ON THE REPRESENTATION OF CONVENTIONAL EXPRESSIONS IN L1-ENGLISH L2-FRENCH

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On the Representation of Conventional Expressions in L1-English L2-French

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As I assume is normally the case, working on my dissertation has taught me lot. Expectedly, I certainly know more about formulas and conventional expressions than when I started. But in addition, this process allowed me to gain in confidence and in patience, while also putting into perspective how my research fits into my interests, my teaching, and linguistic research more generally. For this, I am indebted to numerous people: my co-directors (Laurent Dekydtspotter and Kathleen Bardovi-Harlig), the other members of my committee (Kevin Rottet and Alwiya Omar), family, and friends. In particular, I would like to thank Laurent (*avec mes remerciements les plus sincères*) for his generosity: with his time, with his feedback, and with his support. To Kathleen, I would like to say thank you for her comments, always as perspicacious as they were pertinent. I am thankful to Kevin, to Alwiya, and to Stephanie Dickinson (of the Indiana Statistical Consulting Center) for their advice and patience. I also very much appreciate the Householder grant-in-aid awarded by the Linguistics department to help in the funding of my experiments.

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Phraseological phenomena—ranging from idioms to collocations to discourse organizers—have received increasing attention in second language acquisition (SLA), and examinations of such strings are characterized by two distinct perspectives on formulaic language. On the one hand, different speech acts seem to be commonly realized using certain expressions. These conventional expressions are important for the successful realization of everyday interactions and constitute an important target for second language learners. On the other, the pervasiveness of multi-word expressions has been argued to follow from the fact that such sequences are in fact stored as wholes in the lexicon, implying that they are "easier" or "faster" to process. This psycholinguistic definition of formulas is pervasive in the literature, and tests of the veracity of such a proposal have been called for; to date, little such work has been done in SLA. The current dissertation is situated against the backdrop of both of these perspectives, and draws from both in an attempt to offer insights into questions specific to each. To this end, 13 expressions identified as conventional in Pau, France were tested in an online contextualized naturalness judgment task, which was administered to 20 French natives, 20 long stay Anglophone learners of French (>1 year in Pau), and 20 short stay Anglophone learners (4-6 months in Pau). The naturalness judgments provided on this experiment revealed that all groups judged the conventional expressions similarly, whereas the reaction time results suggested that conventional expressions are mentally represented as such for both natives and nonnatives. The reaction time results are argued

to be most consistent with a pragmatic competence model of conventional expression processing.

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Abbreviations

ACE = Alternate frame, conventional expression word

ASUB = Alternate frame, substitute

CCE = Conventional frame, conventional expression word

CE word = Conventional expression word

CSUB = Conventional frame, substitute

CVA = Cerebrovascular accident

L1 = Native language

L2 = Second language

NNS = Nonnative speaker

NS = Native speaker

RT = Reaction time

SD = Standard deviation

CHAPTER 1

TWO APPROACHES TO FORMULAIC LANGUAGE

The Formulaic Language Landscape

A speaker has the ability to produce any number of utterances, ranging from unique strings that have never been heard before (e.g., Chomsky's [1957] *Colorless green ideas sleep furiously*)[1] to invariable sequences that are noncompositional, syntactically and/or semantically. In this second category, we find a wide variety of sequences, including strings that appear to be the result of syntactic structures generally unproductive in a synchronic grammar, such as the coordination of a preposition and an adjective in English (e.g., *by and large*), as well as certain expressions that rely heavily on context—as opposed to the literal meanings of their components—for appropriate interpretation (e.g., *pull his leg*). Given this noncompositionality, such strings appear to be understood as wholes, as opposed to being the simple sum of their parts, which is arguably the case for novel utterances. An expansive middle ground separates these two extremes, as most utterances that one encounters are neither opaque and rigidly fixed nor entirely novel. Instead, a significant proportion of language used appears to be made up of more or less fixed strings that occur frequently, including both sequences that may be tied to certain situations or serve certain functions (e.g., *ladies and gentlemen*), as well as those that are not clearly situationally bound (e.g., *pay attention*). Such expressions simply sound natural to the native ear, as opposed to countless (often novel) paraphrases that ring stiff (Pawley & Syder, 1983). These strings seem to constitute linguistic conventions, and this phenomenon is widespread in language.

[1] The original purpose of this example was to demonstrate the independence of syntax from semantics and world knowledge, insofar as the syntactically valid structure is semantically and pragmatically incongruous. However, it is the novelty of the utterance that is of interest in this discussion.

Accounting for even this greatly simplified view of human language is a challenge to any theoretical approach. For generative linguistics, the creativity inherent in language has been the focus, and generativists postulate a set of primitive syntactic and morphological features and a finite lexicon that, when combined, allow for the generation of unlimited utterances. In such an approach, syntactically or semantically noncompositional strings—often referred to as idioms—may be lexically stipulated or simply treated as peripheral. And as generative syntacticians have concentrated on deriving grammaticality judgments, the question of which strings sound natural (e.g., *ladies and gentlemen* is preferred to *gentlemen and ladies*, although both are grammatical) has largely been relegated to performance, as opposed to competence. Thus, because generative linguistics has dominated linguistic inquiry in the United States since the 1960s, both sequences intuitively thought to constitute wholes as well as those sequences whose use just feels more natural than their paraphrases have received significantly less attention. Both of these phenomena belong to what has generally been referred to as *formulaic language*.

After decades of analyses inspired by transformational and generative grammar in which "creative" constructions were privileged, certain linguists have argued that formulaic aspects of language need to receive more attention, and perhaps even take the lead in linguistic analyses (Bolinger, 1976, 1977; Bybee, 2005; Coulmas, 1979, 1981; Peters, 1983; Sinclair, 1991; Wong Fillmore, 1976). Some have gone so far as to propose that virtually all language is formulaic (e.g., Construction Grammar, see Fillmore, 1988), calling into question the strict separation between grammar and the lexicon set up in generative grammar approaches. Within acquisition, it has come to be acknowledged that

a learner must know more than how to speak grammatically, and that formulaic language—both in terms of what is perceived to be holistic and what seems to be conventional usage—is essential to nativelike mastery of a language (Pawley, 2008; Wray, 2002). The current dissertation belongs to this research trend, and will examine the use and processing of a set of formulaic sequences by English speaking learners of French.

The term *formulaic language* has been used by researchers to refer to many different phenomena, and this diversity is one of the striking aspects of this literature. In order to highlight this variety, a small sampling of 13 examples claimed to constitute instances of formulaic language by various authors is provided in Table 1. If each of the 13 strings shares the distinction of having been argued to be formulaic, this would appear to be the only factor that unites the sequences. Instead, it is the diversity in this set of sequences that is remarkable. For example, the list includes idioms (e.g., *pull his leg*; *by and large*), proverbs (e.g., *honesty is the best policy*), collocations (e.g., *pay attention*), and acquisitional formulas (e.g., *comment t'appeles-tu?*; *I am going to write [about] + NP*). Both syntactically compositional (e.g., *pay attention*) and noncompositional (e.g., *by and large*) as well semantically opaque (e.g., *pull his leg*) and transparent (e.g., *honesty is the best policy*) expressions are argued to belong to the spectrum of formulaic language. The examples included also differ with respect to their invariability, with some sequences having only one accepted form (e.g., *ladies and gentlemen*), whereas others allow some variability, including open slots (e.g., *NP [is/looks] (really) ADJ* or *it is/has been [often] asserted/believed/noted that X*). And if most authors restrict their studies to strings of words, certain researchers consider that even single words can be formulaic (e.g., *hello*).

Finally, these expressions differ with respect to the communicative functions they fulfill, and in this small sampling, we find greetings (e.g., *hello*), compliments (e.g, *NP [is/looks] (really) ADJ*), introductory statements (e.g., *I am going to write (about) + NP*), gambits (e.g., *well, um*), in addition to strings to which no single function can be easily attributed (e.g., *un petit peu* or *you're*).

Table 1. *Sampling of Examples Argued to be Formulaic*

#	Sequence	Source
a	*honesty is the best policy*	Underwood et al. (2004, p. 170)
b	*pull his leg*	Swinney & Culter (1979, p. 534)
c	*pay attention*	Howarth (1998, p. 28)
d	*by and large*	Chafe (1968, p. 111)
e	*comment t'appelles-tu?* "How yourself-call-you? = what is your name?"	Myles et al. (1999, p. 51)
f	*I am going to write (about) + NP*	Bardovi-Harlig (2002, p. 192)
g	*well, um*	DuFon (1995, p. 28)
h	*ladies and gentlemen*	Yorio (1980, p. 437)
i	*hello*	Pawley (2008, p. 3)
j	*un petit peu* "a little bit"	Forsberg (2005, p. 188)
k	*you're*	Erman & Warren (2000, p. 36)
l	*NP [is/looks] (really) ADJ*	Manes & Wolfson (1981, p. 120)
m	*it is/has been (often) asserted/believed/noted that X*	Nattinger & DeCarrico (1992, p.171)

The fact that what is considered *formulaic* can differ so radically from one author to another reflects the serious problems concerning terminology, definitions, and identification criteria that plague this literature (Weinert, 1995; Yorio, 1989). As aptly noted by Altenberg (1998),

> "[p]hraseology is a fuzzy part of language. Although most of us would agree that it embraces the conventional rather than the productive or rule-governed side of language, involving various kinds of composite units and 'pre-patterned' expressions such as idioms, fixed phrases, and collocations, we find it difficult to delimit the area and classify the different types involved" (p. 101)

Numerous authors have wrestled with these issues of delimitation and classification, attempting to offer a response to the fundamental terminological, definitional, and identification questions associated with research into formulaic language. Three particular types of attempts to subdivide the formulaic language spectrum will be examined in this section: (a) Yorio (1980), who opposed idioms to routine formulas in a pedagogical classification, (b) Weinert (1995) and Wray (2000, 2002; Wray & Perkins, 2000), who each provided a functional classification of formulaic language, and (c) Bardovi-Harlig (2008, 2009, 2010), who posited a strict separation between acquisitional formulas and those that are conventional in a target language. Each of these proposals has informed my own view of this problem, which will be presented later in this chapter.

A Pedagogical Classification

Yorio (1980) set out to classify what he referred to as conventionalized forms in English in order to facilitate their teaching to speakers of other languages. With this pedagogical goal in mind, he distinguished between two broad types of formulaic language: idioms and routine formulas. Whereas idioms were defined as "an expression whose meaning is more or less unpredictable from the sum of the meanings of its morphemes," he considered a routine formula to be a "highly conventionalized pre-patterned expression whose occurrence is tied to a more or less standardized communication situation" (p. 434). This second category was further broken down into situation formulas, stylistic formulas, ceremonial formulas, gambits, and euphemisms.

Thus, Yorio recognized that a subset of formulaic strings serves a certain function (routine formulas), and he opposed these sequences to opaque idioms. Given Yorio's pedagogical purpose, it is perhaps unsurprising that strings identified as acquisitional formulas—like (e) and (f) in Table 1—do not have a place in his classification. However, there are other target language strings that are not necessarily noncompositional (and, thus, not idioms under his definition), but for which it would be difficult to assign a standardized communication situation (e.g., sequences [a], [c], [j], and [k] in Table 1). Such strings do not apparently have a place in Yorio's proposal.

Functional Approaches

Following Yorio (1989), Weinert (1995) identified three overarching functions that may be associated with formulaic speech, particularly for language learners: communication, production, and learning strategies. Thus, according to Weinert, formulaic language may either "allow learners entry into communication" (p. 186), ease processing burdens and, thus, facilitate production, or provide raw material that can eventually be analyzed by learners, leading to changes in their grammar (insofar as the analysis of formulaic strings more complex than their current grammar may lead the learner to derive new rules). Overlap between the different functions is also possible. Like Yorio's (1980) proposal, Weinert's functional approach to formulaic language classification maintains a separate category for formulaic strings that fulfill a communicative function (e.g., Yorio's *routine formulas*). However, these expressions are not contrasted solely with idioms, but with all strings that are stored holistically (production strategy) and with formulaic sequences in learner language (learning strategy). Thus, in addition to being able to describe most of the sequences cited in Table

1, this proposal is innovative in its use of psycholinguistic assumptions of holistic lexical storage to classify formulaic language.

Likewise, Wray (2000, 2002; Wray & Perkins, 2000) argued that formulaic language can be used to ease processing burdens (Weinert's production function) or can be employed with the goal of serving an interactional function (Weinert's communicative function). Wray envisioned these two functions as overlapping, their predominance depending on the goals of the speaker. When the speaker wants to aid their own production, it is the processing function that is most important, and when the speaker wants to aid the hearer (insofar as using formulaic sequences that the hearer is familiar with can presumably facilitate comprehension), Wray considers that the interactive function dominates. Despite this dual-goal proposal, Wray defines formulaic language as sequences that are stored and retrieved holistically, which effectively implies that all formulaic sequences fulfill the processing function, whereas only a subset have associated interactional functions. However, Wray argues that the two types of functions are not necessarily in a superset-subset relationship. Specifically, she claims that sequences fulfilling the interactional function are not necessarily easier to process, insofar as the anticipation of expressions that might be known to one's interlocutor may in fact entail greater processing effort on the part of the speaker (a proposal which is not detailed more fully by Wray). However, the processing effort to which she is referring would not appear to be related to the building up of the formulaic sequences (assumed to be holistic), but rather to the selection of an appropriate string. Thus, the potential psycholinguistic gains associated with holistic lexical storage would seem to be available, regardless of function.

Separating Conventionality from Psycholinguistics

In her 2006 article, Bardovi-Harlig maintained that the term *formula* currently covers three different phenomena: an acquisition process, a target language string (e.g., social or pragmatic formulas), and components of a speech act (e.g., semantic formula or strategy). In more recent publications, Bardovi-Harlig (2009, 2010) has highlighted the division between these first two phenomena: (a) use of formulas as an acquisition process and (b) strings that belong to a target language and that play a communicative role in that language (what she calls *conventional expressions*). This proposal is partly a response to the widespread assumption that all formulaic language is holistically stored and retrieved, which Bardovi-Harlig rightfully points out is a hypothesis that remains to be tested. In her view, strong evidence of such holistic lexical storage is largely restricted to examples of strings in learner language whose form is more advanced than the larger grammar, strings she refers to as acquisitional formulas. In her own work, Bardovi-Harlig has taken pains to define *conventional expressions* without reference to assumptions about processing, defining them as "those sequences with a stable form that are used frequently by speakers in certain prescribed social situations" (Bardovi-Harlig, 2009, p. 757). As she says herself, this definition makes "no presuppositions about the eventual mental representation of these sequences for either native speakers or learners" (p. 757). The repercussions of this terminological innovation are most clearly seen in the type of research questions relevant to a study of such expressions; as Bardovi-Harlig does not consider that her conventional expressions can necessarily speak to the processing questions that surround conventionalized speech, she concentrates instead on questions of pragmatic competence.

Bardovi-Harlig's proposal, then, opposes conventional expressions (for which no assumptions are made about storage and retrieval) to acquisitional formulas (which are generally assumed to be stored and retrieved whole). This division parallels in a certain sense the contrast between a communicative and a learning strategy suggested by Weinert (1995). However, whereas Weinert stressed the function of such expressions, Bardovi-Harlig proposed distinct definitions, implying the existence of distinct constructs.

Taken together, each of these different attempts at classification identified the presence of expressions that are associated with a communicative function (routine formulas for Yorio, expressions that fulfill the communicative or interactive strategy for Weinert and Wray, and conventional expressions for Bardovi-Harlig). In opposition to this category, each of the four authors proposed a different view, with Weinert, Wray, and Bardovi-Harlig recognizing the widespread assumption that formulaic language (either in its ensemble or simply a subset of formulaic sequences) is stored and retrieved holistically.

In my own view, a fundamental division that must be made in order to make sense of this literature will pit conventionality views of formulaic language against psycholinguistic ones. However, instead of envisioning this distinction as a functional one (as do Weinert and Wray), I will suggest that conventionality and psycholinguistic approaches constitute two different ways of conceiving of formulaic language and, thus, of defining it. In this approach, I follow Bardovi-Harlig, who made important headway in addressing the definitional difficulties inherent in this literature. Following Bardovi-Harlig's lead, in the following section, I will attempt to show that by recognizing this division, and by treating the expressions associated with the two views as different

phenomena, progress can be made in responding to the fundamental terminological, definitional, and identification problems that plague this literature.

Terminological, Definitional, and Identification Challenges

The field of formulaic language is awash in terms, in definitions, and in identification criteria. Although certainly in part reflective of intense interest in this area, this abundance also betrays a field in conflict over what it is that is being studied (see the examples given in Table 1). And, as pointed out by Weinert (1995), these issues must crucially be addressed in order to move research forward in this area.

Terminology

As mentioned by Roberts (1993), the study of word combinations has interested scholars as far back as Saint Augustine, who noted that sequences such as *in saeculum* could be treated as units for the purposes of translation (Kelly, 1979, p. 121, cited in Roberts). In the course of its long history, the number of terms used to designate the recurrent word patterns of interest to researchers has grown, and Wray (2000) provides a list of 47 terms that have been used to "describe aspects of formulaicity in the literature" (p. 465). A subset of the terms cited by Wray is provided in (1).

(1)

frozen phrases	*gambits*	*ready-made expressions*
holophrases	*idioms*	*routine formulae*
lexical phrases	*collocations*	*fixed expressions*
formulaic speech	*amalgams*	*recurring utterances*
chunks	*composites*	*conventionalized forms*
multiword units	*stock utterances*	*formulas/formulae*

Far from claiming, as did Weinert (1995), that these terminological distinctions are largely cosmetic, Wray recognized that formulaicity encompasses a set of phenomena that are more or less related, and that this terminological abundance is in part a reflection of the complexity in the data.

Of the different terms, *formula* is arguably the most common, and Wray's (2000, 2002) decision to adopt this term further ensured its primacy in the literature on formulaicity. Although the definition assigned to this term by Wray is widely cited, *formula* (as well as many of the other words included in [1]) is defined in multiple ways, a situation that further complicates comprehensibility between researchers. In the following section, I will consider the different ways in which *formula* has been defined and argue that there exist two main definitional tendencies in this literature: a conventionality view and a psycholinguistic one.

Definitions

Where there are many terms, there is also the potential for many definitions. A small set of the numerous ways in which *formula* has been defined is provided in (2)-(9).

(2) Routine formulae are expressions whose occurrence is closely tied to types of recurrent social situations. (Coulmas, 1979, p. 239).

(3) A formula is a PLI [phrasal lexical item] with contextually restricted conditions of use. (Kuiper, van Egmond, Kempen, & Sprenger, 2007, p. 317)

(4) The above analysis indicates that although there is seemingly no limit to the possible forms a compliment may take in English, a very few semantic items occur with extraordinary frequency. They include a small set of adjectives and verbs, a few intensifiers, and certain deictic elements. What this means is that, in giving compliments, most speakers of American English make use of what can be called semantic formulas. (Manes & Wolfson, 1981, p. 119)

(5) A sequence, continuous or discontinuous, of words or other elements, which is, or appears to be, prefabricated: that is, stored and retrieved whole from memory at time of use, rather than being subject to generation or analysis by the language grammar. (Wray, 2002, p. 9)

(6) A multimorphemic phrase or sentence that, either through social negotiation or through individual evolution, has become available to a speaker as a single prefabricated item in her or his lexicon. (Peters, 1983, p. 2)

(7) For the purposes of this study, therefore, I will adopt an operational definition of a formula which exploits the fact that combinations of words which recur again and again are likely to be stored, and regard as formulaic any sequence of simple units, with or without a slot, which occurs at least five times in Naomi's corpus. (Dabrowska, 2000, p. 88)

(8) First, approximately 200 expressions are identified on the basis of both frequency in the corpus and structural coherence as phrasal units. These formulaic expressions fall primarily into the category of what Wray and Perkins (2000) identify as discourse structuring sequences, which they argue aid both comprehension and production. (Simpson, 2004, pp. 38-39)

Although details vary from definition to definition, two major lines are visible, corresponding on the one hand to a conception founded on the idea of conventionality and, on the other, to a predominantly psycholinguistic view of formulas. Definitions (2)-(4) espouse a socially situated view, whereas definitions (5)-(7) are clear instances of the psycholinguistic perspective. In the view that privileges conventionality, we also commonly find the terms *conventionalized forms*, *conventional expressions*, *routine formulae*, *clichés*, and *situationally bound utterances*. In those studies that subscribe to the psycholinguistic viewpoint, additional terms include *preassembled speech*, *prefabricated routines*, *ready-made expressions*, *chunks*, *composites*, *fixed expressions*, *frozen phrases*, *non-productive expressions*, *multi-word units* and *stock utterances*. The eighth definition, taken from Simpson's (2004) study of formulas in English academic writing, is representative of studies in which what is meant by *formula* is not made explicit. The identification criteria that she cites—frequency and structural coherence—are consistent with both perspectives, and it appears that the author simply intends the term *formula* to mean "common."

Although they appear rather distinct in the definitions cited, these two points of view often overlap, and it is not uncommon for authors to borrow aspects from both.

Peters (1983), for example, defines formulas as "prefabricated" (see [6]), but then goes on to include community-wide use—which is arguably linked to conventionality—among her identification criteria. And whereas Coulmas (see [2]) emphasizes the prevalence and importance of what he calls *routine formulae* for the successful accomplishment of many everyday communication situations, in a later publication (entitled "Conversation routine: Explorations in standardized communication situations and *prepatterned* speech," italics added), he states that such strings "can be drawn from the memory without much effort, and, at the same time, they give us time for conversational planning" (Coulmas, 1981, pp. 9-10), implying that they are stored and retrieved whole from memory. This overlapping appears to be the rule rather than the exception, and the conventionality and psycholinguistic interests in this literature have only rarely been teased apart, both in theory and in practice. In proposing a division between these two approaches, this project aims to examine the individual goals and assumptions associated with each, calling into question the permeability between the two that currently characterizes this literature. In the subsections that follow, the two ways of defining *formula* will be considered in more detail.

Conventionality definition. The conventionality perspective of formulaic language is largely a functional or pragmatic one. For those definitions that privilege the conventional nature of formulaic language, it is this term's nontechnical sense that is central. In this perspective, *formula* refers to any fixed or conventional way of doing something. Thus, for these authors, a formulaic string corresponds to a conventionalized means of saying something in a given linguistic community or culture, generally without reference to the mental representation associated with the string (e.g., Altenberg, 1998;

Bardovi-Harlig, 2008, 2009 , 2010; Bardovi-Harlig, Rose, & Nickels, 2008; Blum-Kulka & Olshtain, 1986; Burghardt et al., 2007; Coulmas, 1979; De Cock, 1998, 2000, 2007; Edmondson & House, 1991; Eskildsen & Cadierno, 2007; Feng Yuan, Kuiper, & Shaogu, 1990; Fónagy, 1998; House, 1996; Jaworski, 1990; Kasper & Blum-Kulka, 1993; Kecskes, 2000; Kuiper et al., 2007; Manes & Wolfson, 1981; Pawley, 2008; Roever, 2005; Scarcella, 1979; Sorhus, 1977; Wolfson, 1981a, 1981b). Coulmas, who uses the term *routine formulae*, defines such strings as "highly conventionalized prepatterned expressions whose occurrence is tied to more or less standardized communication situations" (1981, p. 3).[2] Thus, not only are these strings seen as "conventional," but they are also commonly described with respect to the situations in which they occur, a practice which is generally limited to this perspective of formulaic speech. Concretely, this implies that an identical surface string may be a formula in certain communication situations but not in others. Thus, for these authors, formulas represent a sort of social agreement, whereby certain communicative goals are accomplished by certain linguistic means.

Given that formulaic sequences in this view are seen as inextricably tied to a communication situation, it is essential to define what is meant by—or at least to operationalize—*communication situation*. In general, researchers have relied upon an operationalization that uses speech acts (Searle, 1969), such as apologizing, complimenting, and greeting, in order to divide up language on a functional basis. In practice, authors explore how these various pragmatic functions are accomplished, essentially concentrating on pragmalinguistic knowledge (i.e., form-function mappings) or sociopragmatic knowledge (i.e., in what social contexts different expressions or speech

[2] Yorio's (1980) definition of routine formula matches Coulmas' exactly.

acts are appropriate). Coulmas (1979) argues that mastery of such strings and knowledge of when and where they can be appropriately employed is important, because these formulas

> are obligatory to a greater or lesser extent. Their obligatoriness serves a very important social function: the more obligatory a formula is, the more it is something like a password giving access to the group where it is habitually employed in some particular situation. The misuse of, or failure to use, an obligatory formula is very revealing, while the correct usage helps to establish the user's membership of a group. (p. 252).

Psycholinguistic definition. In recent literature, the mostly commonly encountered definition of *formula* was originally proposed by Wray, a definition that Myles (2004, p. 142) goes so far as to describe as "uncontroversial." Wray (2002) defines a formula as

> a sequence, continuous or discontinuous, of words or other elements, which is, or appears to be, prefabricated: that is, stored and retrieved whole from memory at time of use, rather than being subject to generation or analysis by the language grammar. (p. 9)

The lynchpin of this definition is the presumed fundamental storage and processing difference between formulaic (i.e., prefabricated) and nonformulaic (i.e., generated) language. This definition, or definitions inspired by similar assumptions, are pervasive in the literature on formulas (Barron, 2003; Biber, Conrad, & Cortes, 2004 Boers, Eyckmans, Kappel, Stengers, & Demecheleer, 2006; Bygate, 1998; Dabrowska, 2000; DuFon, 1995; Ellis, Simpson-Vlach, & Maynard, 2008; Erman, 2007; Erman & Warren, 2000; Foster, 2001; Girard & Sionis, 2003, 2004; Granger, 1998; Hakuta, 1974; Jiang & Nekrasova, 2007; Myles, 2004; Myles, Hooper, & Mitchell, 1998; Myles, Mitchell, & Hooper, 1999; Nekrasova, 2009; Oppenheim, 2000; Raupach, 1984; Rehbein, 1987; Schmitt, Dörnyei, Adolphs, & Durow, 2004; Schmitt, Grandage, & Adolphs, 2004;

Schmitt & Underwood, 2004; Sugiura, 2002; Tode, 2003; Underwood, Schmitt, & Galpin, 2004; Warga, 2005; Weinert, 1995; Wong Fillmore, 1976, 1979; Wood, 2002a, 2002b, 2006; Wray, 2002; Wray & Namba, 2003; Wray & Perkins, 2000). Although widely accepted as accurate, what is meant by *holistic storage* is largely left to the imagination. To take just one example, Weinert (1995), following Peters (1983), pointed out that there is no consensus on the means by which a string achieves formula status. Potential explanations reviewed by Weinert range from segmentation strategies that concentrate on larger chunks of speech to the possibility that expressions become holistically stored as a result of practice (an example of automatized as opposed to controlled processes).

In addition to the vagueness inherent in this definition, attempts to empirically confirm this supposed storage and processing difference are rare, a gap that has been noted—and in some cases addressed—by several linguists interested in second language acquisition (Conklin & Schmitt, 2008; Ellis et al., 2008; Schmitt & Underwood, 2004; Siyanova & Schmitt, 2008; Underwood et al., 2004; Weinert, 1995). However, this lack of empirical verification has not deterred researchers from proposing and adopting a myriad of identification criteria, which are based on the assumption that holistic processing should manifest itself via several superficial phenomena, as outlined in (9)

(9) *Invariant*. Formulas will be invariant in form because they are retrieved whole from the lexicon
Processing advantages. Because formulas are presumably unanalyzed, a speaker should be able to retrieve or understand such a string faster than a similar non-formulaic one
Frequency. Because formulas are processed easily, they will be more frequent than strings similar in content but novel—and therefore generated—in form
Discourse planning. Because formulas are stored as wholes, they free up time for discourse planning
Fluency. Formulas will be pronounced fluently because they are stored whole

These characteristics are thus taken to constitute superficial (and approximate) indicators of the only true fundamental difference between formulaic and non-formulaic language—namely, the storage/processing difference. This reliance on the assumed equivalence between psycholinguistic and surface characteristics pervades the formula literature, and the use of such characteristics as identification criteria has led to an explosion in the different strings considered to be formulaic. However, these identification criteria only diagnose the presumed processing/storage difference indirectly, both insofar as the presumed relationship between holistic storage and and the different characteristics cited remains a hypothesis, and because this hypothesis has been only rarely tested using online measures (cf. Conklin & Schmitt, 2008; Ellis et al., 2008; Schmitt & Underwood, 2004; Siyanova & Schmitt, 2008; Underwood et al., 2004). Thus, although Wray defines formulas as strings that are *or appear to be* stored and retrieved whole from memory, in practice, the appearance and the reality of holistic lexical storage are often conflated, a position whose validity is questionable.

Definitions—an overview. The terminological variety that characterizes this domain is accompanied by definitional challenges. Using the most common term—*formula*—as a starting point, we have seen that this label is in fact defined in two distinct manners. The first definition sees a formula as an expression commonly used to accomplish a certain communicative goal in a linguistic community, whereas the second considers a formula to be any string that is stored and retrieved whole from memory. However, it is important to underline that these two perspectives are not mutually exclusive, and that the two conceptualizations seem to exist on a continuum, intersecting regularly in the literature on formulas (e.g., the examples of Peters, 1983, and Coulmas,

1979, 1981, cited earlier). And although my discussion was largely restricted to the term *formula*, the polysemy identified is not limited to this term, with the two views of formulaic language visible throughout the literature. However, certain labels seem to take a clear stand with respect to either the conventional (e.g., *conventionalized forms*) or the prefabricated (e.g., *ready-made expressions*) nature of the strings in question, and the adoption of these terms will reflect a researcher's view of the issue at hand.

Given that the two definitions represent divergent ways of understanding formulaicity, that the research goals associated with each are largely distinct, and that the strings identified as "formulas" in each case are different, it would seem logical to propose a single term to represent each perspective. With respect to the psycholinguistic definition, Wray's (2002) adoption of *formula* has been largely imitated, which argues in favor of the use of this term to refer to a string stored and retrieved whole from memory at time of use. As for studies couched within the conventional perspective, the clearly conventional definition attributed to the term *conventional expression* by Bardovi-Harlig (2009, 2010)[3] and Burghardt et al. (2007) in combination with the transparency of the term make it a good candidate.[4,5] Following this logic, sequences that respect both definitions may be called *formulaic conventional expressions*.

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[3] "those sequences with a stable form that are used frequently by speakers in certain prescribed social situations" (Bardovi-Harlig, 2009, p. 757)

[4] Although I have chosen the term *conventional expression* to act as the hypernym for strings associated with the conventionality definition, in the literature a wide variety of terms is found, with *pragmatic formula* being one of the more common. If *conventional expression* can generally be taken to supersede *pragmatic formula*, there is an acceptation commonly attributed to this term that should not be associated with *conventional expression*. Specifically, a pragmatic formula—also called a pragmatic strategy—can refer to the different components that may be employed in the realization of a speech act (see Bardovi-Harlig, 2008, for a discussion of this). To take examples from the Cross-Cultural Speech Act Realization Project (Blum-Kulka, House, & Kasper, 1989), requests may involve the pragmatic formulas of alerters, supportive moves, and head acts, whereas apologies often are accomplished by means of all or a subset of the following: an illocutionary force indicating device, an explanation, an acceptance of responsibility, an offer of repair, and/or a promise of forbearance. In this sense of the term, *pragmatic formula* does not refer to an actual lexical expression, but instead to a conventionalized strategy used to fulfill a given function. It

Thus, the current proposal follows Yorio (1980), Weinert (1995), Wray (2000, 2002), and Bardovi-Harlig (2009, 2010) in singling out a subset of formulaic language that is essentially defined with respect to the conventional communicative function that it fulfills. Unlike these previous authors, I have argued that all remaining instances of formulaic language can be subsumed under what I have called a psycholinguistic view, for which the fundamental assumption states that such strings are stored and retrieved whole. Although this proposal essentially divides the formulaic language landscape into two parts, this division is not watertight, as the existing research suggests that conventional expressions and formulas exist on a continuum, with formulaic conventional expressions representing the intersection of these two approaches. In the following section, I will review the numerous identification criteria adopted in the various studies of formulaic language, and will separate them with respect to the definition of formulaic language that each reflects.

Identification Criteria

Contrary to what might be expected, the identification criteria adopted in studies into formulaic language do not always appear to represent an operationalization of the definition subscribed to. In other words, there are studies that adopt a conventionality-based definition, but then include among their identification criteria requirements that reflect assumptions concerning holistic lexical storage and processing (e.g., Granger, 1998; Kecskes, 2000; Pawley, 1985; Pawley & Syder, 1983; Wildner-Bassett, 1994). There are also studies that appear to be couched within what I have called the

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is not in this sense that *conventional expression* will be used in the current project, as I am interested in actual expressions and not the more abstract strategies.

[5] Note that although Pawley (2008) also used this term, his definition is broader than the one adopted here and is essentially synonymous with *formulaic language*. Pawley calls those conventional expressions with associated pragmatic functions situation-bound expressions (p. 7).

psycholinguistic perspective and that select identification criteria that situate the sequences socially (e.g., Girard & Sionis, 2003, 2004; Myles et al., 1998; Warga, 2005; Wood, 2006). This tendency to choose both conventionality and psycholinguistic based criteria can be traced back to some of the original pioneering work on formulaic language (e.g., Hickey, 1993; Peters, 1983; Wray, 2002). These studies attempted to provide a set of comprehensive identification criteria—that is, a list that would allow a researcher to pinpoint all of the different instantiations of formulaic language. In attempting comprehensibility, these lists made no distinction between a conventionality and a psycholinguistic approach to formulaic language. For example, Peters' (1983, pp. 8-11) oft-cited list of identification criteria for formulas in a first language (L1) acquisition is provided in (10).

(10)
a. Is the utterance an idiosyncratic chunk that the child uses repeatedly and in exactly the same form?
b. Is the construction of the utterance unrelated to any productive pattern in the child's current speech?
c. Is the utterance somewhat inappropriate in some of the contexts in which it is used?
d. Does the utterance cohere phonologically?
e. Is the usage of the expression situationally dependent for the child?
f. Is the expression a community-wide formula?

Whereas high frequency and invariability (criterion a) are relevant for both conventionality and psycholinguistic perspectives, criteria (b), (c), and (d) are clearly psycholinguistic, whereas criteria (e) and (f) are related to conventionality. Although authors generally recognize that most examples of formulaic speech will not meet all of these criteria (and, as a result, these comprehensive lists are usually mined for the criteria most suitable to a particular project), the prevailing assumption is that the more criteria from such comprehensive lists respected by a given string, the more prototypically

formulaic that string will be. Seen broadly in the tendency to evoke both types of criteria (regardless of the type of definition adopted), this assumption is also evident in proposals such as Hickey's (1993), in which she attempted to rethink identification criteria in terms of a preference rule system (according to which the more criteria a string fulfills, the more sure we are that it is an example of formulaic language). However, if we accept my proposal that there are two different ways of apprehending formulaic language, then it is logical that certain identification criteria will only be valid under one perspective. For example, we would generally not expect formulas to be situationally dependent (criterion 10e), nor would we expect conventional expressions to be unrelated to other productions produced by a speaker (criterion 10b). In what follows, I will review the identification criteria that have most commonly been cited in the literature and will classify them according to whether they are in line with conventionality assumptions or psycholinguistic ones for formulaic language.[6]

Conventionality criteria. Five different criteria, provided in (11), can be associated with the conventionality approach to formulaic language.

(11) a. Multiword/multimorpheme
b. Invariability
c. Higher frequency
d. Community-wide in use
e. Situationally bound

[6] Although the identification criteria that will be reviewed are the most common, some authors have argued that an intuitive approach is the most efficient. Bahns et al. (1986) appealed to the authors' status as NSs of the language under investigation as a justification to identify formulaic sequences. Although often eschewed because of their inherent subjectivity, Wray and Namba (2003) see potential in intuitive approaches. These authors attempted to provide a more reliable method to intuition-based judgments by proposing 11 criteria designed to "enable the researcher to explore *why* he or she feels that a particular wordstring is formulaic, by establishing reliable justifications for that intuitive judgment" (p. 27, italics in original). Although the intuitive approach has not seemed to gain additional credence since the publication of these articles (although see Foster, 2001), it attests to the challenges faced by authors in the empirical investigation of such strings.

The first of these five criteria reflects a consensus in formulaic language research in general with respect to the type of strings of interest: both conventionally and psycholinguistically oriented studies generally limit their analyses to phrasal phenomena, and thus do not investigate single word strings. Within the conventional perspective, however, there are also researchers who do not adopt this criterion. Authors such as Coulmas (1979, 1981), Sorhus (1977), and Pawley (2008), for example, do not rule out the inclusion of single-word expressions associated with a specific communicative function in their analyses (e.g., *bonjour* "hello," *merci* "thank you," and *désolé* "sorry").

The second criterion states that a conventional expression must be invariable. Although this may seem to be a straightforward requirement, Bardovi-Harlig (2009) pointed out that what is at issue here is what it means to "say the same thing," a concept that can be defined in many different manners. Thus, within the conventionality perspective, the purpose of this invariability criterion is to essentially allow researchers to classify sequences as the "same" or "different." As a result, strict invariability has often been relaxed to allow some variation (and even open slots), depending on how "same" is operationalized (e.g., Bardovi-Harlig, 2009, 2010; Manes & Wolfson, 1981; Nattinger & DeCarrico, 1992; Wolfson, 1981a, 1981b). For example, variation in my own data was particularly common for adverbs and adjectives (e.g., *je suis vraiment/extrêmement/ très/Ø désolé* "I am truly/extremely/very/Ø sorry"), and I classified each of these strings as members of the same conventional expression: *je suis (intensifier) désolé*. As we shall see in the following section, a similar criterion requiring invariability is generally less flexible in the psycholinguistic perspective.

The third criterion requires that a conventional expression enjoy higher frequency than similar nonconventional expressions. For those who subscribe to a conventionality view of formulaic language, high frequency is a result of the conventionalization of a sequence in a certain context. In other words, conventional expressions are not necessarily expected to show a high absolute frequency in an individual's speech,[7] but rather should enjoy high relative frequency (Wray, 2002), with relative frequency defined as how many times a sequence occurred relative to how many times it could have occurred. Determining relative frequency is not a simple task, as it requires not only calculating frequency, but controlling contextual variables (in order to control for function). Bardovi-Harlig (2009, 2010) and Warga (2005) adopted a similar strategy in order to determine relative frequency. In both studies, responses to a Discourse Completion Task (DCT) were first separated on the basis of function before comparisons of frequency for different expressions were made. Specifically, Bardovi-Harlig attributed the label of *conventional expression* to any string employed by at least 50% of NSs to fulfill a given function in response to a specific context on an oral DCT. Warga's approach was similar, although her cut-off was much lower (15%). The gap between the frequency cut-offs adopted in these two studies highlights the variability in interpreting what is meant by "frequent."

[7] The criterion of absolute frequency is nonetheless found in the literature on conventional expressions, insofar as some authors propose that higher frequency forms in the input are more likely to be extracted as formulas by learners of both a L1 (Peters, 1983) and a second language (L2; Bartning & Hammarberg, 2007; Eskildsen & Cadierno, 2007; Girard & Sionis, 2003, 2004; Tode, 2003; Weinert, 1995). For example, in a study of the use of pronoun + copula sequences in the writing of Japanese-speaking L2 learners of English, Tode (2003) assumes that the high input frequency of this sequence means that learners will likely treat it as a formula in their interlanguage. Similar assumptions are put forward in the context of usage-based grammar (e.g., Bartning & Hammarberg, 2007; Eskildsen & Cadierno, 2007), in which researchers assume that "there is a link between what is conventionalised in speech community and entrenched in the mind of the individual" (Eskildsen & Cadierno, 2007, p. 7).

The fourth criterion situates a conventional expression within a community of speakers. Specifically, a conventional expression is required to be community-wide in use, which implies that it will be known by most members of a given linguistic community. However, this criterion is generally interpreted to mean that such a string will be frequent in a given community. Thus, it differs only with respect to the more broad *higher frequency* criterion in the sense that "community-wide" cannot be interpreted speaker-internally (which is a possibility with the third criterion).

The fifth and final criterion—that a conventional expression will be situationally dependent—states that such an expression must be tied to a particular context (Bardovi-Harlig, 2002; Kecskes, 2000; Myles et al., 1998, 1999; Peters, 1983; Weinert, 1995). This criterion can and has been interpreted in several different ways, depending on how *situation* is defined (e.g., Wray, 2002, suggested that *situation* can be defined socially, pragmatically, or grammatically). With respect to conventional expressions, it is predominantly the association with a social (e.g., classroom discourse) and/or pragmatic (e.g., different speech acts or conversational management) situation that is of interest. As stressed by Coulmas (1981), such expressions are "appropriate to a situation of a certain kind or a strategy which is appropriate relative to certain communicative ends" (p. 16).

Psycholinguistic criteria. If the operationalization of *conventional expressions* appears rather straightforward, operationalizing the psycholinguistic definition of formulaic language presents numerous challenges. According to this definition, the only feature that distinguishes formulaic from nonformulaic language is that the former is stored and retrieved whole. Given this claim, we might expect that studies adopting this definition will necessarily employ psycholinguistic means to identify formulas. Contrary

to expectations, the vast majority of these studies have trusted surface features to detect mental representation, and these surface features have subsequently been transformed into nine identification criteria. These criteria are built on common sense reasoning, and very little psycholinguistic work has been done to verify their efficacy. Reliance on these criteria represents one of the major weaknesses of this literature, as strings that they identify cannot be claimed to necessarily be stored and retrieved whole (Weinert, 1995). Although these superficial characteristics may prove to be reliable indicators of formula status, there has been no direct test of this assumption, and it is troubling that an entire literature is dependent on such a conjecture. These nine criteria, of which the first three overlap with the conventionality approach, are presented in (12).

(12) a. Multiword/multimorpheme
b. Invariability
c. Higher frequency
d. Syntactic coherence
e. Semantic opacity
f. Noncompositionality
g. Discourse planning and greater fluency
h. Greater complexity
i. Overextensions

As was the case for conventional expressions, formulas are expected to be multiword/multimorpheme in length, invariable in form, and of higher frequency than similar strings. However, the justifications for these criteria are largely different. The restriction to strings that are phrasal is due to the fact that researchers in the psycholinguistic perspective are interested uniquely in the storage and processing of strings longer than one word; in other words, single word expressions tell us nothing about the psycholinguistic hypotheses that form the basis of this approach. The second criterion—invariability—is no longer a question of a sameness standard, but is instead

seen to derive from holistic lexical storage. If an expression is stored as a chunk, proponents of this perspective reason that it will not—and perhaps cannot—show variation in its form. Thus, whereas investigations into conventional expressions often allow variation (reflecting the flexibility in this sameness requirement), the definition of formulaic language would be seemingly incompatible with variation.[8]

Thirdly, formulas are required to be frequent. To justify this criterion, adherents to the psycholinguistic perspective do not refer to the process of conventionalization in certain contexts, but instead argue that elevated frequency is a result of processing ease. Specifically, authors claim (in rather vague terms) that a formula can be more quickly retrieved than a nonformula because one does not need to construct it from scratch. This is generally taken to mean that such a string is stored and retrieved whole, although, as pointed out by Weinert (1995), the details of this assumed holistic lexical storage have generally been left underspecified. In any case, speakers are thought to prefer formulas to nonformulas precisely because they demand fewer processing resources.

Once again, the operationalization of *frequent* is difficult. To take just one example, Erman and Warren (2000), Erman (2007), and Forsberg (2005, 2010) compared the frequency (either intuitive, in the case of Erman & Warren, or using Google searches, in the case of Forsberg) of a suspected formulaic sequence with that of a near equivalent (i.e., a string that differed by only one word). The authors refer to this practice as *restricted exchangeability*. As stated by Erman and Warren, a string is a formula if "at least one member of the prefab cannot be replaced by a synonymous item without causing a change of meaning or function and/or idiomaticity" (p. 32). For Forsberg, the

[8] There are, nonetheless, studies that evoke the psycholinguistic definition but also accept variation (e.g., Nattinger & DeCarrico, 1992; Wildner-Bassett, 1994; Wood, 2006).

label of *formula* is only bestowed if the string suspected of being a formula shows frequency counts that are at least double that of the matched nonformula. Although this approach acknowledges the fickleness of formulaic language, it would seem to champion a rather generous view of what constitutes target language formulaic language. To take an example from Erman and Warren's article, the authors suggest that a string such as *go to a seminar* (p. 35) constitutes a prefab, given that no words that make up this string can be replaced without changing meaning, grammaticality, or formulaicity. Thus, to *go to a lecture* does not mean the same thing as to *go to a seminar* and, in certain contexts, to *go to the seminar* may not be a grammatically correct substitution for to *go to a seminar*. However, the lack of clear synonyms for each of the four words that make up this string would make it difficult to assess any change in formulaicity. Thus, sequences of this sort will necessarily be considered prefabs in this approach, simply by virtue of the fact that there exist no synonyms for the words that compose them.

The fourth criterion requires syntactic coherence, and is generally understood to restrict formulas to syntactic wholes (e.g., noun phrases, verb phrases, full clauses, etc.), thus ruling out such sequences as *and the* or common repetitions like *the the*.[9] This requirement reflects the psycholinguistic assumption that formulas are stored as a syntactic whole (cf. the original Brown corpus studies, Kjellmer, 1994). However, authors such as Bybee and Scheibmann (1999, p. 590) found that distributional and

[9] Although the conventional approach also generally disregards such sequences, this requirement can be at odds with an invariability criterion which allows for the inclusion of strings involving open slots. For this reason, I did not include it among the criteria associated with the conventionality perspective.

phonological evidence suggested that those sequences that cohere do not necessarily respect the constituent structure that classic syntactic analyses might impose.[10]

The fifth and sixth criteria—semantic opacity and noncompositionality—assume that a string stored whole is not required to respect maxims of semantic or syntactic compositionality, as the string is presumably not generated by the language grammar. As a result, formulaic sequences may show semantic or syntactic patterns that are at odds with patterns of the overall grammar. In particular, semantic opacity refers to those strings whose meaning is not a straightforward amalgamation of the meanings of their parts. Thus, the syntactically well-formed *pull his leg* appears to have two meanings, one in which we are speaking about physically tugging someone's leg, and its idiomatic counterpart, which corresponds to something like *to kid or fool someone*. Whereas the first meaning is transparent given the meanings of the words and morphemes that compose this string, the second is opaque, relying heavily on context for decoding. For this reason, many have proposed that such a string must be stored whole in the lexicon. For syntactic noncompositionality, the strings in question are those that are syntactically ill-formed, when judged by the synchronic grammar. The coordination of a preposition and an adjective, as in *by and large*, is a classic example of a string whose generation would be impossible in today's grammar. The applicability of these criteria is generally restricted, tending to be cited only in those studies interested in idioms (in the sense of Yorio, 1980). As noted by Erman and Warren (2000),

[10] In their study, the two authors investigated patterns in the phonological reduction of the auxiliary *don't*. They found the reduction of the vowel to be largely dependent on the subject and not the following verb, a result that runs counter to classic analyses, which would group the auxiliary with the following verbal complement in the predicate

> syntactic or semantic irregularity makes the non-compositional character of a phrase evident, but it is a mistake to believe that whatever is transparent is also compositional. It is probably because of this assumed connection between transparency and compositionality that idiomaticity has been looked upon as a marginal phenomenon. (p. 54)

The seventh criterion states that use of formulaic language should afford more time for discourse planning and result in increased fluency, both of which are assumed to be due to the holistic lexical storage of such sequences. With respect to discourse planning, it is assumed that the use of prefabricated strings will free up resources for the planning of future utterances. As for fluency, it is taken for granted that a string stored and retrieved whole will necessarily be pronounced without pauses or false starts. However, as pointed out by Bybee (2005, p. 29) in an article on French liaison as an example of a construction (in the sense of Construction Grammar), pauses can occur in the middle words, and no one would suggest that the presence of such a pause calls the holistic lexical storage of such units into question. Identification criteria that require that strings be spoken in an uninterrupted (i.e., no pauses or false starts), phonologically coherent string follow from assumptions that holistically stored speech should result in fluent production (see Girard & Sionis, 2003, 2004; Myles et al., 1998, 1999; Peters, 1983; Raupach, 1984).

