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Linguistic evidence in second language acquisition

A theoretical discussion of negative evidence and corrective feedback in developing second language grammar

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Abstract

The factors and mechanisms that influence L2 acquisition have been a topic of debate for decades. One of the central questions is what type of linguistic evidence can be said to be relevant for L2 acquisition, and whether L2 learners can actually benefit from receiving corrective feedback whilst acquiring L2. Formal and generative approaches to SLA have typically assumed that only positive evidence, or instances of grammatical target language examples, can be utilized for the process of L2 acquisition. This is based on the argument that language acquisition is driven by Universal Grammar and exposure to positive evidence, and that negative evidence, or information about what is not permitted in the target language, cannot be used for this purpose. This also means that for these approaches to SLA research, corrective feedback and other forms of language instruction containing negative evidence are seen as irrelevant for L2 acquisition.

In contrast, theoretical approaches stemming from for instance applied linguistics, interactionist approaches, and skill acquisition theories have posited both negative evidence and corrective feedback as essential factors for SLA. These approaches have claimed that such treatments can benefit the L2 acquisition process by drawing attention towards gaps between interlanguage and target language, making input more comprehensible, and helping learners avoid overgeneralization of target structures.

To investigate these claims, a review of previous studies on negative evidence and corrective feedback in SLA was conducted, focusing on the potential impact on the learners' L2s and the relative effectiveness of different types of corrective feedback. The results show that there is evidence of a potential positive effect of corrective feedback and negative evidence on L2 behaviour. However, this effect cannot be conclusively related to changes in linguistic competence, nor can one type of corrective feedback be conclusively determined to be more effective than other types for targeting L2 acquisition. Moreover, a significant lack of long-term testing was also found, which further complicates the process of determining whether acquisition has occurred or not.

Samandrag

Faktorane og mekanismane som påverkar andrespråkstileigning har vore eit debattert tema i fleire tiår. Eit av dei sentrale spørsmåla knytt til dette er kva type lingvistisk bevis som kan seiast å vere relevant for andrespråkstileigning, og om andrespråkselevar faktisk har bruk for korrigerande tilbakemeldingar undervegs i læringsprosessen. Formelle og generative tilnærmingar til andrespråkstileigning har vanlegvis antatt at berre positive bevis, eller tilfelle av grammatiske målspråkseksempel, kan bli nytta i andrespråkstileigning. Dette er basert på haldninga at språktileigning er drive av *Universal Grammar* og møte med positive bevis, og at negative bevis, eller informasjon om kva som ikkje er korrekt på målspråket, ikkje kan tene dette føremålet. Dette betyr også at for desse tilnærmingane blir ikkje korrigerande tilbakemeldingar og andre typar språkundervisning som inneheld negative bevis sett på som relevant for andrespråkstileigning.

På den andre sida har teoretiske tilnærmingar frå bruksretta lingvistikk, interaksjonisme, og teoriar innanfor ferdigheitstileigingsteori alle forsvart nytta av både negative bevis og korrigerande tilbakemeldingar i andrespråkstileigning. Desse tilnærmingane har hevda at slike faktorar kan påverke andrespråkstileigningsprosessen ved å rette merksemd mot hòlet mellom *interlangauge* og målspråket, gjere innputt meir forståeleg, samt hjelpe med å unngå overgeneralisering av språklege strukturar.

For å undersøke desse påstandane vart det gjennomført ein gjennomgang av tidlegare forsking på negative bevis og korrigerande tilbakemeldingar, med fokus på potensiell påverknad på språksystemet og dei relative effektane av forskjellige typar korrigerande tilbakemeldingar. Resultata syner at det kan vere grunn til å forvente ein positiv effekt av korrigerande tilbakemeldingar og negative bevis på språkleg framferd. Samtidig kan ikkje denne effekten relaterast direkte til endringar i lingvistisk kompetanse, ei heller kan ein type korrektiv tilbakemelding bli stadfesta som meir effektiv enn andre typar for å nå tileigning. I tillegg vart også ein betydeleg mangel på langtidstesting funne, noko som kompliserer arbeidet med å stadfeste om faktisk språktileigning har funne stad.

