1b. Travis: Picture H—The red man is funny (misspelled) and has the Pavarotti T-Shirt 10:05:21 <T> 2b. Theodore: funny? (misspelled) 10:06:37 <I> 3b. Travis: What color T-shirt is the young woman wearing? Does she have a sweater? 10:06:45 4b. Travis: I'm sorry. Not funny, rather happy 10:07:29 <R> 5b. Theodore: yes. The sweater is grey and her hair is not long. 10:08:00 <RR>

English translation of Figure 9.3 transcript (column B)

1b. Pierre: he has cleaned up his shop 12:59:43 <T>
2b. Pierre: picture C he goes home and his garage is not clean 1:00:08
3b. Daniel: D-The man goes inm the garage and it is very dirty 1:00:29
4b. Daniel: E-he goes out of his room 1:00:54
5b. Daniel: F-The garage is clean and he has an axe in his hand 1:01:15
6b. Daniel: **in your hand 1:01:26
7b. Daniel: his* 1:01:31
8b. Daniel: his shop? 1:02:19 <I>
9b. Daniel: I don't have a shop only a garage and a bedroom. 1:02:36
10b. Daniel: are you there? 1:03:39
11b. Pierre: yes 1:03:48
12b. Daniel: k 1:03:52
13b. Pierre: I don't know whether it is a shop but there is no bed and all around are tools. 1:04:19 <R>
14b. Daniel: I think that the first picture the shop is first 1:04:32 <RR>

English translation of Figure 9.4 transcript (column B)

1b. Tim: C: the man in blue sleeps on the chair 1:08:11 <T>
2b. Nigel: H blue man is left and red man is right and blue man has the paper 1:08:22
3b. Nigel: In all (of the pictures) they are on a chair 1:08:43
4b. Tim: d: The men are sitting on the chair and the man in blue is reading a newpaper/book 1:08:45
5b. Nigel: I think A is first and you? 1:09:55
6b. Tim: yes 1:10:09
7b. Nigel: Is B at the end? 1:10:14
8b. Nigel: what does slept mean? 1:10:34 <I>
9b. Tim: B or c is at the end 1:10:35
10b. Nigel: In A is the blue or red man left? 1:11:12
11b. Tim: I think the man in red is angry and he stands up and went then the man in blue sleeps on the chair 1:11:34 <R>
12b. Tim: the man in red is on the left 1:12:01
13b. Nigel: In F the red man is angry too 1:12:15

English translation of Figure 9.5 transcript (column B)

1b. Brian: the girl with blond hair said >>I have a bear's hunger<< 1:13:44 <T>
2b. Brian: The man said>>I'd like Schnitzel and Wurst<< 1:14:34
3b. Kade: ok 1:14:46
4b. Kade: do you know what Baerenhunger is? 1:15:02 <I>
5b. Brian: hunger of a bear (in English) 1:15:13 <R>
6b. Kade: thanks 1:15:23 <RR>

English translation of Figure 9.6 transcript (column B)

1b. Amy : G: man has forgot (in English) your identification 12:10:20
2b. Jason : Identification? 12:10:52
3b. Amy : ID/ passport (in English) 12:11:00
4b. Jason : thanks 12:11:05
5b. Jason : Ok in C. . . 12:11:22
6b. Jason : How do you say, "run" in German? 12:11:45
7b. Amy : laufen, I think 12:11:58
8b. Jason : ok 12:12:04
9b. Jason : The man run [away from] the table12:12:26
10b. Amy : then D,A,B. . .. . . . .C? 12:12:54
11b. Jason : Yes 12:13:01
12b. Amy : D,A,B. . .. . .G,C 12:13:35
13b. Jason : How many [pictures] (in English) do you have? 12:14:08
14b. Amy : 4 12:14:18
15b. Amy : picture = Bild 12:14:31
16b. Jason : thanks 12:14:37
17b. Jason : So, the man [forgot] (in English) your identification, right? 12:15:03
18b. Amy : Yes, in G 12:15:12
19b. Amy : D,A,B,H,F,E,G,C??? 12:15:53
20b. Jason : I think G, D, B, A, H, F, E, C 12:16:38
21b. Amy : why is G first? 12:16:53
22b. Jason : I don't kinow 12:17:13
23b. Amy : H,E,F,G 12:21:54
24b. Amy : and you? 12:21:58
25b. Jason : I don't know your pictures 12:23:05

English translation of Figure 9.7 transcript (column B)

1b. Kade: ok that is like picture D of mine 1:08:57
2b. Derek: The man with the pink shirt is holding the newspaper 1:09:23
3b. Derek: hoe do you say "to look at?" 1:10:12
4b. Kade: shen 1:10:37
5b. Kade: sehen** 1:10:40
6b. Kade: or "sieht etwas an" 1:10:50
7b. Kade: ok in which picture does the man with the pink shirt take the newspaper 1:12:14
8b. Derek: the man with the pink shirt looks at the man with the blue shirt 1:12:15

English translation of Figure 9.8 transcript (column B)

1b. Amy: Man has ham and French fries
2b. Amy: Helg has menue (number) 67 or 76?
3b. Casey: first are the people are sitting and talking or are they looking at the menue first?
4b. Amy: ?
5b. Casey Will: OK. . . the people are sitting and talking. . .right? 12:19:58
6b. Amy : Yes 12:20:06
7b. Amy : with menue 12:20:15
8b. Amy : three people 12:20:19
9b. Casey: Then, the people look at the menue right? 12:20:36
10b. Amy : Yes 12:20:42
11b. Casey: Then, Helga says "this or this" 12:20:58

English translation of Figure 9.9 transcript (column B)

1b. Casey: The order begins perhaps with G? 12:10:45

2b. Becky: yes D and F are in the garage E is in the bedroom, I think that he (in English) gets the dustpan in the bedroom 1:03:13
3b. Becky: goes 1:03:37
4b. Sara: A—the man has the tricycle in his hand and the snowshovel and he is clean 1:03:58

English translation of Figure 9.10 transcript (column B)

1b. Sara: do you have then 1:22:35
2b. Sara: which letter is that? 1:22:43
3b. Daniel: buschtabe? 1:22:54
4b. Sara: letter 1:22:57
5b. Daniel: ahh 1:23:01
6b. Daniel: I don't have it 1:23:12
7b. Sara: I don't have it either 1:23:21
8b. Daniel: I was only asking you 1:23:27
9b. Daniel: okay 1:23:29
10b. Daniel: then 1:23:30
11b. Daniel: . . . 1:23:31
12b. Sara: do you have something with the old woman? 1:23:33
13b. Sara: something? 1:23:42
14b. Daniel: the old woman should be the first one 1:23:44

15b. Jordan : what is this man wearing? 10:15:05
16b. Katarina : He is wearing a black pullover and has. . . 10:15:41
17b. Katarina : Speise? 10:15:46
18b. Katarina : (glasses) (in English) 10:15:49
19b. Jordan : brille 10:15:55
20b. Katarina : haha, brille. 10:15:58
21b. Jordan : ah 10:15:59
22b. Katarina : okay. . 10:16:02

English translation of Figure 9.12 transcript (column B)

1b. Mary: In my second picture, the man is turning 12:02:03
<23 messages of text>
2b. Mary: In my pictures I don't see a woman 12:08:21
3b. Casey: what does "dreht sich" mean? 12:08:59
4b. Mary: Also, I see only a man in all of the pictures 12:09:08
5b. Mary: I think "dreht sich" means "to turn" 12:09:30
6b. Casey: oh ok 12:09:37
7b. Casey: The order begins perhaps with G? 12:10:45
8b. Mary: So, in my pictures the man has his wallet, then he turns, then jumps away, then he stands in front of the counter 12:10:47
<5 messages of text>
9b. Casey: ok first the man stands in front of the counter, then he turns and jumps away, then the woman says "Man here is your wallet" (G) then H and E and F 12:15:10

10b. Mary: Sounds good to me 12:15:31
<3 messages of text>
11b. Casey: stands, then turns, then jump? 12:16:38
12b. Mary: yes 12:16:50

English translation of Figure 9.13 transcript (column B)

1b. Tim: in D is he wearing a suit? 1:12:32
2b. Nigel: what is "suit"? 1:12:46
3b. Tim: a jacket and shirt and pants 1:13:12
4b. Nigel: what is "thermos"? 1:13:12
5b. Tim: a cup of coffee 1:14:03
6b. Nigel: In D he doesn't have shirt and pants rather overalls. 1:14:37
7b. Tim: good 1:15:17

10

INTERACTION AND ATTENTION TO FORM IN L2 TEXT-BASED COMPUTER-MEDIATED COMMUNICATION

Lourdes Ortega

The foundations of the interaction approach were laid during the early 1980s and rapidly burgeoned into an increasingly coherent research program led by Susan Gass along with other key contributors (see reviews in Gass, 2003; Gass & Mackey, 2006). The approach has been sustained for about three decades now and has demonstrated that through interactions with others, learners of an additional language (L2) avail themselves of linguistic data under conditions that have been shown to have competence-expanding potential (Gass, 1997). The initial research was guided by the goals of describing interactional modifications and gauging the benefits they entail for comprehension. A seminal study by Gass and Varonis (1994) inspected, for the first time, the linguistic benefits of interaction on subsequent L2 production. This study marked the prelude towards a second generation of efforts that has concentrated on demonstrating that interaction "focuses a learner's attention on linguistic form, on ways of creating discourse" (Gass & Varonis, 1994, p. 298). Since then, studies have embraced attention to form as a central explanatory construct (Gass, 1991, 2003) and have also probed the L2 learning outcomes of interaction (Keck, Iberri-Shea, Tracy-Ventura, & Wa-Mbaleka, 2006; Mackey & Goo, 2007).

It was also in the mid-1990s that various computer-mediated communication (CMC) technologies entered L2 classrooms and opened up real-time, online L2 interactions as an additional site for L2 learning (for an overview of CMC see Thorne, 2008). This expansion reflects the fast pace at which the use of various CMC technologies has increased, including synchronous CMC. Some SCMC activities are done with messengers designed for use among learners from the same class located in the same

computer laboratory and connected in local area networks (e.g., Daedalus/Interchange, http://www.daedalus.com/), but most contemporary uses rely on the many user-friendly and often freely available Internet Relay Chat programs on the World Wide Web, which enable synchronous real-time communication among peers connected to a server from separate locations (e.g., mIRC, http://www.mirc.com/; Yahoo! Messenger, http://messenger.yahoo.com/). Two main benefits of these virtual environments for L2 learning were extolled in early publications (e.g., Chun, 1994; Kern, 1995; Warschauer, 1996; see review in Ortega, 1997). First, the use of computers for text-based SCMC was said to facilitate more equally distributed participation across individual learners and to foster more egalitarian interactions between teacher and students. Second, and as a consequence of such changed participation patterns, language students doing SCMC were said to engage in ideal L2 practice, because they appeared to produce more language of a wider variety when they interacted in online environments as compared to face-to-face (FtF) ones. A few years later, at the turn of the millennium, the theoretical apparatus of the interaction approach was explicitly identified as holding great promise for the study of L2 learning benefits of text-based SCMC (Fernández-García & Martínez Arbelaiz, 2002; Pellettieri, 2000; Smith, 2003; see theoretical discussion in Chapelle, 2005), and the question was asked: can real-time, online interactions generate opportunities for L2 learning that are comparable to those found for traditional face-to-face interactions? As had already happened with most investigations of traditional L2 interactions, these SCMC researchers soon adopted attention to form as a central theoretical construct. They capitalized on a promising feature for L2 learning that is unique to SCMC and is generally referred to as the *amplification of attention to form* effect in the L2 SCMC literature. Namely, the real-time demands of communication are present in SCMC, but the medium affords some leeway and self-pace for cognitive processing during L2 production (that is, during keyboarding) and L2 reception (that is, during the reading of messages). Learners also have their unfolding texts visible as they are composing them, and their own contributions and those of others remain also visible on the screen, permanently available for reinspection. Given the additional processing time available during real-time, online interactions and the visibility and permanence of SCMC texts, might the attention to form benefits afforded by interaction be amplified in the online mode?