The final two criteria are associated uniquely with a specific portion of the formulaic language spectrum—that is, formulas found in the speech of language learners (acquisitional formulas, see Chapter 3). Criterion eight requires that such strings show a complexity greater than what the learner's grammar is capable of, which is taken as evidence that they are stored and retrieved whole (as they could not be realistically built up). This criterion is the cornerstone of acquisitional formula identification. There is,

however, a second criterion associated uniquely with these learner formulas—namely, that they will tend to be overused or overextended by learners (Myles et al., 1999; Myles, 2004; Peters, 1983; Tode, 2003; Wong-Fillmore, 1976, 1979). Thus, if a learner finds a formulation that seems to function well in a given situation, that learner may attempt to extend it to other (perhaps inappropriate) situations. For example, Kecskes (2000) reports on a learner who used the phrase "sure, no problem" to respond to both requests (*Can I borrow your pen?*) and to offers (*Would you like some candy?*). This identification criterion has also been justified by the sequence's presumed holistic lexical storage (e.g., Myles et al., 1998, 1999; Myles, 2004). Myles (2004) mentioned that the overextension of *comment t'appelles-tu* to third person contexts (*comment t'appelles-tu la fille*) could follow if such a string were stored as an unanalyzed whole. Specifically, she argued that in such examples, the string *comment t'appelles-tu* had been analyzed semantically (and, thus, the learner knew that it did not refer to the third person), but as the learner's current grammar was not yet able to analyze the string syntactically, he or she had to resort to lexical means to express the third person (thus, the addition of the NP *la fille*). In studies that cite this identification criterion, it is generally employed as a sufficient but not necessary condition for formula status; in other words, it is not expected that all acquisitional formulas will be overextended, only that this is a possibility among these strings.

Identification criteria—an overview. Referred to as a "vexed question" (p. 467) by Wray (2000), the identification of formulaic sequences continues to pose problems. In this section, 11 different surface characteristics that have been commonly employed to identify formulaic language were reviewed. A small core—multiword/multimorpheme,

invariability, and higher frequency—are common to studies adopting either a conventionality or a psycholinguistic view of formulaic language, although the way in which they are operationalized differs as a function of perspective. The remaining eight criteria are more strongly associated with one perspective or the other. Whereas conventional expressions will be community-wide in use and situationally bound, formulas will be syntactically coherent, will be pronounced fluently and will afford more time for discourse planning. They may also be semantically opaque and/or noncompositional. Moreover, acquisitional formulas will show greater complexity than the learner's grammar at large and may also be overextended.

Finally, as will be seen in the following chapters, there is one additional nuance that must be incorporated into the division between conventional expressions formulas. This nuance concerns any target language formula (see Chapter 3). Because "target language formula" is a status conferred on an expression that is known and used by a community of speakers, any investigation into targetlike formulaic language—whether couched in a psycholinguistic or a conventionality perspective—will necessarily evoke the identification criterion of community-wide in use.

Formulaic Language—An Overview

Although it is generally agreed that formulaic language exists, the terminology, definitions, and identification criteria associated with this phenomenon are complicated, if not confused, revealing a complex and divided field. As argued in this chapter, it appears that most of the terms, definitions, and identification criteria can be associated with one of the two main currents in the existing literature: one that sees formulaic language as conventional language (conventionality definition) and one that views it as

stored and retrieved whole (psycholinguistic definition). Following Bardovi-Harlig (2009, 2010), I have chosen to refer to formulaic sequences belonging to the first definition as *conventional expressions* and to those respecting the second as *formulas*, with the terms *formulaic sequence* and *formulaic language* acting as umbrella terms covering both types of expressions. For the current project, conventional expressions will be my object of study, and I will attempt to borrow from both conventionality and psycholinguistic approaches to formulaic language in order to examine the representation of such sequences for both native speakers (NS) and English-speaking nonnative speakers (NNS) of French.

Although the separation between conventionality and psycholinguistic approaches detailed in this chapter is essentially forward-looking, offering a new way of conceptualizing formulaic language, this division can also be profitably applied to past research. In the two chapters that follow, the existing research into formulaic language will be critically reviewed. Chapter 2 will be devoted to those studies that have taken a predominantly conventionality approach to the study of formulaic language, whereas Chapter 3 will discuss the literature on acquisitional formulas and collocations and idioms, which are generally couched in a psycholinguistic view of formulaic speech.

CHAPTER 2

FORMULAIC LANGUAGE AS CONVENTIONAL EXPRESSIONS

The previous chapter highlighted the conceptual independence of the conventionality and psycholinguistic status of a purported formulaic sequence, as well as the interest in considering these factors as independent in research. In reviewing the literature, the focus will first be on those studies that have investigated formulaic sequences as conventional expressions (current chapter), before examining studies whose focus has been more clearly psycholinguistic (Chapter 3). Although there are a number of researchers who have set out expressly to examine conventional expressions, there is also much anecdotal evidence which comes from studies into pragmatics whose aims did not necessarily include an examination of formulaic language. Findings from both such sources will be drawn upon to offer a selective review of production tasks investigating NNSs' knowledge of conventional expressions, as well as of the smaller number of studies that have used receptive tasks to examine learners' knowledge of such strings. The term *conventional expression*, which was argued for in Chapter 1, will be used throughout this discussion to refer to any sequence commonly used in a given community in a particular communicative situation. As such, the original vocabulary employed by most authors (who generally spoke of *formulas*) will not be retained.

Production Tasks

Although data from observation (DuFon, 1995), interviews (Forsberg, 2005; Wildner-Bassett, 1997), conversation games (Bygate, 1988), dialogue construction tasks (Jaworski, 1990), modified vocabulary knowledge tasks (Bardovi-Harlig, 2008), C-tests (Jones & Haywood, 2004; Schmitt et al., 2004), role plays (Félix-Brasdefer, 2007;

Forsberg & Fant, 2010; Warga, 2005), retellings (Forsberg & Fant, 2010), and fill-in-the-blank tasks (Scarcella, 1979; Tode, 2003) have all been employed in studies that have used production tasks to investigate knowledge of conventional expressions, the experimental design that has dominated this field is the discourse completion task (DCT: Bardovi-Harlig, 2008, Barron, 2003; Blum-Kulka & Levenston, 1987; Blum-Kulka & Olshtain, 1986; Edmondson & House, 1991; Eisenstein & Bodman, 1993; Kecskes, 2000; Sabaté i Dalmau & Curell i Gotor, 2007; Schauer & Adolphs, 2006; Warga, 2005; Warga & Scholmberger, 2007; cf. Bardovi-Harlig, 2009, 2010, who used an oral DCT). The predominance of the DCT is due at least in part to the Cross-Cultural Speech Act Realization Project (CCSARP; Blum-Kulka, House, & Kasper, 1989). For this project, NSs and NNSs of seven languages completed a DCT of eight request and eight apology contexts, and the data collected inspired a large body of research on pragmatic expression, with a focus on identifying pragmatic universals in the two speech acts examined. This project did not necessarily set out to examine formulaic speech, but given its focus on pragmatic expression, several of the analyses based on the data collected have provided insights relevant to the study of conventional expressions.

If the original CCSARP studies were not attempting to elicit formulaic speech, subsequent authors (e.g., Bardovi-Harlig, 2008, 2009, 2010; Burghardt et al., 2007; Schauer & Adolphs, 2006; Warga, 2005) have relied on DCTs to specifically investigate conventional expression use. However, DCTs are not without their detractors, who have attempted to highlight the potential disjunct between naturally occurring discourse and DCT responses. While the difference between DCT data (and, indeed, data gathered using any of the elicitation techniques mentioned) and authentic data is generally

acknowledged, many have argued both for the utility of this elicitation technique and for its validity, particularly for projects interested in idealized responses, which is generally the case for questions of conventional expressions (e.g., Blum-Kulka et al., 1989; Cohen, 2005; Golato, 2003; Kasper, 2000). Kasper and Rose (2002) stated that

> whether or not speakers use exactly the same strategies and forms in actual discourse is a different matter, but the questionnaire responses indicate what strategic and linguistic options are consonant with respondents' understandings of L2 pragmatic norms and what context factors influence their choices. (p. 96)

Thus, it is generally accepted that findings from experiments employing DCTs may provide an important source of information about conventional expressions.

The remainder of the section will begin with a brief review of the results concerning formulaic language that have come out of both the pragmatics literature and the literature on formulaic language more generally. This review will then be followed by a selective critique of a small sampling of studies.

Some Findings

Results from the numerous studies that have made reference to the use of conventional expressions point to several general conclusions. First, many experimental studies belonging for the most part to the pragmatics literature have shown that NSs tend to prefer to express certain pragmatic functions with conventional expressions (Barron, 2003; Bergman & Kasper, 1993; Blum-Kulka & Levenston, 1987; Bodman & Eisenstein, 1988; Eisenstein & Bodman, 1986, 1993; Olshtain & Weinbach, 1993; Takahashi & Beebe, 1993). Given NSs' preference for "conventionalized expressions and ideas" (Eisenstein & Bodman, 1993, p. 67), authors have set out to compare nonnative behavior to that of NSs in quantitative terms, and have found that nonnatives tend to underuse

conventional expressions with respect to natives (Edmondson & House, 1991; Scarcella, 1979; Warga, 2005).[11]

This difference between native and nonnative speakers has sometimes been imputed to the verbosity of learners, a strategy that Blum-Kulka and Olshtain (1986) interpreted as the nonnative's attempt to ensure that the illocutionary force of their utterance is understood. According to this second finding, learners may opt for a more explicit (and less natural) response in lieu of using the conventional expressions employed by NSs in the same situations (for a similar conclusion, see also Faerch & Kasper, 1989; Golato, 2003; Hartford & Bardovi-Harlig, 1992; Hoffman-Hicks, 2000; Kecskes, 2000; Olshtain & Weinbach, 1993; Scarcella, 1979). And although Edmondson and House (1991) suggested that task effect may be an alternative interpretation for Blum-Kulka and Olshtain's data, in their own study, they found a similar pattern: an inverse correlation between the use of conventional expressions and supportive moves, such that learners tended to use more supportive moves, whereas NSs used more conventional expressions.

The final general conclusion comes from both the pragmatics literature and general research into formulaic language, and finds that learners who have spent time abroad are more targetlike in their use of conventional expressions, either with respect to performance recorded before they went abroad (Barron, 2003, Dörnyei et al., 2004; Kecskes, 2000; Schmitt, Dörnyei, et al., 2004) or in comparison with foreign language learners (Forsberg, 2005). Different factors that may influence this improvement were examined by both Schmitt et al. and Dörnyei et al. Although none of the individual

[11] Although see Aijmer (2004), who found that her Swedish learners of English tended to repeat or string together pragmatic markers (like *I guess* and *kind of*) more frequently than did NSs. She explained this finding with reference to the likelihood that learners feel more communicative stress.

difference variables (e.g., aptitude and attitude/motivation) that were coded in the Schmitt study were significant, the interviews conducted by Dörnyei et al. led the authors to conclude that "success in acquiring formulaic sequences is strongly related to the learners' active involvement in some English-speaking social community" (p. 104).

Thus, this literature supports at least three general conclusions concerning the production of conventional expressions: Such expressions tend to be underused by learners, learners tend to be wordier than their native counterparts, and time abroad appears to be important for the mastery of such expressions. Although these findings are generally well-supported in the existing studies, there are several recurrent problems in this literature that must be taken into consideration when interpreting these conclusions.

A Selective Critique

Most of the problems with this literature are related to difficulties in the defining and identifying of conventional expressions, both of which are fundamental challenges for the field of formulaic language more generally. Specifically, what is meant by *conventional expression* (or *formula*) is often either unclear or varies from author to author, both in studies whose aim was to investigate formulaic language and in those that have merely mentioned such strings anecdotally. Even in the few studies that have set out to specifically investigate conventional expressions, it is not always clear that different authors are investigating the same phenomenon—despite claims to the contrary. In these studies, there are clear differences of opinion with respect to how one should go about identifying conventional expressions and perhaps even with respect to the types of sequences that are of interest. In particular, decisions made with respect to what variation is accepted in a single string as well as the operationalization of what is meant by

"frequent" vary from author to author. The studies reported by Warga (2005) and Bardovi-Harlig (2009, 2010), which used similar elicitation techniques but different identification procedures in order to pinpoint conventional expressions, are representative.

In a study that concentrated on conventional expressions used to close high imposition requests among teen-aged NSs of French (*n* = 45) and German (n = 20) and German-speaking learners of French (*n* = 84), Warga (2005) found that both the number and the nature of such expressions were different in the native and nonnative groups. In their request-closings (expressions of gratification and reward) on a 6-item DCT and in role-plays, learners produced far fewer conventional expressions, and those that were used seemed to reveal interlanguage specific strategies as well as L1 transfer. In order to identify conventional expressions, Warga relied on four main criteria: A conventional expression had to be composed of between 3 and 6 words, had to be (more or less) invariable, had to make up at least 15% of all closing-request types for a given group (all contexts combined), and had to be "multisituational" (p. 76). Whereas the first criterion serves simply to restrict the scope of the study, the author's operationalizations of the final three criteria merit additional attention.

As mentioned in the preceding chapter, what is meant by *invariable* changes from author to author, from study to study, although a sameness requirement of some form is almost inevitably cited in investigations couched in both the conventionality and psycholinguistic approaches. In the case of Warga (2005), the sameness requirement appears to be rather loose, allowing a relatively high level of variation. For example, the two strings *je te rendrai* ("I will return to you/pay you back") and *je te revaudrai* ("I will

pay you back") were grouped together into one conventional expression. For request-closings expressing reward strategies among French NSs, *je te rendrai/revaudrai* was the only string that reached the frequency threshold necessary to be labeled as conventional.[12] For learners, the four strings *je vais aider* ("I'm going to help"), *je peux aider* ("I can help"), *je vais faire* ("I'm going to do"), and *je peux faire* ("I can do") were considered to belong to a single conventional expression: *je vais/peux aider/faire* (p. 80), whose combined usage amounted to 11 tokens of the 60 request-closings that included a reward strategy among the learner responses. Although Warga explicitly stated that she would not restrict herself to continuous formulaic sequences, and thus would accept open slots, the principles by which she determined whether two strings—or four strings—constituted manifestations of the same expression are not made clear. In the case of *je te rendrai/je te revaudrai*, the open slot would apparently be defined as *je te* + [verb$_{\text{FUTURE}}$ promising reward]. For the example taken from the learner data, the only similarity clearly binding the four surface strings would appear to be their structure (*je* + verb$_{\text{PRESENT}}$ + INF), as it would be difficult to describe a semantically defined slot that would be restricted to *vais* and *peux* or *aider* and *faire*. Taken together, these two examples paint a picture of a very generous view indeed of what it means to say the same thing.

In addition to a generous invariability criterion, the frequency criterion adopted by Warga is permissive. The frequency cut-off of 15%, which, in Warga's own words, is somewhat arbitrary but "gives at least some guarantee that the selected sequence of words is frequent in the respective corpus" (p. 76), is surprisingly low. Thus, in Warga's analysis, the string *ce serait sympa* ("that would be nice" p. 77) is argued to be

[12] One of these two expressions was used in 8 of the 16 request-closings in which natives evoked reward strategies.

conventional for NSs of French, because 8 of the 53 (15.09%) request-closings expressing gratification produced by the natives used this string. For those expressions that showed variation, the frequency criterion is even more problematic, as the number of times the different variants were used would appear to be very low (although the frequency for the individual strings is not specified). Thus, for the expression *je vais/peux aider/faire*, which encompasses four different surface strings, only 11 occurrences (of 60 = 18.33%) were recorded. Whether this low level of convergence in terms of frequency can really be argued to reflect conventionalization is unclear.

Finally, despite the fact that conventional expressions are generally defined as sequences that are situationally bound,[13] the way in which the frequency cut-off was applied, in combination with the final criterion requiring that a string be multisituational, effectively divorces each conventional expression from the context that evoked it. Specifically, Warga applied the frequency cut-off to the aggregate data (pooled across the six DCT contexts) for a given speech act. For example, the string *ce serait gentil* ("that would be nice" p. 77) was identified as a conventional expression for the learners because out of the 58 request-closings expressing gratification elicited by the six contexts, 18 (31.03%) used this string. From these figures, we do not know if both the request-closings and the expression *ce serait gentil* were equally distributed across the six contexts, or whether this string was uniquely evoked by one or two of the six. The application of the frequency cut-off to the aggregate data effectively liberates the expressions from the contexts that elicited them, which undermines the situational dependence of the strings identified. The final identification criterion—*multisituational*—

[13] "Conventional expressions are those sequences with a stable form that are used frequently by speakers *in certain prescribed social situations*" (Bardovi-Harlig, 2009, p. 757, italics added).

also weakens the bonds between an expression and its context, insofar as it required that the conventional expressions be able to be used in multiple situations. Thus, instead of identifying *conventional expressions*, Warga would seem to be engaged in the identification of the most common ways of expressing a given speech act, regardless of the context in which that speech act is used, thus concentrating uniquely on the pragmalinguistic dimension of such expressions. Such a procedure ignores differences that might be brought about by variables encoded in contexts, such as social distance and register, which are essential to sociopragmatics. Given that conventional expressions are defined both in terms of the functions they perform (pragmalinguistics) and the contexts in which they are used (sociopragmatics), the focus of Warga's project appears to be different.

Bardovi-Harlig recently undertook an investigation of conventional expressions, using both production tasks (2009) and receptive tasks (2009, 2010) to explore knowledge among learners of English studying in a target language community. In order to identify target conventional expressions to be tested, a DCT was developed and piloted twice (both orally and in writing) with NSs living in the same community as the learners (Burghardt et al., 2007). Following the pilot phase, 32 scenarios were used for an oral DCT, the results of which were analyzed in the 2009 study. As was the case in Warga's experiment, Bardovi-Harlig also applied both an invariability criterion and a frequency criterion to the oral DCT responses in order to identify conventional expressions. However, the operationalization of each differed in significant ways from Warga's manner of interpreting the same guidelines. And although no mention of

multisituationality was made, Bardovi-Harlig required that each expression be a response to a single context, effectively ruling out multisituational strings.

Conventional expressions identified from among the results from both the pilot DCT and the oral DCT had to respect a stricter application of the sameness requirement than was seen in Warga's study. The two most common examples of accepted variation within a single conventional expression included *thanks* and *thank you* being counted together as a single form and the grouping together of the contracted and full forms of the copula (e.g., *sorry I'm late* and *sorry I am late*). Examples with more variability included *ADJ {to see/seeing} you* (e.g., *nice to see you* or *good seeing you*) and *that {'d/would} be + ADJ* (e.g., *that'd be great* or *that would be nice*). Thus, in Bardovi-Harlig's (2009, 2010) application of the sameness requirement, variation was essentially restricted to (a) contracted and full forms of the copula and modals, (b) variation between the infinitival and gerundive forms, and (c) a certain amount of synonymy in adjectives.[14] When compared to Warga's vision of sameness, Bardovi-Harlig is clearly more exacting.

In addition to allowing less variation, Bardovi-Harlig (2009, 2010) also chose to impose a more demanding frequency cut-off. For each of the scenarios piloted, a single speech act was targeted, and of the original 77 contexts, only those that elicited a single expression in at least 50% of the responses or for which the exhaustive response set was made up of two or three expressions were retained for further analysis. In the end, this procedure identified 30 target language conventional expressions, most of which had been provided by at least half of the NSs who responded to the final version of the DCT. Thus, these expressions had to respect a frequency threshold that was much higher (50%)

[14] Bardovi-Harlig (2009) was even more strict when determining whether learner and NS responses matched on a subsequent oral DCT. Only variation in full and contracted forms was accepted.

than the one put into place by Warga (15%). Moreover, the frequency criterion was applied within scenarios, pitting expressions elicited by a single context against its competitors. This practice, which recognizes the situationally bound nature of conventional expressions, again places Bardovi-Harlig at odds with Warga, who applied her frequency cut-off to aggregate data.

Although Warga (2005) and Bardovi-Harlig (2009, 2010) both used DCTs in order to elicit conventional expressions,[15] and both used superficially similar identification criteria in order to identify these expressions, the operationalization of *conventional* in the two studies is strikingly different. Warga's approach used a flexible sameness requirement and a low frequency threshold, both of which were applied to her aggregate data. Bardovi-Harlig, on the other hand, accepted less variability in strings grouped together as a single conventional expression and required that her conventional expressions be provided by at least 50% of the respondents. Moreover, Bardovi-Harlig applied these criteria on a context by context basis, and the aggregate data were not considered, a decision that reflects her assumption that such strings are situationally bound. Thus, although both authors claim to investigate strings that were frequently used in a certain communicative situation by a community of speakers (i.e., conventional expressions), their different manners of interpreting and applying the identification criteria of *invariability*, *frequent*, and *situational boundedness* would seem to have led the two authors to very different types of results. Whereas Warga's findings may be more relevant for a discussion of expressions generally associated with a given speech act

[15] It is important to keep in mind, however, that these two authors presented their contexts and recorded the responses in different modalities. Warga's DCT, like the vast majority of such tasks, was written, whereas Bardovi-Harlig used an oral DCT (however her pilot DCT was presented in both written and oral modalities).

(although her low frequency cut-off could be argued to undermine the generalizability of her results), Bardovi-Harlig succeeds in targeting what she sets out to examine—that is, conventional expressions. Thus, the operationalization of these deceptively simple identification criteria continues to be fraught with difficulties, which represents one of the biggest challenges facing the literature on conventional expressions.

Production Tasks—An Overview

In general, the research into conventional expressions using production tasks has claimed to show deficits in NNSs' competence. Potential sources for these gaps vary, and may include a desire to be explicit, a misinterpretation of a context with respect to native norms, lack of time abroad, among others. Although questions of how a learner may linguistically accomplish a certain communicative function have attracted much attention, the conceptual problems surrounding the defining and identifying of conventional expressions have complicated matters. In particular, the different interpretations attributed to relevant identification criteria appear to vary widely. As a result, it is far from certain that different authors are in fact talking about the same phenomenon, despite claims to the contrary, a problem that represents the most pressing question facing this literature. In the section that follows, research that has used predominantly receptive tasks to investigate conventional expression knowledge will be reviewed.

Receptive Tasks

Most studies have been preoccupied with determining what conventional expressions a learner produces, with comparatively few focusing on receptive capabilities with respect to such sequences. Moreover, interpreting this small literature is complicated by conceptual and design challenges. First, given that receptive knowledge is a complex

concept, encompassing several different types of competence (basic string recognition, familiarity, knowledge of form-function mappings, to name only a few), comparing results across studies is often difficult. Second, constructing a receptive task presents particular challenges, and the authors of most of the published studies hypothesize that their tasks were too easy, leading to the potential overestimation of mastery of the targeted expressions. Although these difficulties may explain in part the lack of such tests, this gap would also appear to be due to the assumption that demonstrated use implies receptive mastery. If this presumption may be justified with respect to string recognition, it is far less clear that use (even appropriate use) is necessarily indicative of an apparently targetlike understanding of the function(s) fulfilled by a string (pragmalinguistic knowledge) or the context(s) in which it can be used (sociopragmatic knowledge). In this section, the studies that have examined conventional expressions using receptive tasks will be reviewed on the basis of type of receptive knowledge examined: recognition and familiarity or pragmalinguistic and sociopragmatic knowledge.

Recognition and Familiarity

Bardovi-Harlig has conducted two different experiments, the first examining recognition of conventional expressions (2008), and the second targeting learner familiarity with a different set of such expressions (2010). The first study reported on 61 ESL learners at four levels of proficiency who completed three written tasks: one receptive (self-report recognition), one production (DCT), and one that tested both (modified vocabulary knowledge scale). The sequences under investigation were conventional expressions taken from Roever (2005) and other published studies (e.g., *no*

thanks, I'm full; *excuse me*). As noted in her discussion, the self-report recognition task resulted in very high (close to ceiling) levels of recognition, which were not paralleled in the production data. Although this might seem to indicate the primacy of recognition over production, the author acknowledged that the generosity of the self-report measure probably led to inflated levels of recognition.

Bardovi-Harlig (2010) reported on an aural familiarity study completed by 149 learners at four levels of proficiency as well as by 49 NSs of American English (both NS peers and NS ESL instructors). Thirty-five of the 60 items were identified as conventional expressions for the target language community under investigation in earlier research (Burghardt et al., 2007). The remaining 25 items consisted of modified versions—either lexically (*excuse the mess/excuse the dirt*) or grammatically (*no problem/no problems*)—of one of the conventional expressions. Participants listened to each item and were asked to determine whether they felt they heard the sequences often, sometimes, or never. Overall, conventional expressions were reported to be heard significantly more often than their modified counterparts. Although raw scores suggested that recognition of conventional expressions increased with proficiency, the tests of statistical significance only differentiated between NSs and NNSs (no differences were found within the four learner proficiency levels). NSs also rejected modified expressions significantly more often than learners. However, within the learner groups, the most advanced learners rejected modified expressions more often than the lower level learners, suggesting development. In addition to these general trends, Bardovi-Harlig discussed those items on which the NSs and NNSs showed different patterns and pointed out that learners seemed to be familiar with certain items early on (e.g., *nice to meet you* and *you*

too), whereas others received low marks even from the most advanced learners (e.g., *thank you for having me*).

In addition to testing different aspects of receptive knowledge, there are at least two methodological differences that distinguish Bardovi-Harlig's two studies, both of which deserve further note. In her first experiment, Bardovi-Harlig (2008) presented the different sequences to her participants in written form, whereas in Bardovi-Harlig (2010), participants were asked to judge how often they heard a sequence after its oral presentation (which was not accompanied by visual support). In the more recent study, the author argued that conversational expressions—such as those elicited using scenarios that simulate conversation—should be tested using an oral presentation. She moreover suggested that the phonetic realization of such expressions may be characterized by reduction, leading to a potential mismatch between the pronunciation and the written transcription of a common expression. The logic of Bardovi-Harlig's plea for congruence in the type of presentation used in testing and the type of modality usually associated with a sequence is uncontroversial. However, the extent to which testing oral expressions using written means impacts the results is an empirical question that remains to be tested.

For the second methodological distinction, we return to the problems of identifying conventional expressions. In her first experiment, Bardovi-Harlig (2008) relied on other research in identifying conventional expressions to target, a practice that she abandoned in her later experiments. This first method, which is often adopted in order to allow for comparisons across studies of conventional expression using receptive tasks, is problematic for several reasons. First, unless the linguistic community in question is the worldwide community for a given language, there is no guarantee that sequences

targeted in other studies will necessarily enjoy community-wide status in a new linguistic community that shares the same language. Second, it is possible and even probable that expressions will be used with different frequencies and will have different situational restrictions as a function of the community that uses them. Thus, in order to ensure that the expressions tested are in fact sufficiently frequent and community-wide in use, it would appear that any receptive task would need to be preceded by research examining use, so as to pinpoint which strings to investigate in a given community. This is precisely the approach adopted by Bardovi-Harlig (2010).

Differences in the two studies on receptive knowledge of conventional expressions authored by Bardovi-Harlig (2008, 2010) represent methodological advances in a small but growing field. On the one hand, her current research calls into question how conventional expressions are tested, by questioning whether a written testing modality is appropriate for such sequences. On the other hand, Bardovi-Harlig (2010) is the first study to report on a receptive task looking at conventional expressions that have been shown convincingly to be conventional in the community in question. If Bardovi-Harlig has restricted herself to questions of familiarity and recognition, a small group of authors has explored learners' ability to select an appropriate expression as a response to a context, thus essentially examining questions of pragmalinguistic and sociopragmatic knowledge of conventional expressions. These studies will be reviewed in the following section.

Pragmalinguistic and Sociopragmatic Knowledge

The remaining receptive tests come from both the interlanguage pragmatics literature (Kecskes, 2000; Roever, 2005, 2006) and the more general literature on

formulaic language (Dörnyei et al., 2004; Schmitt, Dörnyei, et al., 2004). Despite this difference of orientation, all of these authors have generally concentrated on learners' ability to select an appropriate conventional expression response to a given context. Thus, to use pragmatic terms, these studies have concentrated on what forms or linguistic means are used to accomplish what functions (i.e., pragmalinguistic knowledge) in what contexts (i.e., sociopragmatic knowledge). Most of the published studies have relied on a similar task design, which consists in providing a context and several possible responses to the established context, one of which is assumed to be a conventional expression (Dörnyei et al., 2004; Roever, 2005, 2006;[16] Schmitt, Dörnyei, et al., 2004). Kecskes (2000), in one of the sole exceptions, chose to present participants with a Dialogue Interpretation Task, for which they were asked to interpret what he called situation bound utterances (e.g., *get out of here*, *piece of cake*). Taken together, most of the quantitative results were quite high, with Schmitt et al. (2004) and Dörnyei et al. (2004) reporting on a task for which no significant differences were seen between pre and post session administrations, a result that they hypothesized to be due to the almost ceiling level results attained on the presession test.

In addition to showing high levels of mastery, such experiments have provided evidence for the influence of time abroad on the mastery of conventional expressions. For example, Roever's routines task presented 12 multiple choice items targeting conventional expressions. Learners of English in both host and foreign language environments read short contexts and chose the most natural response from four possibilities, with targeted responses ranging from very simple (*Hello*) to more complex (*Can I leave a message?*). Roever's results showed that even limited experience (less

[16] With respect to Roever (2005, 2006), I am here referring to his routines task.

than 3 months) in the host environment resulted in significant improvement in the selection of the correct conventional expression (proficiency was held constant), thus providing evidence for the importance of time abroad for receptive knowledge of such sequences, a conclusion echoed by Kecskes (2000).

Although multiple choice tasks can provide information concerning pragmalinguistic knowledge, there are several shortcomings to this sort of activity. As pointed out by Bardovi-Harlig (2008), such a task necessarily tests preference rather than recognition. I would take this one step further and say that the selection of the targeted expression in this sort of task cannot necessarily be construed to indicate that the learner believes the form-function mapping selected to be acceptable or appropriate. Additionally, the construction of distracters poses difficulty for such tasks. In the case of Roever, distracters ranged from formulaic but inappropriate, to not especially formulaic, to somewhat unconventional. The effect of this uncontrolled variable on the results is not clear. The final criticism will be familiar, as it concerns the identification of the expressions targeted for testing. As was the case in Bardovi-Harlig (2008), none of the strings tested in each of the studies cited was originally piloted in the target language community. Different strategies for identifying relevant expressions were used, including consulting with teachers of the language (Schmitt, Dörnyei, et al., 2004), corpus searches (Schmitt, Dörnyei, et al., 2004), and intuition (Kesckes, 2000a), but none of these ensure that the strings tested can be reasonably considered conventional expressions in the respective linguistic communities. And although a NS control group also generally judged them to be acceptable in the established contexts in each experiment, this is not

necessarily evidence that the tested strings are the preferred ones in the community in question.

Receptive Tasks—An Overview

The handful of studies that have examined receptive knowledge of conventional expressions have explored a variety of aspects of this construct: recognition, familiarity, and form-function/context mappings. In general, results from receptive tasks tend to be quite high, and even short periods of time spent abroad may have a significant impact. Although the challenge of creating a task that is not overly generous cannot be ignored and must be taken into consideration when interpreting these results, important methodological advances have been made, particularly with respect to recognition and familiarity. Examinations into receptive pragmalinguistic and sociopragmatic knowledge, on the other hand, have been restricted to multiple choice tasks, which were shown to be problematic for several reasons. Thus, new approaches to the study of receptive pragmalinguistic and sociopragmatic knowledge are needed.

Future Innovations in Formulaic Language as Conventional Expressions

The literature on conventional expressions has found that learners tend to underuse these sequences so common in native interactions, with verbosity and circumlocution being common in NNS responses. Studies using production and receptive measures have found that time abroad can positively affect a learner's mastery of conventional expressions. When the production and the receptive results are taken together, two broad generalizations are suggested: (a) current tests of productive competence show low levels of knowledge, even for advanced learners and (b) tests of receptive knowledge consistently show higher abilities for recognition in comparison to

production. These generalizations were put to the test in Bardovi-Harlig's (2009) study. Unique in the literature, this article reported on a productive (oral DCT) and a receptive (familiarity task, discussed in Bardovi-Harlig, 2010) task for conventional expressions, administered to a total of 171 participants (learners and NSs of English). For the learners, the results showed a correlation between receptive and productive knowledge, with levels of receptive knowledge always found to be as high or higher than those demonstrated for productive knowledge. Although this does not necessarily mean that receptive knowledge precedes productive knowledge (longitudinal data would be needed for such a claim), it does appear to be the case that, at least in these data, productive knowledge implies concomitant familiarity with the expressions.

Bardovi-Harlig's (2009) study is an important step toward understanding the complex relationship between productive and receptive knowledge of conventional expressions. As for the remaining literature reported on in this chapter, most of the receptive tests may in fact give nonnatives more credit than they deserve, whereas production tasks still struggle with eliciting conventional expressions when so many other responses are felicitous. Nonetheless the variety in experimental design is promising; for example, the recent contribution by Bardovi-Harlig (2010) provides both a more detailed and a more nuanced examination of speaker's familiarity with conventional expressions than has been seen to date, thanks to the use of a non-binary aural task. And there is still room for innovation. Contextualized judgment tasks (to be distinguished from a preference task, like Roever's, 2005) do not currently exist. Particularly with respect to conventional expressions, for which formulaic status relies in part on the fact that a sequence is situationally bound (i.e., a certain string may be conventional in some

contexts but not in others), contextualized tasks would be an important source of information. The current study attempts to respond to this gap with a first attempt to investigate knowledge of appropriate form-function/context mappings for conventional expressions using a context-based judgment task.

CHAPTER 3

FORMULAIC LANGUAGE AS A PSYCHOLINGUISTIC PHENOMENON

Conventionality approaches to formulaic language, the results of which were reviewed and critiqued in the previous chapter, are complemented by a large literature whose approach to formulaicity is essentially psycholinguistic. This research assumes that it is the mental representation of formulaic language that distinguishes it from nonformulaic sequences: A formulaic sequence is stored and retrieved as a whole string from memory, whereas nonformulaic language is generated, insofar as single lexical items are selected and combined together by the speaker's grammar. Whereas some consider that all examples of formulaic language—including conventional expressions—are holistically stored, three different types of sequences seem to be consistently associated with this approach: acquisitional formulas, collocations, and idioms. The first of these presumably represents a learning process (Bardovi-Harlig, 2008) or strategy (Weinert, 1995), and the form of acquisitional formulas varies with the learner. Collocations and idioms, on the other hand, constitute learning targets and their form is thus defined with respect to use within a community. Research examining acquisitional formulas will be briefly reviewed before moving on to psycholinguistic approaches to target language sequences.

Psycholinguistic Approaches to Acquisitional Formulas

Specific to the speech of language learners, acquisitional formulas are sequences that generally show greater complexity than the learner's larger grammar. Unlike conventional expressions, collocations, and idioms, there is no clear external target for acquisitional formulas, meaning that such strings are idiosyncratic. Instead, it is thought

that these formulas arise as a result of different learning pathways, which may push the learner to segment input into larger chunks and perhaps to associate these chunks with different contexts. Such strings are argued to be holistically stored and retrieved on the basis of two types of evidence that often characterize their early use (see discussion of identification criteria in Chapter 1): (a) the disparity between the apparent grammatical complexity of such sequences as compared to other utterances, implying that the learner's current grammar would be incapable of producing them, and (b) the overextension of such strings to inappropriate contexts (e.g., the use of a string specified for the first person singular in a context in which the learner is talking about a third person), which also implies that the grammar could not have generated such sequences. Acquisitional formulas have been documented for both L1 and L2 acquirers, and among L2 learners, such strings appear to be particularly common among younger learners.

Acquisitional Formulas in a L1

Researchers interested in child language have noted that there appear to be at least two different dominant pathways taken by children when learning their L1: the first involving the initial acquisition of many individual words that are later combined into longer sequences, the other privileging sequences that are both longer and more complex early on, which then later seem to be broken down into their constituent parts. Known under many different names (see Bloom, Lightbown, & Hood, 1975; Lieven, Pine, & Dresner Barnes, 1992; Nelson, 1973), for the field of formulaic language this distinction was perhaps most influentially discussed by Peters (1983) as *analytic* versus *holistic* approaches to language acquisition. According to Peters, the two pathways are not independent and children may (and often do) make use of both. For those instances in

which a child privileges the holistic approach, many of the resultant utterances appear to be acquisitional formulas. Peters postulates that such sequences are subject to a breaking down (fission), but that new formulas (although not restricted to acquisitional ones) may be built up (fusion). A similar view was espoused by Tomasello and Brooks (1999):

> In any case, the general principle is that young children come equipped to move in either direction—part to whole or whole to parts—in learning to partition scenes and indicate their constituents with different linguistic elements in syntactic constructions. All children probably use both processes to some extent in different aspects of language acquisition. (p. 166)

Evidence for holistic phrases in the L1 acquisition of English has been put forward by many authors (e.g., Clark, 1974; Dabrowska, 2000; Hickey, 1993; Lieven et al., 1992; Peters, 1983, 1995; Pine & Lieven, 1993; Tomasello, 2000; Tomasello & Brooks, 1999; cf. Vihman, 1982, for a claim concerning the apparent lack of such phrases in Estonian and Romanian L1 acquisition). These studies have generally reported on initial, targetlike use of complex sequences, followed by a period during which such strings were overextended and began to show signs of analysis (i.e., the substitution of different lexical items for original members), before the child showed nativelike competence. This result has been cited as an example of the U-shaped curve, a pattern posited for acquisition more generally (e.g., Kellerman, 1985). Such formulas, and the associated learning trajectory, do not seem to be restricted to L1 acquisition, as will be seen in the following section.

Acquisitional Formulas in a L2

Some of the earliest attempts to investigate the L2 acquisition of formulaic language involved children, most of whom were learning their L2 in target language environments (e.g., Hakuta, 1974; Kenyeres & Kenyeres, 1938; Wong Fillmore, 1976,

1979). The learning patterns manifested by these child L2 learners were found to be similar to those reported for L1 learners. Thus, authors looking at children in immersion environments (Bahns et al., 1986; Ervin-Tripp, 1974; Gibbons, 1985; Hakuta, 1974; Kenyeres & Kenyeres, 1938; Vihman, 1982; Wong Fillmore, 1976, 1979) as well as in classroom settings (R. Ellis, 1992; Kanagy & Igarashi, 1997; Myles et al., 1998, 1999) have found that apparently targetlike use of complex sequences was replaced by a larger number of usually nontargetlike combinations suggesting analysis that, for some learners, eventually gave way to a larger set of grammatical expressions. Although this pattern has been reported in numerous studies, Bohn (1986), in an examination of four German-speaking children learning English as a L2, argued against the very discovery of acquisitional formulas in such language samples. According to Bohn, Wong Fillmore's (1976) results suggesting the presence of formulaic language could be due to limitations in the methodology adopted, namely the sampling method used. Using data on the modal *can* from one of his participants, Bohn demonstrated that sampling 30 minutes at weekly intervals gives the impression that Lars initially uses *can* only in the formula *can you/we need/do + X*, a pattern which subsequent data show to become less rigid (pp. 192-193). However, Bohn demonstrates that when compared to the entire language sample, these 30 minute extracts clearly underestimate Lars' command of *can*.

Although concerns about sampling must be given consideration, acquisitional formulas have been robustly reported for L2 learners in target language environments. After arriving in the United States, Hakuta (1974) recorded 50 hours of interactions between his 5 year old daughter (Japanese L1) and English speaking peers over the course of 15 months, capturing her first attempts at speaking English. Hakuta identified

and reported on three different acquisitional formulas: patterns involving the copula (e.g., *this is*), the phrase *do you* in questions, and the phrase *how to* in embedded questions.[17] In each case, the child showed initial accurate usage: *Do you know? How do you do it? Do you have coffee?* (p. 293). At a subsequent point in time, the child produced utterances such as *What do you doing, this boy? What do you do it, this, froggie?* (p. 293). Hakuta suggested that these patterns, particularly when contrasted with the nonnativelike→ nativelike acquisitional trajectories found for certain grammatical morphemes, indicated that the child began to use *do you* as a question marker without having analyzed its constituent parts. Although the evidence for the subsequent analysis of *do you* is not as robust as the evidence for its initial formulaic use, Hakuta showed that at a later point in time, the child began to consistently use *do you* in a more creative and targetlike way (e.g., with the past tense), suggesting that the child had begun to analyze the acquisitional formula.

The general results reported by Hakuta (1974) are echoed in numerous studies, including in an investigation of untutored German-speaking children learning English (Bahns et al., 1986), in a study of English-speaking kindergartners in a Japanese immersion classroom (Kanagy & Igarashi, 1997), and in data presented by Wong Fillmore (1976, 1979), who tracked the acquisition of English by five Spanish-speaking children who had recently moved to the United States. But whereas some children who acquire their L2 in the target language culture appear to make use of acquisitional formulas and follow a learning trajectory similar to the one noted for L1 acquisition (i.e., U-shaped curve), we might expect children who learn a L2 as a foreign language in the

[17] Although the criteria for identification appear to be frequency, invariability, and greater complexity, this is not made explicit.

classroom to show different results. Among other things, classroom foreign language learners are exposed to different input, have different communicative needs (dictated by the classroom environment, which is generally restricted and predictable), and often share their L1 both with the teacher and with the other students. Myles et al. (1998, 1999) and Chini (2001) provided examples of acquisitional formulas used by children in this type of environment.

In a 2-year longitudinal study, Myles et al. (1998, 1999) tracked the use of acquisitional formulas by 11- and 12-year-old students of French in the British school system. The 16 children reported on in the two studies participated in regular French language classes that were "both strongly oral and strongly teacher centered, with considerable emphasis on the rehearsal and memorization of conversational exchanges" (1999, p. 55). The classes were observed on a bi-weekly basis, and data for the project were collected via three 1-hour sessions per year (informal interviews, picture-naming tasks). The researchers identified two different groups of acquisitional formulas: *j'aime* "I love," *j'adore* "I adore," *j'habite* "I live" (1998) and interrogative chunks, namely *comment t'appelles-tu?* "What is your name?" (1999). Although initial usage of these sequences was largely accurate, learners' attempts to speak in the third person provided compelling evidence that these sequences were not analyzed: *Richard j'aime le musée* "Richard I love the museum" (1998, p. 335) and *Comment t'appelles-tu un garçon?* "What is your name a boy?" (1999, p. 60). In both cases, approximately one-third of the 16 learners did not move past this type of use in the span of 2 years. The remaining learners eventually showed at least some unpacking of these acquisitional formulas and creative use of their parts; it was found that the ability to use third person subject

pronouns was associated with the break-down of both the *je* + Verb chunks and the interrogative chunks.

In interpreting these patterns, Myles et al. suggested that initial formulaic sequences were not simply discarded by learners, but that they were eventually analyzed, feeding the creative construction process, a proposal that was also put forth by Wong Fillmore (1976) for naturalistic child L2 acquisition and discussed in detail by N. Ellis (1996, 2002a, 2002b). To take the example of the *je* + Verb chunks, the authors found that the verbs involved in these formulas were always used in a finite form, as opposed to the majority of other verbs, which tended to first be employed uniquely in an untensed form before use of a finite form was documented. Given that the formula stage was not followed by the use of such verbs uniquely in the infinitive form, the authors argued that formulas are not simply abandoned to make room for a generative system, but instead that such sequences can feed that system. However, for the example cited, this argument is difficult to evaluate. Given that the finite forms found in the learner's productions were not contrasted with nonfinite forms, the value that a learner attaches to such apparently tensed forms is difficult to ascertain. As Myles (2004) argued herself, we must be wary of interpreting learner utterances that resemble adult ones as equivalent with the L2 target. Thus, Myles' (2004) claim that acquisitional formulas "remain grammatically advanced until the grammar catches up, and it is this process of resolving the tension between these grammatically advanced chunks and the current grammar which drives the learning process forward" (p. 152) might be better considered a working hypothesis than an established statement of fact.

Taken together, the results from studies of use of acquisitional formulas among tutored and untutored child L2 learners consistently show a similar trajectory: Well-formed strings whose grammatical structure is more advanced than the child's current interlanguage are used early on, which is followed by a period of inaccurate usage (often due to overgeneralizations) that generally shows evidence of attempts at analysis by way of the freeing up of slots within the string, before the child attains a system that is apparently targetlike with respect to the strings in question. Although most often documented with respect to child acquisition (L1 or L2), similar results have been found in several studies that examined what appear to be acquisitional formulas in adult L2 learners (Bardovi-Harlig, 2002; Bolander, 1989; Eskildsen & Cadierno, 2007; Forsberg, 2005; Schmidt, 1983).

In one of the earliest reports on the development of communicative competence in an adult L2 learner, Schmidt (1983) used data collected over the course of 3 years to describe the speech of Wes, a 33-year old Japanese-speaking immigrant to Hawaii. The analysis revealed a learner who relied heavily on memorized or formulaic sequences, an apparently conscious strategy as the learner often commented on and rehearsed expressions used frequently by his friends. Examples cited by Schmidt ranged from *Do you have time?* to *I beg your pardon…what did you say your name was?* to *thank you calling* (pp. 149-150). Schmidt pointed out that only those sequences that exceeded Wes' grammatical competence (like the first two examples given) constituted clear examples of memorized wholes (i.e., acquisitional formulas). Thus, for the first example *do you have time?*, Schmidt specified that with the exception of two formulas, no subject-verb inversion was found in questions (e.g., *ah you has keys? When Tim is coming?* p. 149).

Although imitation of expressions appears to have been one of Wes' main learning strategies, it is not clear that the mastery of these sequences later fed grammatical development, in the way described by Myles et al. (1998, 1999) or Wong Fillmore (1976). In fact, Schmidt claimed to find only one clear example of the breakdown of formulas leading to a "creative grammar" (p. 150). For the acquisitional formula *can I X?* (e.g., *can I get some coffee?*), Schmidt documented misanalysis of the type of verb form that can follow this string (e.g., *can I getting some coffee?*), as well as overextension of this directive to contexts requiring a request in the second person (e.g., *can I bring cigarette?* for *please bring me a cigarette*), both of which he considered to constitute examples of creative grammar. However, there are also apparent examples of strings originally argued to be acquisitional formulas for which one lexical item of the original string is eventually freed up, suggesting analysis and, thus, "creative grammar." For example, *shall we go?* was used early on, to the exclusion of other strings with the same form (e.g., *sitting?* was used instead of *shall we sit?*). At a later point in time, Schmidt reported that *shall we X?* was used productively (p. 154), implying at least partial analysis of the original string.