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Table of contents

Abbreviations

CF   -   Corrective feedback

L1   -   First language

L2   -   Second language

LLB   -   Learned linguistic behaviour

LLK   -   Learned linguistic knowledge

PLD   -   Primary linguistic data

SLA   -   Second language acquisition

UG   -   Universal Grammar

1.0 Introduction

There is a discrepancy between the different approaches to second language acquisition (SLA) in what factors are perceived as relevant for the process of acquiring a language. This can be attributed to the numerous traditions of language acquisition research and the several fields of study directly related to questions of SLA, each entailing a particular set of methods and assumptions. One aspect of SLA that has received special interest is the role of negative evidence, or information about what is not permitted in a language (Gass, 2003, p. 226), which has been at the centre of an ongoing debate within fields of SLA for decades. Whereas the acquisition of first language (L1) is generally assumed to function without negative evidence, some researchers argue that the conditions for second language (L2) acquisition may be different. As DeKeyser (1993, p. 502) notes, L2 learners typically receive far less input than L1 learners, indicating that L2 learners may benefit from exposure to information about what is unacceptable in the L2, in addition to input representing what is permitted.

Regarding L2 acquisition, the core of the debate has primarily been concerned with the question of whether negative evidence has any influence on learners' linguistic competence, or if it can be claimed as data that is irrelevant for acquisition. The latter perspective has largely been shaped by formal and generative SLA research in the Chomskyan tradition, which assumes that negative evidence does not affect the development of linguistic competence, or – at best – may only lead to learned knowledge about the target language (Whong, 2013). This perspective comes from the notion that learners acquire language through positive evidence only, or instances of grammatical target language examples in the input (Li & Vuono, 2019, p. 95). In contrast, negative evidence through for instance language instruction and corrections has been claimed as mere means to improve metalinguistic abilities and L2 behaviour (Krashen, 1982; 1985; Schwartz, 1993; Schwartz & Gubala-Ryzak, 1992).

However, this position also entails certain complications regarding the development of human language and knowledge. For instance, if negative evidence and explicit instruction are treated as irrelevant for SLA, there must be another explanation to how L2 learners can establish boundaries and avoid overgeneralizations of target language constructions. The question is therefore whether it can be determined that learners reject ungrammaticality based on internal language mechanisms only, or whether L2 information and linguistic evidence, i.e., both positive and negative, are required to fully acquire a language (Marcus, 1993, p. 54).

Contrasting the claims made by formal and generative approaches to SLA, other research traditions, such as interactionist approaches, skill acquisition theories, and theoretical approaches stemming from applied linguistics, have all posited negative evidence as beneficial for SLA. In support of negative evidence, effects such as restricting possible grammars and drawing attention to potential mismatches between the target language and the learners' utterances have been cited – all factors that have been argued to benefit L2 acquisition (Leeman, 2007; Li, 2010). As opposed to the formal and generative traditions, these paradigms argue that both positive and negative evidence are key components of SLA, and that providing learners with both types of evidence is necessary for the L2 acquisition process.

The above debate has also been related to the question of whether conscious processing of language by means of explicit knowledge can share an interface with unconscious processing of implicit knowledge (Trahey, 1996, p. 112). Instigated by Krashen's (1982; 1985) distinction between learning and acquisition, different positions have been claimed regarding the relationship between explicit and implicit knowledge. This has had significant consequences for both research on SLA and language instruction, as this differentiation between types of knowledge serves as the foundation to whether one assumes that explicit language instruction can in fact lead to changes to linguistic competence and the development of implicit knowledge (Umeda et al., 2019, p. 180).

As an extension of the debate about negative evidence and explicit instruction in SLA, questions have also been raised to whether corrective feedback (CF) can be of use for language learners. CF provides learners with some form of correction and information following an erroneous utterance, with the exact content and formulation depending on the specific type of CF (Bruton, 2000, p. 120). For language instruction and pedagogical contexts, this is generally seen as an advantage, as it may serve to guide learners towards the target structures and aid learning of correct target language grammar (Leeman, 2007, p. 116). In contrast, for SLA research and theories stemming from formal linguistics and generative traditions, the potential benefits of CF have traditionally been treated as related to linguistic performance, not linguistic competence, as with negative evidence (Leeman, 2007, p. 113). However, as CF can potentially consist of both positive and negative evidence and can to some extent be administered implicitly, depending on context and type of CF, the exact scope and relevancy of CF in SLA remain undetermined.

1.1 Purpose and scope of thesis

The purpose of this thesis is to examine the claim that language instruction, by means of CF and negative evidence, cannot fundamentally influence the underlying linguistic competence and implicit knowledge in SLA. This entails a discussion of the theoretical approaches that have shaped the fundamental claims of what factors underlie L2 acquisition, in addition to an investigation of the role of CF and linguistic evidence in SLA and language instruction. The theories and arguments discussed here were included due to their impact on SLA research and their contributions to the fields of linguistics and language instruction.