In this chapter I take stock of what has been learned in the past ten years about interaction and attention to form during L2 text-based SCMC and point at future directions for research. I review studies that were published since 2000 and have investigated the interaction-related benefits of L2 text-based SCMC. I critically examine the evidence that this body of empirical findings offers with regard to negotiation for meaning,

negative feedback, amplified attention to form, and L2 learning outcomes of L2 online interaction. I conclude with a summary of the extant findings and a glimpse of areas particularly deserving of future research in this domain.

The Fundamentally Similar and Fundamentally Distinct Nature of L2 SCMC and FtF Interactions

Real-time, online interactions in the L2 have been found to be broadly comparable to FtF interactions. For example, L2 SCMC researchers have been able to apply successfully to text-based SCM discourse the four-part episode structure of trigger-indicator-response-reaction that was first proposed in a seminal article by Varonis and Gass (1985) and has become an analytical staple in interaction studies. Likewise, most SCMC interactional episodes fit well the analytical categories that are well established for FtF episodes, such as clarification requests and comprehension checks (Long, 1983), recasts (Nicholas, Lightbown, & Spada, 2001), uptake (Lyster & Ranta, 1997), or Language Related Episodes (LREs; Swain & Lapkin, 1995). Finally, the tendency for SCMC negotiations to revolve around L2 vocabulary has been repeatedly noted across studies, replicating for online interactions the "negotiate-over-lexis-first" principle that has been found in many FtF studies (Pica, 1994; Williams, 1999).

Despite these fundamental commonalities with FtF, SCMC interactions also exhibit some distinctive features which stem directly from two unique characteristics of text-based, real-time online discourse. One, CMC discourse is non-sequential, that is, it exhibits *disrupted turn adjacency* "caused by the fact that messages are posted in the order received by the system, without regard for what they are responding to" (Herring, 2001, p. 617). Two, text-based SCMC is a *lean medium*, as Daft and Lengel (1984) termed it, because by definition it makes available information only through the visual channel.

The disrupted turn adjacency feature explains an important difference in the interactional architecture of text-based SCMC when compared to FtF, which was first analyzed in depth with L2 data from an interaction approach perspective by Smith (2003). SCMC interactional moves often exhibit a format that Smith called *split negotiation routines*, to signify that there may be a multiple-turn delay between the nontargetlike trigger of a communication problem, the indication that something needs to be negotiated, the response to that indication, and the reaction to the response. To illustrate the consequences of this feature with some observations that we will examine in more detail in later sections, in L2 SCMC interactions, recasts may be non-contingent (Lai & Zhao, 2006) and uptake may be delayed (Smith, 2005). On the other hand, the leanness of the text-based medium explains another difference noted by most L2 SCMC researchers:

namely, SCMC signals of communicative trouble are marked more explicitly in SCMC through linguistic material and typographical signs (emoticons, asterisks, punctuation, capitalization, onomatopeia), because prosodic and paralinguistic markers that are present in the FtF mode to indicate communicative trouble (e.g., segmentation, intonation, stress) are not available for use in text-based online communication.

How exactly these distinguishing features of text-based SCMC interaction may affect L2 learning opportunities is a pending question that has not been tackled empirically thus far. At least in theory, the greater explicitness of meaning negotiations may offer a unique advantage to SCMC interactions. On the other hand, split negotiation routines may possibly damp the learning potential of online interactional work. Particularly in SCMC interaction with more than two participants, the fact that negotiation or negative feedback moves are posted does not guarantee that reception by the intended interlocutor will take place. This is because in SCMC interactants are free to read or skip messages, or they may read them in an order different from that of not only composing but also posting.

Text-based SCMC as an Ideal Site for L2 Negotiation for Meaning?

Negotiation for meaning is probably the area that has received the most consistent attention ever since the first efforts emerged to apply the theoretical insights of the interaction approach to the study of online L2 interactions in SCMC environments. The initial expectation was that SCMC would foster particularly optimal levels of negotiation for meaning (Ortega, 1997; Pellettieri, 2000), and such an assertion continues to be routinely repeated in contemporary L2 publications. Yet, a closer look at the mounting evidence suggests some need for temperance and empirical qualification.

L2 SCMC Studies That Show High Levels of Negotiation

In an early observation, Warschauer (1996) commented in passing that negotiation levels were lower on SCMC than FtF in his comparison of four small groups of ESL learners who debated two topics in the two modes. This initial remark was subsequently disconfirmed by six studies in which high amounts of negotiation for meaning were found.

The first study was conducted by Pellettieri (2000), who investigated five dyads of Spanish learners as they interacted on five different SCMC tasks. Most likely due to the careful task design, she found one of the highest levels of negotiation ever reported for task-based laboratory SCMC, with a mean that ranged from 3.6 episodes to 8.2 episodes

per dyadic SCMC session of twenty or thirty minutes, or a proportion of 31 percent of all turns. In raw frequency terms, there were between eighteen and forty-one negotiation episodes per task, suggesting rather large variation related to task design and content. In a second study, Smith (2003) found that lexical negotiations in the transcripts of fourteen ESL dyads amounted to about a third of all turns (492 of 1,455 turns, or 34%) of a jigsaw task and a decision-making task combined. This very high proportion must be qualified by the realization that the tasks employed by Smith in his research program are specifically designed to make negotiation a necessity, because they are seeded with unknown words. Thus, an interlocutor uses a new word given in his or her materials (e.g., *comb*), and this triggers the partner who does not share the same information to issue a clarification request (e.g., *what is comb / can u explain to me??*) (Smith, 2005, p. 45). While in other kinds of SCMC interaction requests triggered by unknown vocabulary may originate from chatters "once or twice per session" (Kötter, 2003, p. 155), their frequency is undoubtedly boosted by a task design like Smith's.

Nevertheless, two other studies have reported relatively high amounts of SCMC negotiation work in the context of project-oriented tasks. In an oft-cited study, Toyoda and Harrison (2002) investigated an exchange between five advanced Japanese students in Australia and Japanese native speakers who were living in Australia and Japan. In groups of three, they engaged in one-hour chat sessions outside of class time, weekly over a semester, and discussed ideas for a joint web page creation project. The seven sessions analyzed yielded forty-five negotiation for meaning episodes, or an average of 6.4 per hour. Kötter (2003) investigated eight teams of three to four students (total n=29) who joined and chatted on MOO but came from two geographically distant groups, an L2 English class in Germany, and an L2 German class in the United States. The groups completed projects on topics of their choice, for example, representations of Germans in Hollywood movies or immigrant education in the two countries. Few text-based SCMC L2 corpora have been more substantial or dense than the one Kötter collected and analyzed. It included eight consecutive seventy-five-minute biweekly sessions, an average of sixty twelve-word-long turns per learner per session, and a total of 184,000 words. He found 1,549 clarification requests in the data, which amounted to 12 percent of all turns produced. These figures translate into a hypothetical average of 194 clarification requests in a seventy-five-minute transcript of any of the eight given groups, or eight per learner per session. This is indeed a very high rate of negotiation for meaning in either the traditional or the online mode.

Similarly high are the levels of negotiation reported in two studies by Tudini of one-on-one chat conversations with L1 users in a public chat line on the Internet. In the first, small-scale study, Tudini (2003) asked

nine L2 Italian learners in Australia, mostly third-generation heritage learners, to participate in a public chat line on the Internet over two semesters. This assignment was in response to students' complaint that "they wanted to chat with 'someone they could learn from' " (p. 147), as opposed to just chat with other learners, as they had been doing until that point in their course. She obtained and analyzed forty-nine chat sessions and 3,687 turns, and found sixty-one instances of negotiation work, representing 328 or 9 percent of all turns. In a recent partial replication of this study, Tudini (2007) asked twenty-seven L2 Italian learners to participate in one-on-one chat conversations with L1 Italian users by logging into the same public chat line on the Internet as in the previous study, this time for a period of eight weeks. They submitted 120 L1–L2 dyadic chat sessions involving 118 different unknown L1 chatter interlocutors. The corpus contained 1,104 negotiation episodes, 645 that had been initiated by the learners (58%) and 459 that had been initiated by a native speaking chat interlocutor (42%). They amounted to 10 percent of all 10,644 turns, with a high hypothetical average of 9.2 negotiation episodes per session.

L2 SCMC Studies That Show Low Levels of Negotiation

In conflict with the evidence gleaned from the six studies discussed above, many other researchers have reported consistently low amounts of negotiation for meaning in their studies, with or without a direct comparison to FtF interactions, and regardless of whether the SCMC interactions unfolded in second or foreign language contexts, in or outside of the classroom, and in dyads, small groups, or whole-class online formats.

In a large-scale study conducted in a Spanish as a foreign language context similar to that of Pellettieri's, Blake (2000) investigated two groups of twenty-five L2–L2 dyads of intermediate Spanish learners as they interacted online on a number of SCMC tasks over a semester. The dyads produced low levels of negotiation even with the most successful jigsaw task, which exhibited thirty-six negotiation moves or only 3.8 percent of all 929 turns examined. That is, each of the twenty-five dyads examined for this task produced little more than a single negotiation move on average. The reported amounts are even smaller on the other tasks included in the study. Using the same jigsaw task, Blake and Zyzik (2003) inspected the negotiation for meaning that ensued from eleven dyadic one-hour interactions between heritage Spanish speakers and intermediate-level students; they found thirty instances, or 2.7 moves on average per dyad.

Two research teams have inspected negotiation levels by comparing directly SCMC with FtF interactions conducted by dyads, and both have reported a clear negotiation advantage for the FtF mode. Fernández-García and Martínez Arbelaiz (2003) compared an FtF and an SCMC task

on two similar conversational topics, all done by the same eighteen dyads, four Spanish L1–L2 speaker dyads, and 14 L2–L2 speaker dyads. They found that the four L1–L2 speaker dyads experienced more difficulties in understanding each other and thus engaged in more negotiation overall, but also that they negotiated statistically significantly and clearly more in the oral FtF mode (k=13) than in the SCMC mode (k=4). Moreover, the reported raw frequency of negotiations on the SCMC task across the eighteen dyads was very low (k=13 episodes), and amounted to less than one instance per dyad and task, and about half the negotiation episodes observed in the FtF mode. Lai and Zhao (2006) investigated six ESL dyads completing a spot-the-difference task in both modes. They reported that negotiation episodes were statistically significantly more frequent in the FtF than the SCMC mode, although they did not provide raw frequencies.