Nonetheless, the relationship between acquisitional formulas and subsequent grammatical development remains unclear, particularly for adult learners. For example, Rehbein (1987), who documented acquisitional formulas in the speech of immigrant workers in Germany, suggested that such strings seemed to lead to fossilization, as opposed to opening the way to greater grammatical development. The fact that Wes showed little change in the vast majority of strings argued to be memorized would seem to generally support this conclusion.

Psycholinguistic Approaches to Acquisitional Formulas—An Overview

As demonstrated in this section, acquisitional formulas characterize L1 acquisition as well as acquisition of a second or foreign language by children and by adults. Particularly common in early acquisition, these sequences are generally distinguishable by their grammatical well-formedness and their tendency to be overextended. Although psycholinguistic experiments would be almost impossible to conduct on such sequences, given their idiosyncratic nature, their complexity and overextension are assumed to indicate their lexical storage, assumptions that appear justified as their generation would be problematic. If their presence has been clearly documented across a wide variety of learning situations and individuals, the relationship between such unanalyzed strings and the development of grammatical competence is not entirely clear, and continues to inspire research.

In addition to questions about the relationship between acquisitional formulas and the larger grammar, there are several other outstanding issues concerning these sequences. For example, although acquisitional formulas are strongly associated with the psycholinguistic approach to formulaic language, studies on the pragmatic functions fulfilled by such strings may offer insight into both why learners employ them and what types of sequences tend to be singled out. In their thorough review of the literature that bears on pragmatic development, Kasper and Rose (2002) concluded that results from longitudinal studies of pragmatic comprehension, pragmatic and discourse ability, and speech acts showed "a tendency for beginning learners to rely on pregrammaticalized productions, *routine formulae*, and repetition, which gradually give way to an expansion of their pragmatic repertoire and overgeneralization of one form for a range of different

functions" (p. 307, italics added). In other words, acquisitional formulas may tend to fulfill specific pragmatic functions, allowing speakers immediate access to their new linguistic community. Thus, despite the fact that acquisitional formulas are defined as strings stored and retrieved as a whole, they may be pragmatically motivated, and it may be the conventional expressions of the target language that tend to serve as models for the acquisitional formulas ultimately used by learners.

Psycholinguistic Approaches to Target Language

The majority of European work on target language phraseology has been concerned with the dividing up of the formulaic landscape into idioms, collocations, and free combinations (e.g., Bosse-Andrieu & Mareschal, 1998; Dryzmala, 1990; Gross, 2003; Grossmann & Tutin, 2003; Heinz, 1993, 2003; Klein & Rossari, 2003; Lamiroy, 2003; Martin, 1997; Roberts, 1993; Tutin & Grossmann, 2002; Weinreich, 1969). Collocations and idioms (in contrast to free combinations) are generally considered to belong to the formulaic language spectrum, and approaches adopted in their study are most commonly aligned with a psycholinguistic perspective; these sequences are presumed to be stored and retrieved whole, and their use is generally not associated with a particular context or function (but see Siepmann's, 2005, classification, discussed below). Thus, in addition to the idiosyncratic acquisitional formulas, psycholinguistic approaches have also focused on target language sequences defined with respect to a linguistic community. Those studies that have used psycholinguistic methods in investigations into collocations and idioms will be the focus of the following review. In addition to studies that have focused predominantly on collocations or idioms, there have

been several investigations into the relationship between fluency and psycholinguistic status, and these studies will also be considered and critiqued.

Collocations

Within target language phraseology, collocations, which have been defined as "une cooccurrence lexicale privilégiée de deux éléments linguistiques entretenant une relation syntaxique" *a preferential lexical co-occurrence of two linguistic elements between which there exists a syntactic relationship* (Tutin & Grossmann, 2002, p. 8), are generally seen to represent a transitional zone between idioms and free combinations. The nature of this preferential lexical co-occurrence is still debated, and Siepmann (2005) identified three different approaches that are used in the study of such strings: those approaches that are semantically based (Grossmann & Tutin, 2003; Mel'čuk, 1998), those that are frequency oriented (Kjellmer, 1994; Sinclair, 1991), and those that he calls pragmatic. This multiplicity results from varying opinions as to which characteristics are most important to collocations: semantic coherence, high frequency, or association with certain pragmatic functions.[18]

In spite of the outstanding issues over how a preferential lexical co-occurrence might manifest itself, certain characteristics are traditionally associated with collocations. First, many authors restrict such sequences to just two lexical items: the *base*, which preserves its original meaning, and the *collocate*, which modifies the base, generally with a nonliteral sense. In addition to being binary, such combinations tend to be described as lexically transparent and syntactically well-formed, and yet subject to an arbitrary lexical selection restriction (see Williams, 2003). Thus, identification of collocations generally

[18] In the end, Siepmann argues for a much broader view of collocations, one that integrates the different strengths he sees in these three approaches, and one that ultimately includes a much larger set of sequences under this term.

proceeds by way of tests of substitutability, with an aim to singling out lexical combinations that are arbitrary, as opposed to those whose restrictions are due to semantic requirements. For example, whereas the anomalous nature of **walk a bird* as opposed to *walk a dog* would appear to be due to the fact that birds are generally not walked, English speakers' preference to *pay attention* to something (as opposed to, for example, *lend* or *do attention* to something, as one does in French) does not appear to be due to a clear semantic restriction. On the basis of this evidence, *pay attention* may be argued to represent a collocation in English, whereas *walk a dog* would not. The strings presented in (13), all claimed to be collocations, highlight the diversity associated with this label.

(13) a. *pay attention* (Howarth, 1998a)
b. *profondément enraciné* "deeply rooted" (Granger, 1998)
c. *long time* (Siyanova & Schmitt, 2008)
d. *une faim de loup* "very hungry" lit: a wolf's hunger (Williams, 2003)
e. *un brouillard à couper au couteau* "fog that can be cut by a knife" (Grossmann & Tutin, 2003)
f. *nuit blanche* "sleepless night" lit: white night (Grossmann & Tutin, 2003)
g. *cold war* (Makkai, 1972)

Whereas certain authors have attempted to make further divisions within the class of collocations (e.g., Howarth, 1998b; Grossmann & Tutin, 2003), generally on the basis of whether and to what extent both elements are restricted, others have attempted to widen what is included under this label. Thus, for Grossmann and Tutin (2003) as well as for Makkai (1972), certain semantically opaque sequences, such as *nuit blanche* or *cold war*, should also fall within the scope of collocations. This inclusiveness poses two different sorts of problems. On the one hand, some may consider that such sequences are compound words, and thus would not necessarily belong to the domain of phraseology (e.g., Roberts, 1993). On the other hand, for those who accept that such strings are

phraseological, their semantic opacity implies that they may be better considered idioms. These differences of opinion serve to highlight the fact that the teasing apart of collocations from idioms, from free combinations, as well as from compound words continues to pose problems.

If linguists find the classification of collocations to be challenging, learners also evidence important difficulties in mastering collocational knowledge in their L2 (e.g., Gabrys-Biskup, 1992; Howarth, 1998a, 1998b; Laufer & Girsai, 2008; Nesselhauf, 2003; Sugiura, 2002). In the following subsection, some of the general findings from the literature on collocational knowledge in an L2 will be reviewed. The final subsection will be dedicated to the published psycholinguistic studies that have explored the storage and retrieval of collocations among learners.

Some findings. The potential influence of the L1 on L2 collocational knowledge has been documented by numerous authors, and constitutes one of the clearest conclusions from this literature: Bahns (1993), Bahns and Eldaw (1993), Farghal and Obiedat (1995), Gabrys-Biskup (1992), Granger (1998), and Nesselhauf (2003, 2005). It is hypothesized that learners may be more tempted to assume that relatively transparent expressions (i.e., collocations) can be directly translated into their L2, whereas they may show more reluctance to assume such equivalence with regard to more opaque (i.e., idiomatic) expressions. Thus, an English-speaking learner of French may see little risk in saying **payer attention* (from *pay attention*)—despite the French preference to *prêter* or *faire attention* "lend or do attention"—whereas the same learner may be more hesitant to directly translate an expression such as *take the bull by the horns* (even though, in this case, French has an identical expression: *prendre le taureau par les cornes*). Working

with 32 essays composed by German-speaking learners of English, Nesselhauf (2003) showed that there was evidence of the influence of German in 45% of all mistakes, a rate that increased to 56% when only collocations were considered. Such results have led several authors to advocate a pedagogical approach that contrasts L1 and L2 collocational patterns, concentrating on those strings that are incongruent in the two languages (Bahns, 1993; Bahns & Eldaw, 1993; Farghal & Obiedat, 1995; Nesselhauf, 2003, 2005). This proposal finds support in results from a recent study by Laufer and Girsai (2008). These authors compared the effect of three teaching conditions (message-focused instruction, form-focused instruction, and contrastive analysis + translation) on the acquisition of single words and collocations. Results showed that the contrastive analysis + translation condition led to significantly greater passive and active recall for single words and collocations both on an immediate and on a delayed post test.

A second conclusion concerns a certain conservatism in L2 learners' collocational knowledge, described by Granger (1998) as a tendency to prefer "safe bets" (p. 148). Granger found that her French speaking learners of English showed a clear preference for more neutral and less collocationally restricted intensification adverbs (e.g., *very, completely, totally*) in ADV+ADJ combinations, which contrasted with the greater number of restricted collocational combinations found in the NS writing samples. The patterns discovered by Granger led her to conclude that learners—even relatively advanced ones—tend to prefer "building bricks" (p. 151) as opposed to preformed combinations. Such bricks are more flexible, insofar as they can be combined with a greater number of adjectives.

Finally, collocations are notoriously difficult to master, and numerous studies have shown that even advanced learners continue to make mistakes (e.g., Bahns, 1993; Bahns & Eldaw, 1993; Granger, 1998; Howarth, 1998a, 1998b). Nonetheless, there is some evidence suggesting that mastery of collocations may co-vary with L2 proficiency more generally. In particular, Forsberg (2010) and Bartning and Forsberg (2008) found that very advanced learners living in a target language community could be distinguished from less advanced learners by the frequency with which they successfully used lexical formulaic sequences (which look to be collocations containing at least one content word). Whereas less advanced learners underused such sequences, advanced learners were indistinguishable from NSs (Forsberg, 2010). Moreover, the ability to correctly use such strings correlated with other characteristics typical of near-native speakers identified in previous work (e.g., Bartning & Schlyter, 2004). However, in a study of collocations used in academic writing by learners completing postgraduate degrees in the UK, Howarth (1998b) remarked that there was a "lack of correlation between general proficiency and the number of deviant collocations" (p. 180). Interestingly, Forsberg (2010) found very few differences among her three groups of foreign language learners who presumably differed by proficiency, which would seem to imply that proficiency must reach a very high level, and that significant time abroad may be necessary, before positive effects can be seen for the mastery of such expressions.

Collocations and L2 processing. A variety of different online methodologies have been used to explore the storage and retrieval of L2 collocations. In such studies, *collocation* generally corresponds to preferential lexical co-occurrences that are particularly frequent (i.e., Siepmann's, 2005, frequency oriented approach), and authors

have used a variety of terms, including *recurrent sequences* (Altenberg, 1998) and *lexical bundles* (see Biber et al., 2004), to refer to what I am calling collocations.[19] In the case of both Schmitt, Gradange, and Adolphs (2004) and Nekrasova (2009), an oral dictation task was used in order to explore whether strings that occur frequently in a corpus are in fact processed more quickly than matched conditions. Schmitt and colleagues relied on criteria such as frequency and teacher judgments of usefulness to identify their targets, whereas Nekrasova depended solely on frequency. For their dictation tasks, participants heard short passages into which collocations had been incorporated, and participants were required to recite back the passages as completely as possible. The authors reasoned that in asking participants to repeat back bursts of text that are too long to be kept in short term memory, "there is a high likelihood that they [collocations] would be produced as part of the participants' responses" (Schmitt et al., p. 131).

The analysis consisted in determining how many targeted sequences were used by the participants in their recitations, and both studies found relatively low levels of recall (e.g., only 45% of targeted lexical bundles in Nekrasova's (2009) study were spontaneously used by participants). Despite similar results, the conclusions drawn by the two sets of authors were different. Whereas Schmitt et al. (2004) concluded that these findings, particularly combined with evidence of only partial recall for many strings, suggested that not all recurrent sequences are also holistically stored, Nekrasova stated that "the holistic nature of lexical bundles might not necessarily be reflected in a greater

[19] Moreover, in approaches that rely exclusively on the use of frequency to identify collocations, it is possible some of the strings identified might be syntactically noncompositional or semantically opaque (and, thus, would be considered *idioms* in my classification) or might be associated with a particular context or pragmatic function (and, thus, would be considered *conventional expressions* in my classification). Although I have chosen to present such studies in the current section, I have attempted to highlight the presence of idioms or conventional expressions among target sequences when appropriate.

number of these units produced in the exact form in which they appeared in the input" (p. 672). Although Nekrasova appears to base this conclusion on the fact that her NSs produced fewer targeted lexical bundles than her higher proficiency learners, this comment points to the important fact that the non-use of presumed formulas in such an experiment tells us nothing about the mental representation of such strings. That said, the claim that the use of such sequences is evidence of their holistic storage appears to be similarly flawed, as use of a sequence after it has been modeled does not necessarily have to be restricted to sequences that are lexically stored.

Jiang and Nekrasova (2007) used a design that was inspired by work done on the processing of idioms in order to examine the processing of strings such as *in any case* and *as soon as*. Each of the targeted strings (which were taken from other published studies) was modified by replacing one of the words with a substitute of similar length and frequency. Ungrammatical strings were also constructed, and an online grammaticality judgment task was developed. Reaction times (RT) and accuracy scores were examined, revealing that formulaic sequences were responded to both more quickly and more accurately than matched nonformulaic strings and ungrammatical strings, a finding that held for both native and nonnative speakers (NNSs were students at an American university) as well as when the strings were presented in lowercase and uppercase font. The authors argued that these results support a holistic lexical representation explanation for formulaic sequences, claiming that the faster RTs and lower error scores on such items are due to the fact that these sequences are simply not processed syntactically. Although the asymmetries recorded point to a psycholinguistic difference between such strings and the matched conditions, the authors' desire to equate processing advantages

with holistic lexical storage and a lack of syntactic processing is hasty; not only are there other explanations that may account for such patterns, but the interpretation of speeded RTs as evidence of a lack of syntactic processing appears entirely unfounded.

In their study of L2 collocational knowledge, Siyanova and Schmitt (2008) reported on three experiments: a corpus experiment, an offline frequency judgment experiment, and an online frequency judgment experiment. In the final two tasks, participants were asked to rate decontextualized English collocations in terms of "commonness." Results for the offline experiment showed that, unlike NSs, learners did not significantly distinguish between high and medium frequency collocations with their commonness judgments. Moreover, learners tended to underestimate the commonness of English collocations, as compared to their native counterparts. For the online experiment, the authors noted that the learners responded significantly more quickly to high frequency collocations than to low frequency ones (i.e., combinations that did not occur in the British National Corpus), and that their RTs were significantly slower than those recorded for NSs. The authors concluded that

> this result indicates that not only are nonnative judgements of collocational frequency less accurate than those of natives (Study 2), but that the recognition processing necessary to reach those judgements proceeds more slowly for nonnatives. Together with the results from Study 2, these results give a picture of L2 collocational knowledge that is both less accurate and slower than native knowledge. (p. 23)

In essence, the authors are arguing for a conservative judgment strategy among the NNSs (insofar as they did not use the extremes of the commonness judgment scale) as well as for relatively slower processing. Although slower processing in one's L2 is hardly surprising, the result concerning the significantly faster RTs in response to frequent collocations provides evidence that collocations may enjoy a processing advantage.

The final experiment that will be discussed also reported on three experiments. The strings tested by Ellis et al. (2008) were identified using corpus-linguistics techniques. Several corpora of academic English (both spoken and written) were consulted, and all three-, four-, and five-word sequences occurring at least 10 times per million words were extracted. For each string, frequency and mutual information (MI) scores were calculated from the corpora. The MI scores provide a measure of the degree to which the co-occurrence of two (or more) words is attested more often than would be expected by chance, thus providing a measure of internal coherence. Strings were then classified according to whether their frequency and MI scores were high, medium, or low. A total of 108 collocations, equally distributed with respect to length and with respect to MI and frequency scores, were targeted for further testing. The results from the first two psycholinguistic tasks were similar. The first task asked 11 NNSs and 11 NSs to judge whether a string was English or not, whereas 6 NNSs and 6 NSs were recruited to read aloud the test strings in task 2. In both cases, RTs were recorded and used as the dependent variable in multiple regression analyses. For task 1, each participant saw the original 108 strings as well as scrambled versions of each string, whereas participants in task 2 only had to read aloud the 108 original strings.

Forced entry multiple regression analyses showed that speed of NS responses in the grammaticality judgment task and in the read aloud task was significantly predicted by length of the expression and the MI score (the stronger the string cohered, the faster the NSs responded). Significant predictors for the learner responses on both tasks, on the other hand, included length and frequency (higher frequency strings were responded to more quickly). For the third experiment, 18 NSs and 16 NNSs participated in a priming

task designed to determine to what extent seeing the beginning of a formulaic sequence increased the speed with which the final word was articulated. The participants were told that they would see an incomplete expression or a series of x's followed by a single word, which they were to read out loud as quickly as possible. Results from this experiment showed continued significance for length (e.g., number of phonemes) and MI scores for the NSs. However, none of the predictor variables explored was found to account for a significant portion of the variance in the learner data.

According to Ellis et al. (2008), their results demonstrate the psycholinguistic validity of corpus-derived formulas. In other words, the use of criteria such as frequency and MI scores to identify formulaic sequences in corpora would seem to succeed in identifying expressions that enjoy processing advantages, given that strings with higher frequency are responded to and read aloud faster by NNSs, and NSs show a similar pattern for those strings showing a higher MI score. In an attempt to explain the importance of frequency for the learners but not for the NSs, the authors stressed that frequency has greater impact at the beginning of a learning curve, insofar as the influence of practice is greatest at early stages of learning, eventually leveling out. As for the role played by MI for NSs but not for NNSs, the explanation is less clear. As pointed out by the authors, strings with high MI scores tend to have clearly defined functions (and some of them would seem to correspond to what I have termed conventional expressions). This mapping of a sequence to a function presupposes, according to Ellis et al., that the sequence is recognized as comprising a coherent whole (rather than being interpreted literally) by NSs. This argument, however, would seem to imply that the mapping of a function to a form indicates that the form in question enjoys a holistic lexical

representation. Although many expressions performing certain communicative functions may be conventionalized and perhaps even holistically stored, functions can and indeed must be assigned to novel strings, and this in no way implies that such strings—while interpreted globally and recognized as comprising a coherent whole, insofar as such a string fulfills a certain function—are holistically stored. In any case, the authors conclude that their processing data indicate that "native speakers are attuned to these constructions as packaged wholes" (p. 391), a result that NS data from Ellis and Simpson-Vlach (2009) seem to confirm.

Idioms

Whereas collocations are syntactically well-formed and semantically transparent, idioms may be either syntactically noncompositional (e.g., *by and large*), semantically opaque (e.g., *pull his leg*), or both (e.g., *kith and kin*). Such strings are also generally considered to be invariable in form, although certain idioms do permit some syntactic transformations (e.g., passivization; see Chafe, 1968, and discussions in Tabossi, Wolf, & Koterle, 2009). It is generally taken for granted that such expressions are stored as such in the lexicon (psycholinguistic definition), their characteristic noncompositionality and semantic opacity rendering their building up by a generative grammar model a difficult task. As is the case for collocations, idioms are target language formulas and, thus, are common to a particular community of speakers, although they are not situationally bound (see Nattinger & DeCarrico, 1992).

The literature on idioms is vast, and includes attempts to reconcile these typically opaque and noncompositional strings with different syntactic viewpoints (e.g., Chafe, 1968; Fraser, 1970), investigations into their distribution (e.g., Moon, 2001), the

identification of the pragmatic functions they might play (e.g., Simpson & Mendis, 2003), as well as numerous studies into the acquisition of such expressions (e.g., Irujo, 1986a, 1986b, 1993; Steinel, Hulstijn, & Steinel, 2007). In this section, however, only those studies that have been concerned with the processing and storage of such sequences will be discussed. This large literature includes numerous investigations into native language processing (both typical and asphasic), but only a small number of recent attempts to investigate L2 processing of such expressions. Questions revolve around the access to the literal and figurative meanings that can be attributed to many idioms as well as whether such strings are stored holistically or not.

Idioms and nondisordered L1 processing. Several hypotheses concerning idiom processing (both in terms of access and meaning assignment) and storage have been proposed, including the idiom list hypothesis (Bobrow & Bell, 1973), the idiomatic processing model (Gibbs, 1980), the configuration hypothesis (Cacciari & Tabossi, 1988; Tabossi, Fanari, & Wolf, 2009), the graded salience hypothesis (Giora, 1997, 2002), and the lexical representation hypothesis (Swinney & Cutler, 1979). The idiom list hypothesis contends that idioms belong to a distinct lexicon, such that each speaker has both an idiom and a normal lexicon. When an idiom is encountered, this hypothesis says that one first attempts to process it using the normal lexicon; the figurative meaning is only assigned (through the idiom lexicon) if the literal meaning is found to be incongruent with the context. The second hypothesis—the idiomatic processing model—assumes a single lexicon, but posits that idioms are stored as a single unit. Of the two licit meanings that belong to each idiomatic string, this hypothesis states that idioms will be processed figuratively before being processed literally (and that the literal meaning will only be

accessed if the figurative meaning is inappropriate). The configuration hypothesis states that the figurative meaning of an idiom is only activated after the idiomatic key (i.e., those content words that clearly signal to the speaker that the string is an idiom) is encountered. The fourth hypothesis—the graded salience hypothesis—states that it is the more salient meaning of the string that will be accessed first via direct look-up in the mental lexicon. Finally, the lexical representation hypothesis posits that idioms are stored like any other word and that, when accessed, their literal and figurative meanings are processed simultaneously. Within the L1 processing literature, it is this last hypothesis that has been considered the "traditional view" (Papagno, Tabossi, Colombo, & Zampetti, 2004, p. 226).

As reflected in the five hypotheses reviewed, most of this literature is concerned with situating access to the figurative and literal meanings of idioms with respect to one another in online processing. Of more importance for the assumed holistic lexical storage of formulaic sequences in general are tests of Swinney and Culter's (1979) proposal that idioms are stored as big words. Using a phrase classification task in which participants were required to decide whether the strings presented (including idioms and matched controls) formed a natural string in English, Swinney and Cutler found that NSs judged idioms to be acceptable significantly more quickly than the control strings. This result has been confirmed with various populations, ranging from college students (Cronk & Schweigert, 1992) to school children (Qualls, Treaster, Blood, & Hammer, 2003) to speakers with aphasia (Nenonen, Niemi, & Laine, 2002).

Although global measures have indicated that idioms are read more quickly than matched literal strings, experiments that have looked more closely at the time courses

involved suggest that this processing advantage is perhaps not due to the storage and retrieval of such strings as single lexical items, as suggested by the lexical representation hypothesis. Colombo (1993) discussed data from a cross-modal priming experiment and two self-paced moving window experiments. If her results show activation of both figurative and literal meanings of idioms in processing, evidence for facilitation of the figurative meaning is seen only in medial and post-idiom positions. Similarly, Tabossi and Zardon (1995) reported on data from a cross-modal lexical decision task that found priming for the figurative meaning of idioms such as *to be in seventh heaven* only at the end of the expression (*heaven*) and not after the verb (*to be*). Finally, Peterson, Burgess, Dell, and Eberhard (2001) presented the results from four priming experiments that showed that syntactic computations continue to be active in idiom processing, even after semantic ones have been terminated. Thus, participants were able to name unrelated nouns more quickly than unrelated verbs after having seen *kick the …*in a context biasing the idiom *kick the bucket*, which the authors interpreted as proof of syntactic processing. However, the naming of concrete nouns was not facilitated in idioms, whereas it was with literal matches (e.g., *kick the …* in a context that implies the kicking of a ball), which was taken to indicate that a literal interpretation of the idiom had not been computed.

Taken together, these results suggest incremental processing of idioms, with the faster global RTs reflecting the increased speed recorded at the end of such strings. Although the source of this increase in speed is unclear—and may be explained by increasing automization, by the priming of final words, or by the access to a holistically stored representation at a later point in the parse (see Tabossi, Wolf, et al. 2009)—, these

results suggest that encountering the first elements of an idiom (even in figuratively biasing contexts) does not lead to the immediate retrieval of the entire idiom.

Idiom processing and brain trauma. In addition to findings from typical populations, results from studies conducted with individuals who have experienced brain trauma are relevant for questions of storage and processing of formulaic language, including idioms. Some of the earliest literature on aphasia mentions the preservation of apparent formulaic language (referred to most often as automatic, stereotyped, or recurrent speech) by patients exhibiting both fluent and nonfluent post-trauma command of language (Jackson, 1878, cited in Van Lancker & Kempler, 1987). For example, even patients who show difficulty with naming are still often able to count, recite song lyrics, or reproduce conventional expressions with natural pronunciation (both in terms of intonation and segmental phonology). Interestingly, "residual formulaic speech has been observed in all types of aphasia" (Van Lancker & Kempler, 1987, p. 267). This phenomenon has led researchers to investigate these individuals' pronunciation and comprehension of formulaic sequences, with idioms receiving particular attention. Most studies attempt to clarify issues concerning the potentially lateralized storage of the formulaic sequences that are preserved (i.e., does damage to the left or right hemisphere affect production and/or comprehension of such sequences?). In general, the results of these studies point to a neurological basis to the proposed difference between formulaic and nonformulaic language for NSs, with congruent evidence found in both production and comprehension experiments.

Van Lancker-Sidtis and Postman (2006) addressed the hypothesized role of the right hemisphere in the production of formulaic language in an experiment that involved

five participants who had suffered a left hemisphere cerebrovascular accident (CVA), five who had suffered a right hemisphere CVA, and five participants in a control group. All participants with CVA demonstrated a fluent aphasia. Transcripts from natural conversations were generated and two raters classified the speech into what were called speech formulas, idioms, and proverbs. Results across the three groups clearly differed: left-hemisphere-damaged participants used more formulaic expressions than did the control participants who, in turn, used more formulaic expressions than the participants with right hemisphere damage. The retention of apparent formulaic expressions in the speech of left hemisphere-damaged individuals has been documented elsewhere (see Van Lancker-Sidtis, 2006, for a review). The authors concluded that "the major findings of this study support the hypothesis that the right and left hemispheres may each serve as neural substrates for separate components of language performance" (p. 420), and that their results are in line with a dual-process model of language processing. Such models propose that the storage and retrieval of formulaic expressions is an entirely different mode of processing than that which is responsible for the generation of novel utterances. This model is a specific instantiation of the presumed storage and processing difference between formulaic and nonformulaic language.

Comprehension studies involving right- and left-hemisphere-damaged participants have also examined formulaic—and in particular idiomatic—expressions. In an experiment with both right hemisphere and left hemisphere-damaged patients, Van Lancker and Kempler (1987) asked participants to match idioms to images depicting the idiom. Participants in both experimental groups performed significantly worse than the control group, and those patients with right hemisphere damage performed worse than

their counterparts with left-hemisphere damage. Participants were also asked to match novel, nonformulaic utterances with an illustrative picture; for this task, the results for the two experimental groups were reversed and the right hemisphere patients outperformed the left hemisphere damaged patients. The authors argued that these data support the hypothesis that familiar expressions are stored and processed differently than are novel expressions (for similar results, see Myers & Linebaugh, 1981). Studies by Papagno and colleagues (e.g., Papagno & Genoni, 2004; Papagno et al., 2004), however, also found an important role for the left hemisphere in the comprehension of idioms, a conclusion based on results showing that left-hemisphere damaged patients had more difficulty in understanding idioms than matched controls. Although these authors suggest that their results provide evidence against the predominance of the right hemisphere in the comprehension of idioms, these results instead seem to suggest that idiom comprehension is not uniquely the responsibility of the right or the left hemisphere.

Although researchers continue to disagree as to whether formulaic sequences (and, in particular, idioms) are in fact stored in the right hemisphere, the results from both the production and comprehension studies with patients who have suffered brain trauma strongly suggest that the right hemisphere plays an important role in their processing and storage. Moreover, this literature often demonstrates that CVA patients show differing abilities on formulaic and novel language sequences—the severe deficits seen among right-hemisphere damaged patients on formulaic language are not replicated when nonformulaic sequences are tested. Although these results do not necessarily indicate that the formulaic sequences tested are stored and retrieved holistically, the neurological distinction between formulaic and nonformulaic in these cases is unquestionable.

Idioms and L2 processing. Even if the L2 literature on the processing of idioms is much smaller than its L1 counterpart, a wide variety of questions has been addressed, including investigations into which meaning—the literal or figurative—is first assigned to an idiom (Cieślicka, 2006), the speed with which literal and figurative meanings are accessed (Conklin & Schmitt, 2008), studies into the question of decomposability (Abel, 2003), comparisons of the processing of different idioms on the basis of whether translation equivalents are available (Liontas, 2003), the effects of idiom transparency and imageability on the ability to access a L2 idiom (Steinel et al., 2007), and comparisons between the speed with which idioms and control phrases are processed (Conklin & Schmitt, 2008; Schmitt & Underwood, 2004; Underwood et al., 2004). The majority of these studies focus on processing issues within the more general class of idiomatic expressions, as opposed to comparing idioms to putatively nonformulaic language. To take one example, Cieślicka (2006) used a cross-modal priming design to test whether priming of the literal meanings, the figurative meanings, or both could be shown for L2 English idioms, and her findings supported the primacy of the literal meaning even for idioms for which such a meaning could not be easily assigned. In interpreting her results with respect to the numerous proposals for L1 idiom processing, Cieślicka stated that "it appears that our L2 results are much more compatible with general processing predictions of compositional models of idiom processing" (p. 134).

The remainder of this section will concentrate on the three existing psycholinguistic studies that compared the processing of idioms to the processing of nonformulaic language, beginning with Conklin and Schmitt (2008). These two authors employed a moving window experiment in which items were presented line by line (see

[14]). Idioms and matched controls were embedded in contexts, and each idiom was seen twice: once in a context forcing its idiomatic interpretation and once in a context requiring its literal interpretation. Nineteen NSs and 20 NNSs completing postgraduate degrees in the UK participated in the experiment. RTs were collected line by line and the results showed that idioms were read significantly more quickly on both the literal and figurative meanings than the control sequences. No significant difference was found between the RTs for the literal and figurative meanings of the same strings. The authors interpret these results as evidence for the processing advantage conferred on formulaic speech.

Although the difference between the idiomatic phrases and control phrases may reflect a processing advantage specific to idioms, it also bears note that of the two examples given in the Appendix, slower RTs for at least one of the control phrases is not particularly surprising. Consider the following excerpt from one of the passages presented:

(14) Also, it is a long trip
until we arrive at the river.
I would like something to read while
you are taking your turn driving.
I find that a novel or
a short story can make long
trips go by much faster.

The control phrase for the idiom *to make a long story short* is in italics in this passage. The segmenting of the preceding lines (and of most of the passage) is such that any potential local ambiguities are resolved before moving on to the next line. However, in the case of *a short story can make long*, the parser can treat the final adjective either as a predicate adjective or as announcing an upcoming noun. Although the first interpretation

may be less common in English, the current segmentation may very well encourage it. And if in fact the parser attempts to incorporate *long* as a predicate adjective, longer RTs would be expected on both this line and the line that follows, with more time necessary on the line in question because of interpretive difficulties presumably associated with the sequence *make long*, and more time predicted for the following line due to the reanalysis of the adjective necessitated upon encountering the noun. Such ambiguities are certainly not present for the idioms. And if similar ambiguities are found in other control phrases, this could very well have had an impact on the results.

In the final two studies that will be discussed—Underwood et al. (2004) and Schmitt and Underwood (2004)—the formulaic sequences examined constituted a heterogeneous group. Composed mostly of idioms or common sayings (e.g., *put all your eggs in one basket, honesty is the best policy*), two of the experimental stimuli could be classified as conventional expressions or collocations (e.g., *I see what you mean, on the other hand*). The authors claimed that their selection of sequences was directed by their desire to focus "on the processing, rather than identification, of formulaic sequences" (Underwood et al., 2004, p. 156). To this end, frequency counts for 85 candidate phrases taken from either Schmitt, Dörnyei et al. (2004)[20] or the *Oxford Learner's Dictionary of English Idioms* (1994) were calculated, with the 21 most frequent being administered as a cloze test to NSs. Twenty of these expressions were retained for online testing. In the two studies, the processing of these expressions when embedded in larger contexts was examined. In each case, the final word of the sequence (terminal word) was also located somewhere else as part of a nonformulaic sequence in one of the 20 contexts (control

[20] Formulas in this study were identified on the basis of frequency, their connection to academic discourse, and teacher judgments as to whether they would be useful to students and worthwhile to teach.

word). Two terminal/control word pairs (pp. 170-172)—which were extracted from their larger contexts—are given in (15). The formulaic sequences are in italics and the terminal/control words are in bold.

(15) Terminal word: Sally agreed and thought that he'd *hit the nail on the* ***head***; if they had another week, they could have done much better.
Control word: The only downside to his visit was that he picked up a terrible cold in his ***head*** and had to take time off work to recover.
Terminal word: But *to cut a long story* ***short*** we eventually got home soaking wet at 3:30am.
Control word: I'm sure you'll pass it easily and in a ***short*** time you'll be driving yourself all over town.

This design allowed comparisons of eye-gaze measures or RTs (depending on the experiment) between the same word in different contexts. Finally, each context was followed by a comprehension question. This feature was included to ensure that participants were reading for content.

Twenty advanced NNSs and 20 NSs of English completed the eye-gaze experiment of Underwood et al. (2004). Comparisons of the number of fixations as well as length of fixation were made between the two groups of participants as well as between the terminal word of each formulaic sequence and its corresponding control word. Overall, NNSs were found to be less fluent readers than were the NSs, both in terms of number and length of fixations. Significant differences in eye-gaze measurements on the basis of whether a word was the final word of a formulaic sequence (terminal word) or was a control word were also found for both NSs and NNSs. NSs showed significantly fewer fixations and accorded significantly less time to these fixations when the word in question was a terminal word in a formulaic sequence as opposed to a control word. NNSs showed a similar pattern with respect to number of

fixations, although the length of the fixation did not differ significantly on the basis of formulaicity. The researchers claim that these findings are consistent with the processing of formulaic sequences as a complex lexical unit, and that the asymmetry found in the learners' data may indicate that improved processing proceeds in steps: As efficiency increases, the number of fixations drops before the length of fixations decreases.

Using the same set of stimuli as was used with the eye-gaze experiment, Schmitt and Underwood (2004) designed a moving window task in which the participant controlled the progression of the context with a press of the space bar: With each press, the current word disappeared, and the next word of the context appeared on the screen; RTs were recorded with each button push. After completing the task, participants orally defined each of the expressions tested, to ensure that they were familiar with them (this was not done in the eye-gaze task). Thus, RT on the basis of familiarity with the expressions was one of the factors examined. Additional factors included the RTs for NSs versus NNSs, the RTs on terminal versus control words, the RTs on each of the last four words of each expression, and RT differences depending on the overall length of the expression. A group of 40 participants (half NSs, half NNSs) completed this task. The results revealed that NSs read the formulaic expressions faster than NNSs and that NNSs read familiar expressions more quickly than unfamiliar ones. Although not surprising, this second result is important because Underwood et al. (2004) neglected to determine whether the learners were familiar with the sequences tested. Additionally, NSs showed a significant tendency to read the final word of a formulaic expression more slowly than the penultimate word. Finally, no differences in RTs were found between the terminal and control words for either the NSs or the NNSs. The authors themselves admit that this

set of results, particularly in light of the findings from the eye-gaze experiment, presents interpretive challenges. Most important, the lack of difference in RTs between terminal and control words is unexpected given the significant asymmetries found using the eye-tracking methodology.

These somewhat anomalous results may be due to at least four different problems with the design of the tasks. Considering first potential problems with the stimuli set, it is notable that the placement of the terminal and control words within the larger contexts was not controlled for. More specifically, in several cases, either the terminal or the control word was located in phrase-final position, a position that is susceptible to final wrap-up effects that would be evident in RTs or eye-gaze measurements (see [15]). A second critique of the stimuli set concerns its heterogeneity. Although the authors' intentions were to use uncontroversially formulaic sequences, the resultant list included both idioms (*the straw that broke the camel's back*) as well as sequences that might be considered either collocations or conventional expressions (*on the other hand*; *I see what you mean*). Additionally, the authors of both studies assumed that NSs and advanced NNSs would be familiar with these expressions. Although this assumption is probably accurate for the NSs, it is unjustified for the learners. And although familiarity with a formula was found to significantly affect NNSs' RTs in the moving window experiment, subsequent analyses (on terminal vs. control words, for example) were apparently conducted with the entire data set, instead of the subset of formulas that learners had shown themselves to be familiar with. Even though the connections between recognition, production, and processing of formulaic sequences are far from clear, it seems that this would have been the more conservative analysis: If a speaker is not familiar with a

formula sequence, is it logical to expect that learner to treat it differently from putatively nonformulaic speech (Bardovi-Harlig, 2009)?

A third critique of the task design pertains to the comprehension questions included after each context. According to the authors, the purpose of these questions was to prevent participants from clicking through the contexts without comprehending the content. Given this justification, we would expect data from those passages whose comprehension questions were answered incorrectly to be excluded from the final analysis; however, it is not clear that this precaution was taken. Finally, it is of note that the authors themselves identify a potential design problem with the moving window experiment: By choosing to present each word one-by-one, they hypothesize that they may have biased an online processing characterized by word-by-word processing for all sequences (the design of Conklin & Schmitt, 2008, attempted to remedy this). As they noted, "it may be that the word-by-word nature of the task disrupts the holistic processing of formulaic sequences" (p. 187). This comment essentially assumes that the strings tested could be processed in two different manners—holistically and incrementally—and that the strategy employed by participants may have been manipulated by the presentation of the strings. Although there is evidence that the segmented presentation associated with a moving window format can have an effect on silent prosody (e.g., Dekydtspotter. Donaldson, Edmonds, Liljestrand Fultz, & Petrush, 2008), the moving window presentation has been shown to be sensitive to a wide variety of syntactic computations and processing phenomena. If the experimental power of this methodology is called into question, much existing processing research will have to be revisited.

Idiom processing—an overview. The results from this body of research suggest that idioms are in general processed more quickly than are matched controls by both NSs and advanced NNSs. Although often interpreted as an indication of holistic lexical storage of such strings, there is also evidence for the incremental parsing of idioms from both L1 (e.g., Colombo, 1993; Peterson et al., 2001; Tabossi & Zardon, 1995) and L2 speakers (e.g., Cieślicka, 2006). Recent models of idiom processing, such as Tabossi, Wolf et al. (2009), have succeeded in accommodating these different findings into a single proposal. Building on the configuration hypothesis and on Sprenger, Levelt, and Kempen's (2006) superlemma model, Tabossi, Wolf et al. have suggested that idioms indeed enjoy a lexical representation, but that they are activated and thus retrieved only after they have been recognized (i.e., the idiom key has been encountered). If this proposal explains both the overall results of facilitation for idioms as well as the lack of facilitation seen at the beginning of such strings, additional research is necessary to explore its accuracy for native and nonnative idiom processing. As for examinations into the difference between the processing of L2 idioms and matched conditions, the small number of studies reviewed in this section suffers from important design difficulties that will need to be addressed before clear conclusions can be drawn.

Fluency and Formulaic Language

Before concluding this section on psycholinguistic approaches to target language formulaic sequences, I will comment briefly on a branch of research that relies on fluency to identify formulas. Some of the earliest work on formulaic language from a psycholinguistic perspective comes from the field of *pausology* (Goldman-Eisler, 1972; Raupach, 1984). Such authors have linked the use of formulas to fluent production for

both NNSs (Boers et al., 2006; Raupach, 1984; Wood, 2002a, 2002b, 2006) and NSs (e.g., Erman, 2007; Kuiper, 2004), particularly in certain professions (e.g., auctioneers, Kuiper & Haggo, 1984, sports commentators, Kuiper & Austin, 1990, and weathercasters, Hickey & Kuiper, 2000). These authors reason that strings that are holistically stored will not be interrupted by pauses or hesitations, and their use will lead to greater fluency (Boers et al., 2006; Dechert, 1984; Raupach, 1984; Wood, 2002a, 2002b, 2006). However, in addition to employing questionable identification practices (for each of the studies cited, intuition was relied upon to identify the sequences in question), it must be pointed out that the connection between formulaic speech, processing, and fluency continues to be debated. Fluency is certainly not restricted to formulaic sequences, and some would take issue with the assumption that disfluency cannot be found within holistically stored strings (e.g., Bybee & Schreibmann, 1999). Without a better understanding of the intersection of formulaic speech, processing, and fluency, the interpretation of results from pausology studies is problematic.

Psycholinguistic Approaches to Target Language—An Overview

Associated with the psycholinguistic approach to formulaic language, collocations and idioms have been subject to the first attempts to use online methodologies in order to test claims concerning the way in which they are processed, and most of this section has focused on these studies. Despite much recent attention, no consensus has been reached with respect to formula processing for L2 speakers. Although such strings are generally shown to be processed more quickly than matched control phrases, not all studies have reported this significant asymmetry. Moreover, the comparison between L2 and L1 processing has led to a variety of different conclusions, including similar native and

nonnative patterns of facilitation (Conklin & Schmitt, 2008), similar native and nonnative patterns showing a lack of facilitation (Schmitt & Underwood, 2004), evidence of development on the part of the nonnatives towards an apparent nativelike processing profile (Underwood et al., 2004), and the significance of distinct variables in the prediction of RT patterns for NSs and NNSs (Ellis et al., 2008). Although in part due to the different research goals of these studies, this variability is also in all likelihood a result of the design problems associated with certain experiments, problems that I tried to highlight in the preceding discussion. Moreover, it should be pointed out that the sequences targeted in these investigations have been identified in a variety of ways, with authors of the L2 studies relying on teacher evaluations (Conklin & Schmitt, 2008; Schmitt et al., 2004; Schmitt & Underwood, 2004; Underwood et al., 2004), NS judgments (Boers et al., 2006; Dechert, 1984; Raupach, 1984; Wood, 2006), descriptive norms (Cieślicka, 2006), and especially on corpora searches (Conklin & Schmitt, 2008; Ellis et al., 2008; Jiang & Nekrasova, 2007; Nekrasova, 2009; Schmitt et al., 2004; Schmitt & Underwood, 2004; Siyanova & Schmitt, 2008; Underwood et al., 2004) and dictionaries (Abel, 2003; Conklin & Schmitt, 2008; Liontas, 2003; Schmitt & Underwood, 2004; Siyanova & Schmitt, 2008; Underwood et al., 2004). Thus, few of the studies discussed have verified that the sequences tested were known by the participants who took part in the experiments or were even used in the communities in which they were living. Taken together, these results indicate that the field of L2 processing of formulaic language is clearly in need of additional research involving methodological innovation.

Next Steps

Regardless of theoretical affiliations and specialized aims, all researchers working on L2 formulaic sequences are in accordance on at least one point: It is interesting—and even important—to investigate how learners acquire and use well-worn ways of saying things in their L2, whether a conventionality perspective or a psycholinguistic one is adopted. If numerous interesting conclusions have come out of the literature on formulaic sequences, much remains to be addressed. Within a conventionality perspective, the focus has been largely on productive knowledge of conventional expressions. This trend has been complemented by a small number of studies examining receptive knowledge that have asked interesting questions, including inquiries into the relationship between productive and receptive knowledge (Bardovi-Harlig, 2009) and the impact of time abroad (Roever, 2005) on the knowledge of which conventional expressions are appropriate in context. However, this literature is in need of methodological innovation. Not only do most authors believe their receptive measures to be overly generous, but contextualized measures of receptive knowledge are rare. The current project explores native and nonnative speakers' ability to judge the mappings between conventional expressions and certain pragmatic functions in context using a novel receptive task (naturalness judgment task). Moreover, a production task (DCT) is used to identify the expressions to be tested, thus ensuring that the expressions under study are indeed conventional for the community in question.

In addition to examining naturalness judgments for conventional expressions, I will also use an online task in order to explore the processing of such expressions. Although the existing psycholinguistic investigations into formulaic language in a L2

have focused almost exclusively on collocations and idioms, some of the strings targeted in several of the studies could have been labeled conventional expressions (e.g., Ellis et al., 2008; Schmitt & Underwood, 2004; Underwood et al., 2004). This is true of sequences such as *it is interesting*, *as opposed to*, and *the first thing that*, used in an evaluative, contrastive, or organizational function in discourse (see Ellis et al., p. 391). In those studies that have examined such strings, their inclusion was generally independent of the discourse or communicative function they might play, these authors privileging statistical (Ellis et al., 2008) or "usefulness" (Schmitt & Underwood, 2004; Underwood et al., 2004) identification criteria. However, their presence in such studies highlights two important characteristics. Not only are conventional expressions among the most frequent formulaic sequences (explaining why they are identified when frequency oriented approaches are adopted), but teachers and researchers also judge them to be among the most useful for NNSs. And if they are included in psycholinguistic experiments, it is also because many believe that conventional expressions—and, indeed, all of formulaic language—are stored and retrieved holistically. To date, there has been no attempt to exclusively evaluate processing claims related to such strings using psycholinguistic means, a gap that the current study strives to remedy. Two research questions guided the design of the experiment, which will be detailed in the next chapter:

RQ 1: Do NNSs and NSs distinguish conventional expressions from grammatical, matched conditions on a contextualized judgment task?

RQ 2: Is there evidence of a processing advantage for conventional expressions?

CHAPTER 4

METHOD

This project set out to examine both how NSs and NNSs judge conventional expressions and how they process such sequences. In order to accomplish these goals, two steps were taken: First, conventional expressions were identified and, second, an online task was constructed and administered. Both of these steps will be detailed in this chapter. With respect to the identification of conventional expressions, the current project followed the example set by Bardovi-Harlig (2009, 2010) in attempting to identify expressions that are actually conventional in the community under study. To this end, NSs living in Pau, France were recruited to participate in an initial production experiment, whose goal was to identify norms with respect to linguistic means (including conventional expressions) used to respond to certain situations. In addition to identifying conventional expressions for NSs, the results from the production task also indicate expressions likely to be present in the input to which NNSs living in Pau are exposed. A subset of these conventional expressions was taken as the target for an online experiment that allowed for the examination of the processing of such strings by NSs and NNSs in Pau while also providing naturalness judgment data for conventional expressions and matched (but not conventional) counterparts. In this chapter, conventional expression identification will first be discussed before detailing the design of the online task.