To evaluate the specific claims of the individual theories, this thesis also includes a review of previous studies of CF and negative evidence. Instead of conducting a direct study of a particular aspect related to SLA, reviewing previous studies was judged to be more beneficial for the research questions investigated here. The reason for this was twofold; first, data collection from for instance L2 learners or instructors would entail a narrower scope of this thesis, as this would require a focus on a specific aspect of CF and negative evidence. Instead of evaluating whether general theoretical assumptions regarding CF and negative evidence can be supported empirically, conducting an observational or experimental study would limit the discussion to the specific aspect in question. Second, several studies have already been produced regarding language instruction, linguistic evidence, CF, and other relevant factors. Instead of conducting another study of aspects that have already been investigated, this thesis focuses on evaluating the claims of such studies.

Moreover, a distinction is made here between oral and written CF, as these two categories include their own set of terms and research paradigms. Although research on CF has been predominantly occupied with instances of oral production, it is still important to note that a majority of classroom instruction is also done through writing and reading (Ellis, 2010, p. 336). However, for this thesis, only instances of oral CF and language instruction are included and discussed, as the substantial work of both approaches to CF would require more than what can be covered by the scope and length of this thesis. Additionally, a significant number of studies have been conducted on the effects of CF and negative evidence on vocabulary, pronunciation, and other aspects of language outside grammar. As this thesis is concerned with morphosyntax and the effects of CF and negative evidence on linguistic competence and implicit knowledge, the results of such studies are not included or discussed here.

Lastly, it is important to emphasize that this thesis is relevant for both the study of English as a language, but also for SLA in general. Although most studies reviewed in this thesis focus on English as L2, this is primarily because the English language has occupied a prominent position in previous SLA research. For this thesis, a focus on the mechanisms and factors of English L2 acquisition alone would be quite limited, as most general aspects of language acquisition are assumed to function similarly regardless of language in question. This also means that the discussion and findings of this thesis are primarily founded on previous research of L2 English, but this can also be generalized to other languages as well.

1.2 Research questions

To investigate the above issues and evaluate the claims of previous studies a set of research question were formulated. The first follows the general purpose of this thesis in differentiating between the theoretical assumptions that have shaped SLA research and the role of CF and negative evidence:

1. How do theories of formal and applied linguistics compare regarding the role of corrective feedback and negative evidence in second language acquisition, and what research evidence exists in favour of the respective theories?

In addition, to fully answer this question, two additional research questions were formulated to separate the specific claims regarding CF from the overall effectiveness of such treatment and negative evidence in SLA:

2. Which type of corrective feedback can be claimed to be the most beneficial for second language acquisition?

3. Does providing second language learners with negative evidence and corrective feedback lead to changes in their underlying linguistic competence?

This thesis is divided into five chapters. In chapter two, the theoretical approaches to SLA and linguistic knowledge are examined, with a particular focus on what function CF and negative evidence are assumed to carry in L2 acquisition. In chapter three, previous studies of CF and explicit instruction containing negative evidence are reviewed, in addition to a short summary of some prominent trends of such studies. Chapter four includes a discussion of the results of the previous studies and follows the structure of the secondary research questions. First, different types of CF are compared in terms of effectiveness in L2 acquisition. This is followed by a discussion of whether negative evidence and CF can be said to benefit L2 acquisition or simply cause changes to learners' explicit knowledge, including possible limitations related to the previously reviewed studies. Finally, chapter five includes a summary of the findings of this thesis and a conclusion based on the research questions and discussion. The thesis concludes by offering some suggestions for further research.

2.0 Theoretical background

As mentioned in the introduction, there is a fundamental difference between formal and generative approaches to SLA and applied linguistics in what factors can be argued to influence the process of L2 acquisition. Consequently, there has been an ongoing debate for decades about the role of negative evidence in SLA and whether language instruction and CF can lead to changes in linguistic competence.

The following chapter starts by discussing the differentiation between explicit and implicit knowledge and how this is manifested in L2 acquisition. Although most researchers acknowledge the existence and separation between the two types of knowledge, the relationship between them remains a debated topic. This chapter then includes a discussion of different types of linguistic evidence and how this can be related to CF and language instruction. Finally, a detailed view of the different theoretical approaches to questions of SLA and linguistic evidence is presented, with a particular focus on formal and generative traditions, interactionist approaches, and skill acquisition theories, and their relationships with negative evidence and CF.