Similarly low levels of negotiation work have been found for SCMC interactions in small group formats, although no direct comparisons with FtF exists when it comes to groups rather than dyads. Lee (2001, 2002) conducted two studies with L2 Spanish students who chatted in groups of three or four members for an hour weekly over a semester. The various topics were conversational and were provided by the researcher. The corpus in Lee (2001) amounted to 120 three-to-four-page sessions contributed by twelve groups (40 students total) and contained a total of 127 instances of negotiation for meaning. The data in Lee (2002) comprised ninety-six sessions of similar length also contributed by twelve groups (34 students total). This time 118 episodes were found. These averages of 1.06 and 1.23 negotiation episodes per session are very low. Fernandez-García and Martínez Arbelaiz (2002) presented a qualitative description of the interaction by four groups of at least six members, all third-year Spanish students. While they offered no quantification of negotiation for meaning, they remarked that one session of the eight analyzed did not contain a single case of negotiation. Kitade (2000) undertook analyses of twenty-two L2 SCMC sessions conducted by twelve advanced Japanese learners who discussed class team projects in small groups in chat rooms. Although she employed mostly qualitative analyses of discourse, for the group of three female students with the most active negotiation profile she reported that the number of negotiation episodes (involving requests for meaning) was between one and four per session.

In a singular approach that makes for a markedly different context for dyadic SCMC interaction, Jepson (2005) examined group chat interactions in an English language learning public chat room. He collected his data by randomly joining the public chat room and recording data from unknown L2 learners while lurking for five minutes, in five different sessions, on five different days. He compared text-based with voice-based interactions in the same environment, where the latter is arguably closer

to the FtF mode (Yamada & Akahori, 2007). The resulting data exhibited almost no correction (in either text- or voice-chat), and a very low six episodes of negotiation for meaning in the text-based transcripts, which was statistically significantly lower than the thirty-six episodes found in the voice transcripts.

Finally, negotiation for meaning in SCMC whole-class discussion formats has been investigated less frequently. The only evidence comes from Sotillo's (2000) SCMC ESL corpus, consisting of four ninety-minute SCMC transcripts produced by two intact classes and their respective teachers. They discussed various reading topics online in preparation for essay writing. The corpus contained 186 attempts to negotiate (or 15% of all 1,272 moves), but only about half of them (95) were initiated by the students. The proportion of 7.5 percent lies far below the one third of all turns proposed by Smith (2003) for online task-based dyadic interaction.

The discordant evidence reviewed in this section is sufficiently pervasive to give L2 SCMC researchers reason to fear that Warschauer's (1996) early observation is not an isolated case, and to conclude that negotiation for meaning, at least in terms of quantity, must be highly variable across SCMC contexts. Future research is needed to determine the extent to which such variability is, at least in part, explained by contextual factors, for example, the tasks employed across studies, whether interlocutors are classmates who interact in a laboratory or strangers who meet in a chat room, whether the exchanges are done in a dyad versus small group format, and so on.

Negative Feedback During L2 SCMC Interactions

Negative feedback has received thus far less attention than negotiation for meaning in the L2 SCMC literature, although interest is growing. When it comes to negative feedback during FtF instruction-oriented L2 interactions, a substantial proportion of errors appears to be responded to. Thus, in the laboratory with native-speaking interlocutors, between a half and a third of ungrammaticalities produced by learners typically receive some kind of negative feedback (e.g., Iwashita, 2003; Mackey, Oliver, & Leeman, 2003; Oliver, 1995), although the proportion is sometimes lower (e.g., a fourth of errors were responded to in Braidi, 2002). In L2 text-based online interactions, the evidence gleaned so far suggests that negative feedback is variable, as is the case with negotiation for meaning, with levels that tend to be generally lower than those attested in FtF laboratory studies.

The only direct SCMC and FtF comparison of negative feedback was offered by Lai and Zhao (2006), who compared recasts provided on similar SCMC and FtF tasks in their study with ESL dyads. They reported similar amounts across the two modes, mentioning that seventeen recasts

were produced in the SCMC interactions by the six dyads combined, a low total if we consider that each dyad chatted for an average of thirty-eight minutes and produced long transcripts of 859 words and seventy-nine turns on average. Analyzing dyadic online interactions between twelve L2 Japanese learners and native-speaking interlocutors, Iwasaki and Oliver (2003) found that only about 21 percent of errors were responded to with negative feedback online. Kötter (2003) found a mere twenty-nine recasts in his 184,000-word chat corpus, and all but one of them issued by the more proficient L2 English students in Germany. Tudini's (2007) L2 Italian students, who were successful at negotiation lexis and grammar with their L1 Italian interlocutors in public chat rooms for about 10 percent of all turns, received a mere total of forty-one recasts in 120 sessions. Jepson's (2005) public chat room data exhibited almost no negative feedback instances in either the voice-based or the text-based modes. Finally, in a semester-long study of two intact Spanish classes, Fiori (2005) also reported low levels of teacher-initiated negative feedback in SCMC, with a total of twenty-three and fifteen feedback episodes (most of which were recasts: 14 and 11) issued by the teacher during whole-class SCMC discussions with her two classes over eight sessions with each, or a low session average of 2.88 for one class and 1.88 for the other.

By comparison to the research already discussed, higher rates of negative feedback have been reported in two other studies. Lai, Fei, and Roots (2008) analyzed a corpus of 290 recasts that were provided by a researcher interlocutor to seventeen ESL learners during two fifteen-minute spot-the-difference tasks. This high mean of seventeen recasts per participant or 8.5 recasts per fifteen minutes of task interaction may be uncharacteristic of L2 online interactions and is explained by the fact that the researcher interlocutor's role was to "constantly provide recasts whenever it was natural to do so" (Lai et al., 2008, p. 87). Nevertheless, Sotillo (2005) also found encouraging levels of negative feedback in a multimodal chat study involving five TESOL teachers in training, two English native speaking and three advanced English nonnative speaking. They interacted in a dyad format with five ESL volunteers who had graduated from an ESL program. The five dyads interacted on communicative tasks across five sessions over nine weeks. Sotillo found about six correction episodes per hour (65 correction episodes in 11 hours) and a correction rate of 41 percent of nontargetlike utterances. A plausible explanation is that whenever interlocutors assume a more pedagogical role (and perhaps particularly those who take on a teaching or tutoring role), then negative feedback may occur more frequently. Nevertheless, the picture is probably more complex, as the levels of correction observed in the two dyads where the teachers in training were native speakers was much lower (3.8 episodes per hour, or a total of 19 cases, which

corresponded to only 30% of errors committed) than the levels found in the other three dyads (7.6 episodes per hour or a total of 46 cases, which represented a 48% error correction rate). Furthermore, the native-speaking preservice teachers overwhelmingly preferred implicit corrections (e.g., recasts, clarification requests), whereas the advanced nonnative-speaking preservice teachers preferred explicit corrections. In addition, these numbers must be treated with some caution because they may overestimate the extent of negative feedback in text-based SCMC, if one considers that they included some cases of self-correction and that they resulted from counts of the text-based data (8 hours) and audio-chat data (3 hours) combined, where the interactional architecture of audio-chat data can be potentially closer to that of FtF interactions (cf. Jepson, 2005).

It is also important to recognize that not all teachers who participate in the SCMC interactions will orient in similar ways to negative feedback. The teacher investigated by Fiori (2005), for example, showed a conversational orientation to the chat interactions with her two classes, peppered by a few implicit and lexically focused corrective feedback moves. Experience may be a related factor as well. Although Fiori's instructor had four years of past teaching, with increasing experience other teachers may become more adept at interacting with their students in ways that maximize their language output, as was found in the traditional FtF mode for nine teachers with a median of ten years of experience by Mackey, Polio, and McDonough (2004), and for eight teachers with four years at least of experience by Polio, Gass, and Chapin (2006).

Two observations have been made about online recasts, in particular, that are interesting from a theoretical viewpoint and deserve future empirical attention. Lai and Zhao (2006) noted that about half of the recasts they found in their SCMC data occurred in a delayed fashion, or what they call *non-contingent recasts*, on average three or four turns after the error. Many of them also typically fit what Lyster (1998) has called incorporated recasts, that is, recasts embedded in larger sentences that go beyond the meaning initially put forth by the interlocutor in the error turn. By contrast, in their FtF data all recasts were contingent, that is, they were provided immediately after the error, and about half of them fit the category Lyster calls isolated, or a repetition of a part or the whole of the error turn minus the error. Thus, they feared SCMC recasts may be difficult to notice. Lai, Fei, and Roots (2008) found a lower rate of non-contingent recasts than initially expected (only 39% of their 290 recasts were delayed) but the evidence confirmed they are more difficult to notice (only slightly over a third of them were noticed by the 17 ESL learners in their study). The other, more hopeful suggestion is made by Fiori (2005), who has argued on the basis of qualitative data that online interrogative recasts may elicit uptake from the students more effectively than online declarative recasts do. The suggestion is intriguing

in light of Loewen and Philp's (2006) finding that interrogative recasts (which comprised only 17% of all oral recasts in their FtF study) were associated with higher scores on tailor-made posttests in a logistic regression analysis.

Attention to Form During Text-based SCMC Interaction

Beginning in the mid-1990s, the interaction approach experienced a cognitive reorientation (Gass, 1991; Long, 1996; Pica, 1994) which catapulted attention to form to the center of the theoretical claims in the research program. Particularly, the constructs of noticing and consciousness (Schmidt, 1995) have deeply influenced contemporary empirical research on L2 interaction. Many studies of L2 interaction since then have attempted to empirically document noticing in a number of ways. Two methods have been employed most widely. One is the analysis of immediate uptake in the discourse, or whether the learner repeats or incorporates the targetlike reformulation in his or her own speech upon receiving it from the interlocutor. Uptake was initially identified by Lyster and Ranta (1997) as a potentially good indicator of noticing. The other well-established strategy for measuring noticing is the collection of introspective data via stimulated recall. This methodology has been championed by Gass and Mackey in a particularly influential empirical study by Mackey, Gass, and McDonough (2000) and a book-length treatise by Gass and Mackey (2000).

In text-based SCMC research, too, attention to form has begun to be investigated via inspection of uptake and retrospective evidence of noticing. The research has been motivated by the theoretical prediction of SCMC as an amplifier of attention to form, enabled by the additional processing time available during real-time online interactions and the visibility and permanence of SCMC texts. Attempts to investigate these issues in L2 text-based SCMC have begun only recently, and the evidence thus far is positive, albeit without being as encouraging as perhaps initially expected.