Probing for Conventional Expressions

The first experiment in this project attempted to determine which sequences may constitute conventional expressions for NSs living in and around Pau, France. To this end, a multiple response written discourse completion task (DCT) was administered to 86

NSs, and the data collected were then analyzed in order to identify conventional expressions. The DCT, which was borrowed from interlanguage pragmatics research (e.g., Blum-Kulka, 1982; Blum-Kulka et al., 1989), was used because it allowed for both the control of contextual variables and the administration of the task to a large number of participants. Although it has been argued that conventional expressions would be best explored using oral/aural tasks (e.g., Bardovi-Harlig, 2009), the current DCT was administered in written format. This was due to the lack of facilities; where the experiment was being conducted, the task could have been administered orally to only two participants at a time.

A multiple response format—which provided space for up to four different responses to a context—was adopted because the purpose of this DCT was to identify the range of conventional expressions associated with a given scenario (e.g., Golato, 2003). Responses were not treated differently as a function of whether they were provided first, second, or later, and the full dataset was used to identify conventional expressions. Given that one of the goals of the online experiment was to determine whether such expressions have a processing advantage, one might argue that expressions provided in initial (as opposed to in other) responses may have a different status. Specifically, it is conceivable that expressions used in the first response may be more likely to show such an advantage precisely because it appears that they came to mind first. However, the psycholinguistic goals of this project were to investigate whether conventional expressions in general have a processing advantage and, for this reason, all responses were taken into account in the analysis. Moreover, for each of the contexts, only between one fourth and one third of the

respondents provided multiple responses; thus, most responses analyzed were in fact initial responses.

Data Elicitation

Traditionally, DCT contexts are designed to elicit a single speech act (e.g., apology or request), the realization of which is often examined by varying sociopragmatic variables such as speaker status and degree of imposition in the contexts presented (e.g., Blum-Kulka et al., 1989; Bergman & Kasper, 1993; Byon, 2004; Felix-Brasdefer, 2007; Takahashi & Beebe, 1993; Warga, 2005). In the current project, the DCT was adapted in several respects. First, sociopragmatic variables were not systematically varied, as this was not the aim of the project. Second, the possibility of providing multiple responses was given to the participants (see examples provided in Table 2). And, third, contexts were not designed to elicit a particular speech act, but rather to elicit a particular expression. This final departure was motivated by the attempt to elicit strings with a certain syntactic structure for the subsequent online task.[21] Thus, before designing the contexts to be used on the DCT, a set of potential conventional expressions was selected in accordance with the goals set for the subsequent psycholinguistic experiment. Twenty-four multiword utterances identified as "useful expressions" in a French as a foreign language text book for intermediate learners (Bragger & Rice, 1999) were selected as target expressions, their status as "useful" suggesting that they may be candidate conventional expressions for many French speaking populations. These 24 expressions served as a point of departure in the design

[21] An examination of the processing of conventional expressions involving movement was initially planned, and results from the pilot showed that the contexts used successfully elicited such sequences. However, in the final dataset, most of these movement strings were not identified as conventional, and this portion of the project had to be abandoned.

Table 2. *Two Contexts used on the DCT*

#	Context
5 *Having a drink*	Tu es chez un copain qui t'offre à boire. Tu acceptes et ton copain te propose toutes sortes de jus. Tu es indifférent(e). Tu lui dis: a. _____ b. _____ c. _____ d. _____ *You are at a friend's place, who offers you something to drink. You accept and your friend suggests several different sorts of juice. You are indifferent. You say to him:*
25 *Moving day*	Tu es en train de déménager et tu as besoin d'aide pour déplacer le lit. Ton frère habite près chez toi et il offre de te donner un coup de main samedi, sa seule journée de libre. A cette offre, qui te rend très content(e), tu réponds: a. _____ b. _____ c. _____ d. _____ *You are in the middle of moving and you need help with the bed. Your brother lives close to you and he offers to give you a hand on Saturday, his only day off. In response to this offer, which makes you very happy, you say:*

of the DCT, and contexts designed to elicit these expressions, as well as an additional 11 contexts describing common social situations, were created. The 35 contexts ranged in length from two to five sentences, and each context ended with an incomplete sentence followed by a colon (the full DCT and an English translation areprovided in Appendix A). Eight of the contexts invited interrogative responses (e.g., *Tu lui demandes:* "You ask him:"), whereas the remaining 27 elicited declarative responses (e.g., *Tu lui dis:* "You say to him").[22]

[22] Note that in specifying the illocutionary force of the intended response, this DCT differs from most. This strategy was adopted in an attempt to encourage the use of those targeted useful expressions that were *wh*-questions.

Probably as a result of the attempt to target particular useful expressions as opposed to particular speech acts, a small number of contexts elicited more than one speech act.[23] Of the two contexts presented in Table 2, *Having a drink* (context 5) is an example of a context that elicited a single speech act (*refusal*) in responses, whereas *Moving day* (context 25) is representative of those contexts for which more than one speech act was realized. In the case of *Moving day*, most participants provided an expression of gratitude in response to their brother's offer to help them move (e.g., *Ah! Merci beaucoup!* "Ah! Thank you very much!"). However, approximately one fifth of respondents responded uniquely with an acceptance of his offer (e.g., *Ok super ! à samedi alors ?* "Ok super! See you Saturday then?"), and many participants performed both speech acts in a single response.

The instructions provided for this written multiple response DCT were as follows:

> Vous allez lire les situations suivantes et donner la réponse qui vous semble naturelle. Au cas où vous trouveriez plus d'une réponse naturelle à une situation, écrivez-les toutes sur les lignes fournies en dessous des situations. A chaque situation, vous devez fournir au moins une réponse. Je cherche le français usuel et, avec votre permission, je vais maintenant vous tutoyer.
>
> *You will read the following situations and give the response which you find the most natural. In the event that you find more than one natural response to the situation, write all of them on the lines provided below the situations. For each situation, you must provide at least one response. I am investigating everyday French and, with your permission, I will now address you with the informal "you.*"

There was no time limit imposed on the completion of the DCT, and participants reported spending between 30 and 60 minutes on the task.

[23] Although piloting of the DCT showed this same phenomenon, most contexts were maintained in their piloted form, as the pilot also showed that they were effective in eliciting the targeted strings.

Participants

The DCT was administered to NSs of French living in or around Pau, France or in *Pyrénées Atlantiques*, the region in which Pau is located. Only NSs from the Pau region were selected because the NNS participants were to be drawn from this same area. Eighty-six individuals (65 women and 21 men) between the ages of 17 and 55 completed the questionnaire. Participants were recruited principally at the Université de Pau et des Pays de l'Adour and, as such, the majority of the participants (n = 50) were college students, which is reflected in their average age (23.6 years).[24] These participants had spent on average 15.8 years in Pau or in the surrounding area. Eight of these participants reported knowledge of a language in addition to French from a young age (Basque = 3; Arabic = 2; Occitan = 1; German = 1; Hebrew = 1). All participants were volunteers and were not compensated for their participation.

Analysis—Identification Criteria

For each context, a list of all responses was compiled. Responses were then analyzed in order to identify potential conventional expressions using a subset of the identification criteria discussed in Chapter 1. The five identification criteria selected reflect the conventionality and psycholinguistic goals of this project. In addition to the three criteria common to both perspectives (multiword, invariability, and higher frequency), sequences identified as conventional expressions were also situationally bound and community-wide in use (conventionality criteria) and syntactically coherent (psycholinguistic criterion).

[24] Although NSs were considered to constitute a single group in the current analysis, it would be interesting to explore whether NS peers provided different responses as compared to the 36 NSs who were not college students (see Bardovi-Harlig, 2009, 2010, who found a difference between NS peers and NS teachers in her own DCT data).

(16) a. Multiword
b. Situationally bound
c. Syntactically coherent
d. Invariability
e. Higher frequency/community-wide use

In what remains of this section, the operationalization of these criteria as applied in this project will be outlined.

Multiword. The multiword criterion is cited in studies examining both conventional expressions and formulas, as authors from both perspectives generally agree that it is phrasal phenomena that are of interest. It is only within the conventional perspective that this criterion is not always adopted. Thus, authors such as Coulmas (1979, 1981), Sorhus (1977), and Pawley (2008) include in their analyses single-word expressions associated with a specific communicative function: *bonjour* "hello," *merci* "thank you," and *désolé* "sorry." Although the inclusion of single-word expressions would be necessary for a complete analysis of pragmalinguistic and sociopragmatic knowledge, I restricted the scope of the current project to multiword expressions. Firstly, this decision reflects the focus of this project on phrasal phenomena, which is reflected in the definition adopted for conventional expressions: "Conventional expressions are those *sequences* with a stable form that are used frequently by speakers in certain prescribed social situations" (Bardovi-Harlig, 2009, p. 757, italics added). In addition to the desire to restrict this project to phrasal strings, this criterion was important for the psycholinguistic portion of this project. Specifically, the design of the online experiment manipulated two variables (Word and Frame), the second of which involved placing a lexical item from a conventional expression in a nonconventional frame, a manipulation that is impossible for a one word expression, as it has no larger conventional frame.

Situationally bound. Conventional expressions are defined as sequences that are used in certain prescribed social situations (Bardovi-Harlig, 2009), a characteristic that is generally referred to as situational boundedness (see Kecskes, 2000). Given that a DCT was used to elicit the production data, the responses (and, thus, any conventional expressions included in them) were necessarily bound to the situations that had evoked them. Thus, contrary to those projects that have used this criterion in the analysis of free production data (e.g., Myles et al., 1998, 1999), the type of task used for elicitation in the current project ensured that situational boundedness was respected for all conventional expressions, so long as responses were only compared within contexts (cf. Warga, 2005).

Syntactically coherent. All sequences identified as conventional expressions were syntactically coherent. This criterion, which is generally associated with psycholinguistic approaches to formulaic language, is designed to rule out sequences such as *et le* "and the," repetitions, and open slots. Although the current project focuses on conventional expressions, this criterion was adopted in order to exclude strings with open slots from the set of potential sequences. In this first attempt to examine the processing of conventional expressions, open slots were not included in order to facilitate the identification of a base form for each expression.

Invariability. The requirement that conventional expressions be invariant in form has been interpreted in numerous ways, as mentioned in Chapter 1. Thus, most studies into conventional expressions (as well as many into formulas) permit a certain amount of variation in what is considered the "same" expression. Accepted variation differs from one author to another, ranging from relatively small differences (e.g., grouping together the full and contracted forms of the copula) to much larger instances of variation (e.g.,

open slots). In the current project, four types of variation were accepted: (a) presence or absence of the negative particle *ne*, (b) variation in *qui* versus *qu'il*, (c) variation in an adverb or adjective, and (d) variation in word order in interrogatives. When a conventional expression displaying any such variation was retained for use in the subsequent experiment, the most common variant was identified as the conventional expression.[25] Examples of each type of variation are provided in Tables 3 through 6.

Sentential negation in French involves two elements: a preverbal negative particle *ne* and a postverbal negative adverb (*pas, plus, jamais*). Although the postverbal element is generally obligatory, the preverbal particle, particularly in the spoken language, is often dropped (e.g., Ashby, 1981, 2001). In the current datasets, although negation without *ne* was predominant, both versions were found, and sequences that differed only by the presence or absence of this optional particle were considered to belong to the same string. Only three strings that met the criteria for conventional expressions also included sentential negation: responses to *Grandma marries rich* (context 18), *Bad phone line* (context 11), and *New school* (context 19). In *Grandma marries rich* and *Bad phone line*, all participants used the same form of negation, in which *ne* was not produced: *c'est pas vrai?!* "It's not true?!" and *je t'entends pas* "I don't understand you." In context 19, however, variation was apparent, and three different strings were considered to be realizations of the same conventional expression (see Table 3).[26]

[25] Whereas many authors represent optional elements in parentheses in cases of variation, in this project, the most frequent variant was taken to be the base form. It was necessary to identify a base form in such cases as only one form of each expression was tested in the online experiment.
[26] Interestingly, Fónagy (1998, p. 138) claimed that *énoncés liés* (bound utterances), in contrast to *énoncés libres* (free utterances) categorically do not accept the negative particle *ne*. The example he cites is *c'est pas vrai!*

Table 3. *Example of Variation involving Presence/Absence of the Negative Particle* ne

Variant	Translation	Frequency
Ne t'inquiète pas	Don't worry	18
T'inquiète pas	Don't worry	9
T'inquiète	Don't worry	3
Conventional expression: *Ne t'inquiète pas*	Don't worry	30

Note. Data associated with the semantic formula of *comforting*, taken from the context *New School* (context 19).

In choosing which version to identify as the conventional expression, frequency was the deciding factor. As is often the case with imperatives, the negative particle *ne* was present in a large number of strings, and given that the variant *ne t'inquiète pas* was more frequent than either *t'inquiète pas* or *t'inquiète*,[27] it was this variant that was retained as the conventional expression.

When followed by a consonant-initial word, the pronunciations of the relative pronoun *qui* and the relative pronoun *que* followed by the singular masculine pronoun *il* (*qu'il*) are indistinguishable, both being pronounced as [ki]. This homophony led to apparent orthographic neutralization in several contexts. As a result, items differing only in terms of *qui* versus *qu'il* in the phonetic context specified were considered to belong to the same string (see Table 4). In the case of the responses to the *Surprise storm* scenario, *qui* was the most frequent response, which is why *Qu'est-ce qui s'est passé* was ultimately identified as the conventional expression.

[27] The third variant is the only example in the dataset in which the postverbal negative adverb was missing (response provided by 3 participants). This structure, which is only possible in imperatives (as the word order indicates that the sequence is negative), is attested in only a small number of French expressions. Thus, for this example, variation in both the preverbal negative clitic and the postverbal negative adverb was accepted.

Table 4. *Example of Variation involving* qui *versus* qu'il

Variant	Translation	Frequency
Qu'est-ce qui s'est passé?	What happened?	53
Qu'est-ce qu'il s'est passé?	What happened?	18
Conventional expression: *Qu'est-ce qui s'est passé?*	What happened?	71

Note. Data associated with the semantic formula of *request*, taken from the context *Surprise storm* (context 27).

One of the most common types of variation covers cases in which two strings differ only by the presence of an adverb or adjective (e.g., *Je suis vraiment désolé* vs. *Je suis désolé*), as well as cases in which several different adverbs/adjectives were used in the same string (e.g., *Je suis vraiment désolé* and *Je suis profondément désolé*). Both types of variation involving adverbs or adjectives are illustrated in Table 5.

Table 5. *Example of Variation involving Adverbs or Adjectives*

Variant	Translation	Frequency
Je suis vraiment désolé	I am truly sorry	23
Je suis profondément désolé	I am deeply sorry	3
Je suis désolé	I am sorry	9
Conventional expression: *Je suis vraiment désolé*	I am truly sorry	35

Note. Data associated with the semantic formula of *apology—IFID*, taken from the context *Late—boss* (context 35).

This type of variation was only accepted in strings of more than two lexical items. Otherwise, two-word sequences in which one of the lexical items was either an adjective or an adverb open to a certain amount of variation would have met the criteria for conventional expressions, essentially reducing that expression to a one-word lexical core. As the psycholinguistic goals of this project required the exclusion of single word expressions (see the criterion "multiword"), such sequences were not retained.

The final type of variation accepted involved differences in interrogative word order, a well-known feature of French (see Coveney, 1996; Valdman, 2000). For *wh*-questions, these variants include fronting the *wh*-word and inverting the subject and verb, fronting the *wh*-word and using the interrogative phrase *est-ce que*, leaving the *wh*-word in situ, and fronting the *wh*-word without concomitant subject-verb inversion. With the exception of the last schema, all of these possibilities were found in the data collected (see Table 6). For yes/no questions, speakers can maintain the original word order (interrogative by intonation), invert the subject and the verb, or use the interrogative phrase *est-ce que*, all of which were attested in the data collected. Given that these different interrogative variants all share the same global semantic values and realize the same speech act, they were classified as a single string, using the most common variant as the representative conventional expression (in his variation analyses, Coveney essentially adopts a similar stance, insofar as he treats these different realizations as variants). It should be noted that this interpretation of the sameness criterion for interrogatives is controversial in its consideration of multiple surface strings as instantiations of a single expression (see discussion in Chapters 6 and 7).

Table 6. *Example of Variation involving Interrogative Word Order*

Variant	Translation	Frequency
Q'est-ce que tu en penses?	What do you think about it?	27
Tu en penses quoi?	What do you think about it?	21
Qu'en penses-tu?	What do you think about it?	10
Conventional expression: *Qu'est-ce que tu en penses?*	What do you think about it?	58

Note. Data associated with the semantic formula of *request*, taken from the context *Important decision* (context 10).

Higher frequency/community-wide use. The final identification criterion interprets higher frequency and community-wide use as requiring that a conventional expression be frequent. The current operationalization of this frequency requirement attempted to respect Wray's (2002) call for contextualized comparisons of frequency. According to Wray, overall frequency counts are insufficient for the identification of formulaic language. What is more important for the determination of a string's frequency is how often a potentially formulaic (or conventional) string occurs as compared to when it could have occurred. Following this reasoning, a procedure was adopted to ensure that comparisons of frequency were made between strings that ostensibly competed to fulfill the same function within the same context (see Bardovi-Harlig, 2009, 2010; Bardovi-Harlig et al., 2008; Burghardt et al., 2007). Thus, within each context, responses were subjected to an analysis that first separated strings on the basis of speech act performed (see Searle, 1969), and then on the basis of the semantic formulas used to realize each speech act, before applying the frequency cut-off to each set of semantic formulas.

After having separated sequences on the basis of speech acts performed,[28] the coding scheme of Blum-Kulka and Olshtain (1984) and Blum-Kulka et al. (1989) was followed in order to identify the semantic formulas (head acts and any adjuncts) for each speech act. Olshtain and Cohen (1983), with reference to Fraser (1980), describe *semantic formulas* as sequences consisting "of a word, phrase, or sentence which meets a particular semantic criterion or strategy" (p. 20), any one of which may be used to perform a given speech act. Consider the following response given to *Second helpings* (context 33), in which a respondent accepts an offer of a second helping of quiche:

[28] Only five contexts elicited more than one speech act, each of which was realized by at least 10% of respondents.

(17) *Avec plaisir. J'ai une faim de loup et le repas est délicieux.*
« With pleasure. I'm as hungry as a wolf and the meal is delicious. »

The speech act realized is an acceptance of an offer, and the head act is performed with the expression *avec plaisir*. This acceptance is accompanied by two additional semantic formulas, the first of which is clearly an explanation. The respondent justifies his acceptance of the offer by referring to his hunger (*j'ai une faim de loup*). The final element—*le repas est délicieux*—is ambiguous, as it could either be an explanation (the offer of seconds was accepted because the meal was so good), or as a compliment to the chef. Despite the ambiguity of the final element, this acceptance of an offer clearly entails three different semantic formulas. As a final example, a response involving two speech acts is provided in (18). In *Late—boss* (context 35), the respondent speaks with their boss after having arrived 30 minutes late for an important meeting.

(18) *Bonjour, je suis navrée j'ai eu un petit imprévu. Ça ne se reproduira plus*.
« Hello, I am sorry something unexpected cropped up. It won't happen again. »

In this case, the respondent realizes both a greeting (*bonjour*) and an apology (*je suis navrée j'ai eu un petit imprévu. Ça ne se reproduira plus*). Within the apology, three semantic formulas are apparent: the head act in the form of an illocutionary force indicating device (IFID; *je suis navrée*), an explanation (*j'ai eu un petit imprévu*), and a promise of forbearance (*Ça ne se reproduira plus*).

After each response had been analyzed into its constituent semantic formulas, the frequency of each string used to realize a given semantic formula was determined. For each semantic formula, any sequence used by at least 50% of participants who had realized that particular semantic formula was considered an *expression-candidate* (i.e., a potential conventional expression). Thus, if 70 of the 86 participants realized an IFID in

response to a given context, and 35 of those 70 participants used the same sequence to express their IFID, that sequence was identified as an expression-candidate. In other words, instead of requiring that 50% of all participants use an expression in order for it to be considered conventional, the 50% cut-off was applied to only those participants who had realized a given semantic formula.

The absolute frequency of the semantic formulas that gave rise to the different expression-candidates varied widely. For this reason, after identifying all expression-candidates, the frequency of the semantic formulas involved was examined. Specifically, expression-candidates associated with semantic formulas used by less than 25% of all respondents (n = 22) were eliminated. Intended to rule out potential conventional expressions associated with marginal interpretations of a context, it remains an open question whether only those semantic formulas realized by a greater proportion of participants (i.e., 50% or more) should have been retained, and future research should focus on whether this cut-off should be more stringent (see discussion in Chapter 7).

The example given in Table 7 illustrates the frequency analysis with the data from the *Late—boss* (context 35) scenario. Four semantic formulas were realized by multiple participants in performing an apology, two of which were expressed using a single string by at least half of the participants who had used those formulas (IFID and promise of forbearance). The number of participants (out of 86) who realized each semantic formula is found in the column *Frequency (SF)* in Table 7, whereas the number of those respondents who used the expression-candidate to realize that formula is given in the column *Frequency (EC)*. Thus, 63 of the 86 participants used an IFID in their response to context 35, of which 35 provided the string *Je suis vraiment désolé* “I am really sorry” in

order to realize this semantic formula. The column *% Use (Relative)* shows what percentage of respondents who realized a given semantic formula used the expression-candidate to do so. The column *% Use (Overall)* shows what percentage of the 86 participants provided the expression-candidate in question. In the case of the IFID, 56% of the 63 participants who responded with an IFID used the expression-candidate, although the frequency of this expression in the overall dataset is only 41%.

Table 7. *Semantic Formulas Realized in* Late—boss *(Context 35)*

		Frequency		% Use	
Semantic Formula	Expression Candidate	SF	EC	Relative	Overall
IFID	*Je suis vraiment désolé*	63	35	56	41
Explanation	—	56			
Promise of forbearance	*Ça ne se reproduira plus*	9	5	56	6
Offer of repair	—	6			

Note. SF = Semantic formula; EC = Expression candidate

Although the two expression-candidates (*Je suis vraiment désolé* and *Ça ne se reproduira plus*) show the same relative frequency (56% of participants who attempted these semantic formulas used the expression-candidates), promises of forbearance were considered marginal in participants' responses, as they were used by less than 25% of all respondents (n = 9). As such, the data associated with promises of forbearance were not further considered, and only the expression used to realize the IFID—*Je suis vraiment désolé*—was identified as a conventional expression.

Results

The application of the five identification criteria was intended to pinpoint conventional expressions for the community of Pau, France. The analysis revealed 83 common semantic formulas and 31 conventional expressions in the responses to the 35

contexts. These expressions, along with the associated semantic formulas, are presented in Table 8. This table shows the same frequency information as was presented in Table 7: frequency of the semantic formula (*Frequency [SF]*) and the conventional expression (*Frequency [CE]*) as well as the percentage of the respondents who realized the semantic formula with the conventional expression (*% Use [Relative]*) and the overall percentage of use (*% Use [Overall]*) for the expression. In this table, the conventional expressions are given in descending order, according to the overall frequency with which each expression was realized. Finally, those expressions that showed one or more types of variation are identified in the column *Variation* (see *Note* of the table for coding scheme). After having identified conventional expressions for the community of Pau (according to the operationalization of *conventional expressions* in this project), attention turned to the construction of the online task used to test NSs' and NNSs' ability to judge and process such sequences. The design of this experiment will be described in the following section.

Table 8. *Conventional Expressions Identified for NSs living in Pau, France*

Context	#	Semantic Formula	Conventional Expression	Variation	Frequency		% Use	
					SF	CE	Relative	Overall
27	1	Request for information	*Qu'est-ce qui s'est passé?*	2, 3, 4	74	71	96	83
13	2	Introduction	*Je te présente Laure*		86	62	72	72
3	3	Condolences	*Toutes mes sincères condoléances*	3	80	60	75	70
10	4	Request for information	*Qu'est-ce que tu en penses?*	4	71	58	82	67
21	5	Thanking + refusal	*Non merci*		77	54	70	63
34	6	Request for information	*Qu'est-ce qui t'est arrivé?*	2, 4	71	52	73	60
33	7	Accepting offer	*Avec plaisir*		82	46	56	53
1	8	Request for information	*Qu'est-ce qui t'arrive?*	2, 4	78	46	59	53
7	9	Accepting offer	*Avec plaisir*		82	44	54	51
29	10	Declining offer	*C'est bon*		83	41	49	48
24	11	Apology—IFID	*Excusez-moi*		70	40	57	47
5	12	Refusal	*Ça m'est égal*		68	38	56	44
28	13	Compliment response	*Vous aussi*		54	37	69	43
10	14	Request for information	*Tu ferais quoi?*	4	41	36	88	42
35	15	Apology—IFID	*Je suis vraiment désolé*	3	63	35	56	41
11	16	Explanation (leave-taking)	*Je t'entends pas*		47	31	66	36
19	17	Comforting	*Ne t'inquiète pas*	1	35	30	86	35

Context	#	Semantic Formula	Conventional Expression	Variation	Frequency		% Use	
					SF	CE	Relative	Overall
16	18	Request for information	*Qu'est-ce que tu ferais?*	4	52	28	54	33
15	19	Request for information	*Où en étions-nous?*	4	39	28	72	33
32	20	Thanking	*Merci beaucoup*		37	24	65	28
17	21	Greeting	*Content de te rencontrer*	3	35	24	69	28
32	22	Compliment	*C'est très gentil*	3	41	23	56	27
28	23	Compliment	*C'est gentil*		32	22	69	26
9	24	Getting a precommitment (apology)	*Vous avez bien reçu mon mail?*	3	32	22	69	26
6	25	Encouragement	*Tu vas vite y arriver*	3	30	20	67	23
19	26	Reassurance	*C'est normal*		34	18	53	21
9	27	Explanation (apology)	*J'étais vraiment malade*	3	25	17	68	20
18	28	Verification request	*C'est pas vrai?!*		26	16	62	19
29	29	Promise	*Je vais finir*		30	14	47	16
27	30	Confirmation request	*Vous allez bien?*		29	14	48	16
8	31	Encouragement	*Bonne continuation*		26	13	50	15

Note. The numbers in the *Variation* column reflect the six types of variation discussed in 4.1.3: (1) presence/absence of the negative particle *ne*, (2) variation in *qui* versus *qu'il*, (3) variation in an adverb or adjective, and (4) variation in word order in interrogatives.
SF = Semantic formula; CE = Conventional expression

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Constructing the Online Contextualized Naturalness Judgment Task

After identifying conventional expressions in NS production, the psycholinguistic portion of this project set out to examine two different aspects of NSs' and NNSs' knowledge of a set of conventional expressions. First, the ability to distinguish between conventional expressions and slightly modified but grammatical sequences was explored, essentially testing participants' judgments of form-function/context mappings with respect to such expressions. This type of question is consonant with conventionality approaches to formulaic language and aims to contribute to recent interest in examining NNSs' pragmalinguistic and sociopragmatic knowledge of such sequences using a new task design (see Bardovi-Harlig, 2008, 2009, 2010; Dörnyei et al., 2004; Kecskes, 2000; Roever, 2005). Second, the processing of conventional expressions was studied. Given that formulaic language in general is widely assumed to be holistically stored (Wray, 2002), and that this mental representation is presumed to bestow certain processing advantages on such strings, this project set out to examine whether evidence of facilitation on conventional expressions could in fact be documented for both natives and nonnatives. Whereas online experiments have been used to examine the processing of what was referred to as *formulas* in Chapter 1 (notably idioms and collocations), no such attempt has yet to be made to exclusively study conventional expressions. To this end, two research questions were addressed.

RQ 1: Do NNSs and NSs distinguish conventional expressions from grammatical, matched conditions on a contextualized judgment task?

RQ 2: Is there evidence of a processing advantage for conventional expressions?

- 2a: Do NNSs and NSs react to a word within a conventional expression significantly faster than they do to a matched synonym in the same frame?
- 2b: Do NNSs and NSs react to a word within a conventional expression significantly faster when that word is found in the conventional expression as opposed to when it is found in an alternate frame?

An online contextualized naturalness judgment task provided data for both of these research questions. This computer delivered task presented participants with a written context followed by a response and then asked them to judge whether each response was natural in light of the context. In addition to seeing conventional expressions paired with the DCT contexts that had evoked them, participants saw three additional matched conditions that were intended to be not conventional. The responses that followed each context were presented in moving window format, with presses of the space bar calling up each segment, and the computer program recording time elapsed between depressions of the space bar.

With respect to the first research question, the naturalness judgments provided for each context-response mapping were analyzed. The use of the term "natural"—as opposed to "good" or "acceptable" or even "felicitous"—to characterize the type of judgment corresponded to an attempt to focus attention on the pragmatic appropriateness of the response in the chosen context, and not to its grammaticality or semantic felicity. A significant difference in NNSs' judgments of conventional expressions versus their grammatical (but not conventional) counterparts would provide evidence that they are sensitive to the variable of conventionality in the community in which they are living. Such an asymmetry may also be understood as evidence that the NNSs are "on the path toward nativelike selection" (Bardovi-Harlig, 2010, p. 154). For the second research question, the recorded RTs served as the dependent variable, and were analyzed in order to determine whether evidence of a processing advantage for conventional expressions could be found. Starting from the widespread assumption that formulaic language in general is processed more quickly than nonformulaic language, this research question

was operationalized in two different ways, both of which were assumed would be sensitive to facilitated processing of such strings and both of which have been examined in previous studies (but for different types of formulaic language). The first operationalization of research question 2 examined the collocative content of conventional expressions by manipulating one word found in each expression. Specifically, a single word from each conventional expression was replaced by a near substitute, and RTs on the two lexical items were compared. It was assumed that if processing of a conventional expression is facilitated, any given lexical item contained in that expression should be reacted to more quickly than a similar lexical item substituted into the original expression (see Jiang & Nekrasova, 2007). The second operationalization examined whether the conventional frames identified confer a processing advantage on the lexical items found within them, by comparing RTs on the same lexical item in a conventional frame and in an alternate frame (see Schmitt & Underwood, 2004; Underwood et al., 2004). If processing of a conventional expression is facilitated, the RTs for the lexical items included in that expression should be faster when those lexical items belong to the conventional expression than when the same lexical items are found in an alternate frame.

Experimental Items

In order to respond to the two research questions, four types of experimental items were developed, manipulating two variables (Word and Frame) in a 2×2 design. The variable of Word pitted a word originally found in the conventional expression (CE word) against a substitute (SUB). Frame, on the other hand, placed the same lexical item in the frame that met the criteria for conventional expressions (conventional frame) as

well as in an alternate frame. The interaction of these two variables is represented in Table 9. For each of the four conditions, the first letter represents the frame (C = conventional; A = alternate), whereas the remaining letters indicate the opposition between a CE word and its substitute (CE vs. SUB). Thus, the ACE condition is the CE word in an alternate frame, whereas the CSUB condition is the substitute inserted in the conventional frame. The first of these items—CCE—corresponds to the original conventional expressions (CE word in its conventional frame), and all other experimental items were derived from these expressions.

Table 9. *Four Types of Experimental Items*

	Frame	
Word	Conventional	Alternate
CE	CCE	ACE
Substitute	CSUB	ASUB

Fifteen CCE-CSUB-ACE-ASUB quadruples were created, and when combined with the 20 distracters, a total of 80 items was presented. In what remains of this section, the selection of the 15 targeted conventional expressions and the design of the experimental quadruples and distracters will be detailed.

In designing this experiment, the first challenge was the selection of which of the 31 expressions that met the criteria for conventional expression identification should be tested in the online task. Although their identification as conventional expressions for NSs implies that NNSs living in the same community were likely exposed to these strings in their input, NNS use of such sequences was explored in a small test before selecting experimental items. As such, the same DCT was administered to a small group of NNSs (13 women and 5 men) living in and around Pau. Ten of these speakers were born in

England, 6 in the United States, 1 in Scotland, and 1 on Jersey, and all were recruited either at the university in Pau or through a non-profit Anglophone social organization based in Pau. Participants included students and lecturers at the university (most of whom had been in Pau for less than 6 months), as well as established community members, who had lived in the community for up to 39 years. Their ages ranged from 19 to 72 years. All Anglophone participants had learned French as adults and reported monolingual childhoods.

The analysis of the responses from the 18 speakers, which applied the same criteria as had been used in the analysis of the NS data (see the section **Analysis—Identification Criteria**), pinpointed 32 expressions (see Appendix B). Of these 32 expressions, 20 were shared with NSs. In other words, 20 sequences met the criteria for conventional expressions in response to the same contexts for both the NSs and the NNSs (Table 10). Given this evidence that 20 of the NS conventional expressions were also present in this small set of NNS responses, experimental items for the online task were restricted to these strings.

After having narrowed down the potential experimental items to 20, the construction of the CCE-CSUB-ACE-ASUB quadruples was undertaken. Efforts were first focused on the identification of substitutes for a lexical item in each conventional expression (CCE vs. CSUB). After the CCE and CSUB items had been finalized, attention turned to the design of alternate frames for CE words and substitutes (ACE and ASUB).

Table 10. *Twenty Conventional Expressions found in NS and NNS Data*

Context	#	Semantic Formula	Conventional Expression
28	1	Compliment	*C'est gentil*
28	2	Compliment response	*Vous aussi*
24	3	Apology—IFID	*Excusez-moi*
19	4	Reassurance	*C'est normal*
19	5	Comforting	*Ne t'inquiète pas*
18	6	Verification request	*C'est pas vrai?!*
9	7	Explanation (apology)	*J'étais vraiment malade*
3	8	Condolences	*Toutes mes sincères condoléances*
7	9	Accepting offer	*Avec plaisir*
17	10	Greeting	*Content de te rencontrer*
6	11	Encouragement	*Tu vas vite y arriver*
5	12	Refusal	*Ca m'est égal*
15	13	Request	*Où en étions-nous ?*
27	14	Request	*Qu'est-ce qui s'est passé?*
10	15	Request	*Qu'est-ce que tu en penses ?*
8	16	Encouragement	*Bonne continuation*
13	17	Introduction	*Je te présente Laure*
35	18	Apology—IFID	*Je suis vraiment désolé*
21	19	Thanking + refusal	*Non merci*
16	20	Request	*Qu'est-ce que tu ferais?*

CCE and CSUB items. The variable of Word was manipulated by replacing a lexical item within each conventional expression (CCE) with a substitute (CSUB), an undertaking which involved two steps: selection of near synonyms and design of carrier phrases. The goal of the first step was to create a grammatical string whose meaning would be similar to that expressed by the original conventional expression, but which would crucially not be conventional. In other words, these modified versions represented

one of the many logically possible ways to respond to the contexts in question, without, however, being favored by either NSs or NNSs. Four different criteria guided the identification of potential substitutes: synonymy, grammaticality, length, and frequency.

Synonymy. To begin, a list of the content words found in the 20 conventional expressions was compiled, and a preliminary search for suitable substitutes was conducted using the analogical dictionary *Le Petit Robert* (Rey, 2001). For each of the content words, all potential synonyms given in the *Petit Robert* were noted, including synonyms that differed predominantly in terms of register.[29] For polysemous words, only synonyms consistent with the sense of the word as employed in the conventional expression were considered. Moreover, any potential synonym that was found more than two times among the DCT data provided by either the NSs or the NNSs was also removed from the list.[30]

Grammaticality. The potential substitutes were then inserted into the conventional expressions. The strings that resulted were examined, and all ungrammatical strings were removed. In the cases of three modified expressions that were ultimately included in the experiment, the technically grammatical sequences that resulted from direct substitution were ruled out. Consultation with NSs, dictionaries, and the Internet indicated that they were at best marginal and, thus, it was feared that participants would treat them as ungrammatical. For this reason, the modified versions differed from the conventional expressions in more than just the replacement of one word for these three pairs. Thus,

[29] For example, *parvenir* was identified as a potential substitute for *arriver*, both of which can mean "arrive," although *parvenir* tends to belong to a higher register. Such substitutes were considered valid candidates, as substitution with a word that is inappropriate for the register established will in all likelihood result in a nonconventional—but grammatical—string.

[30] For the natives, the adjective *souffrant* (pair 7) was used once, the adjective *aimable* (pair 1) twice, and the adjective *pareil* (pair 12) two times. One NNS used the adjective *souffrant* (pair 7), whereas 2 NNSs offered *pardonne-moi* (pair 3).

instead of using the modified version *ça m'est pareil* for *ça m'est égal*, the indirect object pronoun was also removed from the modified expression: *c'est pareil* (pair 12 in Table 11). For the conventional expression *où en étions-nous?*, the modified version adopted was *où en étions-nous restés?* instead of *où en restions-nous?*, involving the conjugation of *rester* in the pluperfect instead of in the imparfait (pair 13). Finally, the modified version of *qu'est-ce que tu en penses?* both substituted *suggères* for *penses* and removed the partitive clitic *en*, resulting in *qu'est-ce que tu suggères?* (pair 15).

Length. The third selection criterion targeted the length of potential substitutes. The original aim was to use only substitutes with the same number of syllables as the CE words, a criterion typical in processing experiments. Strict application of this criterion, however, had to be abandoned for two reasons. First, in several cases, no such substitutes existed. And, second, because the experiment was conducted in the south of France, where a nonnegligible portion of the population pronounces the *e muet* "silent e" in at least some contexts (as opposed to northern dialects where this orthographic *e* is no longer realized phonetically), the number of syllables of several of the items was difficult to predict for the participants. Nonetheless, this length criterion was respected whenever possible. For the statistical analyses, the issue of length differences was accounted for by using residuals as the dependent variable, a strategy that effectively factors out the contribution of word length in RTs recorded.

Frequency. As a result of the application of the first three criteria (synonymy, grammaticality, and length), five of the conventional expressions were determined to be ineligible for inclusion in the subsequent experiment. No suitable synonyms of similar

length for the content words found in the conventional expressions provided in (19) were identified.

(19)

Bonne continuation	"Good continuation"
Je te présente Laure	"I introduce Laure to you"
Je suis vraiment désolé	"I am truly sorry"
Non merci	"No thank you"
Qu'est-ce que tu ferais?	"What would you do?"

Thus, after the application of the first three design criteria, only 15 potential CCE-CSUB pairings remained. For 12 of these pairs, the application of these criteria had ruled out all but one substitute. However, for pairs 1, 4, and 9, two different potential substitutes had met all of the preceding criteria (Table 11). Frequency (the fourth criterion) was used to decide between the two potential CSUB items for these pairs, with the first substitute listed for each being the substitute that was ultimately adopted.

In the literature on lexical retrieval, much attention has been given to the role of lexical frequency in the processing of different words, with more frequent items benefiting from faster retrieval and processing and, thus, faster RTs (Howes, 1957; Howes & Solomon, 1951). As a result, most authors attempt to ensure that RT comparisons are only made between lexical items belonging to the same frequency band. Although it would have been preferable to avoid large frequency differences—particularly differences in which the CE word was more frequent than the substitute—a similarly strict frequency criterion was impossible to implement in this project for two reasons. In addition to the restricted number of potential substitutes for each CE word, the identification of frequency bands in French has not received as much attention as in English. Nonetheless, two different sources of frequency counts were consulted. And for the three CE words for which more than one potential substitute was identified, frequency

Table 11. *CCE and CSUB Pairs*

Pair	CCE	CSUB
1	*C'est* ***gentil***	*C'est* ***aimable***
		C'est ***plaisant***
2	*Vous* ***aussi***	*Vous* ***de même***
3	***Excusez****-moi*	***Pardonnez****-moi*
4	*C'est* ***normal***	*C'est* ***logique***
		C'est ***correct***
5	*Ne* ***t'inquiète***[31] *pas*	*Ne* ***te soucie*** *pas*
6	*C'est pas* ***vrai****?!*	*C'est pas* ***réel****?!*
7	*J'étais vraiment* ***malade***	*J'étais vraiment* ***souffrant***
8	*Toutes mes* ***sincères*** *condoléances*	*Toutes mes* ***fidèles*** *condoléances*
9	*Avec* ***plaisir***	*Avec* ***bonheur***
		Avec ***délice***
10	*Content de te* ***rencontrer***	*Content de te* ***retrouver***
11	*Tu vas vite y* ***arriver***	*Tu vas vite y* ***parvenir***
12	*Ca m'est* ***égal***	*C'est* ***pareil***
13	*Où en* ***étions-nous****?*	*Où en* ***étions-nous restés****?*
14	*Qu'est-ce qui s'est* ***passé****?*	*Qu'est-ce qui s'est* ***produit****?*
15	*Qu'est-ce que tu en* ***penses****?*	*Qu'est-ce que tu* ***suggères****?*

Note. The CE words and substitutes are in bold.

decided between the candidates; the substitute that was closest in frequency to the CE word was kept.

The two different frequency measures taken into account (see Table 12) included one source developed from written French (*Trésor de la Langue Française Informatisé*: *TLFi*), and a second source based on a corpus of film and television show subtitles

[31] The CE word in this expression is actually *inquiète* "worry," but in the online presentation, the direct object clitic *t'* "you" was presented with the verb. Although *t'* could have been separated from *inquiète*, its contracted form provides an important hint as to what is to follow, insofar as only a verb beginning with a vowel is possible. For this reason, the clitic was included with the verb, both in the CCE condition and in the CSUB condition.

(*Lexique*). Although the expressions under investigation are thought to be oral (insofar as participants were generally asked to identify what they would say), responses were provided in writing and, for this reason, both types of frequency measures were potentially relevant. The first measure consulted was the TLFi, an electronic version of a dictionary of the 19th and 20th centuries in 16 volumes.[32] Each entry provides the frequency with which the word in question is found in the documents consulted for the compilation of the work. For the most recent time period covered by the dictionary (1919-1964), 23,505,451 occurrences are taken into consideration. However, the resultant frequency counts reflect overall frequency of the citation item (e.g., the frequency of *égal* "equal" does not distinguish its use as a noun from its use as an adjective).[33] The second source consulted was the *Lexique* database,[34] which is a 52 million word corpus compiled using movie and television show subtitles (New, Brysbaert, Veronis, & Pallier, 2007).[35] In addition to its arguably closer connection to spoken discourse, the *Lexique* corpus was exhaustively tagged, and all word-based searches yield frequencies sensitive to part of speech (e.g., the frequencies of *égal* as a noun or as an adjective are separated) and to person, number, and tense.

[32] Available at http://atilf.atilf.fr/

[33] TLFi frequency counts have been used in past RT studies to select matched frequency substitutes. For Frenck-Mestre (1993), a word that occurs more than 100 times per million words in this corpus is of high frequency, one that occurs between 5-15 times per million is of medium frequency, whereas words occurring less than one time per million are low frequency. Following this division, all CE words and substitutes either belong to the high frequency band or fall within the medium and high frequency bands (i.e., occur between 16 and 99 times per million words). Thus, although there are some large absolute differences in the TLFi frequencies of the lexical items tested, Frenck-Mestre's operationalization would suggest that all words tested in this experiment are essentially frequent.

[34] Available at http://www.lexique.org/

[35] The creators argue that this type of corpus approximates word frequencies in spoken discourse more closely than corpora based on written works, despite the overrepresentation of certain subjects (e.g., police, jail, murder). In an attempt to establish the validity of their corpus, New et al. demonstrated that frequencies derived from their subtitle corpus and from a written corpus are similarly effective in predicting lexical decision time, for which word frequency is known to be the strongest predictor.

Table 12. *Frequency Measures for CE and Substitute Words (Per 1 Million Words)*

		Measures of Frequency	
#	CE Word-Substitute	*TLFi* (1919-1964)	*Lexique*
1	gentil	49	134.11
	aimable	39	21.98
	plaisant	13	2.11
2	aussi	964	1402.33
	de même	—	—
3	excusez	61	230.25
	pardonnez	68	34.31
4	normal	55	90.98
	logique	55	13.79
	correct	12	14.32
5	inquiète	56	114.06
	soucie	27	7.01
6	vrai	582	678.47
	réel	166	23.97
7	malade	154	147.5
	souffrant	19	2.88
8	sincères	46	4.31
	fidèles	76	4.57
9	plaisir	294	177.4
	bonheur	197	78.34
	délice	22	3.75
10	rencontrer	222	82.72
	retrouver	332	100.9
11	arriver	473	182.85
	parvenir	114	6.45
12	égal	81	27.4
	pareil	168	95.18
13	étions-nous	—	—
	étions-nous restés	—	—
14	passé	728	297.63
	produit	174	20.16
15	penses	834	186.9
	suggères	28	1.54

Note. Individual frequencies could not be calculated using either of the databases for items involving more than one lexical item (e.g., *de même, étions-nous*, and *étions-nous restés*).
In each case, the first word is the CE word, whereas the second and third words are the proposed substitutes.

Although the direction of the results taken from the two sources is similar, the magnitude is often different.[36] Thus, both databases show the CE word to be more frequent in pairs 1, 5, 6, 7, 11, 14, and 15, although the asymmetry is greater in the *Lexique* database. In the most dramatic example (pair 6), *vrai* is 3.5 times more frequent than *réel* in the TLFi, a ratio that increases to 28.3 in the *Lexique* database. Additionally, there are a few instances in which lexical items with similar frequencies in the TLFi are clearly distinguishable by frequency in *Lexique*. This is the case for *excusez* versus *pardonnez* (pair 3) and *normal* versus *logique* (pair 4) and, in both examples, *Lexique* finds the CE word to be more frequent than its substitute. Thus, with the exception of pairs 8, 10, and 12, CE words are more frequent than the substitutes in at least one corpus, a result that is not particularly surprising given that the CE words belong to a conventional expression (which is, by definition, a frequent sequence).

Carrier phrases. After having selected substitutes for each CE word, the second step in the construction of CCE and CSUB items, which involved the embedding of each sequence in a longer string (a carrier phrase), was undertaken. This embedding was necessary for two reasons. First, the presentation of a bare conventional expression as a response to most contexts was inadequate, as multiple semantic formulas had been realized in most of the original DCT responses. Thus, conventional expressions often needed to be accompanied by additional elements in order to create a response plausible for the context.[37] Second, in 11 of the 15 conventional expressions, the CE word was the last word of the sequence. Because it has been shown that RTs on phrase final elements

[36] Although perhaps due to the written versus oral nature of the two databases, differences also could be due to the fact that the two sources were tagged differently: the frequency counts in the *TLFi* are essentially lemmatized, whereas those in *Lexique* are sensitive to person, tense, number, etc.
[37] Note that although most of the contexts associated with the 15 targeted conventional expressions had elicited numerous semantic formulas, none of the contexts in this set had evoked more than one speech act.

are consistently elevated (wrap-up effects) and, thus, difficult to interpret, it was crucial to embed the conventional expression within a longer string. Thus, the carrier phrases were designed such that the conventional expression never appeared at the end of a response, and only appeared at the beginning in two instances (both *wh* questions).

ACE and ASUB items. For the final two types of experimental items, the CE words and substitutes were embedded in alternate frames (ACE and ASUB). This allowed for the RT comparison described in the second operationalization of research question 2, whereby RTs on the CE word in a conventional expression (CCE) were compared to RTs on that same lexical item in an alternate frame (ACE). Moreover, the substitute for each CE word was presented in both the conventional (CSUB) and the alternate (ASUB) frames in order to ensure that any RT asymmetry discovered was due to the combination of Word and Frame, and not simply the result of certain frames leading to slower or faster RTs regardless of word. Because the lexical item of interest remains the same in comparisons across two frames, questions regarding the numerous variables that distinguish any two lexical items—frequency, register, synonymy, length—are moot.