2.1 The relationship between explicit and implicit knowledge

An issue that has been investigated by researchers in several fields of linguistics and SLA research is the distinction and relationship between implicit and explicit knowledge. Although most researchers assume some form of difference between explicit and implicit knowledge, there is still no broad consensus on what the relationship between these types of knowledge is. As a result, there have been numerous attempts at defining the concepts of explicit and implicit knowledge and the mechanisms and factors that influence them (Whong et al., 2014, p. 553). A common component in many of these approaches to this question is the role of *consciousness* in language processing; learners seem to possess knowledge that can only be explained in terms of unconscious acquisition of language, whereas other aspects can only be targeted directly through instruction and conscious processing of rules and structures.

Some researchers view implicit knowledge as referring to intuitive knowledge that is accessible through automatic and unconscious processing, and that it is acquired without consciousness or awareness and retrieved under similar conditions during production. Conversely, explicit knowledge can be understood as knowledge that is consciously available to learners, usually through controlled processing (Ellis et al., 2009, p. 5; Rassaei et al., 2012, p. 62). The latter type of knowledge is typically associated with tasks that require some form of monitoring or awareness, often due to learners' current level of development or the nature of the task. In this also lies the assumption that implicit knowledge is only evident in the behaviour of learners, whereas explicit knowledge can be verbalized (Ellis et al., 2009, p. 11).

In addition, some researchers have attempted to apply a more concrete set of qualities by which explicit and implicit knowledge can be distinguished. For instance, Ellis (2005) emphasizes factors such as whether learners can be said to be aware of language processing and production, how knowledge is stored and accessed, whether knowledge can be verbalized, and how it can be said to be learnable. Additional factors have also been added to congregate a set of criteria for operationalizing constructs for measuring explicit and implicit knowledge: 1) degree of awareness, or the extent to which learners are aware of their own linguistic knowledge; 2) time available to the learners for responding to testing treatments; 3) focus of attention, meaning a focus on fluency or accuracy; 4) systematicity of learner responses; 5) learners' certainties that the produced linguistic form conforms to target language norms; 6) learners' metalinguistic knowledge, which can be related to explicit knowledge; and 7) learnability, or the notion that younger learners are more likely to display more implicit knowledge, whereas explicit knowledge is more likely to display explicit knowledge (Ellis, 2005, p. 152). In total, these factors represent one possible approach to the differentiation between explicit and implicit knowledge. However, the process of determining the extent of which learners have access to the different types of knowledge remains a critical question in SLA research, a point which also influenced the results of this thesis.

2.1.1 Krashen's Monitor Model

A theory which has had a significant influence on the distinction and relationship between explicit and implicit knowledge is the work done by Krashen (1982; 1985). He most notably argues that there is no interface between the two forms of knowledge, and that there should be a strict separation between *acquisition* and *learning*. In this, Krashen asserts that explicit knowledge is driven by the process of learning, whereas implicit knowledge can only be obtained through acquisition, and that learned knowledge cannot be transformed into acquired knowledge. These ideas were included in his theory of language acquisition and the role of input, coined the Monitor Model, which is a theory of SLA consisting of a collection of five hypotheses: 1) the Acquisition-Learning Hypothesis, 2) the Monitor Hypothesis, (3) the Natural Order Hypothesis, 4) the Input Hypothesis, and 5) the Affective Filter Hypothesis (Krashen, 1985).

The first two hypotheses, the Acquisition-Learning Hypothesis and the Monitor Hypothesis have been especially influential regarding the debate concerning the effects of CF and negative evidence in L2 acquisition. The Acquisition-Learning Hypothesis asserts that there is a fundamental difference between acquisition and learning, and that this difference affects how learners interact with language and how learning or acquiring a language occur. Krashen (1985) argues that acquisition refers to a subconscious processing of language, whereas learning should be understood as a conscious process that results in knowing about language (Krashen, 1985, p. 1; Mitchell et al., 2013, p. 41). This distinction between acquisition and learning can be directly related to the next hypothesis, the Monitor Hypothesis, which states that learning only serves to monitor production. This means that the acquired system initiates and produces the utterance, whereas learned knowledge functions to edit or monitor during production. From these two hypotheses one can also make the claim that explicit or conscious knowledge, either from CF or explicit instruction, does not have an impact on the acquired L2, as it only serves to restructure knowledge obtained through learning.