Documenting Noticing in Text-based L2 SCMC Interaction via Retrospection and Uptake

Two studies by Lai and colleagues are the only ones to date that have employed stimulated recall as a measure of noticing in SCMC. Lai and Zhao (2006) directly compared the amount of noticing in the SCMC and FtF modes by six ESL dyads, separating the analyses into the noticing of negotiation versus recasts. They found that, out of ten of their twelve participants who noticed at least some negotiation episodes, six noticed them more often in chat than in oral interactions. While this difference

in favor of SCMC noticing was large (with an effect size of Cohen's d=0.83), it was nevertheless statistically not significant. Because only four learners received recasts in both modes, the data were insufficient for the investigation of noticing in this subset of the data. In a subsequent study of the noticing of 290 online recasts delivered by a researcher interlocutor, Lai, Fei, and Roots (2008) triangulated stimulated recall data with concurrent think-aloud data from seventeen ESL learners. They reported that 132 or 46 percent of all recasts were noticed, a high overall rate. They were also interested in ascertaining whether the contingency of the recasts had any impact on noticing and whether working memory would moderate such effects. They found a difference in favor of contingent recasts that was statistically significant and of medium size (d=0.59). Specifically, all but three of the ESL participants noticed contingent recasts more often, and only about a third of the non-contingent recasts were noticed, as compared to about half of the contingent ones. A sizeable relationship between working memory and noticing of recasts was found (Spearman ρ=0.58), which upon closer inspection turned out to be related to the contingency factor: The higher the working memory of participants, the more they noticed non-contingent recasts (Spearman ρ=0.79).

Three other studies have examined noticing as measured by uptake, although none included a direct comparison with FtF interactions. Iwasaki and Oliver (2003) found that about a fourth of corrections (21 of 90) led to learner uptake in their study, a lower proportion than would be expected in the traditional mode. Smith (2005) inspected the data collected from twelve ESL dyads in a previous study (Smith, 2004) and found higher levels of uptake than Iwasaki and Oliver, probably due to differences in task design between the two studies. Specifically, there were twenty-eight instances (42.4%) of successful lexical incorporation, twenty-eight instances (42.4%) of simple acknowledgement, and only ten instances (15.2%) of no uptake. He also suggested that delayed uptake may be typical of SCMC, based on the observation that only seven (or 25%) of the twenty-eight instances of observed successful uptake occurred in the immediate next turn after provision of the new word. Nevertheless, like Iwasaki and Oliver, Smith considered these levels of uptake to be low by comparison to previous FtF studies. Sotillo (2005) reports similar rates of successful uptake, albeit in a more optimistic overall pattern, as she found twenty-four (37%) successful cases of repair, but also only eight instances (12%) of unsuccessful uptake in the face of opportunity, and a majority of cases (33 or 51%) where a topic continuation made it impossible to attempt uptake. If the opportunity is taken into consideration, then the five ESL speakers in this study repaired successfully 75 percent of the time when they had the chance to do so. Some additional mixed evidence about uptake levels comes from two

other studies which only tangentially reported information about the issue. Specifically, in a study that will be reviewed in a later section, Loewen and Erlam (2006) reported a total of eight cases of uptake following eighty-nine recasts, or a very low rate of 9 percent. On the other hand, Tudini (2007) noted in passing that the forty-one recasts she found in her data showed a high level of immediate uptake (24, or 59%).

The issue of opportunity for uptake is in need of more systematic investigation in the future. In the oral mode, negative feedback episodes that offer learners no chance of uptake are notoriously common, particularly after recasts (Oliver, 1995). Iwasaki and Oliver (2003) suggest that such episodes may be rare in SCMC, since they found that only nine of ninety (or 10%) negative feedback episodes made uptake inappropriate or impossible in their transcripts. In contrast, however, Sotillo's (2005) data suggest they may be rather frequent, since about half of the corrections (33 or 51%) involved a topic continuation that made it impossible for the ESL learners to attempt uptake.

In the end, any conclusions about levels of uptake would be premature in the absence of studies pursuing a more direct comparison between SCMC and FtF and without knowing whether L2 SCMC researchers allowed for uptake to be counted when it happened in a delayed fashion, several turns after the correction, as may be typical of SCM discourse (Smith, 2005). The issue of uptake will be revisited from the perspective of L2 learning outcomes in the next section. First, however, I would like to consider monitoring, which is together with noticing a cognitive process by which attention to form may be achieved.

Monitoring as Self-correction in Text-based SCMC

Self-correction is a good indicator of monitoring during interaction (Kormos, 2000) and, although this area has been slow in attracting attention in the FtF interaction research, it appears ripe for future development (Buckwalter, 2001; Shehadeh, 2001). Among L2 SCMC researchers, the general consensus appears to be that real-time online interactions are likely to foster productive self-correction levels, but the available evidence is largely limited to in-passing observations.

For example, upon inspection of the students' use of the backspacing key, Pellettieri (2000) observed that "learners were doing a good deal of self-monitoring, as evidenced by their same-turn self-repair" and moreover that they "backspaced to make syntactic elaborations, thus pushing their utterances to a more advanced syntax" (p. 81). In her analysis of twenty-four chat sessions by four groups of advanced learners of Japanese, Kitade (2000) noted that a special form of self-correction arose, in which an explicit apology and the use of quotation marks marked the self-correction for the interlocutor, even several turns after the occurrence

of the error. Also adopting a qualitative analysis in this regard, Fiori (2005) discussed many examples of L2 Spanish chatters who had been asked to pay attention to certain grammar forms and engaged in lexical and grammatical self-correction, oftentimes accompanied by explicit linguistic or graphic markers, such as an apology or an asterisk. In her ninety-six chat sessions in learner-only group format, Lee (2002) reported fifty-five cases of self-correction, many of them involving gender and number agreement issues; and in her 120 sessions in learner-unknown L1 speaker data, Tudini (2007) found sixty-two cases. Sotillo (2005) attested only eleven cases of self-correction in eleven hours of dyadic interaction, but nevertheless considered it encouraging that such moves should be found among L2 users and in a chat environment. Clearer, comparative evidence has been contributed by Lai and Zhao (2006), who found that ten out of twelve participants self-corrected more often during SCMC interactions than during completion of the same task in the FtF oral mode.

More investigations of L2 SCMC and self-correction will be warranted in the future, particularly given the promise of key-stroke logging software that can help document all self-corrections as they occur during typing.

Probing L2 Learning Outcomes in L2 Text-based SCMC

Building on the insights of Gass and Varonis (1994), the second generation of the interaction approach, particularly since Mackey (1999), has probed the learning products of interaction in quasi-experimental designs. This work has now been synthesized in two meta-analyses (Keck, Iberri-Shea, Tracy-Ventura, & Wa-Mbaleka, 2006; Mackey & Goo, 2007), both of which have furnished robust cumulative evidence for the facilitative role of interaction with the learning of L2 grammar and vocabulary. The L2 SCMC literature has also begun to investigate the link between synchronous online interaction and L2 learning outcomes. To date, the L2 learning outcomes of L2 text-based online interactions have been probed in the areas of task-essential negotiation for meaning (Smith, 2004), collaborative episodes of negotiation of form (Shekary & Tahririan, 2006), and negative feedback (Loewen & Erlam, 2006). In addition to the gold standard of quasi-experimental design and, as Mackey, Gass, and McDonough (2000) pointed out, "[d]etailed longitudinal studies" (p. 491) provide a valuable alternative research strategy for the investigation of developmental benefits associated with interaction. To the best of my knowledge, this call has remained largely unheeded in the FtF literature, with the exception of Bitchener (2004), who inspected whether thirty L2 English learners showed knowledge of items that were negotiated on two tasks when they repeated the task one and twelve weeks later, and when

they took a tailor-made test three days later. As we will see, in the SCMC literature, one study has also pursued to link interaction and acquisition longitudinally (González-Lloret, 2008).

Quasi-experimental Evidence of L2 Learning Outcomes

In what is the first process-and-product study of L2 SCMC interaction, Smith (2004) examined whether online tasks designed to contain eight new words evenly split among two members of a dyad would result in negotiations of meaning during the interactions that could then be associated with gains in vocabulary knowledge. The study was conducted over a five-week period, in four sessions involving thirty-minute jigsaw and decision-making tasks that were seeded with eight new words each. The total of thirty-two relatively unknown words had been generated through a pretest. They were all concrete nouns, such as *goat*, *binoculars*, *raccoon*, and *barn*. The twenty-four L2 chatters were posttested immediately upon completion of each chat session on the words they had used in that session, both receptively and productively, and a delayed posttest was also administered seven days after each session. Subsequently, scores on all posttests were adjusted for the words that each individual had actually reported as unknown on the pretest. The process analyses of the transcripts revealed that these learners dealt with the seeded new words in three ways: (a) a total of forty-three times the two interlocutors negotiated over the new item by issuing a clarification request; (b) a total of twenty-three times the learners holding a particular piece of information preemptively explained the word to their partners (presumably in anticipation that it would be unknown for them); and (c) unknown vocabulary items were ignored almost about the same number of times as they were negotiated (38% of the time). As already mentioned, uptake in the immediate next turn, as the construct is traditionally defined, occurred only seven times and was therefore minimal, regardless of whether learners had negotiated or preempted trouble with the new item. The product analyses of the test data revealed that learners were able to demonstrate new knowledge of the target vocabulary immediately after the SCMC sessions, and also that the items which had been negotiated online exhibited large average gains that were superior by about 10 percent over the average gains showed on items treated preemptively. The learning advantage was even greater over the items that had been ignored. The differences were statistically significant for most sub-comparisons. Only for the negotiated items were these gains sustained over the seven-day interval of the delayed posttest. Smith concluded that "there is robust evidence that negotiated interaction helped facilitate initial steps in the acquisition of word meanings for the target items embedded in the tasks, at least in the short and middle term" and, more generally, that

"negotiated interaction leads to a heightened degree of attention not afforded when the same or similar input is provided in a preemptive format" (p. 386).

In a follow up analysis of the same data, Smith (2005) investigated more specifically the relationship between uptake during the SCMC interactions and gains in the vocabulary posttest scores. He found that uptake levels were actually higher than initially thought, once he included uptake moves that occurred several turns after the correct word form had been offered by the interlocutor. Including delayed moves, the rate of successful uptake was larger than in other SCMC studies (28 instances or 42.4% of all cases). Yet, no relationship was found between uptake and gain scores on any of the vocabulary posttests employed. Disappointed by the results, Smith called into question the role of uptake in SCMC.

A second study by Shekary and Tahririan (2006) investigated LREs in the chat interactions of eight dyads of college students of English as a foreign language in Iran. The researchers asked whether the L2 participants would be able to show evidence of some learning of the items treated in the LREs on tailor-made posttests, which were administered one-on-one to the students one to five days after the SCMC interaction and again three weeks later. The researchers analyzed over 125 hours of SCMC interaction elicited via dictogloss, jigsaw, and free discussion tasks carried out within the span of a month. Shekary and Tahririan reported a very high occurrence of LREs which focused on a range of language issues, including vocabulary and grammar. The average number of LREs per dyad was ninety and ranged from thirty-eight to 144 LREs contributed by any given dyad, yielding a very large corpus of 718 LREs for analysis. They found that on the posttests most learners had forgotten only a fourth of the LRE items when tested one to five days later and still remembered over half of them three weeks later. Using a logistic regression analysis, they reported that the best predictor of posttest performance was successful uptake, a finding that conflicts with Smith (2005). However, the context for the SCMC interactions may have been markedly different from that usually assumed in many other studies, judging from the researchers' explanation that the students "often saved each other's errors, reflected on them, revised them, and refreshed their memories by rereading previous comments. Then, at the end of each task, or even in the next task, they exchanged their views and opinions about each other's errors and established their dominance over each other" (p. 569). In addition, insufficient details are reported about the design. For example, it is impossible to know how many tasks or sessions each dyad participated in, how sessions were scheduled, or the amounts of both time-on-task and language that resulted per dyad, task, or session. The absence of such information precludes a full evaluation of the findings.