The alternate frames were intended to be strings in which the CE word and substitute were both possible, although not conventional (as operationalized in this project). Moreover, just as the CCE-CSUB pairs were matched as responses to a DCT context (in this case, the one that had originally evoked the conventional expression), each ACE-ASUB pair needed to constitute an appropriate response to one of the original 35 DCT scenarios. With these requirements in mind, a DCT context was selected for each of the CE word-substitute pairs, and an alternate frame was created that realized the

common semantic formulas for the responses to that context and in which both the CE word and substitute could be inserted. For example, the alternate frame for the CE word-substitute pair *vrai* "true"-*réel* "real" was given as a response to context 33 (*Second helpings*). In response to this context, most participants accepted the offer of seconds, a speech act that was typically realized with a head act and an explanation. Both were included in the proposed alternate frame, with the pair *vrai-réel* being included in the explanation (see Figure 1). Importantly, the alternate frame (*Volontiers—je prends un* ***vrai/réel*** *plaisir à manger ta quiche, elle est délicieuse*) did not appear among the responses provided by the DCT respondents.

Context	Tu dînes chez un collègue. Tu as très faim ce jour-là et le repas te plaît énormément. Donc, quand ton collègue t'offre un peu plus de quiche, tu réponds:
ACE	Volontiers—je prends un **vrai** plaisir à manger ta quiche, elle est délicieuse.
ASUB	Volontiers—je prends un **réel** plaisir à manger ta quiche, elle est délicieuse.
Context	*You are having dinner at a colleague's place. You are very hungry, and you really like the meal. So, when your colleague offers you second helpings on the quiche, you respond:*
ACE	*Gladly—I take a* ***true*** *pleasure in eating your quiche, it's delicious*
ASUB	*Gladly—I take a* ***real*** *pleasure in eating your quiche, it's delicious*

Figure 1. *Example Item for Alternate Frames*

Although in the CCE/CSUB items a distinction is made between the conventional frame and the carrier phrase into which it was embedded, for the ACE/ASUB items, the entire response acts as the alternate frame. The full set of experimental items retained for this experiment is given in Appendix C.

Verification task. The design of this experiment crucially distinguishes conventional expressions (CCE) from the CSUB, ACE, and ASUB conditions, which are assumed to not be conventional. Although none of the CSUB, ACE, or ASUB sequences was found to be frequently used in the DCT data, an additional method was employed to verify the accuracy of this important assumption. Specifically, a fill-in-the-blank verification task was administered to a group of 43 NSs who were living in Pau and attending the University of Pau, and who had not taken part in any of the other experiments. For this task, each of the 15 conventional frames (CCE/CSUB) and 15 alternate frames (ACE/ASUB) were shown as responses to their contexts. Each response included one blank, which corresponded to the CE word/substitute. Two sample items are provided in Figure 2.

> SAMPLE ITEM 1 (Conventional frame)
> Tu es chez un copain qui t'offre à boire. Tu acceptes et ton copain te propose toutes sortes de jus. Tu es indifférent(e). Tu lui dis:
> « Tout ça, _____ et je prendrai la même chose que toi. »
> *You are at a friend's place, who offers you something to drink. You accept and your friend offers you many different kinds of juice. You are indifferent. You say to him:*
> *« All that, _____ and I'll have the same thing as you »*[38]
>
> SAMPLE ITEM 2 (Alternate frame)
> Tu es chez un copain qui t'offre à boire. Tu acceptes et ton copain te propose toutes sortes de jus. Tu es indifférent(e). Tu lui dis:
> « Peu importe, au niveau des calories, un jus est _____ à tout autre. »
> *« Of no importance, as concerns calories, one juice is _____ to any other »*

Figure 2. *Two Sample Items from the Fill-in-the-Blank Task*

[38] For the pairs 12, 13, and 15, which involve slight grammatical changes between the CCE frame and the frame used for the CSUB item, the blank for the conventional frame corresponded to more than one word. For example, the blank for this item (pair 12) corresponds to *ça m'est égal*.

Within conventional frames, such as the first example, the CE words are expected to be provided more frequently than the substitutes, which are grammatical but not particularly natural. Within the alternate frames (e.g., the second example), where both the CE word and substitute are hypothesized to be similarly possible, this same asymmetry is not expected. Three different randomized orderings of the 30 context-responses pairings were prepared and given to respondents in a packet. Participants were instructed to fill in the blanks with one or several words to create a natural response given the context. They were shown one practice item, for which several different responses (ranging from 1 to 3 words) were suggested.

For the conventional frames, the results revealed that the participants overwhelmingly responded using the CE word, with either one or two NSs offering the substitute in only six of the pairs (see Table 13). The CE word was generally provided as the sole lexical item in order to complete the response (see column *CE Word [Alone]*), although for certain items (e.g., 1, 7, 8, 9, and 10), the response given by some respondents included the CE word modified by an adjective or an adverb. For example, in pair 9, 11 participants provided *grand plaisir* "great pleasure," instead of the unmodified *plaisir* (the CE word). The total number of such modified responses is provided in the column *CE Word (Modified)*. No modified forms of substitute responses were found.

In addition to CE word and substitute responses, "other" responses were found among the answers provided for almost all items. Such responses were particularly common for those items for which the participants would have had to offer a multi-word response in order to provide the original conventional expression (pairs 12, 13, and 15), an effect that could very well be an artifact of the type of task (i.e., fill-in-the-blank tasks

Table 13. *Fill-in-the-blank Responses for Conventional Frames*

	CE Word			
Pair	Alone	Modified	Substitute	Other
1 *gentil vs. aimable*	30	7	1	5
2 *aussi vs. de même*	36		2	4
3 *excusez vs. pardonnez*	39		2	2
4 *normal vs. logique*	32			10
5 *inquiète vs. soucie*	26			16
6 *vrai vs. réel*	24			17
7 *malade vs. souffrant*	30	3	1	7
8 *sincères vs. fidèles*	38	2		1
9 *plaisir vs. bonheur*	26	11		4
10 *rencontrer vs. retrouver*	38	1		2
11 *arriver vs. parvenir*	33		1	6
12 *égal vs. pareil*	15		2	20
13 *étions-nous vs. étions-nous restés*	32			12
14 *passé vs. produit*	43			
15 *penses vs. suggères*	24			16

Note. Total responses for each item vary, as some participants offered more than one response or skipped certain items.

usually require the insertion of only one word for a complete response, which was also the case for the majority of items on this task). Nonetheless, with the exception of the three pairs whose CE word response necessitated more than one word, the average number of different responses included in "other" solutions for conventional frames was low, ranging from one to nine, with an average of 3.4 per item.

In the alternate frames, the CE word was not expected to dominate, an expectation that was borne out. Whereas the participants overwhelmingly provided the CE word in completing the conventional frames for the conventional expressions identified (Table

13), a greater number of different responses—including both CE words and substitutes—was provided for most alternate frames (Table 14).[39] Specifically, "other" responses were more prevalent in alternate frames, with an average of 5.9 different solutions being proposed per item, and both the CE word and substitute were provided as responses for all but four pairs. For the four items for which either the CE word or the substitute was not found among the responses, we find two cases in which the majority of solutions were "other" (pairs 5 and 13), with 11 and 10 different strings, respectively. Thus, for the first 13 of the 15 pairs, these results clearly suggest that a wide variety of lexical items

Table 14. *Fill-in-the-blank Responses for Alternate Frames*

Pair	CE Word	Substitute	Other
1 *gentil vs. aimable*	16	24	1
2 *aussi vs. de même*	2	1	37
3 *excusez vs. pardonnez*	8	2	30
4 *normal vs. logique*	12	1	26
5 *inquiète vs. soucie*		9	31
6 *vrai vs. réel*	7	8	25
7 *malade vs. souffrant*	1	15	26
8 *sincères vs. fidèles*	7	29	5
9 *plaisir vs. bonheur*	1	13	30
10 *rencontrer vs. retrouver*	3	13	27
11 *arriver vs. parvenir*	20	10	10
12 *égal vs. pareil*	7	14	21
13 *étions-nous vs. étions-nous restés*	12		28
14 *passé vs. produit*	43		
15 *penses vs. suggères*	32		13

Note. Total responses for each item vary, as some participants offered more than one response or skipped certain items.

[39] Note that no modified versions of either the CE words or the substitutes were found in these data.

(which generally included both the CE word and its substitute) can successfully complete the proposed frames.

The data from the two remaining strings, however, parallel the responses given for the conventional frames: For pairs 14 and 15, the NSs clearly preferred the CE word to the substitute (with the substitute never being used), independently of frame type. Unlike the other items, for pairs 14 and 15, the CE word accounted for more than half of the responses in the alternate frames, a result that is particularly troublesome for pair 14, for which NSs unanimously provided the CE word in both conventional and alternate frames. This result calls into question the intended distinction of conventionality by frame for these two pairs and, as a result, these two items will not be considered in the subsequent analyses.

Distracters. In addition to the 60 experimental items, 20 distracters were included. Following the model of the experimental items, each of the distracters was grammatical. Moreover, each item was based on one of the useful expressions identified and tested in the pilot study for this project (none of these strings had subsequently met the criteria for conventional expressions). In each useful expression, one word was replaced by a near-synonym that was clearly inappropriate: For example, instead of *je n'ai pas faim* "I'm not hungry," the participants saw *je n'ai pas famine* "I don't have starvation." Because participants could have conceivably judged all experimental items to be natural, the distracters were designed to be clearly inappropriate.

Task Administration, Presentation of Items, and Instructions

Participants made individual appointments to complete the experiment, and the experimenter was present for each administration. Each session lasted approximately an

hour and began with the completion of a background questionnaire (Appendix D) and the signing of a consent form. The background questionnaire asked participants to indicate their age, their birthplace, mother tongue, and how long they had spent in Pau or the surrounding region. Details were also gathered with respect to what languages the participants had studied and for how long, as well as whether participants had lived abroad and where. Participants then completed the experiment, which was presented on either a Dell laptop computer or a Dell desktop computer, and the program used to administer the experiment was Linger.[40] Participants were given the option of taking a break after having completed the first 40 items of the experiment, although few did so. Overall, the experiment required between 30 and 60 minutes.

For each of the experimental items, the participants read a context that ended with an incomplete sentence followed by a colon, such as *tu dis:* "you say:" With a press of the space bar, the first segment of the response appeared, the beginning of which was marked by a quotation mark. With each subsequent press, the current segment disappeared and the following segment appeared. Segments ranged in length from 1 to 4 words, and the CE words and substitutes were always the sole members of their segments. The end of the response was indicated with either a period or a question mark, followed by a closing quotation mark. A final press of the space bar brought up the question *Est-ce que c'est naturel ici?* "Is it natural here?," to which participants could respond *oui* "yes," *non* "no," or *indécis* "cannot decide." This design is illustrated with the experimental quadruple associated with pair 1 (*gentil/aimable*), provided in Table 15.

The F key corresponded to an affirmative response, the J key to a negative response, and the space bar to a cannot decide response. Participants were instructed to

[40] The program is available at: http://tedlab.mit.edu/~dr/Linger/

Table 15. *Example Quadruple*

Condition	Item	English Translation
CCE	Tu entres dans le supermarché où tu vois ta voisine, une femme gentille qui a toujours l'air en pleine forme. Elle s'approche de toi pour te dire que tu as très bonne mine aujourd'hui. Le compliment te fait plaisir et tu lui réponds:	You enter the supermarket where you see your neighbor, a kind woman who always looks well. She comes up to you to tell you that you are looking well today. The compliment made you happy and you respond to her:
	« Merci, / c'est / *gentil* / de / votre part. »	"Thank you, / that's / *nice* / of you."
	Est-ce que c'est naturel ici? OUI NON INDECIS	Is it natural here? YES NO CANNOT DECIDE
CSUB	Tu entres dans le supermarché où tu vois ta voisine, une femme gentille qui a toujours l'air en pleine forme. Elle s'approche de toi pour te dire que tu as très bonne mine aujourd'hui. Le compliment te fait plaisir et tu lui réponds:	You enter the supermarket where you see your neighbor, a kind woman who always looks well. She comes up to you to tell you that you are looking well today. The compliment made you happy and you respond to her:
	« Merci, / c'est / *aimable* / de / votre part. »	"Thank you, / that's / *amiable* / of you."
	Est-ce que c'est naturel ici? OUI NON INDECIS	Is it natural here? YES NO CANNOT DECIDE
ACE	C'est samedi après-midi, et tu es assis(e) sur un banc dans un parc public. Un homme s'assoit sur le même banc et commence à te parler. Après une conversation de 30 minutes, l'homme révèle qu'il est un homme politique très connu. Quand il t'invite à boire un café avec lui, tu es ravi(e) et, donc, tu dis:	It's Saturday afternoon, and you are sitting on a bench in a public park. A man sits down on the same bench and begins to talk to you. After a 30 minutes conversation, the man reveals that he is a well-known politician. When he offers to treat you to a coffee, you are delighted and so you say:
	« C'est / bien / *gentil* / à vous / de me le / proposer, / merci. »	"It's / very / *nice* / of you / to suggest / it to me / thank you."
	Est-ce que c'est naturel ici? OUI NON INDECIS	Is it natural here? YES NO CANNOT DECIDE

Condition	Item	English Translation
ASUB	C'est samedi après-midi, et tu es assis(e) sur un banc dans un parc public. Un homme s'assoit sur le même banc et commence à te parler. Après une conversation de 30 minutes, l'homme révèle qu'il est un homme politique très connu. Quand il t'invite à boire un café avec lui, tu es ravi(e) et, donc, tu dis: « C'est / bien / *aimable* / à vous / de me le / proposer, / merci. » Est-ce que c'est naturel ici? OUI NON INDECIS	It's Saturday afternoon, and you are sitting on a bench in a public park. A man sits down on the same bench and begins to talk to you. After a 30 minutes conversation, the man reveals that he is a well-known politician. When he offers to treat you to a coffee, you are delighted and so you say: "It's / very / *amiable* / of you / to suggest / it to me / thank you." Is it natural here? YES NO CANNOT DECIDE

Note. CE words and substitutes are given in italics. The segmentation of responses is shown using slashes. CCE = Conventional frame, CE word; CSUB = Conventional frame, substitute; ACE = Alternate frame, CE word; ASUB = Alternate frame, substitute.

maintain their hands on the keyboard, with the left index finger on the F key, the right index finger on the J key, and the thumbs on the space bar. Although participants were asked to work quickly, they were not told that time elapsed between each push of a key was recorded (data that served as the dependent variable for the RT analysis). Instructions were provided in French for the NSs, whereas the NNSs read the instructions in English. Participants were told that the experiment was looking at everyday French and that the goal was to determine what strings are "natural" in a given context. The naturalness judgment was explained to the participants in the instructions in the following way:

> En posant cette question, nous nous intéressons à savoir si la réponse que vous veniez de lire est une réponse que vous diriez naturellement suite au contexte.
>
> In asking this question, we are interested in knowing if the response that you will have just read is a response that you might naturally say following the context.

After having read the instructions, all participants completed the same four practice items before starting the experiment, two of which were expected to be judged as natural and

two of which were expected to be judged as unnatural. Practice items had the same context-response pairing format as the experimental items, and the responses were "useful expressions" taken from Bragger and Rice (1999). These expressions were either presented in their original form (*toutes mes felicitations* "all my congratulations") or in a modified form (*tous mes louanges* "all my praises"). Upon completion of the practice items, participants were given the chance to ask questions before beginning the actual experiment. Items were presented in a randomized order, as determined by the Linger software; the first item was always one of the distracters.

Participants

Sixty participants, all of whom were living in Pau or in the *Pyrénées Atlantiques* (the region in which Pau is located), completed this experiment. Participants were equally distributed among three groups: 20 NSs of French, 20 NNSs who had spent between 4 and 6 months in the Pau region (short stay NNSs), and 20 nonnatives who had spent more than 1 year in the Pau region (long stay NNSs). Recruitment procedures mirrored those used for the DCT, in an attempt to solicit participants from the same populations. None of the participants for this experiment had completed the DCT. Participants were compensated for their time with 10 euros.

NSs were recruited at the Université de Pau et des Pays de l'Adour, following the same recruitment procedure used for the DCT phase of this project. Classes were visited, the project explained, and volunteers solicited. Twenty NSs participated in the experiment. Their ages ranged from 17 to 21, with an average age of 18.4 years, and the majority of the participants were female (19 women, 1 man). Participants had spent an average of 16.4 years in Pau or the surrounding region, and all subjects reported only

French to be their native language. All participants had studied at least two foreign languages, and some up to as many as four (M = 2.5). The average age of participants is slightly lower than that for the DCT data (23.6 years), and these speakers had, on average, spent slightly more time in the Pau region than the participants for the DCT (15.8 years).

Short stay NNSs were recruited through posters put up at the university and class visits. All participants were either Anglophone students or lecturers at the Université de Pau et des Pays de l'Adour at time of testing; the average time spent in Pau was 5 months, with lengths of residence varying from 4 to 6 months. The 20 short stay NNSs included 5 men and 15 women from England (n = 13), the United States (n = 6), and Scotland (n = 1). The participants ranged in age from 20 to 57 (M = 26.5 years). Participants reported having an average of 9.15 years formal education in French, and seven had already spent time in a French speaking country (M = 7.6 months). Twelve reported having learned at least one other foreign language in addition to French, and two participants noted that they were bilingual (one English-Filipino, one English-Spanish). Despite these two reports of bilingualism, English was the sole native language reported by all of the 20 participants.

Nonnative participants who had lived in or around Pau for more than a year were recruited primarily through contacts at the local university and through soliciting participants belonging to a local Anglophone association. Most of these participants had settled in France permanently (n = 15), the remaining five having spent between one and two years in the area either studying or working, but had plans to return to their countries of origin. Unsurprisingly, these NNSs are on average older than their short stay

counterparts (*M* = 41 years). All long stay participants reported having learned at least one other foreign language besides French. Length of residence in the Pau region varied between 1.25 and 33 years with an average of 10.5 years. Seven of the participants had spent time in other regions of France or other Francophone countries, with time of residence averaging 4.8 years. These 20 long stay NNSs came from different parts of English-speaking world, including Australia (*n* = 2), the United States (*n* = 5), Wales (*n* = 1), England (*n* = 9), Ireland (*n* = 1), and Scotland (*n* = 2). All speakers reported only English as their native language. Finally, years of formal French study was slightly less than that reported by the short stay participants (8.4 years), implying that the important difference between these two groups is the time spent abroad (and, in particular, in the Pau region). The demographic details for the participants in this project (both for the DCT and the online task) are provided in Table 16.

Table 16. *Demographic Details*

				Length of Stay					
		Age		Pau Region		Other		French Study	
Group	#	Years	*SD*	Years	*SD*	Years	*SD*	Years	*SD*
NSs — DCT	86	23.6	8.9	15.8	9.7				
NSs — Online	20	18.4	.8	16.4	4.7				
Long stay NNSs	20	41	12.4	10.5	9.6	4.8[a]	5.5	8.4	3.3
Short stay NNSs	20	26.5	10.4	.4	.03	.6[b]	.34	9.15	3.3

[a] *n* = 7; [b] *n* = 9

Innovations in Method

In order to investigate how NSs and NNSs in Pau judge and process conventional expressions, preliminary work to identify such expressions in that community was necessary. Thus, DCT data from 86 NSs were collected, and five identification criteria

were used to identify conventional expressions, an analysis that revealed 31 such expressions. These results were moreover confirmed for NNSs using a small population, and only those 20 conventional expressions also provided by nonnatives were used to design the online task. The application of several design criteria further reduced the number of experimental items to 15, of which 13 were ultimately included in the analyses that will be presented in Chapter 5. The design of this experiment will allow for the examination of naturalness judgments attributed to the 13 conventional expressions and their matched conditions (research question 1) as well as an investigation of the processing of these 13 conventional expressions through the manipulation of the two variables of Word and Frame (research question 2).

Several methodological features of the current project distinguish it from the existing L2 studies that have examined the processing of formulaic language. First, although both Word and Frame have been manipulated in previous studies, this project incorporates both types of RT comparisons into a single task. This design feature allows for the examination of two assumptions about facilitated processing on formulaic language. Second, the participant pool was carefully controlled as to include only individuals living in a restricted geographic area. For investigations into conventional expressions, which may be geographically bound, this aspect of the project is important. Finally, the expressions tested were shown to be conventional for the target language community. To my knowledge, this project constitutes the first attempt at an online experiment in which production data from the community from which participants were drawn were used to identify conventional or formulaic expressions. Previous studies have instead relied on sources specific to a language or a genre (e.g., academic English) to

identify the sequences to test, with the two most common resources being corpora searches and dictionaries (see citations in the preceding chapter).

The use of such sources assumes that the sequences so identified have formulaic (or conventional) status for all speakers of a given language or for all speakers with a command of a given genre within a given language. It is currently not clear whether this assumption is well-founded. Even sequences such as idioms, which (as a result of their opacity and/or noncompositionality) may be assumed to show less variation than conventional expressions, are not exempt from dialectal (and perhaps regional) variation. Thus, whereas the British may *cut* a long story short, Americans prefer to *make* a long story short. And regardless of the favored formulation, a NNS must be shown to be familiar with the expression before we can reasonably ask questions about how such an individual may process it (cf. Schmitt & Underwood, 2004). Following the example of Bardovi-Harlig (2009, 2010), the identification process adopted in this project provides a reasonable guarantee that the selected experimental sequences were both familiar to and conventional for the NSs of the community under study in the targeted contexts. Moreover, although these results imply the presence of such expressions in the input available to nonnatives living in the community, NNS use of these sequences was also verified, and only those expressions found to be used by a small group of NNSs were retained as experimental items. Together, these aspects of the design provide a relatively strong indication that the expressions examined are in fact conventional in the populations in question, a step that distinguishes the current project from its predecessors.

CHAPTER 5

ONLINE JUDGMENT TASK: RESULTS

This chapter presents the online judgment and RT data for 13 conventional expressions collected from both native and nonnative speakers of French living in Pau, France. The experiment, for which the method was detailed in the previous chapter, asked participants to judge the naturalness of conventional and matched expressions in context using a moving window presentation. The experiment aimed to both examine native and nonnative judgments of 13 conventional expressions and to document mental correlates of conventionality for both NSs and NNSs, by examining whether processing is facilitated on the 13 conventional expressions identified using a DCT in the contexts that had evoked them. Two research questions guided the design of this experiment and are repeated below.

RQ 1: Do NNSs and NSs distinguish conventional expressions from grammatical, matched conditions on a contextualized judgment task?
RQ 2: Is there evidence of a mental correlate of conventional expressions?
- 2a: Do NNSs and NSs react to a word within a conventional expression significantly faster than they do to a matched synonym in the same frame?
- 2b: Do NNSs and NSs react to a word within a conventional expression significantly faster when that word is found in the conventional expression as opposed to when it is found in an alternate frame?

The contextualized online judgment task used to examine these research questions had a 2×2 design, and this design gave rise to four different types of items: CCE (CE word in a conventional frame), CSUB (substitute in a conventional frame), ACE (CE word in an alternate frame), and ASUB (substitute in an alternate frame). An example of one experimental quadruple is provided in Table 17.[41]

[41] This table only shows the experimental items, as the contexts with which these items were paired were shown in Chapter 4, Table 10. Note, however, that items belonging to the same column were presented as responses to the same contexts

Table 17. *Example of One Experimental Quadruple*

	Frame	
Word	Conventional	Alternate
CE	CCE	ACE
	Merci, [*c'est* ***gentil***] de votre part	C'est bien ***gentil*** à vous de me le proposer, merci.
	Thank you, [it's ***nice****] of you*	*It's very* ***nice*** *of you to offer it to me, thank you*
Substitute	CSUB	ASUB
	Merci, [*c'est* ***aimable***] de votre part	C'est bien ***aimable*** à vous de me le proposer, merci.
	Thank you, [it's ***aimable****] of you*	*It's very* ***aimable*** *of you to offer it to me, thank you*

Note. Conventional expression is shown in []; CE words and substitutes are in bold.

For research question 1, acceptance rates on the conventional expressions (CCE condition) will be compared to the three other conditions. Particular attention will be paid to acceptance rates on the CCE versus CSUB conditions, as they differed by only one near-synonym substitute and were paired as responses to the same contexts. In response to research question 2, two RT comparisons will be made, corresponding to the two operationalizations of this question. For research question 2a, a comparison of RTs recorded on CE words versus substitutes in the same frame will be made. For research question 2b, RTs recorded on a CE word in its conventional frame (CCE) will be compared to those recorded on the same word in its alternate frame (ACE), and a similar comparison will be carried out on the substitutes (CSUB vs. ASUB). With respect to Table 17, RT comparisons for the first operationalization will be carried out within columns, whereas those for the second correspond to comparisons within rows.

Naturalness Judgments

Each of the four conditions presented in this experiment was grammatical and semantically felicitous in the contexts with which it was paired. Although all experimental items may thus be argued to constitute possible natural responses to their contexts, only the CCE items had been identified as conventional for a group of NSs living in Pau, France. If the CCE items are judged to be significantly more natural than the other conditions, this would constitute evidence of sensitivity to conventionality among the target populations. This is precisely the result that we find. When collapsed across the 13 CCE-CSUB-ACE-ASUB quadruples, the judgment patterns from each of the three groups show high acceptance rates for the conventional expressions (CCE condition); just over 75% of all judgments were affirmative (Table 18).

Table 18. *Aggregate "Yes" Judgments by Group and by Condition*

	Group					
	Short Stay NNSs (n = 20)		Long Stay NNSs (n = 20)		Native Speakers (n = 20)	
Condition	*n*	%	*n*	%	*n*	%
CCE	203	78.3% (13.7)	203	75.3% (12.1)	209	80.4% (14.7)
CSUB	124	48.8% (17.4)	99	38.1% (19.8)	109	41.9% (16.3)
ACE	168	64.6% (13.4)	157	60.4% (16.9)	129	49.6% (14.1)
ASUB	137	52.7% (9.4)	131	50.4% (22.2)	148	56.9% (16.9)

Note. *Yes* and *no* judgments were largely complementary, with *cannot decide* accounting for no more than 5% of responses. Standard deviations are in parentheses. CCE = Conventional frame, CE word; CSUB = Conventional frame, substitute; ACE = Alternate frame, CE word; ASUB = Alternate frame, substitute

Although certain differences emerge when expressions are considered on an item-by-item basis, all conventional expressions were judged to be natural by at least 50% of members from each group. Moreover, 9 of the 13 quadruples were accepted as natural by 70% or more of all participants (quadruples 1, 3, 4, 5, 7, 8, 9, 10, and 11).[42] The data for each of the 13 CCE-CSUB pairs is presented in Appendix E.

The conversion of kurtosis and skewness values into *z*-scores revealed that judgments in the four conditions were normally distributed, which indicated that parametric tests were appropriate.[43] Thus, a 2 (Word) × 2 (Frame) × 3 (Group) mixed design repeated measures ANOVA was run on the percentage of affirmative judgments for each participant, revealing a main effect of Word, $F(1, 57) = 170.539$, $p < .001$, due to elevated *yes* judgments on items including the CE word, as well as a main effect of Frame, $F(1, 57) = 9.586$, $p < .01$, reflecting the greater number of affirmative judgments in the conventional frames. The between subjects variable of Group was not significant, $F(2, 57) = .969$, $p = .386$, and did not interact with either Word or Frame. However, the three-way interaction was significant, $F(2, 57) = 3.805$, $p < .05$. The interaction between Word and Frame was also found to be significant, $F(1, 57) = 109.22$, $p < .001$.

The interaction between Word and Frame was further explored using planned *t*-tests, which compared judgments of strings involving the CE word and substitute in the same frame (***C***CE vs. ***C***SUB; ***A***CE vs. ***A***SUB) and those involving the same word in different frames (C***CE*** vs. A***CE***; C***SUB*** vs. A***SUB***). These tests revealed the significance

[42] One or more groups accepted the remaining four expressions less enthusiastically. For conventional expression 6 *(c'est pas vrai*), 50% of short stay NNSs considered the response to be natural, whereas for items 2 (*vous aussi*) and 12 (*ça m'est égal*), it was the long stay NNSs whose responses hovered around chance level. Conventional expression 13 (*où en étions-nous?*) was accepted by fewer NSs than NNSs.

[43] CCE condition: kurtosis, $z = -.48$; skewness, $z = -1.16$
CSUB condition: kurtosis, $z = -.88$; skewness, $z = -.28$
ACE condition: kurtosis, $z = -.61$; skewness = -.44
ASUB condition: kurtosis, $z = .68$; skewness = -1.7

of this interaction to be due to distinct judgment patterns for each of the four conditions. In particular, the CCE condition was accepted significantly more frequently than both the CSUB condition, $t(59) = 13.626$, $p < .001$, and the ACE condition, $t(59) = 10.349$, $p < .001$, confirming that CCE items were indeed judged to be natural at significantly higher levels than the matched conditions. Moreover, the ACE condition received significantly more affirmative judgments than the ASUB condition, $t(59) = 3.914$, $p < .001$, substantiating the main effect of Word, which found that strings including the CE word—regardless of Frame—were judged more clemently than those including substitutes. Finally, the ASUB condition was responded to more favorably than the CSUB condition, $t(59) = 3.496$, $p < .01$, a finding that underscores the low levels of acceptance for the items involving a substitute inserted into a conventional frame.

Thus, the conventional expressions (CCE condition) were accepted at higher rates than the other three matched conditions. Of these different comparisons, it is the asymmetries between the conventional expressions (CCE) and CSUB items that are of particular interest, as these two conditions were presented as responses to the same contexts, with the responses differing by only one near-synonym substitute. When the results for each of the 13 CCE-CSUB pairs are considered (see Appendix E), a clear asymmetry in favor of the CCE items is seen. These results are illustrated in the bar graphs presented in Figure 3. For the NSs, long stay NNSs, and short stay NNSs, the percentage of affirmative judgments for each of the 13 CCE-CSUB item pairs is graphed. For each group, the pairs are ordered beginning with those for which the naturalness judgments on the CCE and CSUB items were the least different (on the left of each graph) and continuing to those with the greatest difference in affirmative judgments (on

the right of each graph). As can be seen in these distributions, no CSUB item had a greater percentage of "yes" judgments than its matching CCE item for any of the three

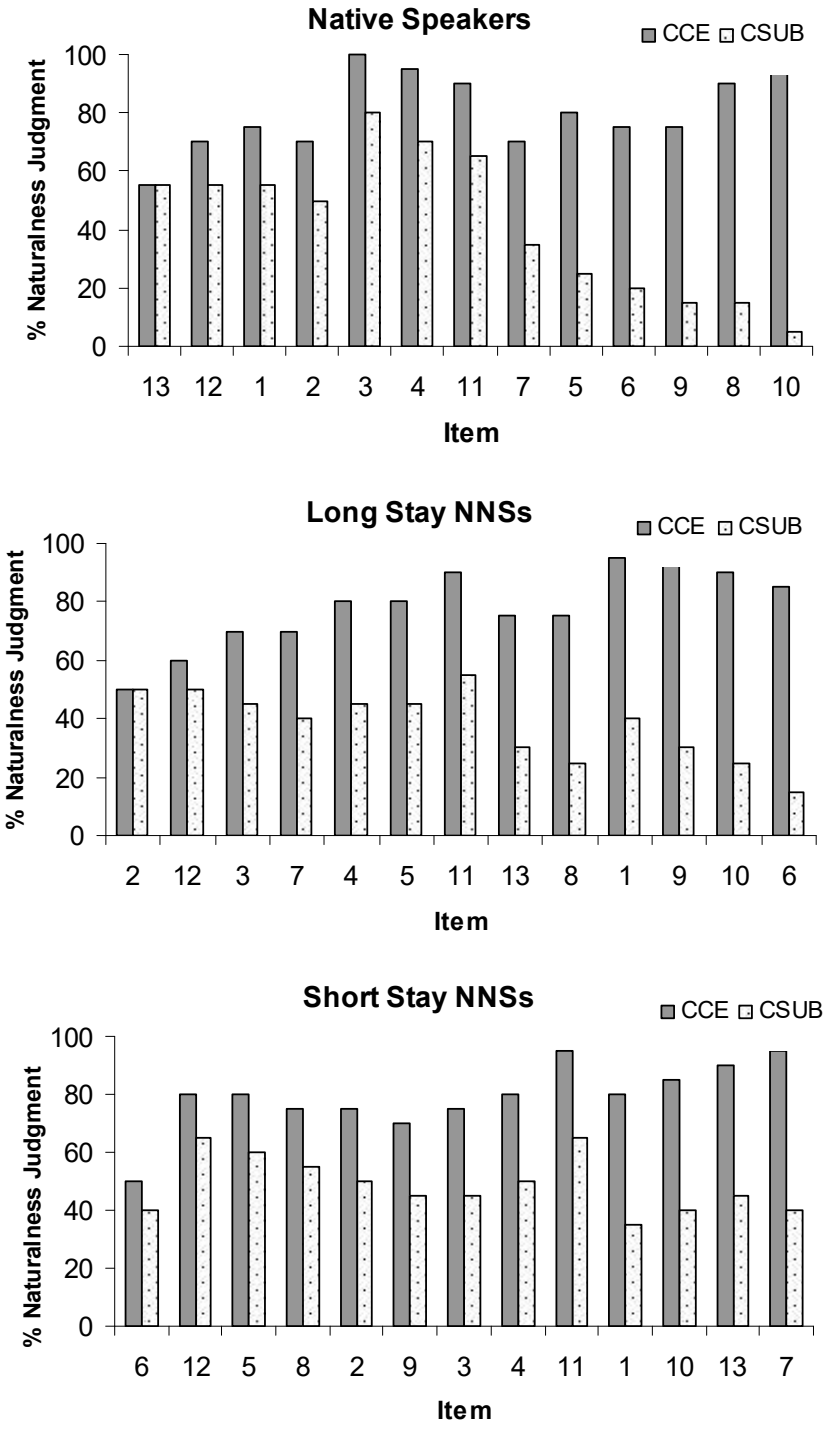

Figure 3. *Percentage of Affirmative Judgments on CCE and CSUB Items by Group*

groups. Moreover, the affirmative judgments for each of the three groups were higher by at least 20% in the CCE condition than in the CSUB condition in the majority of pairs.

Although the majority of CCE items were judged more natural than their matched CSUB strings, for a small set of pairs, at least one group showed less than a 20% difference in acceptance rates for the CCE and CSUB conditions. Such was the case on pair 6 (*c'est pas vrai?!* vs. *c'est pas réel?!*) for the short stay NNSs, on pair 2 (*vous aussi* vs. *vous de même*) for the long stay NNSs, and on pairs 4 (*c'est normal* vs. *c'est logique*) and 13 (*où en étions-nous?* vs. *où en étions-nous restés?*) for the NSs. Finally, there is one pair for which all three groups of participants showed similar acceptance rates on the two conditions. On pair 12 (*ça m'est égal* vs. *c'est pareil*), the CCE version is consistently judged to be more natural than the CSUB version, but the difference is only between 10 and 15%.

In addition to examining the distribution of judgments by item, it is also telling to explore judgment patterns by participant, in order to determine whether all participants tended to accept more CCE items than CSUB items as natural or whether these aggregate results hide various individual patterns. To do so, the number of affirmative judgments on the 13 CSUB items was subtracted from the number of affirmative judgments on the 13 CCE items for each of the 60 participants. Resultant scores could range from -13 (if all CSUB items were judged natural but none of the CCE items were) to 13 (if all of the CCE items were judged natural but none of the CSUB items were). The histograms provided in Figure 4 illustrate the distribution by participant for each of the three groups.

Of the 60 participants, 55 judged the ensemble of CCE items to be more natural than the CSUB items, which can be seen in the general skew to the left in each of the

three histograms. Moreover, the majority of participants provided between 4 and 8 more affirmative naturalness judgments in the CCE condition as compared to the CSUB condition. Finally, only 1 NS gave the same number of affirmative judgments to the two

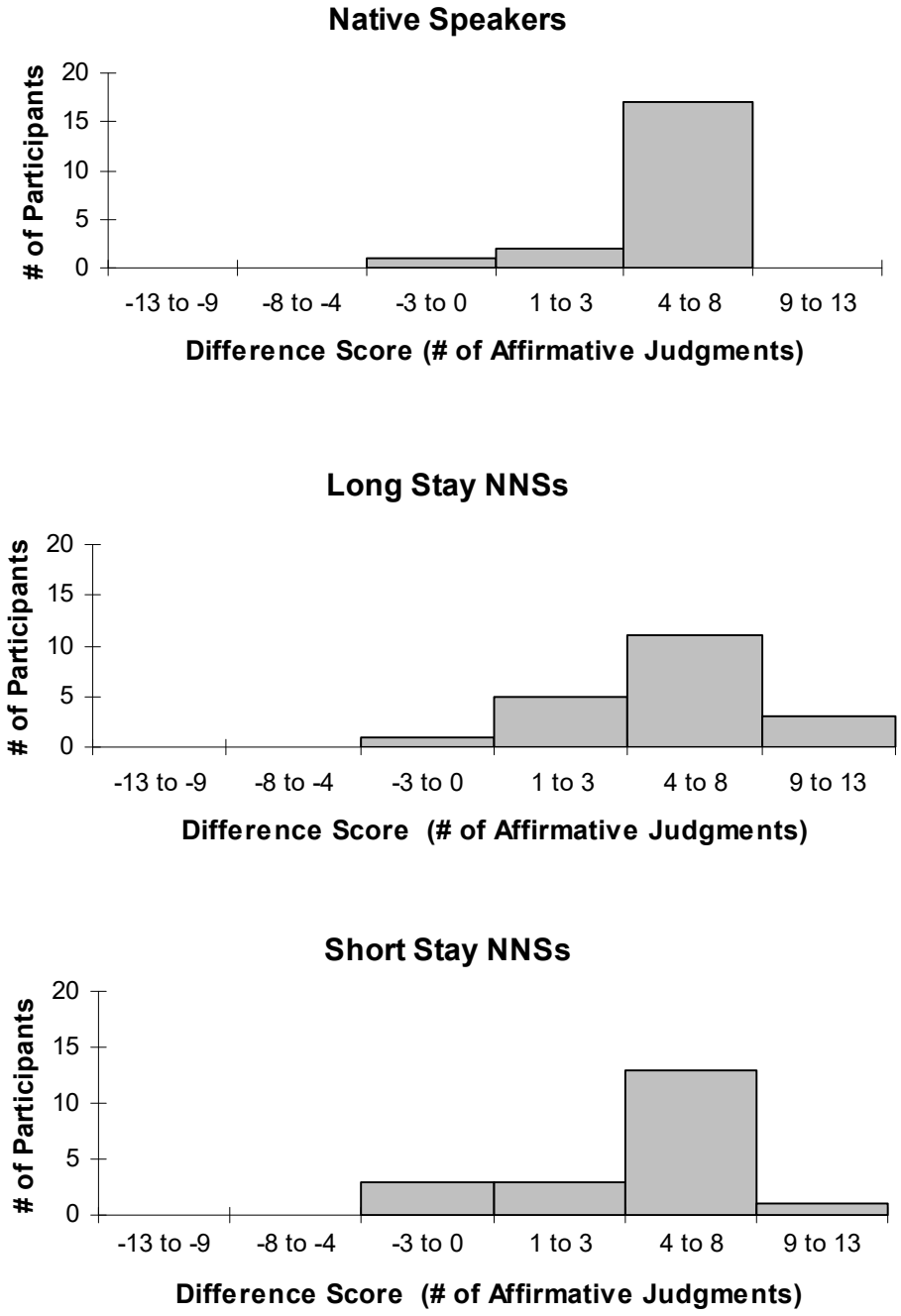

Figure 4. *Histograms of Difference Scores between Affirmative Judgments on the CCE and CSUB Items by Participant by Group*

conditions (i.e., score of 0), and only 1 long stay NNS and 3 short stay NNSs provided more affirmative responses on CSUB items than on CCE items. And for the four participants who gave more affirmative judgments on CSUB items, the difference scores were only slightly in favor of these sequences (i.e., either -1 or -2), with no individuals showing a strong tendency to judge CSUB items natural more often than CCE items.

Taken together, the NSs, long stay NNSs, and short stay NNSs all showed similar behavior in the aggregate naturalness judgments recorded for this experiment, with each group giving the CCE condition the highest naturalness judgment rates of the four conditions. This asymmetry was particularly marked in the CCE-CSUB comparison: 55 of the 60 participants judged the set of CCE items to be more natural than items that differed by one near synonym substitute (CSUB items) as responses to the same contexts. However, this asymmetry was not seen for certain CCE-CSUB pairs, and a difference of less than 20% was found on pair 6 for short stay NNSs, pair 2 for long stay NNSs, pairs 4 and 13 for NSs, and on pair 12 for all three groups. With respect to the alternate frames, responses to ACE items were judged natural significantly more often than ASUB items, indicating that strings involving CE words were generally responded to more favorably than sequences that included the substitutes. Still, ASUB items were judged natural significantly more often than CSUB items, showing that substitutes are only particularly rejected in conventional frames.

Processing Conventional Expressions

Two types of data were collected through the contextualized naturalness judgment task: (a) judgments, which were discussed in the previous section, and (b) RTs, which will be the dependent variable of interest in the current section, as we explore the

processing of conventional expressions. Such expressions are claimed by many to enjoy processing benefits, due to their membership in the formulaic language spectrum, and this project tests this predicted facilitative effect using two different RT comparisons. First, processing benefits should be seen in faster RTs on CE words versus substitutes only in conventional frames (research question 2a). And, second, processing benefits should result in faster RTs on CE words in conventional frames versus in alternate ones (research question 2b). In both cases, a significant interaction between the variables of Frame and Word (due to significant facilitation on the CCE condition) is crucial. A simple main effect (revealing, for example, faster RTs in conventional frames or on CE words) unaccompanied by the significant interaction is uninformative, as such a result would indicate that a single frame (e.g., conventional frame, regardless of word inserted) or a single word (e.g., CE word, regardless of what frame it is inserted into) is always facilitative. Given the 2×2 design of the experiment, such main effect asymmetries tell us nothing about the processing benefits associated with the *combination* of a conventional frame and CE word (i.e., the conventional expression). Moreover, it was expected that inhibition on substitutes in conventional frames with respect to substitutes in alternate frames (CSUB>ASUB) may be found; although both conditions are presumed to not be conventional, the alternate frame was designed to be an acceptable frame for both the substitute and CE word, whereas only the CE word should be preferred in the conventional frame, making the substitute somewhat anomalous (see the fill-in-the-blank results presented in the previous chapter for evidence supporting these assumptions).

As the experiment is composed of 13 individual tests of the facilitation on conventional expressions (in the form of 13 CCE-CSUB-ACE-ASUB quadruples), the

interaction between Word and Frame may be seen in the aggregate analysis, in analyses of the individual quadruples, or both. In addition to examining RTs on the target segments, the RTs on segments immediately following the targeted segments in the CCE and CSUB conditions will be analyzed for evidence of spillover effects, a phenomenon which is particularly relevant when dealing with NNSs, whose global slowness when compared to their native counterparts seems to be at least in part responsible for spillover (e.g., Dekydtspotter, Schwartz, & Sprouse, 2006).

Reaction Times on Target Segments

Before conducting the planned statistical tests, the distribution of the data was examined in order to confirm the assumption of normality essential to parametric tests. The *z*-scores for skewness and kurtosis of the RTs revealed that the dataset was not normally distributed.[44] For the raw data, 7.9% of all data points were outliers (247 points of 3120 total), of which 96 (3.1%) were flagged as extreme outliers (outliers more than 3 *SD*s away from the mean). Moreover, due to extreme scores on the lower end of the scale, the data showed a tendency to skew to the left resulting in a lower overall mean. In an attempt to reduce the amount of variation, the RT data were log-transformed.[45] Box plots for the log-transformed data identified only 4.2% (n = 132) of data points as outliers, with only 32 data points (1%) considered extreme outliers, revealing a clear improvement in comparison to the raw data. Although the log-transformation reduced by almost half the number of outliers, not all were retained in the final analysis. All extreme outliers (n = 32) were replaced with the mean for that group on that item. Whereas many

[44] CCE condition: kurtosis, z =3.79; skewness, z = 4.94
CSUB condition: kurtosis, z = 3.84; skewness, z = 4.82
ACE condition: kurtosis, z = 5.77; skewness = 3.24
ASUB condition: kurtosis, z = 3.65; skewness = 4.6
[45] The dataset prior to log-transformation is provided in Appendix F.

studies replace all data points found two *SD*s beyond the mean for any given item, the approach adopted here is more conservative, allowing for the maintenance of more data points. This was particularly important given that each group has only 20 members and, thus, the replacement of even one data point for any given item affects 5% of the data for that item for that group.

After having log-transformed the data, residuals were calculated in order to account for length differences between CE words and substitutes. Although matched in length as closely as possible, CE words were on average one letter shorter than the substitutes (6.8 letters for CE words, 7.9 letters for substitutes). As shorter words tend to be reacted to more quickly, residuals of the log-transformed data were used as the dependent variable for all statistical analyses, effectively factoring out the effect of length. Residuals were calculated by running a single linear regression model in which all log-transformed RTs (dependent variable) were plotted against the length in letters of the words reacted to (independent variable). The resulting regression line predicted RTs on the basis the length of a word. The predicted values were then subtracted from the observed values, yielding the residuals. Negative values indicate that a data point is faster than predicted given the length of the word, whereas positive values correspond to data points that are slower than expected.

Analysis of the aggregate data. The entire dataset was examined using a 2 (Word) × 2 (Frame) × 13 (Quadruple) × 3 (Group) mixed design repeated measures ANOVA. The main effect of Group was found to be significant, $F(2, 57) = 18.453$, $p < .001$. Group membership moreover significantly interacted with both Word, $F(2, 57) = 21.29$, $p < .001$, and Frame, $F(2, 57) = 6.605$, $p < .01$. However, the three-way interaction

of Word × Frame × Group was not significant, $F(2, 57) = .702$, $p = .5$. The main effect of Word was also revealed to be significant, $F(1, 57) = 42.232$, $p < .001$, due to overall faster RTs on the CE words. Frame was not found to significantly impact the RTs, $F(1, 57) = 1.833$, $p = .181$. Crucially, the interaction between the Word and Frame reached significance, $F(2, 57) = 17.27$, $p < .001$. Finally, the variable of Quadruple was found to be significant, $F(12, 46) = 18.686$, $p < .001$, and this main effect was qualified by interactions with Word, $F(12, 46) = 7.815$, $p < .001$, with Frame, $F(12, 46) = 2.975$, $p < .001$, and with Group, $F(24, 94) = 3.568$, $p < .001$. The significance of this variable suggests that the 13 quadruples were responded to differently, and thus merit individual attention. But before presenting an analysis of each quadruple, the main effect of Group and the interaction between Word and Frame will be explored in more detail.

Given the significant main effect of Group, the three levels were subjected to Tukey HSD and Bonferroni post hoc tests. Both analyses found that the two NNS groups were nondistinct (Tukey: $p = .363$; Bonferroni: $p = .527$), whereas each of the nonnative groups was statistically different from the natives ($p < .001$ in both tests; full statistics provided in Table G1). These results are due to the reliably faster RTs obtained for the NSs. Given this division, the findings from the original ANOVA were then confirmed by performing separate follow-up ANOVAs on the native and on the nonnative data, respectively. For the NSs, the significant interaction between Word and Frame was confirmed, $F(1, 19) = 4.521$, $p < .05$, whereas the main effects of Word, $F(1, 19) = 2.754$, $p = .113$, and Frame, $F(1, 19) = 3.3$, $p = .085$, did not reach significance. For the NNSs, a significant interaction between Word and Frame, $F(1, 38) = 13.089$, $p < .01$, was accompanied by main effects of Word, $F(1, 38) = 66.602$, $p < .001$, and Frame, $F(1, 38)$

= 6.512, $p < .05$, but the main effect of Group was not significant, $F(1, 38) = 1.576$, $p = .217$.[46] Given the nonsignificant difference between the two nonnative groups, they will be treated as a single group for the planned comparisons of the aggregate data, which were used to examine the significant interaction between Word and Frame for natives and nonnatives.[47]

In light of the results from the analysis of the aggregate data showing a significant interaction between Word and Frame, four planned *t*-tests were conducted on the NS and NNS data in order to examine whether this interaction is indicative of facilitation on conventional expressions. Planned comparisons were made both within frames (***C***CE vs. ***C***SUB and ***A***CE vs. ***A***SUB) and within words (C***CE*** vs. A***CE*** and C***SUB*** vs. A***SUB***).[48] The significant results that would allow for an affirmative response to the two operationalizations of research question 2 are given in Table 19, along with the results expected if the processing of substitutes in conventional frames is indeed characterized by inhibition (as described at the beginning of this section).

Table 19. *Significant RT Results consistent with CCE Facilitation and CSUB Inhibition*

Pattern	Significant Result
Research question 2a	CCE < CSUB and ACE ≥ ASUB
Research question 2b	CCE < ACE and CSUB ≥ ASUB
Inhibition on CSUB	ASUB < CSUB

[46] The interaction between Word and Group was not significant, $F(1, 38) = 3.437$, $p = .072$, although the main effect of Frame was qualified by group membership, $F(1, 38) = 4.565$, $p < .05$ (short stay NNSs showed no difference by Frame, whereas long stay NNSs were faster in alternate frames). Finally, the three-way interaction was not significant, $F(1, 38) = .302$, $p = .586$.

[47] These results differ slightly from those obtained in the judgment analysis: Whereas NSs are significantly different from the two NNS groups in terms of RTs, the naturalness judgments of the three groups were nondistinct.

[48] The first two comparisons correspond to the within column comparisons in Table 17, whereas the second two correspond to the within row comparisons illustrated in this same table.

The planned comparisons found that the natives showed significantly faster RTs on the CCE condition versus the ACE condition, $t(19) = 3.307$, $p < .01$, which was accompanied by a nonsignificant result in the CSUB-ASUB comparison, $t(19) = .158$, $p = .876$. This combination of results implies that it was not simply the conventional frame that led to faster RTs, but the combination of the conventional frame and the CE word.[49] Nonnatives, on the other hand, were significantly slower on the CSUB condition as compared to both the CCE, $t(39) = 7.973$, $p < .001$, and the ASUB conditions, $t(39) = 3.803$, $p < .001$. However, they were also significantly slower on ASUB versus ACE, $t(39) = 4.164$, $p < .001$, implying that they are simply always slower on substitutes, regardless of frame. These patterns are summarized in Table 20 and confirmed in the descriptive statistics (which are shown using non-log transformed residuals) in Table 21.

Table 20. *Summary of Significant Planned Comparison Results for RTs on Aggregate Data*.

	NSs	NNSs
Results	($n = 20$)	($n = 40$)
Aggregate	CCE < ACE	CCE, ASUB < CSUB ACE < ASUB

Note. CCE = Conventional frame, CE word; CSUB = Conventional frame, substitute; ACE = Alternate frame, CE word; ASUB = Alternate frame, substitute

[49] CCE vs. CSUB: $t(19) = .02$, $p = .984$. ACE vs. ASUB: $t(19) = 2.65$, $p < .05$ (due to faster RTs on the ASUB condition).

Table 21. *Target Segment: Mean Residuals by Group and Condition*

	Condition							
	CCE		CSUB		ACE		ASUB	
Group	Residual	*SD*	Residual	*SD*	Residual	*SD*	Residual	*SD*
Short Stay NNSs	67.1	298	321.1	467	100.4	284	217.5	382
Long Stay NNSs	23.8	219	149.2	289	-33.3	171	42.6	274
NSs	-209.8	129	-245.7	150	-186.9	103	-245.9	116

Note. CCE = Conventional frame, CE word; CSUB = Conventional frame, substitute; ACE = Alternate frame, CE word; ASUB = Alternate frame, substitute

Analysis of individual quadruples. Given that the aggregate analysis found that results varied as a function of the quadruple (i.e., the variable Quadruple was found to be significant), an analysis of each quadruple was undertaken. Overall, the descriptive statistics from the 13 quadruples presented in Table 22 reveal that only approximately 1/3 for each of the groups show either (a) faster absolute RTs on the CE word than on the

Table 22. *Target Segment: Average Residuals by Group, Condition, and Quadruple*

	Condition			
Quadruple	CCE	CSUB	ACE	ASUB
1 *gentil/aimable*				
Short Stay NNSs	30.38 (374)	56.25 (314)	254.58 (712)	129.8 (554)
Long Stay NNSs	-90.52 (280)	201.05 (673)	-88.82 (214)	-34.56 (324)
Native Speakers	-199.67 (115)	-264.76 (121)	-170.12 (131)	-209.51 (180)
2 *aussi/de même*				
Short Stay NNSs	153.17 (391)	503.58 (1032)	77.62 (354)	210.73 (561)
Long Stay NNSs	40.42 (289)	169.88 (467)	8.57 (195)	104.38 (367)
Native Speakers	-127.43 (182)	-183.91 (149)	-137.33 (106)	-182.37 (114)
3 *excusez/pardonnez*				
Short Stay NNSs	187.7 (830)	-83.13 (264)	-47.21 (314)	-130.68 (281)
Long Stay NNSs	355.5 (1139)	-228.82 (157)	-101.96 (206)	-178.51 (279)
Native Speakers	-222.86 (211)	-279.88 (250)	-164.11 (192)	-388.83 (157)
4 *normal/logique*				
Short Stay NNSs	64.23 (434)	240.25 (622)	-23.22 (286)	334.15 (722)
Long Stay NNSs	-62.56 (247)	-40.11 (258)	-29.27 (308)	-64.94 (203)
Native Speakers	-239.58 (83)	-182.91 (385)	-164.72 (100)	-192 (155)

Quadruple	Condition			
	CCE	CSUB	ACE	ASUB
5 *inquiète/soucie*				
Short Stay NNSs	30.27 (436)	750.61 (1331)	298.47 (823)	581.36 (867)
Long Stay NNSs	-177.93 (203)	521 (745)	-26.63 (348)	310.21 (654)
Native Speakers	-64.33 (945)	-276.59 (157)	-339.78 (164)	-215.59 (220)
6 *vrai/réel*				
Short Stay NNSs	101.16 (276)	304.06 (447)	136.92 (325)	336.96 (453)
Long Stay NNSs	139.61 (292)	359.86 (624)	25.46 (100)	241.71 (390)
Native Speakers	-78.41 (71)	-63.69 (95)	41.11 (318)	19.86 (267)
7 *malade/souffrant*				
Short Stay NNSs	-11.42 (288)	446.32 (757)	-18.72 (288)	-22.68 (307)
Long Stay NNSs	62.18 (342)	222.37 (820)	-73.87 (187)	-191.28 (289)
Native Speakers	-174.38 (92)	-272.13 (263)	-234.62 (86)	-286.78 (322)
8 *sincères/fidèles*				
Short Stay NNSs	-95.64 (262)	72.2 (309)	183.21 (578)	29.35 (267)
Long Stay NNSs	-200.25 (88)	-28.41 (175)	196.96 (720)	36.15 (425)
Native Speakers	-210.84 (257)	-149.76 (146)	-93.89 (312)	-235.26 (103)
9 *plaisir/bonheur*				
Short Stay NNSs	-194.14 (130)	18.6 (468)	-68.91 (318)	-40.46 (338)
Long Stay NNSs	-188.27 (138)	134.69 (481)	-139.21 (189)	-153.56 (210)
Native Speakers	-308.06 (71)	-298.06 (164)	-346.21 (77)	-327.76 (80)
10 *rencontrer/retrouver*				
Short Stay NNSs	-74.83 (582)	-15.38 (407)	-150.87 (323)	59.57 (598)
Long Stay NNSs	-252.43 (280)	-52.78 (412)	-210.32 (328)	26.32 (701)
Native Speakers	-408.17 (156)	-278.98 (265)	-347.12 (374)	-368.68 (111)
11 *arriver/parvenir*				
Short Stay NNSs	-73.51 (185)	736.16 (1527)	113.55 (386)	607.71 (1038)
Long Stay NNSs	-8.25 (353)	76.86 (464)	24.4 (231)	65.71 (498)
Native Speakers	-266.52 (103)	-168.19 (257)	-198.66 (149)	-243.94 (155)
12 *égal/pareil*				
Short Stay NNSs	233.26 (496)	245.63 (535)	160.17 (157)	219.18 (573)
Long Stay NNSs	302.16 (419)	.35 (180)	135.46 (209)	-11.22 (241)
Native Speakers	-47.44 (163)	-172.37 (176)	30.21 (168)	-80.47 (198)
13 *étions-nous/étions-nous restés*				
Short Stay NNSs	521.48 (1184)	899.7 (1374)	389.18 (1167)	511.95 (1498)
Long Stay NNSs	389.58 (1049)	603.6 (1210)	-153.22 (256)	403.3 (1450)
Native Speakers	-419.77 (176)	-603.3 (437)	-304.22 (242)	-485.95 (510)

Note. Results in line with asymmetries supporting facilitation on conventional expressions are filled in in gray. Standard deviations are provided in parentheses. CCE = Conventional frame, CE word; CSUB = Conventional frame, substitute; ACE = Alternate frame, CE word; ASUB = Alternate frame, substitute

substitute in the conventional frame, without the same pattern being found in the alternate frame (ACE and ASUB), (b) faster absolute RTs on the CE word in the conventional

frame when compared to the same lexical item in its alternate frame, without a similar asymmetry in the CSUB and ASUB conditions, or (c) both.

Thirteen 2 (Word) × 2 (Frame) × 3 (Group) mixed design repeated measures ANOVAs were carried out, and results showed a significant effect of the variable of Group in each analysis (due to the faster processing of the NSs with respect to the NNSs). As no difference was found between the two NNS groups in the individual quadruple ANOVAs, the nonnatives were treated as a single group for all subsequent analyses. With respect to the variables of Word and Frame, the results did not support facilitation on the CCE condition for the majority of quadruples, insofar as the interaction between Word and Frame did not reach significance: quadruples 1, 2, 4, 6, 10, 11, 12, and 13 (see Table G2 for full statistics). Whereas Frame was not significant for any of these eight item sets, a main effect of Word was common. In the case of quadruples 2, 4, 5, 6, 10, and 11, this effect was due to facilitation on CE words, whereas the opposite pattern was significant in quadruple 12 (on quadruples 4, 5, 6, 11, and 12, this pattern was qualified by group membership).

For the remaining five quadruples, the interaction between Word and Frame was significant, and the same four planned comparisons described for the aggregate data were conducted in order to further examine this result (comparisons within frames: ***C***CE vs. ***C***SUB and ***A***CE vs. ***A***SUB; comparisons within words: C***CE*** vs. A***CE*** and C***SUB*** vs. A***SUB***). For two of these quadruples (3 and 5), this interaction was found solely in the form of a three-way interaction between Word, Frame, and Group, indicating that the groups behaved in different ways with respect to the interaction. These different patterns are visible in the bar graphs presented in Figures 5 and 6. With respect to quadruple 3

(Figure 5: *excusez-moi*), none of the groups shows facilitation on the conventional expressions, and for the NNSs, RTs are the slowest on these particular items (CCE is significantly slower than both ACE and CSUB). For the natives, none of the asymmetries examined reached significance.

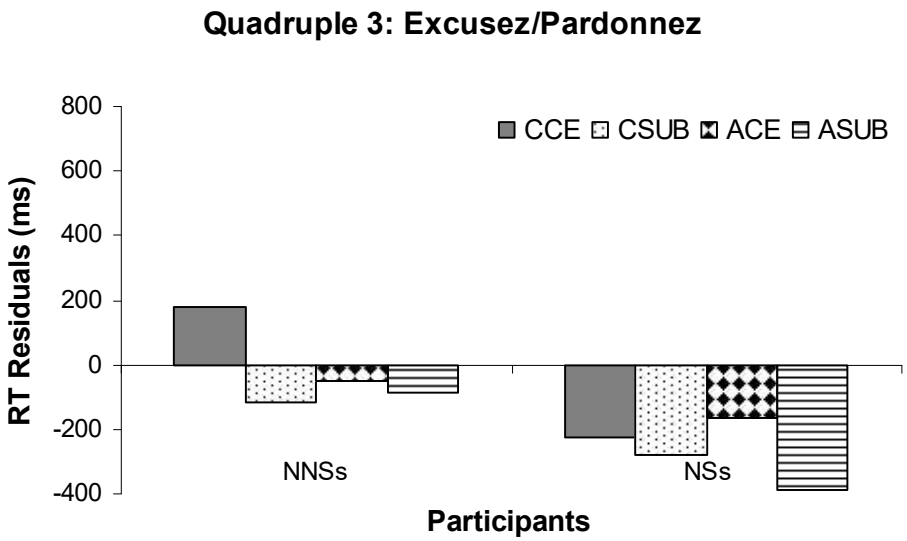

Figure 5. *RT Profiles for Quadruple 3*

With respect to quadruple 5 (Figure 6: *ne t'inquiète pas*), it is only the NNSs who show a profile consistent with ease of processing on the CCE condition (none of the NS comparisons was significant). The planned comparisons revealed that the nonnatives reacted to the CCE condition significantly more quickly than they did to the CSUB condition, $t(39) = 6.339$, $p < .001$, and to the ACE condition, $t(39) = 2.817$, $p < .01$. This finding is qualified by a significant asymmetry in favor of CE words over substitutes in alternate frames, $t(39) = 2.544$, $p < .05$, implying that, on this quadruple, nonnatives consistently responded to the CE word more quickly.

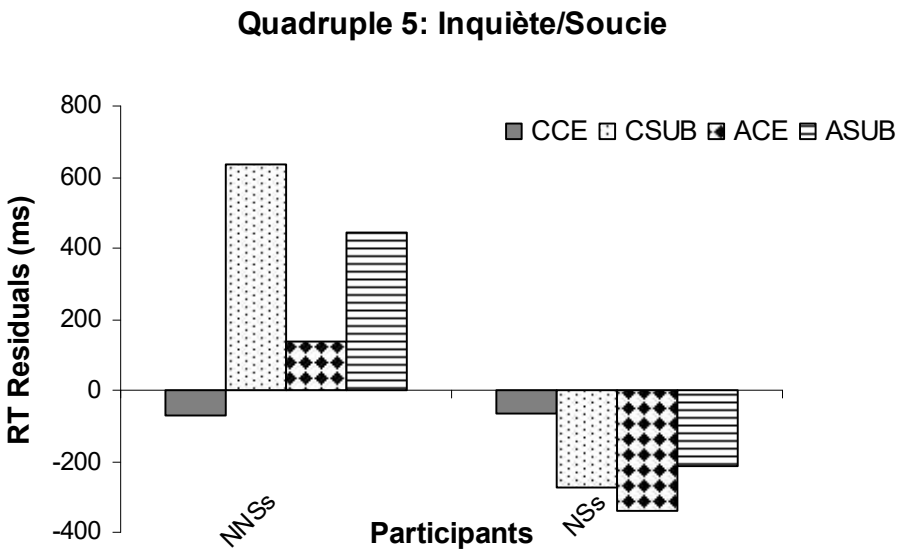

Figure 6. *RT Profiles for Quadruple 5*

Finally, no difference was found between NNSs' RTs on the CSUB and ASUB conditions, $t(39) = 1.28$, $p = .208$, on Quadruple 5.

Both the interaction between Word and Frame and the three way interaction between Word, Frame, and Group were found to be significant for quadruples 7 and 9. The importance of group membership is clear from the bar graphs presented in Figures 7 and 8, which show the facilitation for the NNSs on the conventional expressions, but either the apparent inhibition (quadruple 7) or the flat results (quadruple 9) for the NSs in this same condition. For quadruple 7 (Figure 7: *j'étais vraiment malade*), the nonnatives responded to CCE more quickly than they did to CSUB, $t(39) = 3.57$, $p < .01$, a pattern that was not mirrored in the alternate frame results, $t(39) = .13$, $p = .897$. Moreover, the CSUB RTs were slower than those recorded on ASUB items, $t(39) = 5.002$, $p < .001$, and the CCE condition was responded to significantly more slowly than was the ACE condition, $t(39) = 2.193$, $p < .05$. Finally, no NS comparisons were significant.

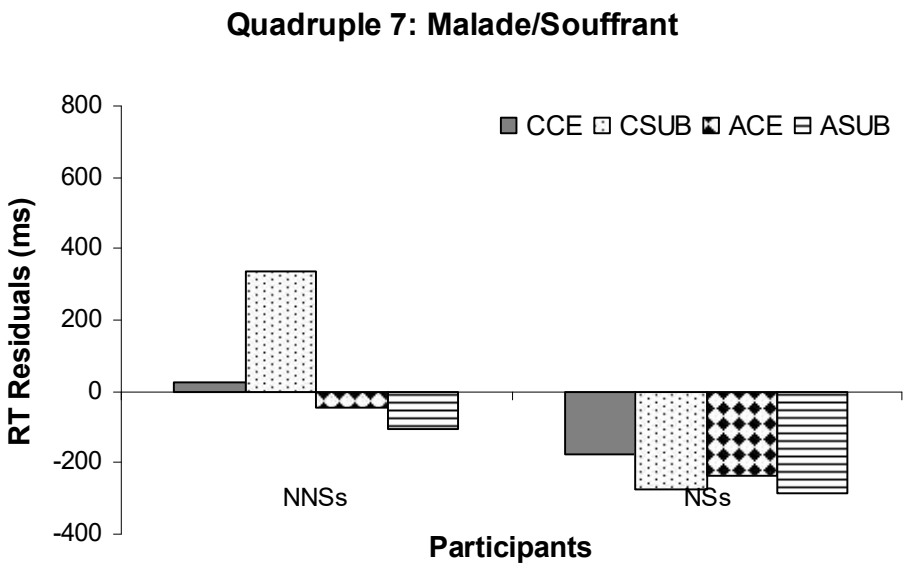

Figure 7. *RT Profiles for Quadruple 7*

For quadruple 9 (Figure 8: *avec plaisir*), the nonnatives showed significantly faster RTs on the CCE versus CSUB conditions, $t(39) = 3.945$, $p < .001$, which was not

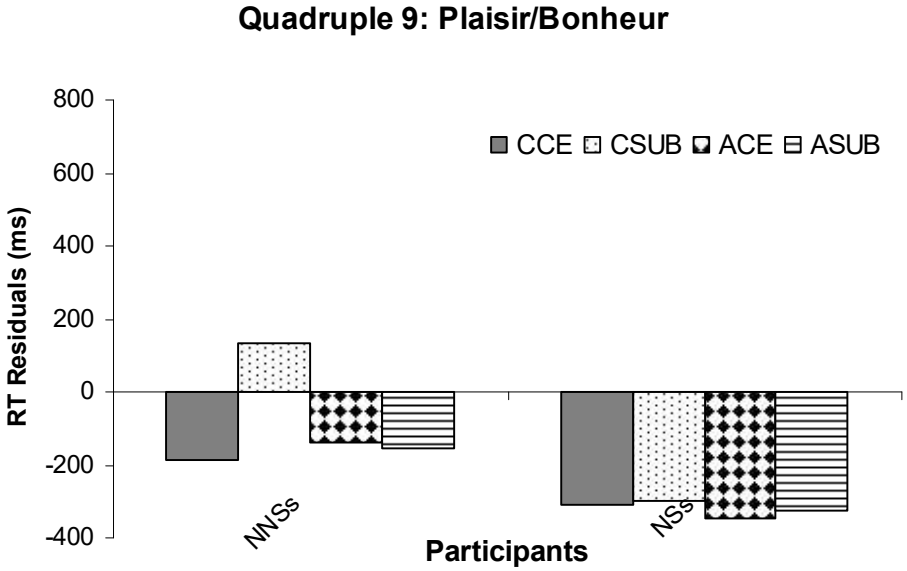

Figure 8. *RT Profiles for Quadruple 9*

due to overall faster RTs on CE words (ACE vs. ASUB: $t(39) = .047$, $p = .963$). Moreover, faster RTs were recorded on the ASUB versus CSUB conditions for the NNSs, $t(39) = 2.71$, $p < .05$. Finally, CE words were not reacted to more quickly in a conventional frame than in an alternate one, $t(39) = 1.838$, $p = .074$. Once again, none of the NS comparisons reached significance.

The repeated measures ANOVA for quadruple 8 (*toutes mes sincères condoléances*) revealed similar response profiles for the natives and nonnatives alike. As can be seen in Figure 9, overall, the conventional expressions were responded to more quickly than the CE words in an alternate frame (ACE) as well as than substitutes in the conventional frame (CSUB). Planned *t*-tests conducted for NSs and NNSs confirmed this observation only for the nonnatives. For these participants, the CCE condition was responded to more quickly than both the CSUB, $t(39) = 4.132$, $p < .001$, and the ACE

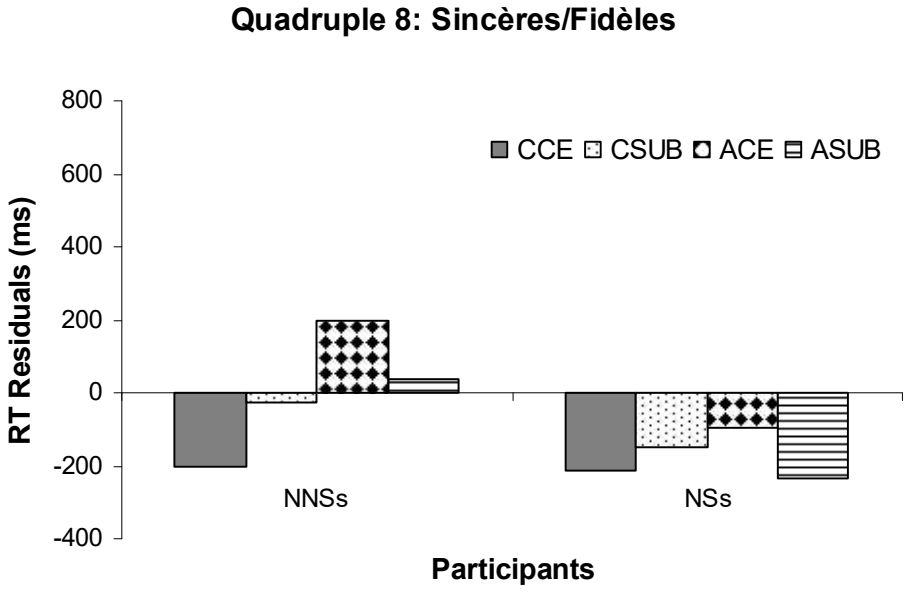

Figure 9. *RT Profiles for Quadruple 8*

conditions, $t(39) = 4.098$, $p < .001$.[50] The NSs, on the other hand, did not show a significant asymmetry between the CCE condition and the CSUB, $t(19) = 1.282$, $p = .215$, or the ACE conditions, $t(19) = 1.409$, $p = .175$. However, they did produce asymmetries between significantly slower reactions to CSUB versus ASUB, $t(19) = 2.495$, $p < .05$, and ACE versus ASUB, $t(19) = 2.425$, $p < .05$.

If the aggregate data show evidence of a processing asymmetry in favor of conventional expressions by virtue of the CCE<ACE asymmetry in the native data as well as the elevated RTs on the CSUB condition versus the CCE and ASUB conditions for the nonnatives, a closer look at the 13 quadruples presents a less unified picture. In two-thirds of the quadruples (1, 2, 4, 6, 10, 11, 12, and 13), no significant interaction between Frame and Word was found, whereas the significant interaction found in quadruple 3 did not show facilitation on the CCE condition. For the remaining four quadruples, the interaction between Word and Frame was significant, and the post hoc *t*-tests confirmed facilitation or inhibition for the nonnatives. Data from quadruples 8 (*toutes mes sincères condoléances*) and 5 (*ne t'inquiète pas*) found evidence of significantly faster processing on the CCE condition with respect to the CSUB and ACE conditions, and significantly elevated RTs on the CSUB versus the CCE and ASUB conditions were recorded for NNSs on quadruples 7 (*j'étais vraiment malade*) and 9 (*avec plaisir*). The only significant post hoc finding for NSs showed significant inhibition on the CSUB condition on Quadruple 8. These results are summarized in Table 23.

[50] The comparisons between ACE and ASUB, $t(39) = 1.373$, $p = .178$, and between CSUB and ASUB, $t(39) = .169$, $p = .867$, were not significant.

Table 23. *Summary of Significant Results on Target Segments*

Results	NSs (n = 20)	NNSs (n = 40)
Aggregate	CCE < ACE	CCE, ASUB < CSUB
		ACE < ASUB
Quadruple 3		ACE, CSUB < CCE
Quadruple 8	ASUB < CSUB	CCE < ACE, CSUB
Quadruple 5		CCE < ACE, CSUB
		ACE < ASUB
Quadruples 7 & 9		CCE, ASUB < CSUB

Note. CCE = Conventional frame, CE word; CSUB = Conventional frame, substitute; ACE = Alternate frame, CE word; ASUB = Alternate frame, substitute.

Reaction Times on Following Segments

In addition to exploring RT patterns on target segments, the RTs recorded on the following segments in the CCE and CSUB conditions were examined for evidence of spillover. With respect to difficulty in processing, the concept of spillover is well known. Specifically, computations presumably initiated or set off by one segment are seen in the form of elevated RTs on the following segment, due to the continuation of such computations after the following lexical item has been retrieved. Contrary to most of this literature, potential spillover effects in the current experiment are not associated with the continuation of computations of phenomena like trace integration. Instead, it is hypothesized that the presence of a substitute in a conventional expression may disrupt the parse, essentially surprising a reader who may be expecting another word (e.g., the CE word). Recovery would be visible in the CCE-CSUB comparison in the form of elevated RTs on the segment that caused the disruption (the substitute), on the segment

that follows the substitute, or on both.[51] In exploring RTs on following segments within the conventional frame, questions of frequency, syntactic complexity, and length are automatically controlled for, as the word on which the RTs are recorded is the same in the two conditions, differing only with respect to whether it follows a CE word or a substitute. As word length does not need to be factored out, residuals were not calculated.

For 10 of the 13 conventional expressions tested, the target segment was the final lexical item of the sequence, meaning that the following segments in these instances were located outside of the conventional expression (i.e., they were part of the carrier phrase). Only in pairs 3 (*excusez-moi*), 5 (*ne t'inquiète pas*), and 8 (*toutes mes sincères condoléances*) was the following segment found within the limits of the original conventional expression (*moi*, *pas*, and *condoléances*, respectively). Although spillover should be visible regardless of whether that segment is found within the bounds of the original conventional expression, we might expect RT differences as a function of the placement of the following segment. In particular, the magnitude of that difference may very well be different. If all segments within conventional expressions are hypothesized to enjoy processing benefits, there are no such expectations for segments outside of such expressions. Thus, spillover effects as a result of the presence of a substitute may logically be more visible when the following segment is found within the original conventional expression (as this following segment may have been processed more quickly in the CCE condition) than when it is not. Although the unequal distribution of following segments inside and outside of conventional expressions prevents a test of the

[51] For the within word comparisons (e.g., CCE vs. ACE), we would not expect to necessarily see elevated RTs after the CE word in an alternate frame, as these constructions were not intended to disrupt the parse.

accuracy of this prediction with the current data, what is important for the current project is that spillover should be seen in both configurations.

The data set for following segments for each of the four conditions showed the same non-normal characteristics as did the data collected on the target segments.[52] Because the number of total outliers (n = 261; 8.4%) and extreme outliers (n = 119; 3.8%) in this dataset was high, the data were log-transformed. As a result of this transformation, the number of outliers was reduced to 160 (5.1%) total outliers and 41 (1.3%) extreme outliers. For the same reasons outlined in the preceding section, extreme outliers (i.e., 41 data points) were replaced with the means recorded for the item and group in question.

Analysis of the aggregate data. For each of the three groups, the descriptive data show faster RTs on the segment following the CE word versus the same segment following a near synonymous substitute, although standard deviations are more elevated in the CSUB condition (Table 24). The difference between the two conditions is, on average, 120ms (571.52 ms for the CCE condition vs. 691.85 for the CSUB condition). A 2 (Word) x 13 (Pair)[53] mixed design repeated measures ANOVA with Group as the between-subjects factor confirmed that this pattern was significant for the aggregate data. The segment following the CE word was responded to significantly faster than was the same segment following a substitute, $F(1, 57) = 32.51$, $p < .001$. Group was found to be significant, $F(2, 57) = 16.508$, $p < .001$, due to the faster overall RTs recorded for the

[52] CCE condition: kurtosis, $z = 25.56$; skewness, $z = 10.3$
CSUB condition: kurtosis, $z = 4.97$; skewness, $z = 5.79$
ACE condition: kurtosis, $z = 10.58$; skewness = 7.28
ASUB condition: kurtosis, $z = 8.79$; skewness = 6.31
[53] Whereas the analyses of the target segments involved CCE-CSUB-ACE-ASUB quadruples, the analyses of the following segments only involve CCE-CSUB pairs.

natives; the two nonnative groups were not distinct. Although Group also significantly interacted with Word, $F(2, 57) = 3.331$, $p < .05$, planned comparisons showed that both NSs, $t(19) = 2.771$, $p < .01$, and NNSs, $t(39) = 5.857$, $p < .001$, reacted significantly faster to a segment when it followed a CE word than when it followed a substitute. Finally, the result for Pair indicated significantly different patterns among the various pairs, $F(12, 46) = 9.53$, $p < .001$, which will be explored more fully in the following subsection.

Mean RTs in the ACE and ASUB conditions are also provided in Table 24 and show little difference between the two conditions. A 2 (Word) × 3 (Group) repeated measures ANOVA on the data from the alternate frame confirmed that there was no significant asymmetry on the basis of Word, $F(1, 57) = .26$, $p = .612$, and no interaction with Group, $F(2, 57) = .856$, $p = .43$, reflecting the across the board flat results in this frame.

Table 24. *Following Segment: Mean RTs (ms) by Group and Condition*

	Condition							
	CCE		CSUB		ACE		ASUB	
Group	RT	*SD*	RT	*SD*	RT	*SD*	RT	*SD*
Short Stay NNSs	659.9	231	793	284	940.5	359	930.6	305
Long Stay NNSs	610.5	131	790.3	299	812.7	277	845	266
NSs	444.1	71	492.3	94	543.6	157	523.6	121

Note. CCE = Conventional frame, CE word; CSUB = Conventional frame, substitute; ACE = Alternate frame, CE word; ASUB = Alternate frame, substitute.

Analysis of individual pairs. The majority of individual pairs show faster absolute RTs in the CCE versus the CSUB condition (Table 25). As compared to the data from the target segments, asymmetries on the following segments appear to be more robust.

Table 25. *Following Segment: Average RTs (ms) by Group, Condition, and Pair*

Pair	CCE	CSUB	Pair	CCE	CSUB
1 *gentil/aimable*			8 *sincères/fidèles*		
SS	517.4 (212)	494.35 (134)	SS	861.21 (391)	1353.9 (1112)
LS	442.12 (82)	515 (136)	LS	936.3 (593)	1110.65 (715)
NS	432.2 (109)	404.78 (66)	NS	551.98 (286)	911.5 (795)
2 *aussi/de même*			9 *plaisir/bonheur*		
SS	709.15 (403)	670.6 (373)	SS	906.75 (401)	865.85 (516)
LS	539.3 (118)	590.55 (168)	LS	850.25 (675)	941 (482)
NS	439.25 (115)	465.65 (121)	NS	442.75 (102)	420.25 (90)
3 *excusez/pardonnez*			10 *rencontrer/retrouver*		
SS	564.85 (304)	701.85 (339)	SS	799.65 (249)	1148.35 (977)
LS	635.95 (216)	618.15 (260)	LS	720.25 (321)	1157.7 (909)
NS	391.1 (78)	426.9 (175)	NS	524.2 (164)	502 (90)
4 *normal/logique*			11 *arriver/parvenir*		
SS	681.9 (298)	746.75 (491)	SS	520.45 (99)	804.85 (734)
LS	571.83 (169)	971.3 (909)	LS	537.2 (108)	604.29 (202)
NS	417.55 (107)	490.1 (153)	NS	450.85 (131)	457.6 (143)
5 *inquiète/soucie*			12 *égal/pareil*		
SS	767.15 (644)	1014.4 (637)	SS	539.6 (207)	619.95 (329)
LS	552.14 (113)	1484.8 (2046)	LS	579.75 (301)	619.35 (325)
NS	453.36 (259)	498.65 (229)	NS	405.4 (97)	453.85 (212)
6 *vrai/réel*			13 *étions-nous/étions-nous restés*		
SS	634.1 (341)	653.95 (354)	SS	546.63 (200)	679.85 (378)
LS	540.1 (153)	602.15 (230)	LS	523.25 (106)	564.62 (128)
NS	432.75 (93)	408.65 (57)	NS	415.35 (95)	453.59 (63)

Pair	CCE	CSUB	Pair	CCE	CSUB
7 *malade/souffrant*					
SS	530.15 (234)	554.42 (236)			
LS	508.3 (87)	493.87 (55)			
NS	416.9 (78)	506.1 (99)			

Note. Results in line with asymmetries supporting facilitation on conventional expressions are filled in in gray. Standard deviations are provided in parentheses. SS = Short Stay NNSs; LS = Long Stay NNSs; NS = Native Speakers. CCE = Conventional frame, CE word; CSUB = Conventional frame, substitute; ACE = Alternate frame, CE word; ASUB = Alternate frame, substitute

Given that the variable Pair was found to be significant in the analysis of the aggregate data, the differences among individual pairs were examined using a repeated measures ANOVA with Group as the between-subjects factor. For each one of these tests, the main effect of Group was found to be significant, and for all analyses except one, post hoc paired comparisons revealed this asymmetry to be due to differences between the NNSs, on the one hand, and the NSs, on the other, with no significant differences between the two groups of nonnatives. The sole exception—pair 1—found the natives to be faster than the long stay NNSs who were in turn faster than the short stay NNSs. Thus, for all pairs except pair 1, the data from the two NNS groups were combined.

Of the 13 pairs, six did not show a significant asymmetry in the RTs on segments after CE words versus after substitutes. Such was the case for pairs 1, 2, 3, 6, 9, and 12. Moreover, the interaction between Group and Word for each of these pairs was nonsignificant, indicating that the three groups had performed in a similar manner. For the remaining seven pairs, a significant asymmetry due to faster RTs following the CE word was found. For six of these pairs (4, 5, 8, 10, 11, 13), the significant main effect of Word was not qualified by an interaction with Group, indicating an overall CCE<CSUB

asymmetry for each of the three groups. For pair 7 (*j'étais vraiment malade* vs. *j'étais vraiment souffrant*), however, the variables of Word and Group showed a significant interaction, $F(2, 57) = 4.137$, $p < .05$ (see Figure 10). Whereas the NNSs showed no significant difference between segments following CE words and substitutes, $t(39) = .395$, $p = .695$, the NSs were significantly faster after CE words, $t(19) = 5.472$, $p < .001$. Full statistical results can be found in Table G2.

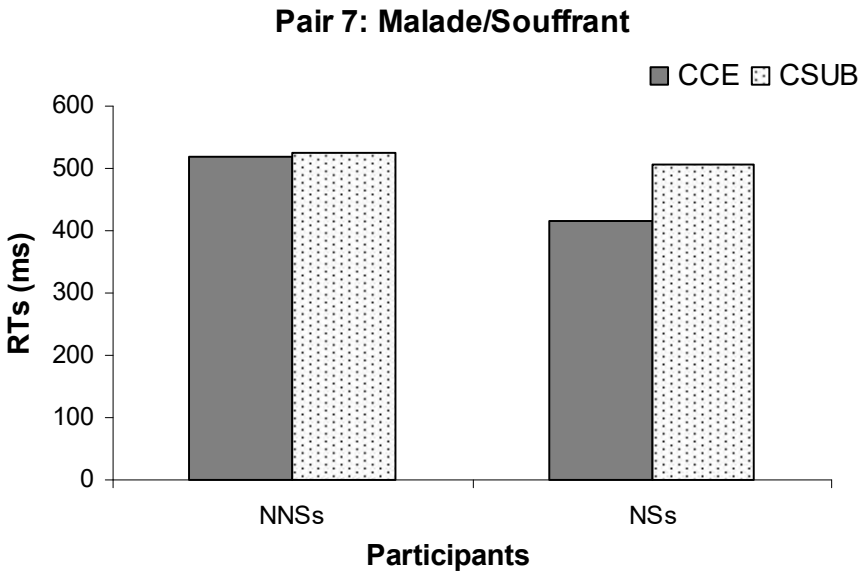

Figure 10. *RT Profiles for Pair 7*

Summary of Online Results

Results from this online contextualized naturalness judgment task found that all three groups of participants judged conventional expressions to be natural responses in the contexts that had originally evoked them, a judgment pattern that contrasted with the lower levels of acceptance found for the three other conditions. Examinations of the aggregate RTs on both the target and following segments provide evidence for significant processing asymmetries in favor of the conventional expressions, which were manifested

in several different types of patterns. On target segments, the natives responded to the CCE condition faster than to the ACE condition with crucially no significance difference found between CSUB and ASUB conditions. NNSs, on the other hand, showed inhibition on conventional frames including a substitute: CSUB>CCE and CSUB>ASUB. On following segments, all participants responded more quickly to a segment when it followed a CE word versus a substitute (CSUB>CCE). Analyses of the target and following segments of individual quadruples revealed a statistically significant processing asymmetry in approximately half of the quadruples tested. Both NSs and NNSs showed a significant asymmetry in seven of the quadruples on the target segment, the following segment, or both (quadruples 4, 5, 7, 8, 10, 11, and 13). In addition, the nonnative results on the target segment for quadruple 9 showed significantly faster RTs on the CCE versus CSUB item without a concomitant ACE<ASUB pattern, a finding that was accompanied by inhibition on the CSUB condition as compared to the ASUB condition. Finally, no significant asymmetries in the opposite direction (i.e., significantly slower RTs on the CCE condition) were found for the NSs, and only one such result was found for the nonnatives (quadruple 3). A summary of the results reported in this chapter is presented in Table 26. The implications of these different results with respect to both the form-function/context mappings associated with conventional expressions and the nature of the mental representation of such strings will be explored in the following chapter.

Table 26. *Summary of Results: Naturalness Judgments, RTs on the Target Segments, and RTs on the Following Segments*

Measure	NSs (n = 20)	NNSs (n = 40)
Naturalness Judgments		
CCE	80.4%	76.8%
CSUB	41.9%	43.5%
ACE	49.6%	62.5%
ASUB	56.9%	51.6%
Target Segment (Aggregate)	CCE < ACE	CCE, ASUB < CSUB ACE < ASUB
Quadruple 3		ACE, CSUB < CCE
Quadruple 8	ASUB < CSUB	CCE < ACE, CSUB
Quadruple 5		CCE < ACE, CSUB ACE < ASUB
Quadruples 7 & 9		CCE, ASUB < CSUB
Following Segment (Aggregate)	CCE < CSUB	CCE < CSUB
Quadruples 4, 5, 8, 10, 11, & 13	CCE < CSUB	CCE < CSUB
Quadruple 7	CCE < CSUB	

Note. CCE = Conventional frame, CE word; CSUB = Conventional frame, substitute; ACE = Alternate frame, CE word; ASUB = Alternate frame, substitute

CHAPTER 6

INVESTIGATING CONVENTIONAL EXPRESSIONS

Informed by Bardovi-Harlig's (2008, 2009, 2010; Bardovi-Harlig et al., 2008) examinations of conventional expressions, the current project set out to further explore a set of 13 such sequences with two new research questions. The online contextualized naturalness judgment task was designed to yield the relevant data. First, natives and nonnatives provided naturalness judgments for different context-response pairings, data that were analyzed in order to determine if the two groups distinguished conventional expressions from three other grammatical—but not conventional—matched conditions in context. Second, RTs recorded on the responses for both groups were analyzed in order to verify whether the processing of conventional expressions is facilitated with respect to two matched conditions. The results pertaining to these two questions will be discussed in this chapter, with the naturalness judgments interpreted with respect to nativelike selection and the RTs examined in the light of two processing hypotheses: lexical storage and pragmatic competence. Modifications and directions for future research will be addressed in Chapter 7.

Naturalness Judgments on Conventional Expressions

Conventional expressions constitute social contracts (Coulmas, 1981), and their use is associated with a particular communicative function and/or a certain social situation in a given linguistic community (Bardovi-Harlig, 2008, 2009, 2010). Thus, mastery of such expressions involves not only the mastery of their form, but also the mastery of the association between a form and its function(s) and between a form and the context(s) in which it is acceptable. Control over these different mappings is of particular

importance, given that such expressions are associated with many of the most common, everyday situations faced by a member or a potential member of a linguistic community. The mappings are not always transparent, complicating the task for outsiders, and rendering it particularly difficult for NNSs.

The current project set out to examine mappings of form to function and to context with respect to a set of 13 conventional expressions using an online contextualized naturalness judgment task. There were four conditions in this experiment—CE words in conventional frames (CCE), substitutes in conventional frames (CSUB), CE words in alternate frames (ACE), and substitutes in alternate frames (ASUB)—and all items were both grammatical and designed to constitute semantically felicitous responses to the context with which they were paired. The 13 CCE items differed from the CSUB, ACE, and ASUB items insofar as only these items had been identified as conventional expressions for NSs in the community of Pau, France, a difference that was confirmed by the fill-in-the-blank task (see results in Chapter 4). Thus, if conventionality translates into a greater impression of "naturalness," an asymmetry between naturalness judgments on the CCE condition versus those on the three grammatical but not conventional conditions should be found. Additionally, this task examined native and nonnative sensitivity to the form of conventional expressions. Specifically, conventional expressions (CCE items) and their modified counterparts (CSUB items) were paired as responses to the same contexts. In comparing judgments on these minimal pairs, higher acceptance rates on the CCE items would imply that participants are sensitive to *how* something is expressed in making their naturalness

judgments (i.e., pragmalinguistic and sociopragmatic knowledge), at least with respect to this set of 13 expressions.

Looking first for evidence of an overall sensitivity to conventional expression status, it was found that the natives and nonnatives judged the CCE items to be more acceptable than the other three conditions, indicating a sensitivity to the variable of conventionality for all participants. Specifically, sequences identified as conventional as operationalized in this project were accepted as natural at a rate of 78%, with the other three conditions receiving significantly lower average affirmative scores, ranging from 43% (CSUB) to 53% (ASUB) to 58% (ACE). With respect to the native data, the asymmetry between the CCE items and the other three conditions lends support to the construct of conventional expressions. Specifically, a set of 13 expressions identified as conventional for one group of NSs (n = 86) living in Pau, France was judged by a second group of NSs (n = 20) from that same community to be more natural than three matched conditions. This convergence suggests that such expressions were in fact conventional for the community of speakers, and not just for the minority that produced them.

Of the four conditions, the patterns of affirmative judgments recorded for the CCE versus the CSUB conditions are of particular interest, as they test for sensitivity to minimal changes in form in conventional expressions when all else—and, in particular, context—is kept constant. In this dataset, all three groups attributed the highest acceptance scores (78%) to the conventional expressions (CCE items), whereas the same sequences into which a substitute had been inserted (CSUB items) consistently received the lowest naturalness judgments (43%). The bar graphs presented in Chapter 5 showed that the CSUB version of the 13 CCE-CSUB pairs crucially never received more

affirmative responses than the CCE version; moreover, for each of the three groups, at least 10 of the 13 CCE items received naturalness judgments that were minimally 20% higher than those attributed to their matched CSUB items. Furthermore, histograms presenting the judgment pattern by participants revealed that 55 of the 60 respondents attributed more affirmative responses to the CCE items than to the CSUB items. This strong asymmetry in favor of CCE items highlights that participants—native and nonnative alike—were sensitive to form and not simply to the grammaticality and semantic content of responses in making their naturalness judgments, as the substitution of a near-synonym led to significantly lower acceptance rates when all else remained constant. For the NNSs, the fact that sequences that met the criteria for conventional expressions in the community in question were judged to be more natural than slightly modified sequences implies sensitivity to how a speech act is performed in context, an ability essential to nativelike selection (Pawley & Syder, 1983).

Although the aggregate data for each of the three groups show a clear asymmetry between judgments on CCE and CSUB items, acceptance rates on each of the13 individual CCE-CSUB pairs reveal a small number of items for which the two members were judged to be similarly acceptable. For example, on pair 4 (*c'est normal* vs. *c'est logique*) for the NSs and 12 (*ça m'est égal* vs. *c'est pareil*) for all three groups, the CCE version was always judged to be only slightly more natural (by 10-15%) than the CSUB version, and the acceptance rates showed that both versions were generally considered to be natural, with the CSUB versions receiving between 50% and 70% affirmative judgments. Thus, in these two cases, the difference between the conventional and modified versions was clearly less marked than that seen in the majority of pairs,

apparently because the modified version was also considered to be relatively natural (although less so than its CCE counterpart) in the context proposed.

A third example in which CCE and CSUB versions received similar judgments is more problematic, and calls into question a decision involving the operationalization of the invariability criterion (see Chapter 4). Specifically, the two versions of item 13 (*où en étions-nous?* vs. *où en étions-nous restés?*) were judged to be similarly acceptable by the NSs, and acceptance rates for both strings hovered around 50%. A similar result was recorded for the two other *wh*-questions included among the original set of 15 conventional expressions (item 14: *qu'est-ce qui s'est passé?*; item 15: *qu'est-ce que tu en penses?*). Although included in the online task, these two strings were ultimately excluded from subsequent analyses due to the results on the fill-in-the-blank task, which showed that the CE word was almost unanimously provided for both conventional and alternate frames (see Chapter 4 for results). Despite this clear preference for the CE word on the fill-in-the-blank task, judgments provided on the online task found that both the conventional expressions and modified versions for items 14 and 15 received affirmative judgments only at or around 50%. The fact that the three interrogatives patterned together in their judgment results—each being accepted as natural by only 50% of native respondents—suggests that the manner in which they were coded may need to be reconsidered. In this project, word order variation was accepted for interrogatives, such that all variant forms of a question—including in-situ, inversion, and *est-ce que*—were considered to belong to the same question string. When overall frequency was high enough for the interrogative to be labeled a conventional expression, it was the most frequent variant that was designated as the base form to be tested in the online

experiment. The less than enthusiastic responses for the base forms of such items suggest that analyzing several superficially different question strings as instantiations of a single conventional expression may not be appropriate in the identification of conventional expressions. This reservation applies only to word order variation in questions, as the items involving other forms of variation (items 5, 7, 8, and 11) did not receive similarly harsh judgments.