Loewen and Erlam (2006) conducted a partial replication of an FtF

study of teacher-delivered negative feedback by Ellis, Loewen, and Erlam (2006). They randomly assigned thirty-one beginning-level English learners (who were enrolled in four intact classes in a private school in New Zealand) to one of three conditions: online recasts on any regular past tense errors made, online explicit metalinguistic feedback on the same structure (in the form of comments like *be sure to use the past tense*), and test-only control. All students completed a twenty-three-item grammaticality judgment task once in an untimed and once in a timed fashion, and the same testing procedure was completed as a pretest, an immediate posttest, and a delayed posttest two weeks after the treatment. The two feedback groups participated in two information-gap tasks on chat rooms in small groups (two chat rooms with five or six students per condition). The providers of the two negative feedback treatments were the researchers, who acted as moderators in the chat rooms and delivered both types of treatments to a different chat room each. The tasks were based on pictures and required the exchange of narrative information that made the use of regular simple past tense essential in Loschky and Bley-Vroman's (1993) sense. They elicited between thirty-four and seventy uses of past tense by any given chat group, of which between 38 percent and 55 percent were nontargetlike. Between 69 percent and 100 percent of these errors elicited negative feedback from the researcher-moderator in a given chat room. No accuracy gains on the simple past tense were observed for either the recast or the metalinguistic feedback condition. Loewen and Erlam identified the non-sequentiality of SCMC as a plausible explanation for their null results (the other one being that the structure may have been too difficult for these beginning-level learners). They stressed that the disorderly turn-taking typical of SCMC may have rendered their researcher-delivered online feedback ineffective, as the error and its treatment were greatly displaced. Without disagreeing with the researchers, and precisely because SCMC makes it difficult for the teacher to maintain control over the interactions (and particularly in large-group formats), one wonders how many teachers would choose SCMC activities as a pedagogically appropriate environment in which to implement systematic error correction with their students.

Longitudinal Evidence of L2 Learning Outcomes

In a rare longitudinal SCMC study of L2 learning outcomes, González-Lloret (2008) replicated the findings reported by Belz and Kinginger (2002) for asynchronous CMC and extended them to text-based SCMC. She did so by investigating the development of formal and informal address terms (*tú/vosotros*) in eight chat sessions conducted between second-year Spanish students and native-speaking peers in Spain. They chatted outside class time during a ten-week project that involved authoring an itinerary for a

trip. She documented critical incidents between Vero, a female L2 Spanish chatter, and A_m, her male L1 Spanish chat-pal. In these critical incidents, A_m explicitly and energetically rebuked Vero and other L2 chatters for choosing the formal *you* during chat exchanges, writing, for example: *no me digais señor :), solo tengo 18 años* ("don't call me sir :), I am only 18 years old") and *me enfadare como me volvais a decir usted!!!!!* ("I am going to get angry if you call me 'usted' again!!!!!"). This very explicit, although not particularly frequent, provision of negative feedback contributed to Vero's learning of the appropriate usage of the Spanish markers for informal and formal addressivity (e.g., *tú/usted*), as shown in her non-linear but eventually complete abandonment of the formal-you markers by the end of the ten-week observation period. González-Lloret provided evidence that rare but salient negative feedback episodes issued by L1 interlocutors who are peers can result in sustained L2 changes in the subsequent production of L2 chatters. Tudini (2007) also documented several instances in which native speaker chatters explicitly corrected L1 Italian learners on their use of *lei/tu* Italian terms of address (e.g., *e dammi del tu ti pare? // non ho 351 anni*; "and use 'tu' do you mind? // I'm not 351 years old"). Therefore, the question is not whether such pragmatic corrections happen on SCMC, as they clearly do. Rather, what is of crucial interest is whether such attested rare events (Nelson, 1981) can have a durable impact on subsequent L2 use, in either the CMC or the FtF mode. Thanks to her longitudinal design, González-Lloret was able to provide evidence of precisely this sort of lasting L2 benefit in the SCMC mode.

Work in the field of information and communication technologies by Walther (1994; see also Ramirez, 2007) suggests that the element of anticipation of future interaction, or knowledge that an encounter online will be sustained over the long term, is a key feature of virtual interactions that can systematically affect interlocutors by making them more inclined to invest extra time and effort at cultivating relationships online. The anticipation and fulfillment of long-term repeated interactions online was an important feature shared by participants in both the synchronous (González-Lloret, 2008) and asynchronous (Belz & Kinginger, 2002) longitudinal studies, and it may help explain the significance attached by these interlocutors to the use of appropriate terms of address. Oskoz (2005) also found clear instances of peers assisting each other with the identification and correction of grammatical errors, although her study was not designed to document learning gains. The interactions occurred in the context of regular encounters between L2 Spanish interlocutors who completed a series of varied tasks, with the dyad members kept constant over time. Thus, in future L2 SCMC research it may be important to gauge longitudinally the impact that the anticipation and fulfillment of future interaction exert on the learning

potential of real-time, online exchanges that have been designed for the purpose to foster L2 learning.

Conclusion

While in several areas this review revealed that much progress has been made in the research domain, in several other areas only mixed findings or insufficient evidence were found. Therefore, the accumulated evidence contradicts euphoric assertions about the benefits of L2 SCMC for interaction and attention to form that are routinely made in the literature and, instead, suggests the need for temperance and more research. I would like to conclude with a summary of the reviewed evidence, followed by some thoughts on areas that may be particularly deserving of future research.

First, although the architecture of interactions during L2 text-based SCMC is broadly comparable to that of L2 FtF interactions, SCMC interactional episodes are uniquely characterized by multiple-turn delays typical of split negotiation routines and by a great degree of explicitness in the marking of communicative trouble. How exactly these distinguishing features of text-based SCMC interaction may affect L2 learning opportunities is a pending question that awaits systematic empirical investigation.

Second, and contrary to repeated assertions, L2 text-based SCMC is not inherently superior to FtF as a site for interactional modifications, at least in terms of sheer amount. Negotiation for meaning appears to be highly variable in L2 text-based SCMC. While very dense negotiation levels ranging from 10 percent to 34 percent of all turns has been found in six studies, very low levels of negotiation, often from no instance to little more than one or two cases per chat session, were found in many others, including studies with or without a direct comparison to FtF interactions, with SCMC interactions that unfolded in second and in foreign language contexts, in and outside of the classroom, and in dyads, small groups, or whole-class online formats. The findings are equally variable with respect to the provision of negative feedback in L2 text-based SCMC. A very low incidence of implicit or explicit corrective moves has been reported in several studies involving teachers (Fiori, 2005), native speakers (Iwasaki & Oliver, 2003; Tudini, 2007), or learners (Lai & Zhao, 2006), whereas higher levels of negative feedback have been attested in two other studies (Lai, Fei, & Roots, 2008; Sotillo, 2005).

Less research has inspected evidence that would be directly relevant to the hypothesized amplification of attention to form in SCMC and the documentation of noticing and monitoring during real-time, online interactions. Only two studies have been designed to probe issues of noticing via stimulated recall (Lai, Fei, & Roots, 2008; Lai & Zhao, 2006) and one of them has also directly inspected self-corrections as a measure of

monitoring (Lai & Zhao, 2006). Only three studies have directly reported on uptake (Iwasaki & Oliver, 2003; Smith, 2005; Sotillo, 2005). Any conclusions about noticing or monitoring would be premature in the absence of sufficient numbers of studies pursuing a direct comparison between the SCMC and FtF modes and featuring more comparable tasks and participation formats (e.g., group size, presence or absence of the teacher, and so on).

Other evidence about SCMC as an amplifier of attention to form comes from a small number of studies that have probed the L2 learning outcomes of synchronous online interactions. There is firm evidence that L2 SCMC can be designed to foster the learning of vocabulary (Smith, 2004) as well as grammar (Shekary & Tahririan, 2006). However, the status of uptake as a reliable predictor of such learning remains controversial, with directly conflicting findings in this area reported by Shekary and Tahririan (2006) versus Smith (2005). Likewise, positive learning outcomes were documented longitudinally when negative feedback on an aspect of L2 pragmatics was provided by native-speaking peers in the context of prolonged interactions online (González-Lloret, 2008), but null findings were reported by Loewen and Erlam (2006) for the effectiveness of teacher-provided negative feedback on an aspect of grammar in the SCMC mode.

Overall, the studies available at present are insufficient in number and inconsistent in design and focus, and thus preclude firm conclusions. The only safe generalization that can be made is that the evidence is encouraging in some respects, but also fraught with empirical and theoretical ambivalence that awaits elucidation in future research programs.

A first priority for future research is to explain the highly variable levels of interactional modifications (i.e., negotiation for meaning and negative feedback moves) attested across the extant L2 SCMC studies. The interaction approach literature has only indirectly discussed the density of negotiation for meaning and negative feedback work that may be critical or optimal for interactions to foster L2 learning, whether in the FtF or the SCMC mode. Some researchers (e.g., Foster, 1998) have leveled criticisms against the interaction approach based on the observation that negotiations are scarce in certain FtF contexts and studies, while scholars working within the approach have repeatedly noted that with interaction quality may be more important than quantity (e.g., Mackey & Oliver, 2002; Oliver, 1995). The findings reported by González-Lloret (2008) suggest that the latter stance has some merit and that future research on interaction in text-based SCMC may have to look for L2 learning benefits in the salience and meaningfulness of a few episodes as much as in the provision of many, nonsalient, and personally non-consequential ones. The virtues of adopting longitudinal designs for such a research program are obvious, and they become augmented by the observation made by

Gass and Varonis (1994) and later by Mackey (1999) that the effects of interaction may be lagged and that it may be necessary to adopt a wide-time window in order to properly document the learning outcomes of interaction.

Another source of explanation for the variability observed may be related to systematic variables of the context of SCMC. Over her career, Susan Gass has investigated the effects that such contextual variables may exert on the amount and quality of interactional modifications, including type of interlocutor, type of task, gender, and degree of experience of teacher interlocutor (Gass & Varonis, 1985a, 1985b, 1986, 1989; Plough & Gass, 1993; Polio, Gass, & Chapin, 2006; Varonis & Gass, 1985). There is good reason to suspect that variables of the context are extremely important in SCMC as well. For example, other things being equal, task-based SCMC may induce larger amounts of negotiation for meaning than open-ended discussions, particularly when the tasks are designed to call for the essential or at least useful use of particular L2 forms (Pellettieri, 2000; Smith, 2004). On the other hand, online interactions over time with the same interlocutors jointly collaborating on long-term projects may also enhance the quality of interactions (González-Lloret, 2008; Kötter, 2003; Toyoda & Harrison, 2002), because they entail the anticipation of future interaction and encourage virtual interactants to view the exchanges as relational encounters and invest in them. One-time, casual encounters may not encourage the same levels of investment in the online interactions. The wider context may also be important, considering, for example, that SCMC interactions can vary dramatically when they involve instruction-like activities carried out by interlocutors who are all learners known to one another and physically gathered in the same physical location (Lee, 2001, 2002), or when they ensue with unknown interlocutors in public chat rooms (Tudini, 2003, 2007). Other important variables of the communicative SCMC context are likely to be the number of interlocutors who jointly interact online (e.g., dyads versus small groups versus whole-class, and groups of varying sizes) and the presence or absence of the teacher as interlocutor. In order to be able to investigate the relationship between any such variables and the amount and quality of L2 interactional modifications online, researchers will need to adopt designs with comparable FtF conditions and to strive to take group composition, task, topic, and context into account.