The final finding of interest with respect to the naturalness judgments concerns the judgment patterns for the three groups, which were found to not significantly differ. For the nonnatives, this result suggests apparently targetlike pragmalinguistic and sociopragmatic judgments with respect to these 13 conventional expressions, a finding that can be interpreted as providing additional evidence of NNSs' sensitivity to nativelike selection. Specifically, nonnatives seemed to dispose of "a means for knowing which of the well-formed sentences [were] nativelike—a way of distinguishing those usages that [were] normal or unmarked from those that [were] unnatural or highly marked" (Pawley & Syder, 1983, p. 194), insofar as their judgments were similar to those of the NSs themselves. This result of convergence of native and nonnative response patterns appears remarkable in the small literature that has examined conventional expressions using receptive tasks. If researchers such as Roever (2005, 2006) found that learners' were better able to complete a multiple choice routines task after as little as 3 months abroad, and Bardovi-Harlig (2010) found evidence of development in her learners' ability to judge their familiarity with conventional expressions as a function of proficiency, neither author reported convergence with NS response patterns.

Although the factors responsible for this convergence of NS and NNS response patterns cannot be definitively identified with the current dataset, several possibilities merit comment. We might imagine, for example, that increased competency with conventional expressions would come with greater amount of time spent abroad or with higher proficiency, both of which are mentioned by Bardovi-Harlig (2010). An important role for time abroad is particularly logical, as conventional expressions are defined with respect to use in a given community. Without having spent time abroad in the community in question, we would generally expect difficulty with linguistic conventions in use in that community. In the current experiment, the two groups of NNSs clearly differed with respect to time spent in Pau (with short stay NNSs having spent an average of only 4.5 months there and the long stay NNSs having spent an average of 10 years 6 months in the same region). However, the judgment patterns recorded for the two groups were not significantly different from each other or from those recorded for the NSs. If we assume that time abroad in Pau is (at least in part) responsible for participants' results on the current judgment task, this implies that any benefits were bestowed early in their stay, a hypothesis that can be tested by administering the same experiment to a group of participants at the beginning and at the end of their stay abroad.

As for proficiency, the participants' command of French was not controlled for in this project. However, all NNSs were presumably high proficiency users of this language (reporting an average of 9 years formal French instruction), which distinguishes the current participants from those recruited for Bardovi-Harlig (2009, 2010) and Roever (2005, 2006). The presumption of high proficiency is further supported by the situation of the French NNSs in their target language community. Specifically, the short stay NNSs

were currently either working at a French university or taking general classes (and not French language classes) at the same university, whereas the long stay NNSs were generally settled in France. If it is the nonnatives' high proficiency that is largely responsible for the convergence in NNS and NS patterns, other high proficiency users who have not spent time abroad should perform similarly to the current participants, whereas low proficiency learners studying French in Pau should show more difficulty. The potential importance of proficiency with respect to conventional expressions highlights the need for research into the relationship between grammatical competence and pragmatic competence (see Bardovi-Harlig, 1999, and citations therein). Of course, we may find that both high proficiency and time abroad are necessary to attain the type of results found here (see Bartning & Forsberg, 2008, and Forsberg, 2010, for a similar conclusion with respect to collocations).

To sum up, the results from the naturalness judgments showed that all three groups of participants were sensitive to form, judging conventional expressions to be more natural than the CSUB condition, even though the only difference was one near-synonym. The 13 conventional expressions were moreover judged to be significantly more natural than the two alternative frame conditions (ACE and ASUB). Finally, judgment patterns did not significantly differ by group. Although these results support *conventional expressions* as an element of pragmatic knowledge and provide evidence of NNSs on the path to nativelike selection, it is not clear from these results whether conventional expressions enjoy a specific mental representation. Such will be the focus of the remainder of this chapter.

Reaction Times on Conventional Expressions

Although in this project a line has been drawn between *conventional expressions* and *formulas*, numerous authors subsume the conventionality perspective to the psycholinguistic one, considering that all of formulaic language is first and foremost holistically stored (e.g., Barron, 2003; Nattinger & DeCarrico, 1992; Pawley & Syder, 1983; Wildner-Basset, 1994; Wood, 2002a). Claims about the mental representation of formulaic language have been only rarely put to the test using appropriate psycholinguistic means, and the veracity of such assumptions is often simply assumed (cf. Coklin & Schmitt, 2008; Ellis & Simpson-Vlach, 2009; Ellis et al., 2008; Jiang & Nekrasova, 2007; Nekrasova, 2009; Schmitt & Underwood, 2004; Siyanova & Schmitt, 2008; Underwood et al., 2004). Moreover, to my knowledge, no previous study has exclusively examined the processing of conventional expressions, be it among native or nonnative speakers. This state of affairs motivated the second research question in this project, which aimed to determine whether there was evidence of a mental correlate for a set of 13 conventional expressions using an online experiment.

In designing an experiment to explore whether conventional expressions are mentally represented as such, the widespread assumption that formulaic language is processed more quickly than nonformulaic language was taken as a starting point. Thus, the design included two different RT comparisons (manipulating the variables of Word and Frame) that were assumed would be sensitive to potentially facilitated processing on the conventional expressions. First, a word in each conventional expression was replaced with a matched synonym and RTs were compared on the CE words and their substitutes, as well as on the segment following each (research question 2a). Second, the CE words

from the conventional expression were inserted into alternate frames and RTs on the same lexical items were then compared (research question 2b). In both cases, if processing of conventional expressions is in fact facilitated, faster processing (and, thus, faster RTs) on the CCE condition should be visible.

In addition to facilitation, there is also the possibility of inhibitory patterns in these results. In particular, it was expected that RTs on the CSUB condition may show significant inhibition with respect to RTs on the same lexical item in an alternate frame (ASUB). This expectation is supported by the results from the fill-in-the-blank task (Chapter 4), which revealed that CE words were more appropriate than substitutes in the conventional frames, whereas alternate frames generally elicited a large number of potential lexical items, including both the CE word and the substitute in most cases. In other words, both the CE word and substitute were designed to be appropriate in alternate frames, whereas the substitute was expected to be dispreferred in the conventional frames, and this dispreference may translate into elevated RTs on CSUB items. Figure 11 presents a RT profile in which the expectations regarding both facilitation on the CCE condition and inhibition on the CSUB condition are represented.

Although these are the patterns that were expected in designing the online experiment, any significant interaction between Word and Frame was explored for insights it might provide into the processing of conventional expressions. In what follows, the results of the online experiment will be briefly described in terms of facilitation and inhibition, after which two hypotheses will be discussed in an attempt to explain the findings. This section will end with a discussion of the definitional questions raised by these results.

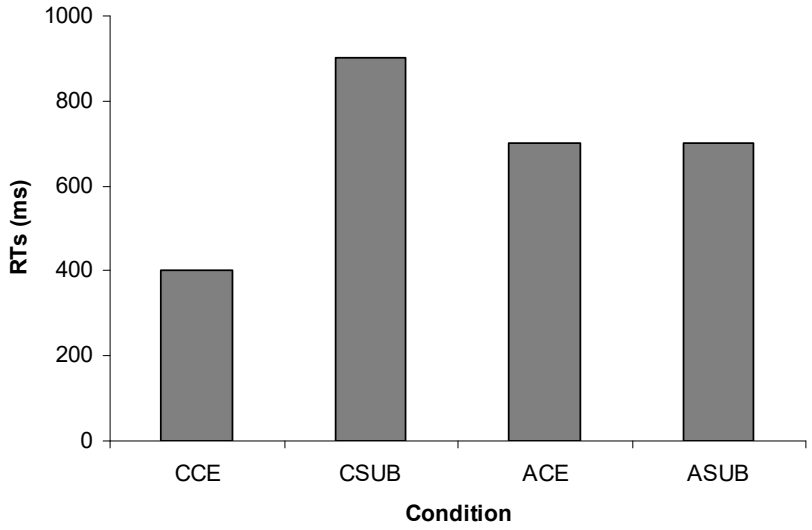

Figure 11. *RT Profile Consistent with Facilitation on CCE and Inhibition on CSUB for NSs and NNSs*.

Reflexes of Facilitation and Inhibition

Both facilitation and inhibition were revealed in the results, providing general evidence of a mental representation for conventional expressions, both in the native and in the nonnative data. Beginning with the target segments (CE words and substitutes), the NSs and NNSs both showed a significant interaction between the variables of Word and Frame, although these interactions reflected different response patterns. In the case of the NSs, aggregate analyses revealed a significant asymmetry between faster RTs on CE words in conventional frames (CCE condition) as compared to the same lexical items in alternate frames (ACE condition). Given that this pattern was accompanied by flat results on the substitutes (CSUB and ASUB), this asymmetry points to facilitation on the conventional expressions with respect to the comparison targeted in research question 2b. Thus, for the NSs, it appears that these 13 conventional frames did confer processing advantages on the target lexical items found within them. As for inhibition on CSUB

items, significantly elevated RTs on CSUB versus ASUB conditions were found only on Quadruple 8.

The aggregate results on the same segments for the NNSs, on the other hand, showed both a significant tendency to always respond to CE words more quickly than to substitutes (CCE<CSUB and ACE<ASUB), as well as no difference between CE words in conventional and alternate frames (CCE~ACE). Thus, although there was evidence of facilitation on CE words in general, no clear indication of facilitation on CCE items was found on target segments. However, these results are nuanced by the consistently elevated RTs on substitutes in conventional frames (CSUB). Specifically, the substitutes in a conventional frame were responded to more slowly than both the CE words in conventional frames (CCE<CSUB) and the substitutes in alternate frames (ASUB<CSUB), painting a picture of particular slowness in the CSUB condition. Although formulaic language is generally assumed to be associated with ease of processing, these results are most consistent with an *inhibition* associated with the substitutes in a conventional frame (CSUB), rather than a generalized *facilitation* on the CE words in the same frame (CCE).

RTs on the following segments for the CCE and CSUB conditions were also examined, and revealed similar results for the natives and nonnatives (group membership did not significantly interact with the variable of Word). Overall, RTs were significantly faster on a segment when it followed a CE word than when the same segment was found after a substitute. Analyses of the individual CCE-CSUB pairs confirmed this tendency for approximately half of the 13 items (pairs 4, 5, 8, 10, 11, and 13 for natives and nonnatives and pair 7 for natives only).

An asymmetry showing faster RTs on segments following CE words versus those following substitutes may be indicative of facilitation on the CCE condition, inhibition on the CSUB condition, or both. One way to determine whether this pattern is due to faster RTs in the CCE condition and/or slower RTs in the CSUB condition is to calculate residuals for all following segments. This process requires that a linear regression with RTs as the dependent variable and length in letters as the independent variable be run (the same process was adopted in the analysis presented in Chapter 5 for the target segments in order to control for length differences). The predicted values for each word length that are calculated from this procedure are then subtracted from the actual RTs recorded, yielding the residuals. Crucially, residuals that are negative are faster than predicted given the length of the word, whereas those that are positive are slower than predicted. Response profiles consistent with facilitation on the CCE condition (Figure 12a) and with inhibition on CSUB condition (Figure 12b) are provided.

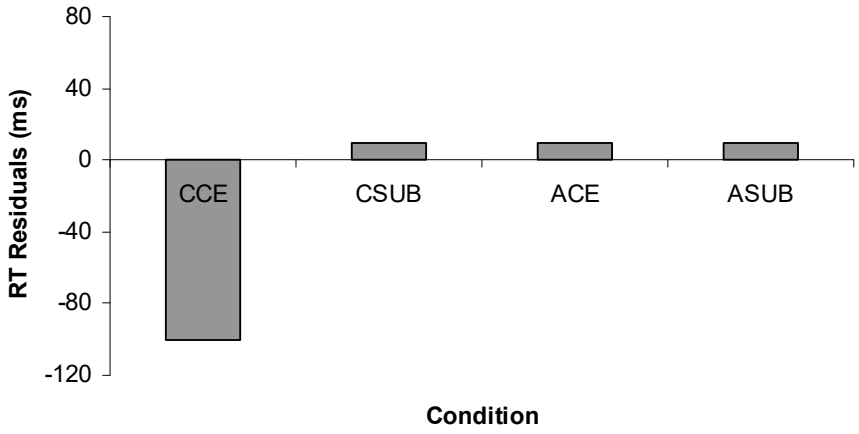

Figure 12a. *Response Profile Consistent with Facilitation on CCE on Following Segments*.

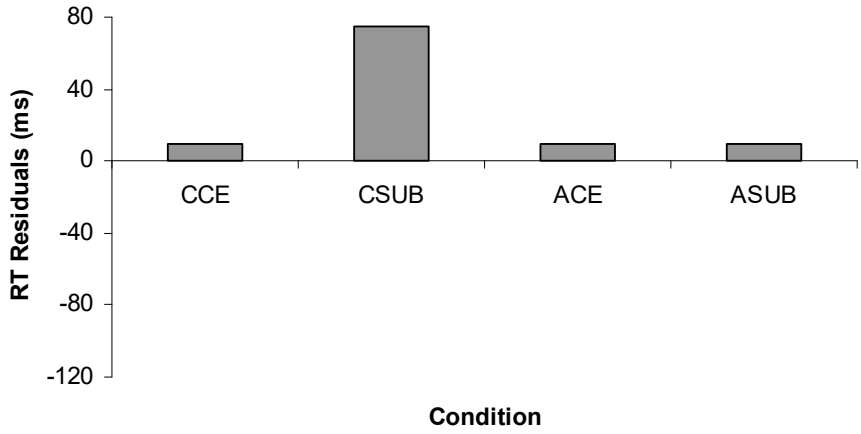

Figure 12b. *Response Profile Consistent with Inhibition on CSUB on Following Segments*.

Residuals were calculated for following segments on each of the four conditions, with a different regression being run for the natives and the nonnatives due to the finding that natives were consistently faster than the nonnatives, whereas the two nonnative groups were nondistinct. Results are presented in Figure 13.

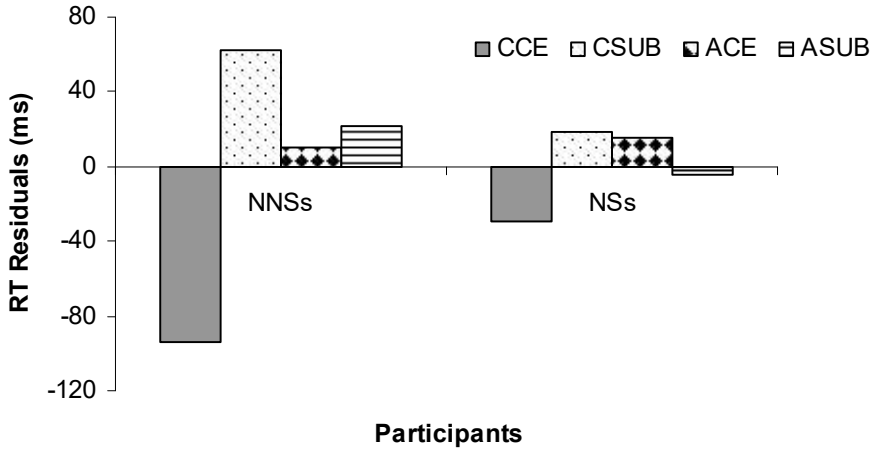

Figure 13. *RT Residuals for Following Segments*.

As can be seen in this figure, for both the NSs and the NNSs, RTs recorded on following segments in the CCE condition have negative residuals, indicating that responses were

faster than expected given the length of the words. Additionally, RTs on the CSUB condition appear to be slower than predicted, which is particularly true for the nonnatives. However, follow-up *t*-tests revealed that the only significant asymmetries for NSs were between CCE < CSUB, $t(259) = 2.571$, $p < .05$, and CCE < ACE, $t(259) = 2.124$, $p < .05$, whereas the only significant NNS asymmetries were between CCE < CSUB, $t(519) = 5.218$, $p < .001$, CCE < ACE, $t(519) = 3.853$, $p < .001$, and CCE < ASUB, $t(519) = 4.458$, $p < .001$. None of the other comparisons reached significance.

In other words, all significant asymmetries for both groups involve the clearly faster RTs in the CCE condition, a result that strongly suggests that the asymmetry in RTs on following segments was due to facilitation on the conventional expressions as opposed to inhibition on the matched substitute condition. When combined with the results on the target segments, natives show a generalized effect of facilitation on these 13 conventional expressions: NSs were found to be sensitive to the collocational content of conventional expressions (CCE < CSUB), and processing benefits were bestowed by a conventional frame for NSs (CCE < ACE). On the other hand, the nonnatives showed early inhibition on substitutes in conventional frames (CCE, ASUB < CSUB) with later facilitation on CE words (CCE < CSUB).[54]

[54] The examination of RT profiles on following segments in the CCE and CSUB conditions was predicated on the assumption that the presence of a substitute (when a CE word is anticipated) may disrupt the parse, and the effects of this disturbance may be seen in elevated RTs on the segment following the substitute. Moreover, because the majority of following segments (i.e., 10 of 13) were located outside of the conventional expression (meaning that the CE word/substitute was the last element of the expression), following segments were not expected to show facilitory effects from a preceding conventional expression. However, this is precisely what was found. The significant impact of the presence of formulaic language on the processing of following lexical items has not, to my knowledge, been previously reported, and raises numerous questions concerning the nature of the processing of boundaries between conventional and nonconventional language. For example, it is unclear whether this facilitory effect for following segments is restricted to conventional expressions or whether sequences such as idioms may have a similar effect on following linguistic material. Whether these results are indicative of what may prove to be a "running-start advantage" for segments following sequences for which processing advantages have been shown or whether contextual predictability plays an important role remains to be determined.

Nature of the Mental Correlate for Natives and Nonnatives: Two Hypotheses

The processing evidence indicates that although native and nonnative online patterns were distinct, both groups processed conventional expressions differently from matched conditions. In this section, two general hypotheses concerning the nature of the mental representation associated with conventional expressions for the two groups will be considered in light of the current data. The first hypothesis corresponds to what might be considered the traditional view with regards to the mental representation of formulaic language, and examines whether the current data support a holistic representation analysis in which such strings would be stored in the lexicon as a complex lexical unit. The second hypothesis takes a more pragmatically oriented stance to the representation and processing of conventional expressions, and considers whether these results may be better explained with reference to a speaker's pragmatic competence.

Lexicalist hypothesis. The traditional lexicalist hypothesis concerning the mental representation of formulaic language finds its roots in the research into idioms. As a result of their characteristic noncompositionality and opacity, idiomatic expressions have been argued to be stored as such in the mental lexicon. A similar argument has been put forward for acquisitional formulas, whose syntactic complexity is generally beyond that which the L1 or L2 learner is presumably capable of. Thus, in the case of both idioms and acquisitional formulas, the speaker is argued to be unable to assemble such sequences, which justifies their placement in the mental lexicon (see discussion in Chapter 3). This lexical storage explanation was later extended to formulaic language more generally, even in the absence of characteristics which would lead us to believe that lexical storage was necessary (noncompositionality, opacity, or greater complexity):

(20) A psycholinguistic theory about the processes that underly [*sic*] the production of MLIs [multi-word lexical items] must always also be a theory about the structures of the so-called *mental lexicon*. (Kuiper et al., 2007)

> […] most lexical phrases are used so automatically that they are quite beyond conscious retrieval. (Nattinger & DeCarrico, 1992, p. 175)
>
> It may also be worth emphasizing that, while formulaic sequences are stored holistically, this does not mean that they are non-compositional or non-analysable. (Boers et al., 2006, p. 246)
>
> […] prefabs can be assumed to constitute single multi-word retrievals from our mental store of words […] (Erman & Warren, 2000, p. 48).

Thus, the traditional view considers a formulaic sequence (which includes conventional expressions for some authors) to be stored as what amounts to a complex lexical unit in the lexicon. This holistic lexical storage is widely assumed to offer "processing benefits to speakers and hearers, by providing a short cut to production and comprehension" (Wray, 1999, p. 213). The benefits most frequently cited include faster processing, more time for discourse planning, and greater fluency:

(21) We rely on such chunks to ease processing problems, using them to 'buy' processing time while other computation proceeds, enabling us to plan ahead for the content of what we are going to say, as well as the linguistic form. (Skehan, 1998, p. 40)

> In the store of familiar collocations there are expressions for a wide range of familiar concepts and speech acts, and the speaker is able to retrieve these as wholes or as automatic chains from the long term memory; by doing this he minimizes the amount of clause-internal encoding work to be done and frees himself to attend to other tasks in talk-exchange, including the planning of larger units of discourse. (Pawley & Syder, 1983, p. 192).
>
> A great proportion of the most familiar concepts and speech acts can be expressed formulaically, and if a speaker can pull these readily from memory as wholes, fluency is enhanced. (Wood, 2002a, p. 7)

As a result of these associations, evidence of faster processing, more time for discourse planning, and greater fluency have come to be interpreted as proof of holistic lexical

representation. Of these three different possible types of evidence, the current experiment can only speak to faster processing on the 13 conventional expressions examined. As highlighted in the previous subsection, evidence of facilitation on conventional expressions was found for both the natives and nonnatives, albeit with superficially different patterns.[55] Despite the fact that my finding of facilitation appears initially consistent with a lexical storage account of the 13 conventional expressions, in what remains of this section, I will raise several objections, first to a holistic lexical account of formulaic language more generally, and then to a lexical account of conventional expressions more specifically.

The extension of the lexical storage hypothesis beyond what is properly *idiomatic* or *acquisitional* to encompass all that is considered to be *formulaic* is problematic for at least two reasons. First, the evidence advanced in support of the lexical storage hypothesis for sequences that are not idiomatic or acquisitional is most often doubly indirect (although it is seldom recognized as such). As mentioned in this section and discussed in Chapters 1 and 3, proof of a holistic lexical representation is based on the assumption that lexical storage results in (a) faster processing, (b) more time for discourse planning, and (c) greater fluency. Evidence of any of these three characteristics is taken as proof of the holistic lexical storage of the string in question, as illustrated in (22) with respect to faster processing:

[55] In a series of studies that examined L2 processing, Dekydtspotter (2009; Dekydtspotter, Donaldson, Edmonds, Liljestrand, & Petrush, 2008; Dekydtspotter & Lorente Lapole, 2008; Dekydtspotter & Miller, in press; Dekydtspotter, Miller, Schaefer, Chang, & Kim, in press; Dekydtspotter et al., 2006) has argued that direct comparisons between native and nonnative time courses must be interpreted with caution, as differences in global processing speed (due at least in part to slower lexical access and retrieval on the parts on NNSs; Favreau & Segalowitz, 1983) combined with the elevated possibility of processing break-downs mean that similar processes may be manifested in dissimilar surface patterns.

(22) The second goal of the present study predicted that the students would show significantly faster response latencies on idioms compared to the matched controls. Our results robustly upheld this prediction, thus, providing developmental data that idioms are stored in the mental lexicon as words. (Qualls et al., 2003, p. 255)

> We now have evidence that the terminal words in formulaic sequences are processed more quickly than the same words when in nonformulaic contexts. This provides evidence for the position that formulaic sequences are stored and processed holistically. (Underwood et al., 2004, p. 167)

> In both experiments, the NSs and the NNSs of English responded to formulaic expressions significantly faster than they did to nonformulaic expressions. They also made fewer errors on formulas. (p. 441) Our findings provide clear and straightforward support for a holistic view of formula representation and processing. (Jiang & Nekrasova, 2007, p. 442)

Thus, these authors (and many others) equate faster processing with holistic lexical storage and, as a result, would presumably interpret the findings from the current project in the same vein. This trend, however, is problematic because evidence of a characteristic *presumably* associated with holistic storage is treated as an unequivocal indication of storage as a whole unit. This misses the fact that even if faster RTs are consistent with a holistic lexical storage account, there is not an exclusive relationship between facilitation and holistic storage.

In addition, it is important to highlight that the adoption of the holistic lexical storage account for conventional expressions essentially constitutes a claim concerning the primacy of the lexicon over grammar in linguistic processing. As put by Bolinger, "speakers do at least as much remembering as they do putting together" (1976, p. 2). Although the estimations concerning the prevalence of formulaic language vary widely, many argue that the phenomenon is widespread. Erman and Warren (2000) state that around 60% of language consists of prefabs, whereas Altenberg (1998) says that 80% of language is made up of recurrent word strings. Finally, Pawley and Syder claim that "the

stock of lexicalized sentence stems known to the ordinary mature speaker of English amounts to hundreds of thousands" (p. 192). Thus, the expansion of the mental lexicon through the addition of multi-word lexical units (including conventional expressions) would be very important indeed. However, the feasibility of efficient processing in such a lexicon-dependent model continues to be debated (see, for example, the 2002 *Studies in Second Language Acquisition* special issue on Frequency effects in language processing, edited by Nick Ellis).

Finally, a lexical storage account of conventional expressions encounters problems specific to these types of strings. Recall that conventional expressions—as opposed to idioms or collocations—are defined as situationally bound, meaning that their use is associated with a specific context or social situation (Bardovi-Harlig, 2009, 2010; Kecskes, 2000). In other words, conventional expressions are presumably triggered only in those situations which "bind" them. In interpreting the documented facilitation on conventional expressions as evidence of holistic storage, the presumed association between these strings and the situations that condition their use is left unexplained. In order to maintain a wholly lexical account of the current results, I would be forced to claim that conventional expressions are stored with their triggering contexts, a proposal that requires considerable expansion of the role of the lexicon in grammatical theory. This issue will be explored in more detail in my discussion of a pragmatic competence hypothesis.

Pragmatic competence hypothesis. Although the traditional lexicalist hypothesis dominates the literature on formulaic language, other explanations are plausible. With respect to conventional expressions in particular there is at least one other hypothesis that

should be considered in explaining my results. Contrary to idiomatic expressions or collocations, which preserve their idiomatic or collocational properties independent of context of use, conventional expressions can only be identified in context (i.e., they are situationally bound). Thus, De Cock (1998) discusses the fact that a superficially identical string may in some contexts act as a conventional expression (*well, **you see**, I knew this guy*), whereas in other contexts it does not (*do **you see** the dog?*).[56] If the results from my project are any indication of the processing of conventional expressions more generally, we would expect processing to be facilitated on the first example of *you see* but not on the second. Applying the logic of the traditional lexicalist hypothesis, such evidence would lead to the assumption that this sequence is stored as such in the mental lexicon. However, under such a proposal it is unclear how the processor would distinguish between the complex lexical unit *you see* and the generated sequence *you see*. In particular, the processing benefits argued to be associated with lexical storage would seem to encourage the use of the holistically stored string whenever possible. And yet if we accept that the asymmetries detected reflect a representational difference between conventional and nonconventional expressions, the processor must be able to distinguish between examples such as *well, **you see**, I knew this guy* and *do **you see** the dog?* despite their identical appearance.[57] Thus, conventional expressions do not appear to be easily amenable to a straightforward holistic lexical storage account.

[56] Although she uses the term *formula*, using the definitions presented in Chapters 1-3, her example would appear to constitute a *conventional expression*.

[57] Although several researchers have mentioned the possibility of doublets, whereby the same string may exist as a lexical unit but may also be generated (see the above quote from Boers et al., 2006, or discussion in Peters, 1983), these authors would presumably agree that only the *you see* of *well, you see, I knew this guy* should be eligible for both types of processing; the second example must always be assembled. Thus, a difference between the two examples must be maintained.

The source of this difficulty would appear to lie with the pragmatically determined nature of conventional expressions. In other words, under the traditional lexicalist hypothesis, the specificity of conventional expressions in the greater formulaic landscape is ignored. Although the frequency of co-occurrence of the different lexical items that make up conventional expressions may contribute to their speeded access, the contribution of context is presumably essential in the faster processing of such strings. This is particularly clear in De Cock's (1998) example. Greater hypothetical rapidity on *you see* in *well, **you see**, I knew this guy* as opposed to in *do **you see** the dog?* must ultimately be traced back to the context in which the first example occurs (in these two examples, "context" corresponds to the utterances as a whole). In other words, the context sets up the expectation for the conventional expression, making its processing faster than on the same sequence in a different (non-triggering) context. This is in clear opposition to what has been found in the idiom literature: Even in literal interpretation biasing contexts, the figurative interpretation of idiomatic strings are primed (see Colombo, 1993; Peterson et al., 2001), a result that is expected for sequences that are lexically stored.

If the traditional lexicalist hypothesis is not capable of accounting for the situationally bound nature of conventional expressions, such expressions are nonetheless somehow recognized as ensembles, at least in certain contexts. How then might we conceive of this relationship between conventional expressions and the contexts in which they are used? One logical proposal to account for this state of affairs would be to suggest that the results found in the current project are more indicative of the architecture of pragmatic competence than that of the mental lexicon. Our pragmatic competence

presumably allows us to recognize, interpret, and encode different illocutionary (or speech) acts. It seems logical that this competence may go even further, housing associations between an expression and an illocutionary act. Thus, if a situation sets up an expectation for an apology, a request, or a refusal, the (conventional) expressions associated with these speech acts would be activated. Validation of responses containing such expressions would be facilitated (the CCE condition in the current experiment), whereas departures from the expected expressions may result in inhibitions in processing (the CSUB condition).

Traditional lexicalist versus pragmatic competence hypothesis. In sum, the tendency to extend conclusions drawn from the idiom literature to the vast expanse of what is considered formulaic language is not without consequences. Specifically, this trend (which is based on doubly indirect evidence) has led to the expansion of the lexicon, and the blurring of the distinction between the lexicon and grammar. This line of questioning is not problematic in and of itself; what is worrisome, however, is that holistic lexical representation proposals are often put forward without explicit consideration of their impact on models of linguistic processing. Whereas there is evidence that idioms and acquisitional formulas are lexical phenomena, attempts to extend the traditional lexicalist hypothesis to conventional expressions encounters many difficulties precisely because of its exclusive reliance on the lexicon. In a traditional lexicalist account, the situational boundedness of conventional expressions does not have a natural place, a clear problem for any discussion of conventional expressions as formulas. Instead, I have suggested that conventionality may be better accommodated in a pragmatic component of language processing, whereby conventional means for

expressing certain illocutionary acts are directly matched with those speech acts. Contexts would minimally set up expectations for speech acts, which would in turn trigger expectations for the use of certain conventional expressions. Of course, the model must be more complicated than here described, as languages may have multiple conventional ways of expressing a speech act, expressions that are not entirely interchangeable and that may be sensitive to variables such as social distance, power, gender, and a host of sociolinguistic variables. These are nonetheless factors that are clearly germane to pragmatic decisions and pragmatic processing.

Maintaining the Distinction between Conventional Expressions and Formulas

The confirmation of a distinct mental representation for conventional expressions has numerous implications for future research. However, the impact of this finding on the definitional issues so familiar to this literature bears mention in the context of the current discussion, which has divided results along the lines of their affiliation with conventionality or psycholinguistic approaches to formulaic language. Following Bardovi-Harlig (2009), the definition proposed for *conventional expressions* in Chapter 1 makes no mention of a psycholinguistic dimension to such strings, in opposition to *formulas*, which were defined as strings stored and retrieved whole. The processing results discussed here might be taken to weaken the proposed separation between conventionality and psycholinguistic approaches, between conventional expressions and formulas.

This would be an error on at least two grounds. First, the proposed separation is a conceptual one, and does not depend solely on the difference in presumed mental representation of the objects under study. Whereas formulas were defined with respect to

assumptions about mental representation, conventional expressions were characterized as sequences that fulfill a functional role in a certain social situation. Thus, even if both types of strings are shown to be processed more quickly than matched conditions, the functional aspect of conventional expressions will continue to set them apart from formulas more generally. Second, on the basis of the current evidence, it is not clear that the mental representation for conventional expressions is the same as that attributed to formulas (if, indeed, such a notion receives independent psycholinguistic validation). In the preceding subsection, I took the position that the traditional hypothesis with respect to formulaic language is inadequate for conventional expressions, and that the significantly faster RTs associated with my small set of expressions may be more logically attributed to pragmatic competence. Thus, it may very well prove to be the case that conventional expressions and formulas are differently psycholinguistically valid.

Two Basic Conclusions

Overall, the results from this project give rise to two basic conclusions. First, evidence of NSs' and NNSs' sensitivity to conventionality and, more specifically, to the form of conventional expressions, was found. Second, analyses of the RTs revealed significant asymmetries indicating a mental correlate for conventional expressions in both native and nonnative processing. Two hypotheses were considered in an attempt to explain this second finding: the traditional holistic storage hypothesis and the proposed pragmatic competence hypothesis. Given the situationally bound nature of conventional expressions, a strict lexical account (such as the traditional hypothesis) was argued to be inappropriate. Instead, it seems more likely that conventional expressions as units belong

to pragmatic competence, where they are minimally matched with the speech acts that they realize.

CHAPTER 7

CONCLUDING REMARKS

The spectrum of formulaic language covers a vast array of sequences, which different authors have divided up according to a variety of semantic, syntactic, functional, pragmatic, and other criteria. In Chapter 1, I built on several past proposals for the dividing up of formulaic language in order to make the case for a basic division between conventionality approaches to formulaic sequences and those that are psycholinguistic in nature. Whereas conventionality approaches are functionally grounded and are interested in the pragmatic value of *conventional expressions*, psycholinguistic perspectives are concerned with the mental representation of *formulas* and, in particular, with the ease with which they are processed. However, for many, the psycholinguistic perspective has primacy, and such authors consider that what first and foremost distinguishes formulaic sequences (including formulas and conventional expressions) from nonformulaic language is a holistic lexical representation.

The current project set out to examine conventional expressions and used a task designed to test claims from both the conventionality and psycholinguistic perspectives. The first research question targeted native and nonnative speakers' ability to distinguish between conventional and modified expressions in context in order to examine mappings of form to function/context. Results showed that (long and short stay) NNSs and natives living in Pau, France accepted sequences identified as conventional expressions for that same community as natural at high levels, crucially distinguishing between the conventional expressions and a minimally modified expression as responses to the same contexts. These results demonstrate the participants' sensitivity to form in making their

naturalness judgments, which was interpreted as an indication of development towards nativelike selection. The second research question focused on the processing of conventional expressions, in an attempt to determine whether NSs and NNSs of French showed significantly faster RTs on such sequences. The RT results showed general facilitation on the conventional expressions in native processing, whereas the NNS patterns revealed both inhibition on the CSUB condition (target segments) and facilitation on the following segments in the CCE condition. Taken together, these results support the notion that there is a mental correlate to conventional expressions for native and nonnative speakers alike. However, I argued that the traditional holistic lexical processing model fails to convincingly account for these patterns, a failure that is due in large part to its inability to accommodate the situational boundedness of such strings. For this reason, I suggested that a pragmatic competence model, in which conventional expressions are associated with illocutionary acts, is better able to explain these results.

The design developed for this project distinguishes it from its predecessors in several regards. First of all, a combination of methodologies specific to the conventional and psycholinguistic approaches was used in the examination of the same set of sequences. This approach was important because many researchers assume that conventional expressions are holistically stored. Second, whereas most previous studies have made claims concerning mental representation on the basis of production data alone, this project belongs to a growing literature that attempts to use psycholinguistic means to evaluate claims of facilitated processing for different parts of the formulaic language spectrum (e.g., Coklin & Schmitt, 2008; Ellis & Simpson-Vlach, 2009; Ellis et al., 2008; Jiang & Nekrasova, 2007; Nekrasova, 2009; Schmitt & Underwood, 2004; Siyanova &

Schmitt, 2008; Underwood et al., 2004). Finally, the procedure used to identify the sequences of interest was different from that employed in most previous projects. Whereas much of published research relies on experimenter intuition, dictionaries, or corpora to identify formulaic sequences, this project used a production task administered to speakers living in the targeted community in order to pinpoint conventional expressions, a strategy that provides a reasonable guarantee that the expressions used in this project have currency in the community under investigation in the contexts defined. Despite these attempts at addressing some of the methodological issues of this literature, there remain a number of potential modifications, improvements, and extensions that may be profitably put into place in future research. The remainder of this chapter will be dedicated to outlining a number of these future directions for research, with respect to conventional expression identification, the naturalness judgments, the processing of conventional expressions, and the different populations tested.

Conventional Expression Identification

For this project, I employed a written DCT in order to identify sequences that were potential conventional expressions for NSs living in and around Pau, France. Although this task allowed for the careful control of context as well as the administration to a large number of participants, the impact of several design decisions (involving the contexts, the task's administration, and the analysis of the responses) should be the subject of research in the future. Considering first the contexts, I departed from classic DCTs insofar as I chose to attempt to elicit certain expressions, as opposed to certain speech acts. This decision, which was justified by the desire to elicit strings with a particular structure to be tested in the online experiment, meant that some of the contexts

did not describe situations that were particularly common. Although the use of less frequent contexts does not undermine the identification of conventional expressions (which have the potential to be associated with any context), I intend in the future to shift my focus to those contexts frequent in everyday interactions, both because consensus concerning the expressions to be used may be stronger in such situations, and because such expressions would be of particular interest pedagogically. Moreover, it should be mentioned that a small number of the 35 original contexts (but none of those used in the online experiment) led participants to realize multiple speech acts. Whether this was due to the attempt to target specific expressions as opposed to specific speech acts is unclear, but could be explored in future studies.

In addition to issues surrounding the design of the contexts, the impact of the adoption of a multiple-response format needs to be examined. In this project, I asked participants to serially list up to four responses for each context. This design decision was justified by the desire to identify as exhaustively as possible the expressions typically used in the context described. However, when participants provide multiple responses (which was only the case in between 25% and 33% of all responses in the current project), it is difficult to determine which string is considered the most natural by the respondent. One obvious hypothesis is that the first responses provided are those that first came to mind, and it would be interesting to examine the patterns found only in the first responses in order to compare them to the overall results reported here. However, a comparative study using both a multiple response and a single response DCT would be able to provide the most definitive answer as to their comparability.

Additionally, the modality of administration of the DCT deserves mention. Given that the current DCT asked participants to imagine what they would *say* in a given situation, it may have been more appropriate to administer the task aurally instead of in writing, following recommendations by Bardovi-Harlig (2009, 2010). This proposal may moverover be of particular relevance for French, as it is generally acknowledged that the spoken and written language can differ widely, leading some authors to go so far as to argue that spoken French and written French are on the brink of developing into separate languages (Joseph, 1988). Thus, it will be interesting to see if differences in presentation modality for the DCT make a difference in the set of expressions identified as conventional. Along the same lines, we might question the validity of identifying conventional expressions using what is arguably an artificial production task, irrespective of whether the items are presented aurally or in writing. The DCT methodology was argued to be appropriate for the current project due to its presumed sensitivity to "prototypes" (Blum-Kulka et al., 1989, p. 13) and "pragmatic norms" (Kasper & Rose, 2002, p. 96). Nonetheless, it would be interesting to compare the current results with findings from fieldwork, following the model of Wolfson and Manes (Manes & Wolfson, 1981; Wolfson, 1981a, 1981b) for compliments, in order to identify both conventional expressions as well as contexts that tend to trigger them.

In addition to various issues regarding the design and administration of the DCT, certain aspects concerning the way in which these data were analyzed to identify conventional expressions need to be reconsidered in future projects. In particular, as discussed in the previous chapter, the decision to group together superficially distinct question forms into a single conventional expression proved to be problematic, as only

half of NSs judged such strings to be natural. The question of what constitutes the "same" expression is far from being resolved, and the results from this project indicate that researchers would do well to adopt strict criteria. In addition, the frequency criterion used in this project sets it apart from most other studies: Only data for semantic formulas realized by at least one fourth of the respondents were considered, and any expression used by at least half of those respondents who performed a given semantic formula was considered to be conventional. The purpose of this operationalization was to divide expressions according to the function realized, such that only strings competing to perform the same function would be compared. However, this attempt at operationalizing relative frequency meant that the overall frequency of certain strings among responses to a given context was rather low: At the low end, a semantic formula realized by only one fourth of participants (n = 22) and expressed using a single string by half of those participants meant that an expression could be identified as conventional when used by only 11 of the 86 total respondents (13% of all participants).[58] Although, following Wray (2002), I continue to believe that "frequency" in studies into formulaic language needs to refer to pertinent comparisons of relative frequency as opposed to absolute frequency counts, after having completed this project I question whether my operationalization of relative frequency was ultimately strict enough. In the current project, sequences used to realize semantic formulas performed by at least 25% of respondents were examined; this cut-off was adopted because the contexts that made up my DCT tended to elicit a variety of semantic formulas, a result that is in all likelihood linked to the type of contexts

[58] This can be compared to Bardovi-Harlig (2009, 2010), who identified as conventional expressions only those strings produced by 50% of all NSs who completed her DCT. However, it is interesting to note that in subsequent testing of the conventional expressions identified using this procedure, only about 2/3 of the original strings were produced at over 50% by subsequent NS populations.

employed (see critique at the beginning of this subsection). However, it may be the case that only semantic formulas that are more frequent (realized by 50% or even 75% of respondents in a given context) should be considered in conventional expression identification. Although projects that provide several analyses of the same data using different frequency cut-offs would offer insight into the actual effects of such decisions, I believe that the most important step toward an agreement on how frequent an expression must be in order to be considered conventional will be the transparent reporting of how frequency is operationalized by different authors. Thus, as was the case when I began this project, the question of what constitutes "frequent" for such expressions remains an open one.

Naturalness Judgments

The sequences identified as conventional expressions using the DCT data were then used to design the online contextualized naturalness judgment task. With respect to the judgment data collected using this task, one suggestion for additional research is particularly pertinent. Specifically, the potential effect of time pressure on the naturalness judgments should be explored. It is unclear to what extent the time pressure inherent in an online measure such as the one used in this project may have impacted the participants' judgments. Thus, in order to provide a point of comparison, it will be important to administer this same judgment activity as an offline task to speakers living in the same community.

Processing of Conventional Expressions

The final aspect of this project attempted to examine the processing of conventional expressions, and the results from the online experiment revealed that these

sequences are mentally represented as such, both for the native and for the nonnative speakers. The priority for future research will be the replication of this finding. In the current experiment, only 13 conventional expressions of the 31 identified were tested, and thus it will be important to verify the current results with other such strings.[59] Additionally, the 2×2 design of this project may be profitably extended to the investigation of other types of strings housed under the umbrella term of *formulaic sequences*. Specifically, the set-up of this experiment allowed for two different reaction time comparisons to be carried out, manipulating Word and Frame for each conventional expression, thanks to which patterns of both facilitation and inhibition were revealed. To my knowledge, no other project has used this 2×2 design, which may explain why studies such as Schmitt and Underwood (2004), in which only Frame was manipulated, reported null results for learners.

Future research with respect to the processing of conventional expressions could also follow the recent example of Ellis and Simpson-Vlach (Ellis et al., 2008; Ellis & Simpson-Vlach, 2009). Using corpus-derived metrics of frequency and mutual information scores (see explanation in Chapter 3), the authors have found that frequency best predicts nonnatives' RTs to formulaic sequences in academic discourse, whereas mutual information scores are the greatest predictors of natives' RTs to the same sequences. This research holds much promise, not only for questions concerning the mental representation associated with such expressions, but also with respect to what characteristics are most strongly associated with these expressions. Specifically, research

[59] I chose to restrict my project to this small number for two reasons: (a) most conventional expressions did not meet the design criteria for Word and Frame manipulation and were thus ineligible for inclusion in the online experiment and (b) using the 2×2 design, one conventional expression gave rise to 4 experimental items, meaning that an experiment involving more conventional expressions would have been prohibitively long.

examining how successfully other traits—such as invariability and frequency of use in a community—predict RT asymmetries would be important sources of information concerning what characteristics may constitute the most effective identification criteria for such expressions.

In addition to using processing experiments to test the validity of identification criteria, future psycholinguistic research should examine a variety of processing moments within conventional expressions. As RTs were recorded on the final lexical items in 10 of the 13 conventional expressions tested in the current project, my overall patterns of facilitation or inhibition are most indicative of processing at the end of such an expression. Thus, it is currently unclear whether similar results would be found if measurements were to be taken on medial or initial elements, meaning that it is unclear whether facilitation and inhibition obtain at earlier points in the processing of such sequences. Conducting experiments in which the RT measurement position is controlled would help to determine whether the results found here are associated with the entire expression or only with a single position within that expression. Moreover, research in the idiom literature has shown that certain idiomatic expressions are recognized only after a certain point, called the "key" (Cacciari & Tabossi, 1988). Although it appears that idioms have lexical status whereas conventional expression processing may be better explained with reference to pragmatic competence, exploring whether such keys exist in conventional expressions (and, if so, determining their location) could provide important insight into their real time processing, as well as into the similarities or differences between the processing of these two types of formulaic sequences.

Finally, empirical research will be necessary to help detail the pragmatic competence hypothesis for the processing of conventional expressions, sketched out in the previous chapter. Crucially, I described a notion of pragmatic competence which would minimally house associations between illocutionary acts and conventional expressions. First and foremost, this broad characterization raises questions concerning how a speaker determines which illocutionary act is necessary in a given context. In addition, there are several testable expectations that can be derived from this proposal, of which I will mention two. First, as discussed in Chapter 6, the proposed association is undoubtedly more complex than a simple illocutionary act-conventional expression match, with different social and contextual variables certainly influencing any such association. Thus, after having identified a context that elicits a certain speech act (e.g., apology), it will be important to examine what strings are judged to be acceptable realizations of that speech act (*désolé, toutes mes excuses, je suis confus*, etc.) as well as how such strings are processed in the context in question. The resultant patterns may reveal a hierarchy of acceptability for different expressions that realize the same speech act in a given context. Such information would help to provide a description of the contextual restrictions on the expressions examined, a description that would be based on both judgment patterns and psycholinguistic evidence. Finally, this proposal predicts that a conventional expression has the potential to be conventional in some contexts but not in others (unlike idioms, which are presumably stored in the lexicon). In other words, the processing of a conventional expression will not be facilitated if it is not associated with the illocutionary act called for by the context (explored in this project through the

manipulation of Frame). Thus, additional experiments that compare RTs on the same expression in multiple contexts will be important in verifying this proposal.

Learners, Nonnative Speakers, and Native Speakers

The final direction for future research that will be mentioned concerns the general absence of differences between the three groups of participants. First, the two NNS groups performed in nondistinct ways with respect to both the naturalness judgments and the RTs. Moreover, when compared to the NSs, the nonnatives were not significantly different in terms of naturalness judgments, and the results from the quadruple by quadruple analysis of the RT data revealed that the NSs and NNSs showed asymmetries on the same conventional expressions (with quadruple 9 being the sole exception). This convergence is particularly striking given that the short stay NNSs' average stay in Pau was only 4.5 months, whereas the long stay NNSs had spent on average 10 years 6 months in the Pau area. Although the impact of context of learning was not examined in this project, previous research has suggested that even relatively short periods abroad can contribute to improvements in pragmatic competence (Bardovi-Harlig & Dörnyei, 1998; Barron, 2003; Matsumura, 2001, 2003; Roever, 2005; Schauer, 2007; cf. Taguchi, 2008). Future research into the role played by context of learning with respect to conventional expressions would need to address several issues. First, as mentioned in Chapter 6, the relationship between linguistic competence and the ability to appropriately use and understand conventional expressions has not been explored in this study. Unless proficiency is controlled for, the contribution of time abroad and general linguistic knowledge may be impossible to tease apart. And, second, the current project did not include a baseline group for comparison. In other words, in order to assess the impact of

context of learning, a group of learners who had not yet spent time abroad would need to be tested using the same measures.