A second promising area for future research is the investigation of noticing during online interactions. Lai and her colleagues (Lai, Fei, & Roots, 2008; Lai & Zhao, 2006) have demonstrated that it is methodologically feasible to gather stimulated recall data in L2 SCMC studies. More researchers should follow their example and fully extend the program initiated by Mackey, Gass, and McDonough (2000) to SCMC investigations of L2 interaction. With regard to the value of uptake in

SCMC as a measure of noticing and a predictor of learning, Smith's (2005) pessimistic conclusions may be premature. For one, it is interesting that the findings in this area reported by Shekary and Tahririan (2006) are radically different, despite the fact that the two studies are essentially in agreement in terms of the immediate and delayed posttest benefits of SCMC interactions. On the other hand, that uptake should yield conflicting evidence is not surprising, given that similarly conflicting results have been found in several FtF studies as well. Thus, the results reported by Mackey, Gass, and McDonough (2000) and Loewen (2005), for example, lent some support to successful uptake as an important indicator of noticing and learning, respectively, but the results reported by Loewen and Philp (2006), Mackey and Philp (1998), and McDonough and Mackey (2006) suggested that uptake may not be a reliable indicator of subsequent learning. McDonough and Mackey, specifically, have proposed syntactic priming (a construct imported from the L1 psycholinguistic literature: see Ferreira & Bock, 2006; Pickering & Garrod, 2004) as an alternative to uptake. They argue that "productively using a form in one's own way a short time after hearing it, rather than immediately repeating or mimicking it, is associated with development" (p. 709). Syntactic priming is a new interesting construct in the interaction approach that awaits investigation in L2 SCMC environments. In addition, the variable of working memory is increasingly emerging as an important moderator of noticing not only in FtF interactions (Mackey, Philp, Egi, Fujii, & Tatsumi, 2002; see also several contributions in Mackey, 2007) but also in the SCMC mode, judging from the findings reported by Lai, Fei, and Roots (2008; see also Payne & Ross, 2005).

Finally, a third fruitful area for future research is whether SCMC interactions are equally suitable for the fostering of attention to grammatical as well as lexical aspects of the L2. The tendency for SCMC to revolve around L2 vocabulary has been repeatedly noted across studies since Blake (2000) first mentioned the issue explicitly. The same "negotiate-over-lexis-first" principle has been found in many FtF studies, particularly those conducted in second language contexts (Pica, 1994; Williams, 1999). There is, however, suggestive initial evidence that text-based SCMC may fare better in this area than FtF interaction does. It is possible that, with some external pressure to attend to form, learners can take fuller advantage of freed-up available cognitive resources to attend to grammatical form, perhaps aided by the slower processing demands and the visibility and permanence of the texts. Thus, for example, a comparison of the results reported by Tudini (2003, 2007) shows a considerable increase in grammatical focus during the same kinds of interactions. In the 2003 study the majority of negotiations were lexical (k=30 or 61%, as opposed to only k=14 or 29% on grammar), whereas in the 2007 study as many grammatical as lexical negotiations were found (82 or

35.35% in each case). This intensification of the grammatical focus may be in part related to the fact that in the 2007 study an element of explicit encouragement to focus on the language was added to the chat room assignment. Evidence of this was, for example, the assessment rubric given to students for this assignment, which included several criteria that emphasized language learning (e.g., "ability to make use of native speaker's knowledge by improving language during chat session", p. 601). Future studies could be designed to inspect the differential L2 learning outcomes of SCMC for lexis versus grammar. This move would be particularly interesting in light of Mackey and Goo's (2007) recent suggestion that effects of FtF interaction pattern differently on lexical versus grammatical L2 learning, with lexical benefits possibly being more immediate and grammatical benefits likely requiring some lag time to consolidate themselves. As Gass (2003) has warned, despite the many empirical accomplishments of the interaction approach, it is still uncertain whether L2 interaction may be differentially effective for learning "different parts of language" (p. 248). This is true for SCMC as much as for FtF, and research on online L2 interactions can contribute knowledge that helps elucidate this important question.

New generations of young people in the United States and in other parts of the world have grown up with a range of communication technologies (Mcmillan & Morrison, 2006; Prensky, 2001), and many show a marked affinity for synchronous CMC over asynchronous alternatives (Thorne, 2003). These sociological trends make the inclusion of SCMC in contemporary language classrooms no longer a choice, but rather a necessity and even an ethical imperative, if we are to be educationally responsive (Ortega & Zyzik, 2008). In such changing and technologized educational contexts, much more research will need to examine the innovative potential that has opened up with real-time, online L2 interactions as an additional site for L2 learning. The seminal work generated by Susan Gass over her long and fruitful career, and the theoretical and empirical legacy of the interaction approach that she has been so influential in forging, will no doubt remain central forces in sustaining and strengthening research on L2 SCMC interactions for many years to come.

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EPILOGUE: EXPLORING THE INTRICACIES OF INTERACTION AND LANGUAGE DEVELOPMENT[1]

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This volume reflects the many directions that work deriving from the original interaction hypothesis has taken. This epilogue seeks to explore some of these directions and consider future prospects, taking the chapters here as the primary illustration of these possibilities. One of the major challenges for future research is that understanding the complexity of interaction and L2 development requires resolving the interrelation between the cognitive, social/affective aspects of learning by using language with others.

Recent reviews of interaction (Gass, 2003; Gass & Mackey, 2006, 2007; Mackey, 2007; Mackey & Gass, 2006) have pointed out the tremendous changes to research within this area: the successive unfurling of insights and understandings about interaction and L2 development over the past forty years. Initially, interaction research was characterized by descriptive work, distinguishing features of interaction, and exploring *why* these features might facilitate L2 learning (e.g., Hatch, 1978; Long, 1983, 1985; Pica, 1992, 1994; Pica, Doughty, & Young, 1986; Swain, 1985, 1995). Later research has filled in some of the gaps, exploring effects of different variables on features and outcomes of interaction, including factors of gender (Gass & Varonis, 1985; Mackey, 2007; Oliver, 2002; Pica, Holliday, Lewis, Berducci, & Newman, 1991; Ross-Feldman, 2007); age (Oliver, 2000); proficiency (Iwashita, 2001); interlocutor familiarity and patterns of interaction (Plough & Gass, 1993; Storch, 2002); targeted form (Iwashita, 2003); and task types (for a review see, R. Ellis, 2003). Building on these findings, further research sought to empirically establish direct links between interactional modifications and L2 development of specific target features (e.g., Mackey, 1999; see Mackey & Goo, 2007). Most recently, establishment of these links has led to explorations of how these processes work (e.g., Doughty, 2001; Gass, 1997; VanPatten, Williams,

Rott, & Overstreet, 2004). Thus, current interaction research seeks to explain the cognitive processes involved in L2 learners' comprehension, processing, and use of language, including how learners make sense of input, recognize novelty or anomaly of form, and manipulate language to express meaning. It explores how the learners' noticing of form connects with and alters existing explicit and implicit knowledge, leading to reformulation of a developing system of L2 grammar and use. Explanations of these processes and the potential of input and interaction for learning have chiefly focused on learner internal capacities, particularly attentional resources (Gass, 2003; Long, 1996; Mackey, 2007).

It is tempting, for the sake of simplicity, to leave the brief synopsis at that. Yet this does not reflect the way interaction has been woven into the backdrop of other developments in SLA research. Links have been forged between interaction and research on: tasks (Bygate, Skehan, & Swain, 2001; R. Ellis, 2003); L2 knowledge (DeKeyser, 2005; R. Ellis, 2005); form-focused instruction (e.g., R. Ellis, 2001; Fotos & Nassaji, 2007; Lightbown, Spada, & White, 1993; Long & Robinson, 1998); individual differences (e.g., working memory: Mackey, Philip, Egi, Fujii, & Tatsumi, 2002; Sagarra, 2007; Tromfimovich, Ammar, & Gatbonton, 2007), and Vygotskian approaches to understanding interaction (e.g., Donato, 1994; Ohta, 2001; Storch, 2002; Swain, 2005). The scope of interaction research has grown enormously. It has included not only a major focus on cognitive factors, particularly attentional resources, but also a challenge to make social aspects of interaction more central in theory. Interaction research has also become more closely linked to research in instructed language learning. Each of these areas is represented in this volume.

In a review of interaction research, Gass and Mackey (2007) refer to the interaction approach, rather than simply the interaction hypothesis (see Block, 2003; Jordan, 2005). This reflects advances in the modeling of input, interaction, and L2 development (Gass, 1997), based on the wealth of theoretical support and empirical evidence for the interaction hypothesis itself, for Swain's output hypothesis, and for the centrality of attention (see Mackey, 2006). The broadening of the scope of inquiry is matched by greater use of cross-disciplinary resources in theory, methodology, and research instruments (Mackey, 2006; Mackey & Gass, 2006). In turn, this is accompanied by a call, in SLA generally, for more principled use of research instruments and analysis with regard to ethical use, dependability, generalizability, and validity (Chalhoub-Deville, Chapelle, & Duff, 2006; Norris & Ortega, 2003; Polio & Gass, 1997; Read, 2007). These methodological and theoretical advances, many of which are demonstrated by the chapters in this book, have made it possible to consider alternative ways of getting at key issues surrounding the role of input, interaction, attentional resources, and output for L2 learning, as I will describe in this epilogue.

Perhaps the biggest task for future interaction research is to take up the challenge to account for the contribution of learner internal factors on the one hand, and the contextual factors (physical, social, and pedagogic) of interaction on the other. In this chapter, I explore three areas that characterize aspects of interaction research found in this volume: cognitive processes, social perspectives, and instructional contexts of interaction, and for each one discuss potentials for future research. In this, I highlight the diversity within the interaction approach.

Cognitive Processes

Cognitive approaches to understanding interaction-driven SLA are considered by many as part of the mainstream of SLA research. This research has provided fundamental models for researching and describing the role of interaction, and particularly for describing processes of learning within an interaction framework (for review see Mackey, 2007). Ellis's chapter in this volume provides us with an account of the psycholinguistic processes of language acquisition, explaining associative and cognitive processes for L2 learning and how they relate to interaction and L2 learning. His reflection on changes within cognitive research on psycholinguistic processing resonates with similar moves in our field, and reminds us of the necessity of cross-disciplinary work in order to deepen our understanding of how interaction promotes L2 development. This clearly necessitates an understanding of learning in general, including the place of attention, which researchers such as Schmidt (1990, 1993, 1994, 1995, 2001) and Gass (1997, 2003) have foregrounded as essential. One of the many contributions Susan Gass has made, and continues to make, to our understanding of the relationship between interaction and second language development has been to highlight the critical role that noticing plays. As she (Gass, 1997) notes:

> The input-interaction view must take the position that noticing is crucial. In negotiation the learner is focusing on linguistic form, and that focus, or specific attention paid to linguistic form, is the first step toward grammar change (p. 101).

The recognition of the centrality of attention (Schmidt, 2001) is reflected in much of the current literature, including interaction and instructed language learning research. Although disagreement remains on issues of operationalizing awareness, noticing, and attention, and on the necessity of awareness for intake (e.g., Gass, 1997; Leow, 1998; Robinson, 1995; Schmidt, 1993; Simard & Wong, 2001; Tomlin & Villa, 1994; Truscott, 1998; Wong, 2001), this work has helped to provide a more principled

approach to researching and explaining L2 processes in interaction (e.g., Doughty, 2001; Gass, 1997; Long, 2007).

Empirical research that has examined attention to form and meaning through interactional discourse suggests an intricate layering of interrelated factors that constrain noticing, including: working memory capacity (Mackey, Philp, Egi, Fujii, & Tatsumi, 2002); the frequency and saliency of a form (Gass & Mackey, 2002); language domain of the targeted form (Gass, Svetics, & Lemelin, 2003; Mackey, Gass, & McDonough, 2000); level of language proficiency or prior L2 knowledge of the learner (Philp, 2003); orientation (Robinson, 1997); task complexity (Robinson 1995, 1996; Rosa & O'Neill, 1999); and relevance and contiguity of the discourse for the learner (van Lier, 1994). Further research in these areas will continue to refine our understanding of what we mean by attention and how it interacts with cognitive, social, and linguistic factors. This will require both careful empirical research on individual variables, as well as studies of interrelationships between variables. As we have seen historically in SLA research, the way forward here may be illuminated by referring to research from other disciplines (Mackey & Gass, 2006), particularly in cognitive psychology (see Ellis, this volume); educational psychology (see Berk, 2006; Bronfenbrenner, 1979), and sociology (see Tarone, this volume). For example, Ellis (2006) looks to associative learning theory, including factors such as contingency, competition between multiple cues, and salience, in order to explain why certain linguistic forms are typically not adopted or used routinely by some L2 learners.

Similarly, sub-disciplines of SLA research continue to support promising avenues for research. For example, individual difference research provides models and instruments for particular constructs that are relevant to interaction research (e.g., aptitude [Robinson, 2005], motivation [Dornyei, 2001; Gardner & Tremblay, 1994], working memory [Conway, Kane, Buntin, Hambrick, Wilhem, & Engle, 2005; Miyake & Friedman, 1998] and willingness to communicate [MacIntyre, 2007]). Making use of such research tools, recent studies have explored the possibility of differential benefits of interaction according to individual difference factors. A case in point is studies that have investigated the relationship between working memory and noticing of interactional feedback (Mackey et al., 2002; Sagarra, 2007; Tromofimovich, Ammar, & Gatbonton, 2007). Further theoretical and empirical work on language cognition and L2 knowledge is essential to developing a plausible theory of interaction and L2 learning (Ortega, 2007a).

Social Perspectives

Another way forward for interaction research is towards uniting social and cognitive perspectives (Batstone, in press). As Ortega (2007a) notes

(in a discussion of the differential experience, variability of L2 processes, and heterogeneity of success among learners), we need to pay more attention to context and, in particular, recognize learner experience as something that is "lived, made sense of, negotiated, contested, and claimed by learners in their physical, inter-personal, social, cultural, and historical context" in order to "achieve a balance between linguistic, cognitive, psychological, and social explanations in our theories" (p. 248). To date, interaction research has tended to be parsimonious in description of participants, setting, and the wider discourse context of interaction (Batstone, 2007; Block, 2003). Ortega (2007b), in discussing how task-based language learning research might take "social context seriously", suggests that, in addition to contextualizing the research (Duff, 2006), adopting cross-disciplinary approaches offers possibilities, including use of systemic-functional linguistics, Vygotskian theory, dynamic systems theory, language socialization, language identity, and conversational analysis. These suggestions hold for interaction research generally. Two chapters in this volume (Brooks & Swain, Bygate & Samuda) illustrate incorporation of social aspects of interaction in theory and research design, as discussed below.

Ellis (this volume), while clearly taking a cognitivist approach, also acknowledges the inherently social nature of interaction. He uses the term "socially gated" to indicate the ways in which, within interaction, attention is always mediated by the learners' experience. As he notes, with respect to making sense of the meaning of linguistic form, "[e]mbodiment and social interaction is crucial to the learner's realization of the intended construals of situations, and hence of the proper interpretations of linguistic signs" (p. 20). Gass (1997) similarly recognizes this in her discussion of apperception of input as a first step to intake: noticing is mediated by the learner's prior knowledge and experience (both cognitive and social). This hints at the point of contact between the cognitive and the social, treated separately in the literature but inseparable in reality. Connections between meaning and form occur in and through the social context of interaction because language is contextualized by the interlocutors themselves, the environment and context (temporal and physical) in which they speak, by their facial and gestural expressions, and by their linguistic choices. As a consequence, certain interpretations of language become more likely than others, and certain elements are foregrounded or become more salient than others. Recent studies have begun to explore this through the use of introspective techniques such as stimulated recall for eliciting participants' perceptions of recent exchanges, particularly corrective feedback (e.g., Mackey, Al-Khalil, Atanassova, Hama, Logan-Terry, & Nakatsukasa, 2007). As Mackey and Philp (forthcoming) note, the use of stimulated recall opens up a range of possibilities, from a very focused and restrictive elicitation of learners' perceptions of a particular

incident in a given discourse to more open elicitation of reflections on a given incident, within the context of that discourse, including perceptions of relationships between participants, of the task itself, and of the expectations of self and others for the activity.

Just as Ellis (this volume) expands our understanding of interaction and its role in SLA by providing a psycholinguistic account of L2 processing, particularly attentional processes, Tarone's chapter reminds us that sociolinguists have long since recognized interaction as a central construct, and that the discipline has much to offer to our understanding of the complexity of interaction and SLA. Tarone points towards future developments in interactionist research, including the importance of carrying out research among populations with varying educational experiences (see also Ortega, 2007b), the need to improve generalizability through replication studies, and the recognition of the impact of the social context on the essential nature and effect of interaction. To illustrate this she cites Tarone and Liu's (1995) study of L2 acquisition by a young child, in which both time and interlocutor appear to affect emergence of developmental forms in the child's production. Tarone demonstrates the need to evaluate acquisition through samples of language produced by the learner interacting with different interlocutors and in different contexts. Batstone (in press), commenting on this research, suggests it demonstrates the interdependence of cognition and social context, as the child adjusted what he chose to say, how he chose to say it, and the roles he allowed the interlocutor to play. This interdependence of cognition and social context is evident in studies of children in school settings (Cekaite, 2008; Philp & Duchesne, 2008). For example, in a study of the potential benefits of peer interaction for the L2 development of a six-year-old child during her first few months of school, Philp and Duchesne (2008) drew on work by developmental researchers who argued that peers both contribute to and are a context for social, cognitive, and linguistic development (e.g., Hartup, 1996; Newcomb, Bukowski, & Bagwell, 1999). They suggested this provided insights into peer interaction for child L2 learners: such interaction provides both a source of L2 input and the context in which to use it, "helping her to be a language partner and to take her place in the classroom" (p. 95). Peer interaction was the means to fulfilling social goals of affiliation and peer acceptance and impacted on the child's future opportunities for interaction, and thus for L2 learning.

Tarone's chapter also demonstrates the contribution of cross-disciplinary thinking to broaden research of key constructs. For example, citing Bell's work, she explains that attention can be seen as a socio-cognitive process, directed by social (and other) factors such as "audience." Many of Tarone's points concerning variation and context resonate with the nature of language learning data. How many of us have not

recognized with interest individual differences between learners *and* variability in any individual learner's language use according to the immediate linguistic and social context? Yet, these insights are often necessarily put aside in the writing up of research in the interests of clarity and brevity when the focus is on L2 development (Gass, 1998). Along with others (Block, 2003; Firth & Wagner, 1997), Tarone suggests that interactionist work would benefit from including these social aspects more centrally in our research questions and designs, suggesting that interactionist researchers need to "expand their theory to take account of [social context] and to more systematically control and manipulate social contextual variables" (p. 43). This would lead to alternative ideas and directions for future interaction research based on a variationist perspective, and an overall broadening of the interaction approach.

In order to make generalizations about interaction and L2 development, or to differentiate on the basis of context and participants, as Spada and Lightbown's (this volume) overview of interaction research over the past forty years suggests, there is an obvious need for replication of studies of the nature and outcomes of interaction with underrepresented populations (Tarone, this volume). Oliver's research (this volume) with child L2 learners exemplifies this. As Oliver points out, work with younger children (5–7 years) is underrepresented within interaction research. This is surprising, given that many of the roots of interaction research reside in child L1 and L2 data: for example, see research by Baker & Nelson (1984); Farrar (1990, 1992); Nelson (1987); Wagner-Gough & Hatch (1975) (see Philp, Mackey, & Oliver, 2008). Oliver's comparison of interaction among children across age groups suggests that, although there are intriguing similarities between child learners of different ages, for example, in terms of negotiation for meaning, there are also differences, particularly with regard to the strategies they use, which in turn reflects their level of psychosocial development. Due to consistent definition and operationalization of interactional features, Oliver is able to compare results of the group of 5–7-year-olds with previous research (see Spada and Lightbown, this volume). Work such as this suggests that age, as a factor in the nature and outcomes of interaction for learners, warrants more attention. Examples from Tarone (this volume) suggest literacy to be another. In order to consider interrelationships between social and cognitive factors, it is clearly necessary for interaction research to plumb a greater diversity of contexts and participants.

Interactions Between Social, Cognitive, and Individual Factors

One avenue for researching interrelationships between social and cognitive factors is through investigations of individual difference factors. As

noted above, this research area also offers a source of methodology for investigating questions related to interaction and L2 development and the interrelationships between variables. Dörnyei and Tseng (this volume) provide an illustration of this. They present a model of task engagement, and clarify learner motivation and the "mediating role of appraisal in the learners' interactional competence" (p. 117).

Using structural equation modeling, they are able to interpret the relationships among variables of task execution, appraisal, and action control, and to test hypothesized cause–effect relationships. Interestingly, their analysis allowed for group comparison, so that they could test differences between novice and expert learners, which in turn led to a more complex understanding of the dynamics of the task-motivation process. They suggest, in conclusion, that task motivation may be tied to learners' attentional resources; successful appraisal may be mediated by noticing.