Conclusion

The motivation for this project grew out of an interest in how NNSs come to recognize the well-worn ways of saying something in their L2 coupled with skepticism with respect to the wide-spread assumption that all of formulaic language is, by definition, holistically stored. The contextualized naturalness judgment task was designed to examine both of these aspects. First, the analysis of naturalness judgments revealed that native and nonnative speakers were sensitive to form in judging conventional (versus modified) expressions. And, second, the RTs collected showed clear evidence that conventional expressions are mentally represented as such in both native and nonnative processing, although the absolute patterns were different for these two groups. The RT results were considered in light of the traditional holistic storage hypothesis and a pragmatic competence hypothesis, and results were argued to be most compatible with the latter account. Additional research will be necessary to confirm this conclusion. All in all, the results from this project paint a picture of nonnatives who appear to be well on their way to nativelike selection, at least with respect to the conventional expressions tested, and for whom these same expressions do indeed enjoy a mental representation distinct from the alternatives proposed. However, my original skepticism regarding the holistic storage of such sequences appears to find support in both the native and nonnative results. These findings reinforce the methodological division argued for in this dissertation between conventionality and psycholinguistic approaches to formulaic language, a division that merits examination across the spectrum of formulaic language.

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Appendix A

Contexts Used on DCT

French Version

1. *Hysterical friend*. C'est vendredi soir et tu arrives à l'appartement de ton amie Marie. Quand tu entres dans l'immeuble, tu trouves Marie, hystérique, qui pleure sur son lit. Tu es très inquiet (inquiète) et tu veux savoir ce qui l'a fait pleurer. Tu dis à Marie:

2. *Bad news clarification*. Un de tes collègues est en train de parler de l'avenir de l'entreprise. Il te confie que la situation financière n'est pas fantastique. Tu es un peu frustré(e) par ce commentaire vague et tu veux qu'il clarifie ses propos. Tu lui demandes:

3. *Death of boss' wife*. Tu viens d'apprendre que la femme de ton patron, quelqu'un que tu ne connaissais pas, est décédée hier. Après avoir appris cette nouvelle, tu achètes une carte pour ton patron. Dans cette carte, tu écris:

4. *Late—friend.* Tu es en retard pour un rendez-vous avec un ami. Quand tu arrives au café—30 minutes en retard—tu lui dis:

5. *Having a drink.* Tu es chez un copain qui t'offre à boire. Tu acceptes et ton copain te propose ou du jus d'orange ou du jus de pomme. Tu es indifférent(e). Tu lui dis:

6. *Learning to use a computer*. Un de tes amis n'a jamais utilisé un ordinateur et maintenant il faut qu'il apprenne à utiliser le courrier électronique pour son nouvel emploi. Comme tu travailles avec les ordinateurs, ton ami demande que tu lui donnes un coup de main. Cet ami s'inquiète que les ordinateurs soient trop difficiles pour lui mais tu es sûr(e) qu'il apprendra très vite. Donc, à sa demande d'aide, tu essaies d'apaiser ses peurs en lui disant, « ne t'inquiète pas…:

7. *Coffee with a politician*. C'est samedi après-midi, et tu es assis(e) sur un banc dans un parc public. Un homme s'assoit sur le même banc et commence à te parler. Après une conversation de 30 minutes, l'homme révèle qu'il est un homme politique très connu. Quand il t'invite à boire un café avec lui, tu es ravi(e) et, donc, tu dis:

8. *Good score on the LSAT*. Carine veut être avocate et, pour cette raison, elle a passé le LSAT (concours américain requis pour commencer des études de droit). Tu es son ancien professeur et quand tu apprends que Carine a reçu une très bonne note, tu lui envoies une carte. Dans cette carte, tu écris:

9. *Missed class*. Tu as un devoir important à faire pour ton cours d'allemand. Quand le jour où tu dois le rendre arrive, tu es malade et ne peux pas assister au cours. Avant le cours, tu envoies un mail au professeur pour le prévenir de ton absence. Tu es désolé(e) d'avoir manqué le cours et la prochaine fois que tu vois ton professeur, tu commences par lui dire:

10. *Important decision*. Tu parles avec ton meilleur ami d'une décision importante que tu dois prendre. Tu veux connaître son opinion sur la situation. Donc, tu lui demandes:

11. *Bad phone line*. Tu parles au téléphone avec un copain. La ligne est mauvaise ; sa voix est déformée et tu as du mal à suivre ce qu'il te raconte. Tu lui dis:

12. *Debate*. Tu travailles dans la politique et tu participes à un débat avec un collègue. On pose la première question, qui concerne l'environnement, seulement à ton collègue. Tu n'as pas aimé sa réponse, mais tu n'as pas l'occasion de donner ton avis avant que la deuxième question, qui est pour toi, soit prononcée. Au lieu de répondre tout de suite à cette nouvelle question, tu essaies de faire connaître ton avis sur le problème de l'environnement. Tu dis:

13. *First meeting*. Mathilde et toi vous promenez en centre ville. Pendant votre promenade, vous croisez une de tes amies—Laure. Laure et Mathilde ne se connaissent pas. Donc, tu te tournes vers Mathilde et lui dis:

14. *Bad cold*. Benoît a un gros rhume. Donc, il consulte un pharmacien sur le remède le plus efficace. Tu es pharmacien(ne) et tu écoutes pendant que Benoît décrit ses symptômes, qui sont nombreux. Après avoir réfléchi, tu sais que le traitement va être compliqué. Donc, pour commencer, tu lui dis:

15. *Technology specialist*. Tu es spécialiste en informatique et tu es en train de renseigner Maxime sur l'utilisation des ordinateurs quand son téléphone portable sonne. Après une brève discussion, il raccroche. Tu veux maintenant reprendre le fil de la conversation précédente, et tu dis:

16. *Work or study ?* Tu dois prendre une décision importante: soit tu continues avec tes études en littérature, soit tu commences à travailler pour gagner de l'argent. Cette décision te donne mal à la tête et tu décides de demander conseil à ton meilleur ami, qui doit lui aussi faire face à une situation semblable. Donc, tu lui expliques ton problème et tu demandes:

17. *Eager first meeting*. Mathilde et toi vous promenez en centre ville. Pendant votre promenade, vous croisez une de tes amies—Laure. Mathilde et Laure ne se connaissent pas, mais tu as beaucoup parlé de Laure à Mathilde, et Mathilde a très envie de la connaître. Donc, Mathilde dit à Laure:

18. *Grandma marries rich*. Ton père vient de te raconter que ta grand-mère va se marier avec un milliardaire. Cette nouvelle te semble incroyable et tu n'en crois pas tes oreilles. Donc, tu demandes:

19. *New school*. Mary, une amie américaine, est venue en France pour étudier à la fac. Elle a déjà fait deux ans d'études aux Etats-Unis, mais elle a du mal à s'habituer au système universitaire français. Elle raconte ses ennuis à toi et à quelques autres étudiants. Alors que les autres sont surpris par ses commentaires, tu as déjà passé du temps à l'étranger et, donc, tu trouves ses sentiments normaux. Tu lui dis:

20. *Waiter*. Tu es serveur(se) dans un restaurant chic. Pour savoir ce que tes clients veulent boire, tu leur demandes:

21. *Snacking between meals*. Tu dînes chez un collègue. Avant d'arriver chez lui, tu as mangé un casse-croûte et maintenant tu n'as plus très faim. Tu réussis à manger un peu de quiche mais, quand ton collègue offre à te resservir, tu n'as plus du tout faim et tu réponds:

22. *Out of service*. Quand tu rentres, ton camarade de chambre commence à se plaindre du four et de la douche qui ne marchent pas. Tu ne t'y connais pas du tout en bricolage et tu ne comprends pas pourquoi il s'en prend à toi. Donc, tu lui demandes:

23. *Madonna*. Alain et toi êtes en train de parler d'un exposé important que vous allez faire bientôt. Tout d'un coup, Alain commence à parler de la musique américaine. Tu es énervé(e): tu n'as pas envie de discuter de Madonna, et cet exposé est très important. Donc, tu dis à Alain:

24. *Forgotten phone call*. Tu es au café avec un groupe d'amis quand tu te souviens d'avoir promis d'appeler quelqu'un. Tu prends ton portable et tu vas sortir du café pendant quelques minutes. Tu dis à tes amis:

25. *Moving day*. Tu es en train de déménager et tu as besoin d'aide pour déplacer le lit. Ton frère habite près chez toi et il offre de te donner un coup de main samedi, sa seule journée de libre. A cette offre, qui te rend très content(e), tu réponds:

26. *Birthday present*. Tu viens d'acheter un cadeau d'anniversaire pour ton époux(se). Comme il reste deux mois avant son anniversaire, tu es sûr(e) qu'il (elle) ne soupçonne rien. Quand tu arrives chez toi, tu ne peux pas t'empêcher de le (la) taquiner un peu, sans révéler exactement ce que tu as fait de ta journée. Donc, tu dis à ton époux(se):

27. *Surprise storm*. C'est vendredi soir et tu arrives au village de tes parents et tous les arbres sont cassés ou ont perdu leurs feuilles. Heureusement les maisons sont intactes. Quand tu vois tes parents, tu leur demandes:

28. *Kind neighbor*. Tu entres dans le supermarché où tu vois ta voisine, une femme gentille qui a toujours l'air en pleine forme. Elle s'approche de toi pour te dire que tu as très bonne mine aujourd'hui. Le compliment te fait plaisir et tu lui réponds:

29. *Cleaning day*. Tu as presque fini de nettoyer la cuisine quand ta camarade de chambre arrive. Elle veut te donner un coup de main, mais il ne reste pas beaucoup à faire et tu veux le finir toi-même. Donc, tu lui dis:

30. *Goodbye*. Mathilde et toi vous promenez en centre ville. Pendant votre promenade, vous croisez une de tes amies—Laure. Mathilde et Laure ne se connaissent pas, mais tu as beaucoup parlé de Laure à Mathilde, et elle a très envie de la connaître. Les deux filles

font connaissance et vous parlez jusqu'à ce que Laure annonce qu'elle doit s'en aller. Avant qu'elle parte, Mathilde lui dit:

31. *Perfume shop*. Tu as un petit emploi à mi-temps dans une parfumerie chic. Un couple entre dans le magasin. Pour leur offrir ton assistance, tu leur dis:

32. *London trip*. Lucas, ton meilleur ami, veut que tu l'accompagnes en janvier quand il va à Londres. Lucas sait que tu n'as pas beaucoup d'argent et, donc, il offre de payer ton billet d'avion. C'est une offre généreuse, et tu es très heureux(se). Pour accepter la proposition de ton ami, tu lui dis:

33. *Second helpings*. Tu dînes chez un collègue. Tu as très faim ce jour-là et le repas te plaît énormément. Donc, quand ton collègue t'offre un peu plus de quiche, tu réponds:

34. *Broken leg*. Tu as un rendez-vous avec Stéphane, un ami de l'université. Quand il arrive, tu vois qu'il s'est cassé la jambe. Tu es surpris(e). Tu veux qu'il raconte son histoire et, donc, tu lui demandes:

35. *Late—boss*. Tu as un rendez-vous important avec ton patron lundi matin. Malheureusement, ton réveil n'a pas sonné et tu arrives en retard de 30 minutes. Quand tu vois ton patron, tu lui dis:

English Translation
1. *Hysterical friend*. It's Friday night and you arrive at the apartment of your friend Marie. When you enter the building, you find Marie hysterical, crying on her bed. You are very worried adn you want to know what has put her into this state. You say to Marie:

2. *Bad news clarification*. One of your colleagues is talking about the future of the company. He confesses that the financial situation isn't great. You're a little frustrated by his vague comment and you want him to clarify what he means. You ask him:

3. *Death of boss' wife*. You've just learned that the wife of your boss (someone who you didn't know) passed away yesterday. After having heard the news, you buy a card for your boss. In this card, you write:

4. *Late—friend.* You are late for a meeting with a friend. When you arrive at the cafe--30 minutes late--you say to him:

5. *Having a drink*. You are at a friend's place, who offers you something to drink. You accept and your friend suggests several different sorts of juice. You are indifferent. You say to him:

6. *Learning to use a computer*. One of your friends has never used a computer and now he must learn to use email for his new job. As you work with computers, your friend asks you to give him a hand. This friend is worried that computers will be too difficult for him

but you are sure that he'll learn very quickly. So, in response to his request for help, you try to calm his fears by saying to him « don't worry…:

7. *Coffee with a politician*. It's Saturday afternoon, and you are sitting on a bench in a public park. A man sits down on the same bench and begins to talk to you. After a 30 minutes conversation, the man reveals that he is a well-known politician. When he offers to treat you to a coffee, you are delighted and so you say:

8. *Good score on the LSAT*. Carine wants to be a lawyer and, for this reason, she took the LSAT (American entrance exam for law school). You are her former teacher and when you learn that Carine received a very good score, you send her a card. In this car, you write:

9. *Missed class*. You have an important homework assignment to do for your German class. When the day that you must turn it in arrives, you are sick and can't attend class. Before the class, you send an email to the professor in order to inform him of your absence. You are sorry to have missed the class, and the next time that you see your teacher, you start by saying to him:

10. *Important decision*. You are speaking with your best friend about an important decision that you must make. You want to know his opinion on the situation. So, you ask him:

11. *Bad phone line*. You're talking on the phone with a friend. The line is bad ; his voice is distorted and you have trouble following what he's telling you. You say to him:

12. *Debate*. You work in politics and you are participating in a debate with a colleague. The first question, which concerns the environment, is posed solely to your colleague. You didn't like his response, but you don't have the opportunity to give your opinion before the second question (directed at you) is asked. Instead of responding immediately to this new question, you try to express your opinion on the environment. You say:

13. *First meeting*. You and Mathilde are walking downtown. During your walk, you run into one of your friends—Laure. Laure and Mathilde don't know each other. So, you turn to Mathilde and say to her:

14. *Bad cold*. Benoît has a bad cold. So, he consults a pharmacist about the most effective treatment. You are a pharmacist and you listen while Benoît describes his symptoms, which are numerous. After giving it some thought, you know that the treatment will be complicated. So, to begin, you say to him:

15. *Technology specialist*. You are a technology specialist and you are in the middle of giving Maxime information on how to use a computer when his cell phone rings. After a brief discussion, he hangs up. You now want to get back to what you were saying, and you say:

16. *Work or study ?* You must make an important decision: either you continue your literature studies or you start to work in order to make money. This decision gives you a headache and you decide to ask your best friend for advice, as he is facing a similar situation. So, you explain to him your problem and you ask:

17. *Eager first meeting*. You and Mathilde are walking downtown. During your walk, you run into one of your friends—Laure. Mathilde and Laure don't know each other, but you have talked to Mathilde about Laure a lot, and Mathilde really wants to meet her. So, Mathilde says to Laure:

18. *Grandma marries rich*. You father just told you that you grandma is going to marry a millionaire. You find this news unbelievable and you can't get over it. So, you ask:

19. *New school*. Mary, an American friend, came to France for college. She has already done two years of school in the states, but she is having trouble getting used to the French university system. She is telling you and a few other students her troubles. Whereas the others are surprised by her comments, you have already been abroad and, so, you find her feelings normal. You say to her:

20. *Waiter*. You are waiter in a chic restaurant. To know what your clients want to drink, you ask them:

21. *Snacking between meals*. You are having dinner at a colleague's place. Before arriving, you ate a little snack and now you're no longer very hungry. You're able to eat a little bit of quiche but when your colleague offers seconds, you are no longer hungry at all and you respond:

22. *Out of service*. When you return home, your roommate starts to complain about the oven and the shower, neither of which work. You are not at all handy and you don't understand why he's taking it out on you. So, you ask him:

23. *Madonna*. You and Alain are in the midst of talking about an important presentation that you will do soon. All of a sudden, Alain starts to talk about American music. You're annoyed: you don't want to discuss Madonna, and this presentation is really important. So, you say to Alain:

24. *Forgotten phone call*. You are in a café with a group of friends when you remember that you promised to call someone. You grab your cell phone and you are going to leave the café for a few minutes. You say to your friends:

25. *Moving day*. You are in the middle of moving and you need help with the bed. Your brother lives close to you and he offers to give you a hand on Saturday, his only day off. In response to this offer, which makes you very happy, you say:

26. *Birthday present*. You've just bought a birthday present for your spouse. As his/her birthday is not for another two months, you're sure that he/she suspects nothing. When

you return home, you can't stop yourself from teasing him/her a little, without revealing exactly what you did with your day. So, you say to your spouse:

27. *Surprise storm*. It's Friday night and you arrive in the town where your parents live. All of the trees are broken or have lost their leaves. Luckily, the houses are still intact. When you see your parents, you ask them:

28. *Kind neighbor*. You enter the supermarket where you see your neighbor, a kind woman who always looks well. She comes up to you to tell you that you are looking well today. The compliment made you happy and you respond to her:

29. *Cleaning day*. You have almost finished cleaning the kitchen when your roommates arrives. She is going to give you hand, but there isn't much left to do and you want to finish yourself. So, you say to her:

30. *Goodbye*. You and Mathilde are walking downtown. During your walk, you run into one of your friends—Laure. Mathilde and Laure don't know each other, but you have talked to Mathilde about Laure a lot, and Mathilde really wants to meet her. The two girls meet and you talk until Laure says that she has to get going. Before leaving, Mathilde says to her:

31. *Perfume shop*. You have a part-time job in a chic perfume shop. A couple enters the shop. To offer them your assistance, you say to them:

32. *London trip*. Lucas, your best friend, wants you to accompany him when he goes to London in January. Lucas knows that you don't have much money and, so, he offers to pay for your plane ticket. His generous offer makes you very happy. To accept his offer, you say to him:

33. *Second helpings*. You are having dinner at a colleague's place. You are very hungry, and you really like the meal. So, when your colleague offers you second helpings on the quiche, you respond:

34. *Broken leg*. You have a meeting with Stéphane, a university friend. When he arrives, you see that he has a broken leg. You're surprised. You want him to explain what happened and so you ask him:

35. *Late—boss*. You have an important appointment with your boss Monday morning. Unfortunately, your alarm clock didn't go off and you arrive 30 minutes late. When you see your boss, you say to him:

Appendix B

Conventional Expressions Identified for NNSs living in Pau, France

Context	#	Semantic Formula	Conventional Expression	Variation	Frequency		% Use	
					SF	CE	Relative	Overall
35	1	Apology—IFID	*Je suis vraiment désolé*	3	15	15	100	83
5	2	Refusal	*Ca m'est égal*		18	14	78	78
13	3	Introduction	*Je te présente Laure*		18	14	78	78
21	4	Thanking + refusal	*Non merci*		15	12	80	67
24	5	Apology—IFID	*Excusez-moi*		16	11	69	61
7	6	Accepting offer	*Avec plaisir*		18	10	56	56
9	7	Apology—IFID	*Je suis désolé*	3	15	10	67	56
25	8	Thanking	*Merci beaucoup*		13	10	77	56
31	9	Offer	*Est-ce que je peux vous aider?*	4	17	9	53	50
3	10	Condolences	*Toutes mes sincères condoléances*	3	16	8	50	44
27	11	Request for information	*Qu'est-ce qui s'est passé?*	2, 3, 4	14	8	57	44
10	12	Request for information	*Qu'est-ce que tu en penses?*	4	14	8	57	44
28	13	Compliment	*C'est gentil*		8	7	88	39
19	14	Reassurance	*C'est normal*		12	7	58	39
16	15	Request for information	*Qu'est-ce que tu ferais?*	4	8	7	88	39
34	16	Request for information	*Qu'est-ce qui s'est passé?*	2, 4	10	7	70	39

Context	#	Semantic Formula	Conventional Expression	Variation	Frequency		% Use	
					SF	CE	Relative	Overall
6	17	Assessment	*C'est très facile*	3	12	7	58	39
1	18	Request for information	*Qu'est-ce qu'il y a?*	4	14	7	50	39
17	19	Introduction	*J'ai beaucoup entendu parler de toi*		13	7	54	39
28	20	Compliment response	*Vous aussi*		10	6	60	33
9	21	Explanation (apology)	*J'étais vraiment malade*	3	7	6	86	33
17	22	Greeting	*Content de te rencontrer*		13	6	46	33
8	23	Encouragement	*Bonne continuation*		7	6	86	33
35	24	Explanation (apology)	*Mon réveil n'a pas sonné*		11	6	55	33
19	25	Comforting	*Ne t'inquiète pas*	1	5	5	100	28
6	26	Encouragement	*Tu vas vite y arriver*	3	10	5	50	28
15	27	Request for information	*Où en étions-nous?*	4	6	5	83	28
1	28	Request for information	*Qu'est-ce qui s'est passé?*	4	5	5	100	28
25	29	Compliment	*C'est très gentil*	3	11	5	45	28
18	30	Verification request	*C'est pas vrai?!*		8	4	50	22
21	31	Compliment	*C'était délicieux*		9	4	44	22
22	32	Request for information	*Qu'est-ce que tu veux que je fasse?*	4	9	4	44	22

Note. The numbers in the *Variation* column reflect the six types of variation discussed in 4.1.3: (1) presence/absence of the negative particle *ne*, (2) variation in *qui* versus *qu'il*, (3) variation in an adverb or adjective, and (4) variation in word order in interrogatives.
SF = Semantic formula; CE = Conventional expression

Appendix C

Conventional and Alternate Frames

Pair	CE word/Substitute	Conventional Frame	Alternate Frame
1	gentil	Merci, / **c'est / gentil** / de / votre part.	C'est / bien / gentil / à vous / de me le / proposer, / merci.
	aimable	Merci, / **c'est / aimable** / de / votre part.	C'est / bien / aimable / à vous / de me le / proposer, / merci.
2	aussi	Merci, / **vous / aussi**, / bonne / journée.	Tu vas / maîtriser facilement / les bases et / tu vas voir / que / ça ira / aussi / pour / le mail.
	de même	Merci, / **vous / de même**, / bonne / journée.	Tu vas / maîtriser facilement / les bases et / tu vas voir / que / ça ira / de même / pour / le mail.
3	excusez	J'ai / un appel / à passer— / **Excusez / -moi**, / je reviens / dans cinq minutes.	Je suis / vraiment / désolé(e)— / Excusez / mon retard, / mon réveil / n'a pas sonné / ce matin.
	pardonnez	J'ai / un appel / à passer— / **Pardonnez / -moi**, / je reviens / dans cinq minutes.	Je suis / vraiment / désolé(e)— / Pardonnez / mon retard, / mon réveil / n'a pas sonné / ce matin.
4	normal	Tu sais / Marie, / **c'est / normal**, / tu vas / t'habituer / avec le temps.	C'est bon, / je vais finir, / mais je trouve / normal / que tu le fasses / la prochaine fois.
	logique	Tu sais / Marie, / **c'est / logique**, / tu vas / t'habituer / avec le temps.	C'est bon, / je vais finir, / mais je trouve / logique / que tu le fasses / la prochaine fois.

Pair	CE word/Substitute	Conventional Frame	Alternate Frame
5	inquiète	C'est pas / si grave / que ça— / **ne / t'inquiète / pas**, / tout va / s'arranger.	Tu sais, / on dirait / que / tu ne / t'inquiètes / pas / de l'exposé / parce que / tu fais tout / pour éviter / d'y travailler.
	soucie	C'est pas / si grave / que ça— / **ne / te soucie / pas**, / tout va / s'arranger.	Tu sais, / on dirait / que / tu ne / te soucies / pas / de l'exposé / parce que / tu fais tout / pour éviter / d'y travailler.
6	vrai	Mais papa, / **c'est pas / vrai** / tout / de même?!	Volontiers— / je prends un / vrai / plaisir / à manger / ta quiche, / elle est délicieuse.
	réel	Mais papa, / **c'est pas / réel** / tout / de même?!	Volontiers— / je prends un / réel / plaisir / à manger / ta quiche, / elle est délicieuse.
7	malade	Bonjour monsieur, / excusez-moi / pour mon absence, / **j'étais vraiment / malade** / et/ pouvais pas / quitter la maison.	Alors, / en général / pour / une personne / malade / d'un gros rhume, / je préconise / le repos.
	souffrant	Bonjour monsieur, / excusez-moi / pour mon absence, / **j'étais vraiment / souffrant** / et/ pouvais pas / quitter la maison.	Alors, / en général / pour / une personne / souffrant / d'un gros rhume, / je préconise / le repos.
8	sincères	Cher Monsieur, / je vous présente / **toutes mes / sincères / condoléances** / dans cette / épreuve douloureuse.	Pour un tel cadeau, / je resterai toujours / ton ami / sincere / et dévoué— / j'accepte / avec plaisir!

Pair	CE word/Substitute	Conventional Frame	Alternate Frame
	fidèles	Cher Monsieur, / je vous présente / **toutes mes / fidèles / condoléances** / dans cette / épreuve douloureuse.	Pour un tel cadeau, / je resterai toujours / ton ami / fidèle / et dévoué— / j'accepte / avec plaisir!
9	plaisir	C'est gentil / et c'est / **avec / plaisir** / que j'accepte / votre invitation	Génial! / Quel / plaisir / d'avoir / un frère / si gentil, / merci beaucoup!
	bonheur	C'est gentil / et c'est / **avec / bonheur** / que j'accepte / votre invitation	Génial! / Quel / bonheur / d'avoir / un frère / si gentil, / merci beaucoup!
10	rencontrer	Je suis / vraiment **content** / **de te / rencontrer** / parce qu'on / m'a beaucoup / parlé de toi.	Excuse-moi, / j'aurais dû proposer / de te / rencontrer / plus tard / dans l'après-midi.
	retrouver	Je suis / vraiment **content** / **de te / retrouver** / parce qu'on / m'a beaucoup / parlé de toi.	Excuse-moi, / j'aurais dû proposer / de te / retrouver / plus tard / dans l'après-midi.
11	arriver	C'est pas / si difficile / et je sais / que **tu vas / vite y / arriver** / sans / aucun problème.	Comment ça? / Est-ce / qu'il y a / des bruits / qui ont pu / arriver / jusqu'à / tes oreilles?
	parvenir	C'est pas / si difficile / et je sais / que **tu vas / vite y / parvenir** / sans / aucun problème.	Comment ça? / Est-ce / qu'il y a / des bruits / qui ont pu / parvenir / jusqu'à / tes oreilles?
12	égal	Tout ça, / **ça m'est / égal** / et / je prendrai / la même chose / que toi.	Peu importe, / au niveau des calories / un jus est / égal / à / tout autre.
	pareil	Tout ça, / **c'est / pareil** / et / je prendrai / la même chose / que toi.	Peu importe, / au niveau des calories / un jus est / pareil / à / tout autre.

Pair	CE word/Substitute	Conventional Frame	Alternate Frame
13	étions-nous	Alors, / **où en / étions-nous** / avec / ta question / sur les ordinateurs?	Désolé(e), / je me suis trompé de café— / Où / étions-nous / la dernière fois / qu'on s'est vus?
	étions-nous restés	Alors, / **où en / étions-nous restés** / avec / ta question / sur les ordinateurs?	Désolé(e), / je me suis trompé de café— / Où / étions-nous restés / la dernière fois / qu'on s'est vus?
14	passé	**Qu'est-ce-qu'il / s'est / passé /** ici / tout à l'heure?	Tu sais chéri(e), / cet après-midi / il s'est / passé / quelque chose / d'extraordinaire / au centre: / j'ai fait / du shopping!
	produit	**Qu'est-ce-qu'il / s'est / produit /** ici / tout à l'heure?	Tu sais chéri(e), / cet après-midi / il s'est / produit / quelque chose / d'extraordinaire / au centre: / j'ai fait / du shopping!
15	penses	**Qu'est-ce que / tu en / penses** / à / présent?	Dis-moi, / tu / penses / que / je devrais / faire quoi / à présent?
	suggères	**Qu'est-ce que / tu / suggères** / à / présent?	Dis-moi, / tu / suggères / que / je devrais / faire quoi / à présent?

Note. Slashes represent how the items were segmented in the moving window presentation; within the conventional frames, the conventional expression is in bold.

Conventional and Alternate Frames—English Translation

Pair	CE word/Substitute	Conventional Frame	Alternate Frame
1	gentil/aimable	Thank you, **it's nice/amiable** of you.	It's quite nice/amiable of you to offer it to me, thank you.
2	aussi	Thank you, **to you too/as well**, have a nice day.	You are going to easily master the basics and tu are going to see that it will be easy too/as well for email.
3	excusez	I have a call to make—**Excuse/Pardon me**, I'll come back in five minutes.	I am really sorry—Excuse/Pardon my lateness, my alarm clock didn't go off this morning.
4	normal	You know Marie, **it's normal/logical**, you are going to get used to it with time.	It's okay, I'm going to finish, but I find it normal/logical that you do it next time.
5	inquiète	It's not as bad as all that—**don't worry/be bothered**, everything will work out.	You know, it seems that you aren't worried/bothered about the presentation because you are doing everything to avoid working on it.
6	vrai	But dad, **it's not** actually **true/real** ?!	Gladly—I take a true/real pleasure in eating your quiche, it's delicious
7	malade	Hello sir, excuse me for my absence, **I was really sick/unwell** and couldn't leave the house.	So, in general for someone sick/unwell with a bad cold, I recommend rest.
8	sincère	Dear sir, I present to you **all my sincere/faithful condolences** in this painful hardship.	For such a gift, I will always remain your sincere/ faithful and devoted friend—I accept with pleasure!

Pair	CE word/Substitute	Conventional Frame	Alternate Frame
9	plaisir	That's nice and it's **with pleasure/happiness** that I accept your invitation	Cool! What pleasure/happiness to have such a nice brother, thanks a lot !
10	rencontrer	I am really **happy to meet/find you** because I've heard a lot about you.	Excuse me, I should have offered to meet/find you later in the afternoon.
11	arriver	It's not that difficult and I know that **you are going to manage/get on just fine** with no problem.	How are you ? Did any rumors arrive/reach your ears ?[1]
12	égal	All that, **it's the equal/same to me** and I'll have the same thing as you.	Doesn't matter, as far as calories, one juice is equal to/the same as any other.
13	étions-nous	So, **where were we/did we stop** with your question on computers?	Sorry, I went to the wrong café—Where were we/did we stop the last time we saw each other?
14	passé	**What happened/occurred** here just now?	You know dear, this afternoon something extradinary happened/occurred in town: I went shopping!
15	penses	**What do you think/suggest** at the present time?	Tell me, you think/suggest that I should do what at the present time?

[1]In French, *arriver* and *parvenir* share two meanings, one being « arrive », the other being « manage ».

Appendix D

Participant Background Questionnaire

Subject #:

Questionnaire

NOM, Prénom:
Lieu de naissance:
Age:
Depuis combien de temps vivez-vous…

dans les Pyrénées Atlantiques? à PAU?
dans les Landes?
dans le Gers?
dans les Midi-Pyrénées?

Quelles langues parlez-vous depuis votre enfance?

Quelles langues avez-vous apprises à l'école ? Pendant combien de temps avez-vous étudié ces langues OU Depuis combien de temps étudiez-vous ces langues ?

Langue	Combien de temps
	depuis: pendant:
	depuis: pendant:
	depuis: pendant:
	depuis: pendant:
	depuis: pendant:

Avez-vous déjà passé du temps à l'étranger ? Où et pendant combien de temps ?

Pays	Combien de temps

Participant Background Questionnaire—English Translation

Subject #:

Questionnaire

Last Name, First name :
Place of birth:
Age:
How long have you lived…
in the Pyrénées Atlantiques? in PAU?
in the Landes?
in the Gers?
in the Midi-Pyrénées?
Which languages have you spoken since your childhood?

Which languages did you learn at school? How long did you study these languages OR how long have you studied these languages?

Language	Length of time
	have studied since: studied for:
	have studied since: studied for:
	have studied since: studied for:
	have studied since: studied for:
	have studied since: studied for:

Have you already spent time abroad? Where and for how long?

Country	Length of time

Appendix E

Acceptance Rate Data by CCE-CSUB Pair

	CCE			CSUB		
Pair	No	Yes	Cannot Decide	No	Yes	Cannot Decide
1 *gentil/aimable*						
Short Stay	20%	80%	—	65%	35%	—
Long Stay	—	95%	5%	55%	40%	5%
NSs	25%	75%	—	40%	55%	5%
2 *aussi/de même*						
Short Stay	25%	75%	—	50%	50%	—
Long Stay	50%	50%	—	45%	50%	5%
NSs	30%	70%	—	50%	50%	—
3 *excusez/pardonnez*						
Short Stay	25%	75%	—	55%	45%	—
Long Stay	25%	70%	5%	55%	45%	—
NSs	—	100%	—	20%	80%	—
4 *normal/logique*						
Short Stay	15%	80%	5%	45%	50%	5%
Long Stay	20%	80%	—	45%	45%	10%
NSs	5%	95%	—	30%	70%	—
5 *inquiète/soucie*						
Short Stay	20%	80%	—	40%	60%	—
Long Stay	15%	80%	5%	45%	45%	10%
NSs	15%	80%	5%	75%	25%	—
6 *vrai/réel*						
Short Stay	50%	50%	—	60%	40%	—
Long Stay	5%	85%	10%	80%	15%	5%
NSs	25%	75%	—	75%	20%	5%

	CCE			CSUB		
Pair	No	Yes	Cannot Decide	No	Yes	Cannot Decide
7 *malade/souffrant*						
Short Stay	5%	95%	—	60%	40%	—
Long Stay	25%	70%	5%	55%	40%	5%
NSs	25%	70%	5%	60%	35%	5%
8 *sincères/fidèles*						
Short Stay	20%	75%	5%	35%	55%	10%
Long Stay	20%	75%	5%	70%	25%	5%
NSs	10%	90%	—	85%	15%	—
9 *plaisir/bonheur*						
Short Stay	30%	70%	—	55%	45%	—
Long Stay	5%	95%	—	70%	30%	—
NSs	25%	75%	—	85%	15%	—
10 *rencontrer/retrouver*						
Short Stay	15%	85%	—	55%	40%	5%
Long Stay	5%	90%	5%	70%	25%	5%
NSs	—	100%	—	95%	5%	—
11 *arriver/parvenir*						
Short Stay	5%	95%	—	35%	65%	—
Long Stay	10%	90%	—	35%	55%	10%
NSs	10%	90%	—	30%	65%	5%
12 *égal/pareil*						
Short Stay	20%	80%	—	35%	65%	—
Long Stay	40%	60%	—	50%	50%	—
NSs	30%	70%	—	40%	55%	5%
13 *étions-nous/étions-nous restés*						
Short Stay	10%	90%	—	55%	45%	—
Long Stay	25%	75%	—	70%	30%	—
NSs	45%	55%	—	45%	55%	—

Appendix F

Nontransformed RT Data for Target Segments

Table F1. *Target Segment: Average RTs by Group and Condition*

	Condition			
Group	CCE	CSUB	ACE	ASUB
Short stay NNSs	756.78 (298)	1085.41 (466)	790.07 (284)	981.73 (382)
Long stay NNSs	713.49 (219)	913.46 (289)	656.44 (171)	806.86 (274)
NSs	479.9 (129)	518.53 (150)	502.82 (103)	518.32 (116)

Note. Standard deviations are presented in parentheses

Table F2. *Target Segment: Average RTs by Group, Condition, and Quadruple*

	Condition			
Quadruple	CCE	CSUB	ACE	ASUB
1 *gentil/aimable*				
Short stay NNSs	661.5 (374)	756.6 (314)	885.7 (712)	830.15 (554)
Long stay NNSs	540.6 (280)	901.4 (673)	542.3 (214)	665.8 (324)
NSs	431.45 (115)	435.6 (121)	461 (131)	490.85 (180)
2 *aussi/de même*				
Short stay NNSs	715.05 (391)	1134.7 (1032)	639.5 (354)	841.85 (561)
Long stay NNSs	602.3 (289)	801 (467)	570.45 (195)	735.5 (367)
NSs	434.45 (182)	447.2 (149)	424.55 (106)	448.75 (114)
3 *excusez/pardonnez*				
Short stay NNSs	888.05 (830)	755.7 (263)	653.15 (314)	708.15 (281)
Long stay NNSs	1055.85 (1139)	610.02 (157)	598.4 (207)	660.33 (279)
Natives	477.5 (211)	558.95 (250)	536.25 (192)	450 (157)
4 *normal/logique*				
Short stay NNSs	695.35 (434)	940.6 (622)	607.9 (286)	1034.5 (722)
Long stay NNSs	568.56 (247)	660.25 (258)	601.85 (308)	635.42 (203)
Natives	391.54 (83)	517.45 (385)	466.4 (100)	508.35 (155)
5 *inquiète/soucie*				
Short stay NNSs	869.1 (436)	1520.2 (1331)	1137.3 (823)	1350.95 (867)
Long stay NNSs	660.9 (203)	1290.6 (745)	812.2 (348)	1079.8 (654)
Natives	774.5 (945)	493 (157)	499.05 (164)	554 (220)
6 *vrai/réel*				
Short stay NNSs	593.8 (276)	796.7 (477)	629.56 (325)	829.6 (453)
Long stay NNSs	632.25 (292)	852.5 (624)	518.1 (100)	734.35 (390)
Natives	414.23 (71)	428.95 (95)	533.75 (318)	512.5 (267)

Quadruple	Condition			
	CCE	CSUB	ACE	ASUB
7 *malade/souffrant*				
Short stay NNSs	619.7 (288)	1285.15 (757)	612.4 (288)	816.15 (307)
Long stay NNSs	693.3 (342)	1061.2 (820)	557.25 (187)	647.55 (289)
Natives	456.74 (92)	566.7 (263)	396.5 (86)	552.05 (322)
8 *sincères/fidèles*				
Short stay NNSs	673.95 (262)	772.55 (309)	952.8 (578)	729.7 (267)
Long stay NNSs	569.34 (88)	671.94 (175)	966.55 (720)	736.5 (425)
Natives	558.75 (257)	550.6 (146)	675.7 (314)	465.1 (103)
9 *plaisir/bonheur*				
Short stay NNSs	506.21 (130)	718.95 (468)	631.45 (318)	659.89 (338)
Long stay NNSs	512.08 (138)	835.04 (481)	561.15 (214)	546.8 (210)
Natives	392.3 (71)	402.3 (164)	354.15 (131)	372.6 (80)
10 *rencontrer/retrouver*				
Short stay NNSs	833.24 (582)	823.45 (407)	757.2 (353)	898.4 (598)
Long stay NNSs	655.64 (280)	786.05 (412)	697.75 (195)	865.15 (701)
Natives	499.9 (156)	559.85 (265)	560.95 (106)	470.15 (111)
11 *arriver/parvenir*				
Short stay NNSs	626.85 (185)	1505.75 (1527)	813.9 (314)	1377.3 (1038)
Long stay NNSs	692.1 (353)	846.45 (464)	724.75 (206)	835.3 (498)
Natives	473.84 (103)	601.4 (257)	501.7 (192)	525.65 (155)
12 *égal/pareil*				
Short stay NNSs	725.9 (496)	876.75 (535)	652.81 (286)	850.3 (573)
Long stay NNSs	794.8 (419)	631.46 (180)	628.1 (308)	619.9 (241)
Natives	445.20 (163)	458.74 (176)	522.85 (100)	550.65 (198)
13 *étions-nous/étions-nous restés*				
Short stay NNSs	1429.55 (1184)	2223.2 (1374)	1297.25 (823)	1835.45 (1498)
Long stay NNSs	1297.65 (1049)	1927.1 (1210)	754.85 (348)	1726.8 (1450)
Natives	488.3 (1976)	720.2 (437)	603.85 (164)	837.55 (510)

Note. Standard deviations are presented in parentheses.

Appendix G

Results from Statistical Analyses

Table G1. *Post hoc Analysis of Group from Target Segments*

Test	Groups		Mean Difference	*SE*
Tukey HSD	SS NNSs	LS NNSs	.0485	.035
	SS NNSs	NS	2.054***	.035
	LS NNSs	NS	1.57***	.035
Bonferroni	SS NNSs	LS NNSs	.0485	.035
	SS NNSs	NS	2.054***	.035
	LS NNSs	NS	1.57***	.035

Table G2. *Statistical Analyses of RTs on Target and Following Segments*

Quadruple	Target Segment	Following Segment
1 *gentil/aimable*		
Word	$F(1, 57) = 2.802, p = .1$	$F(1, 57) = .498, p = .483$
Frame	$F(1, 57) = .399, p = .53$	
Word × Frame	$F(2, 57) = 3.518\ p = .066$	
Word × Group	$F(2, 57) = 6.098\ p < .01$	$F(2, 57) = 2.969, p = .059$
Frame × Group	$F(2, 57) = 1.802\ p = .174$	
Word × Frame × Group	$F(2, 57) = 1.735\ p = .186$	
2 *aussi/de même*		
Word	$F(1, 57) = 1.526, p < .01$	$F(1, 57) = .539, p = .466$
Frame	$F(1, 57) = 1.338, p = .252$	
Word × Frame	$F(2, 57) = .237, p = .628$	
Word × Group	$F(2, 57) = 2.684, p = .077$	$F(2, 57) = .973, p = .384$
Frame × Group	$F(2, 57) = .972, p = .385$	
Word × Frame × Group	$F(2, 57) = .186, p = .831$	
3 *excusez/pardonnez*		
Word	$F(1, 57) = 18.523, p < .001$	$F(1, 57) = 1.287, p = .261$
Frame	$F(1, 57) = 5.1, p < .05$	
Word × Frame	$F(2, 57) = .279, p = .6$	
Word × Group	$F(2, 57) = 1.25, p = .294$	$F(2, 57) = 1.738, p = .185$
Frame × Group	$F(2, 57) = .512, p = .602$	
Word × Frame × Group	$F(2, 57) = 5.896, p < .01$	

Quadruple	Target Segment	Following Segment
4 *normal/logique*		
Word	$F(1, 57) = 13.438, p < .01$	$F(1, 57) = 8.33, p < .01$
Frame	$F(1, 57) = 1.673, p = .201$	
Word × Frame	$F(2, 57) = .005, p = .943$	
Word × Group	$F(2, 57) = 5.054, p < .05$	$F(2, 57) = 1.939, p = .153$
Frame × Group	$F(2, 57) = .886, p = .418$	
Word × Frame × Group	$F(2, 57) = 1.284, p = .285$	
5 *inquiète/soucie*		
Word	$F(1, 57) = 24.148, p < .001$	$F(1, 57) = 15.31, p < .001$
Frame	$F(1, 57) = .005, p = .943$	
Word × Frame	$F(2, 57) = 1.636, p = .206$	
Word × Group	$F(2, 57) = 4.96, p < .05$	$F(2, 57) = 1.987, p = .147$
Frame × Group	$F(2, 57) = .363, p = .697$	
Word × Frame × Group	$F(2, 57) = 4.411, p < .05$	
6 *vrai/réel*		
Word	$F(1, 57) = 20.049, p < .001$	$F(1, 57) = .244, p = .623$
Frame	$F(1, 57) = .188, p = .666$	
Word × Frame	$F(2, 57) = .001, p = .974$	
Word × Group	$F(2, 57) = 4.487, p < .05$	$F(2, 57) = .889, p = .417$
Frame × Group	$F(2, 57) = 3.526, p < .05$	
Word × Frame × Group	$F(2, 57) = .067, p = .936$	
7 *malade/souffrant*		
Word	$F(1, 57) = 4.785, p < .05$	$F(1, 57) = 5.999, p < .05$
Frame	$F(1, 57) = 30.655, p < .001$	
Word × Frame	$F(2, 59) = 6.43, p < .05$	
Word × Group	$F(2, 59) = 4.188, p < .05$	$F(2, 57) = 4.137\ p < .05$
Frame × Group	$F(2, 59) = 2.556, p = .086$	
Word × Frame × Group	$F(2, 59) = 4.541, p < .05$	
8 *sincères/fidèles*		
Word	$F(1, 57) = .012, p = .911$	$F(1, 57) = 7.641, p < .01$
Frame	$F(1, 57) = 6.609, p < .05$	
Word × Frame	$F(2, 57) = 18.261, p < .001$	
Word × Group	$F(2, 57) = .843, p = .436$	$F(2, 57) = .269\ p = .765$
Frame × Group	$F(2, 57) = 1.776, p = .178$	
Word × Frame × Group	$F(2, 57) = .025, p = .976$	
9 *plaisir/bonheur*		
Word	$F(1, 57) = 7.344\ p < .01$	$F(1, 57) = .015, p = .903$
Frame	$F(1, 57) = 2.108, p = .152$	
Word × Frame	$F(2, 57) = 7.318, p < .01$	
Word × Group	$F(2, 57) = 1.404, p = .254$	$F(2, 57) = 4.479\ p = .237$
Frame × Group	$F(2, 57) = 3.547, p < .05$	
Word × Frame × Group	$F(2, 57) = 4.622, p < .05$	

Quadruple	Target Segment	Following Segment
10 *rencontrer/retrouver*		
Word	$F(1, 57) = 10.268, p < .01$	$F(1, 57) = 7.493, p < .01$
Frame	$F(1, 57) = .013, p = .91$	
Word × Frame	$F(2, 57) = .144, p = .706$	
Word × Group	$F(2, 57) = .899, p = .413$	$F(2, 57) = 2.553\ p < .087$
Frame × Group	$F(2, 57) = .173, p = .841$	
Word × Frame × Group	$F(2, 57) = .554, p = .578$	
11 *arriver/parvenir*		
Word	$F(1, 57) = 15.758, p < .001$	$F(1, 57) = 5.313, p < .05$
Frame	$F(1, 57) = .74, p = .393$	
Word × Frame	$F(2, 57) = 3.913, p = .05$	
Word × Group	$F(2, 57) = 8.206, p < .01$	$F(2, 57) = 1.834\ p = .169$
Frame × Group	$F(2, 57) = .75, p = .477$	
Word × Frame × Group	$F(2, 57) = .233, p = .793$	
12 *égal/pareil*		
Word	$F(1, 57) = 10.696, p < .01$	$F(1, 57) = 2.157, p = .147$
Frame	$F(1, 57) = .268, p = .607$	
Word × Frame	$F(2, 57) = .318, p = .575$	
Word × Group	$F(2, 57) = 5.014, p < .05$	$F(2, 57) = .033\ p = .968$
Frame × Group	$F(2, 57) = 3.476, p < .05$	
Word × Frame × Group	$F(2, 57) = .404, p = .67$	
13 *étions-nous/étions-nous restés*		
Word	$F(1, 57) = .011, p = .917$	$F(1, 57) = 7.408, p < .01$
Frame	$F(1, 57) = 1.537, p = .22$	
Word × Frame	$F(2, 57) = .01, p = .921$	
Word × Group	$F(2, 57) = 1.926, p = .155$	$F(2, 57) = .442, p = .645$
Frame × Group	$F(2, 57) = 3.766, p < .05$	
Word × Frame × Group	$F(2, 57) = 1.156, p = .322$	

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American Association of Teachers of French

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PUBLICATIONS

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PRESENTATIONS and POSTERS

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Edmonds, A. (2009, September). *Reconsidering formula identification in light of psycholinguistic evidence*. Paper presented at the 19th annual meeting of the European Second Language Association, Cork, Ireland.

Dekydtspotter, L., Edmonds, A. C., Liljestrand Fulz, A., Petrush, R. A., & Renaud, C. (2009, May). *On the role of context and morphology in the processing of relative clause ambiguity in English-French interlanguage*. Paper presented at the Mind-Context Divide: Language Acquisition and Interfaces of Cognitive-Linguistic Modules, University of Iowa.

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