L2 Development

At the core of interaction research is the claim that individual learners develop language through interaction (e.g., Hatch, 1983). However, L2 development has tended to be seen in terms of an "acquisition metaphor" (Sfard, 1998, p. 6), that is, something empirically measureable in performance *after* rather than during interaction, typically through uniform pre-designed pre- and posttests, with quantifiable changes over time—a day, a week, two weeks, six weeks after the interaction happened.

This is one area that has seen much change over recent years, with sociocultural approaches challenging the ways in which we consider L2 development and evidence of learning. Similarly, in the education literature Sfard (1998) points out that *learning*, formerly seen in terms of "development of concepts" and "acquisition of knowledge", has moved to being seen as "an apprenticeship in thinking" (Rogoff, 1990, cited in Sfard, 1998, p. 6), an activity rather than a state, involving primarily participation (rather than accumulation of concepts or knowledge). This "participation metaphor" (Sfard, 1998, p. 6) is reflected in SLA literature. For example, Swain and Lapkin (1998) propose that "what occurs in collaborative dialogues *is* learning. That is, learning does not happen outside performance; it occurs *in* performance. Furthermore, learning is cumulative, emergent, and ongoing, sometimes occurring in leaps, while at other times it is imperceptible" (p. 321, emphasis in the original). They clearly view learning as dynamic, ongoing activity (see Batstone, in press, for further discussion).

Brooks and Swain (this volume) focus on this process of learning through collaboration, and characterize it in terms of changes to the zone of proximal development, using individualized tailor-made tests in order to see links between interaction and change. Although this latter

technique has been successful in capturing outcomes of specific interactional modifications or exchanges about a particular form (Adams, 2003; Loewen, 2005; Nabei, 2003; Swain & Lapkin, 1998, 2001, 2002), the issue of prior knowledge, new knowledge, performance error, and acquisition is problematic (Long, 2007). In this study, Brooks and Swain are able to match initial written collaborative attempts with each learner's subsequent ability to self-correct the same written work one week later. By maintaining the same task output, they are able to establish, to an extent, differences between early and later production. A further step would be to examine transfer of knowledge through a written production task similar to the original written task. Still another alternative to capturing this participatory aspect of learning, represented in sociocultural research, has been the analysis of co-production, with a focus on the quality or character of the joint contribution of all participants in the conversation, for example, with regard to the amount and nature of assistance offered by the interlocutor to the novice learner (e.g., Aljaafreh & Lantolf, 1994; Nassaji & Swain, 2000).

Brooks and Swain's description of interaction in a collaborative writing task presents a way of thinking beyond a purely cognitive perspective on interaction and SLA, and highlights learning processes as socially mediated. Their work shows how far interactionist work has traveled and demonstrates not only connections with written (rather than oral) work and interaction, but also a different approach to considering outcomes of learner–learner interaction, and an alternative way of assessing development.

Another area of change illustrated by Brooks and Swain's chapter is the use of a variation on stimulated recall to triangulate data on outcomes of interaction and, particularly, to access aspects of interaction not available through description of transcripts alone. Brooks and Swain use what they call *augmented stimulated recall* as a way of exploring the changes the learners have noticed in the reformulation of their text, but equally, as a an instructional tool in itself. Such introspective techniques, matched to specific sequences within a discourse, may be particularly useful in capturing the complexity of interaction, learners' perceptions of the focus of interaction, their noticing of targeted features, or interpretation of feedback.

Interaction and L2 Pedagogy

Perhaps one of the most prominent areas of research that has grown through connections with interactionist research has been that of instructed language learning: task-based language learning and form-focused instruction are two areas which are largely based on early interaction work, particularly Long's (1996) interaction hypothesis, his

subsequent work on focus on form (Long & Robinson, 1998), and defining work by Spada and by Ellis, among others, in this area (see R. Ellis [2003] on tasks, and, on focus on form, R. Ellis [2006]; Spada [1997] for review). As noted in the introduction, Susan Gass's commitment to language pedagogy and the application of theory to pedagogy is evident in her diverse contributions to understanding how interaction facilitates learning. This commitment is true of many interactionist researchers, as is demonstrated by over half the chapters in this book. In particular, with the recognition that not all interaction is equally facilitative of learning (see Spada and Lightbown, this volume), research on the outcomes of different types and conditions of tasks used to foster interaction has been a key focus (Bygate, Skehan, & Swain, 2001; Crookes & Gass, 1993; Ellis, 2003). The use of task-based interaction in classrooms has been motivated both by interactionists and socioculturalist researchers.

Focusing specifically on what makes a task effective in fostering the type of interaction likely to promote L2 acquisition, Bygate and Samuda (this volume) explore to what extent tasks entail communicative pressure, a fundamental aspect of interaction (Gass, 1997, 2003). They identify field or nature of the activity (the overall content and what is required of the learner both in terms of prior knowledge and action), purpose (both for speakers and pedagogic purpose of students and teachers), and engagement as central in this regard. In this, Bygate and Samuda acknowledge the complexity involved in how task-based interaction works (or does not). Future research, similarly, will need to recognize the interrelationship between task and participants from the outset, particularly the fact that any given task changes according to the people involved either directly or indirectly, and their relationship to one another, and to how the task fits within the lesson itself (see Ortega, 2007b). The relationship between learner engagement (van Lier, 2004) and attention, yet tacitly understood, may be an important and fruitful area for future research. This chapter illustrates the ways in which interaction research has extended applied linguistics research generally, particularly with regard to pedagogic contexts and work on tasks, and suggests avenues for future work.

Spada and Lightbown's (this volume) review of classroom-based research carried out within the interaction approach provides an account of the history and evolution of the research based on the interaction hypothesis in relation to instructed language learning, including less reported early classroom-based research. Their discussion of this history throws into light key trends and issues, such as the changing focus of interactionist research and changes in operationalization of common constructs, as well as intriguing similarities and differences in findings of laboratory and classroom-based research. In particular, they recognize the gap between theory and pedagogy and highlight the need for more

classroom-based studies, and for research that includes long-term effects of interaction (see also R. Ellis, 1997; Lightbown, 2000). Like Tarone, they call for more replication studies in order to explore the influence of social and contextual factors, and encourage researchers to maintain consistency in definition, operationalization of key constructs, and use of tasks for comparability of research findings.

Within work on instructed language learning, there is now a large body of research on corrective feedback based on the interaction approach (for review see Long, 2007; Mackey, 2006). Loewen's chapter on corrective feedback demonstrates a recent trend towards recognizing the immediate context of such feedback. The focus on isolated features of interaction, such as negotiation or recasts, has already led to the recognition that any one of these features is not characterized simply by one type, but by many disparate features, each with consequences for learning outcomes. For instance, research on recasts has moved away from Long's (1996, 2007) identification of recasts as a type of implicit negative feedback provided during meaning-focused interaction, to including the kinds of contingent reformulations of learners' ill-formed utterances that occur in language classrooms and which vary in explicitness. This has led to a range of features identified for recasts (Chaudron, 1977, 1987; Ellis & Sheen, 2006; Loewen & Philp, 2006), including declarative versus interrogative recasts, segmented versus non-segmented, simple versus complex.

Loewen's chapter reports on an analysis of single versus multiple responses to learner error in a large data set of L2 classroom interaction. His research illustrates the importance of considering the wider context of corrective feedback, demonstrating that many recasts provided by teachers are not isolated events, but co-occur with other types of responses and, in all likelihood, work in tandem with them. On a larger scale, the entire lesson, or components within a lesson, impacts on learners' perception of, and response to, corrective feedback (Lyster & Mori, 2006; Oliver & Mackey, 2003). Lyster and Mori's (2006) counterbalance hypothesis proposes that the underlying orientation of a language class (whether content- or form-oriented) is conversely related to learners' responses to feedback, that is, the wider context of the interaction impacts on learners' perceptions and expectations concerning feedback and appropriate response. Taking detailed account of learners' perceptions of the contexts of corrective feedback, Batstone (2007) draws attention to the discourse frames within any one class, and the way in which the frame itself affects both use of and response to corrective feedback, sometimes leading to a mismatch between the expectations of teachers and learners. Taken together, this research suggests that interaction researchers need to go beyond the analysis of single episodes (such as "form-focused episodes"), involving corrective feedback, to the wider

context in order to come to a greater understanding of how they impact learning (see also Block, 2003). Again, cross disciplinary perspectives may improve our chances here (see van Lier, 2004).

Another type of interaction context that is relatively new and poses its own particular possibilities, and dilemmas, for research is computer-mediated communication (CMC). In this volume, chapters by Smith and Ortega explore these possibilities in different ways. Smith's chapter delves into the nature of interaction in SCMC in detail, discusses the difficulties of coding interaction in this context, and suggests optimal ways of capturing computer-mediated exchanges for interaction research. His findings regarding limitations of various approaches to analyzing CMC provide some explanation for discrepancies in this research area, and suggest greater care and effort needs to be taken to capture computer-mediated exchanges for analysis within the framework of the interaction approach.

Ortega's chapter complements Smith's work with a review of recent research in computer-assisted language learning, comparing it to interaction in face-to-face contexts, and in doing this makes useful links between other interaction literature and CMC work. This chapter provides a picture of the character of SCMC research, particularly the great variety of contexts for SCMC which may account for inconsistency of results. This is clearly a new and emerging area for future interactionist research, with particular possibilities for exploring relationships between attention, interaction, and L2 learning.

Paying Attention to the Intricacies of Interaction and Development

Interaction research has steadily moved from description to explanation, and progresses along a number of different routes towards capturing the complexity of learning through interaction. Whether more cognitively or more socially oriented, researchers have increasingly looked to other disciplines and to other sub-disciplines of applied linguistics for insights and methods. Accounting for the labyrinth of factors associated with the cognitive and social processes involved in L2 learning through interaction must be a collective enterprise. Bringing together different perspectives on interaction in this volume reflects this. It is particularly fitting that is should be a *festschrift* for Susan Gass, someone who has, for some time, set us thinking about how different theoretical positions on SLA and knowledge of different areas of SLA interrelate, and how they might contribute to "a more complete understanding of the way second languages are learned" (Gass, 1997, p. 2).

Inevitably, there is a need for caution. Firstly, the danger of appropriating theory and method from other disciplines lies in the potential for

superficial understandings of theoretical principles, misuse of instruments, flawed analysis, and false interpretations. Two obvious safeguards against this are collaboration between researchers across disciplines and extensive reading in other disciplines. Secondly, a focus on sociocognition to the exclusion of research based on purely cognitive or purely social perspectives would be equally limiting for SLA inquiry. Finally, while we may adopt alternative methods of researching input, interaction, and L2 development, and consider these constructs in different ways, it is important to do so without compromising research standards of validity, reliability, and generalizability—both in the carrying out and in the reporting of research.

In addition to considering different perspectives, a number of the authors in this volume have also pointed to the need for more longitudinal research, more research that involves participants from outside the pool of easy-access university students, and more replication studies. To date, we have been content to each work on parts of the whole, researching distinct aspects of interaction-driven language development, and obscuring potential interrelationships. We are increasingly aware that we need to start finding ways of bringing the parts together: if we have worked out some of the picture, we are now up to the hard part of working on the middle of the jigsaw. Following the example set by Susan Gass, we need to be paying attention to the complexity of learning through interaction and to the interrelationships of factors involved.

Note

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