The three remaining hypotheses, the Natural Order Hypothesis, the Input Hypothesis, and the Affective Filter Hypothesis are also crucial for Krashen's model of acquisition. The first hypothesis relates to the assumption that there is a certain order of which language is acquired (Krashen, 1985, p. 1). This argument follows the notion of systematicity in L2 development, particularly regarding the acquisition of syntactic and morphological elements. The second, the Input Hypothesis, claims that learners progress through the process of acquisition depending on the availability of *comprehensible input* (Krashen, 1985, p. 2). According to

Krashen (1985), this comprehensible input is defined as *i+1*, meaning L2 input that is just beyond the learner's L2 competence and is neither too simple nor too complex for the learner to utilize it for L2acquisition. A key factor of this hypothesis is that production (i.e., output) is not necessary for L2 acquisition, and that it "emerges on its own as a result of building competence via comprehensible input" (Krashen, 1985, p. 2). In addition, Krashen also identifies an additional factor in SLA, as explained as The Affective Filter Hypothesis. In this hypothesis, the focus lies on the role of emotion in SLA and how internal factors such as motivation and anxiety play an essential role in acquiring L2, and that comprehensible input is not sufficient if the learners are not emotionally open for acquisition.

In full, the Monitor Model predicts that acquisition only happens when learners are exposed to comprehensible input and have a low affective filter, and that learners progress through rules of language in a natural order. Learning, on the other hand, only contributes to conscious knowledge, which functions as a Monitor to edit and correct output, either before or after production (Krashen, 1985; McLaughlin, 1987). The influence of Krashen's arguments has been quite extensive, not only in theoretical approaches to SLA, but also in paradigms related to the pedagogical and instructional aspects of language acquisition. As a result, the claims by Krashen and subsequent research regarding the relationship between explicit and implicit knowledge have received both significant criticism and substantial support, and the relevant aspects of these claims are returned to below.

2.1.2 Declarative and procedural knowledge

To further specify the difference between explicit and implicit knowledge, some researchers have drawn on methods from neurobiology and the internal structures of the brain that are hypothesized to govern linguistic knowledge. For instance, both Ullman (2001; 2015) and Paradis (2009) refer to the distinction between two memory systems located in the brain, namely the *declarative* memory and the *procedural* memory. They both draw on the distinction made by Krashen (1982; 1985) between acquisition and learning in that the former is based on the procedural memory whereas the latter relies on the declarative memory. As both maintain a strict separation of acquisition and learning, the outcomes of these processes, implicit and explicit knowledge, are also seen as distinct from one another. Furthermore, Ullman (2001; 2015) argues that instead of assuming that the systems that compose language are domain-specific, one should regard language as being based on a neurobiological foundation that underlie other domains as well. He proposes that these systems may have been adopted for language processing, but their primary purpose need not have been language.

The declarative memory is assumed to depend on the hippocampus and other medial temporal lobe (MTL) structures and is associated with the learning of facts (semantic knowledge) and events (episodic knowledge), across a wide range of domains (Paradis, 2009; Ullman, 2001; 2015). More specifically for language, it is argued that declarative knowledge is involved in the learning of simple words and mappings, in addition to idiomatic expressions and irregular morphological forms (Paradis, 2009, p. 9). Knowledge learned in declarative memory requires relatively little exposure and is believed to be partly accessible through conscious processing and retrieval (Ullman, 2015, p. 137). Conversely, the procedural memory is claimed to reside in the frontal/basal ganglia circuits in the brain, with the frontal region argued to be particularly important for processing of automatized or implicit knowledge (Ullman, 2015, p. 138). In contrast to learning in the declarative memory, the process of learning in the procedural memory is argued to require extended practice but also resulting in more rapid and automatic processing of skills and knowledge (Ullman, 2015, p. 138).

For language acquisition, it is argued that the procedural memory is particularly involved in grammar and linguistic subdomains, such as syntax, morphology, and phonology (Paradis, 2009, p. 9; Ullman, 2015, p. 141). Moreover, Ullman (2001; 2015) also argues that there is a fundamental difference in access to the different memory systems between L1 and L2 learners. For L1 learners, Ullman (2001, p. 108) claims that the learning and use of grammar depends predominantly on the procedural memory, whereas the use and memorization of words is concentrated around the declarative memory. In contrast, L2 learners may rely increasingly on the declarative memory the older they become, particularly past late childhood and puberty (Ullman, 2001, p. 108).

Support of a distinction between the two memory systems and the difference in access depending on age and language comes in part from what is known as the *Lesion Method* and research on bilingual aphasia. This method involves investigating people suffering from lesions to different brain structures and how this damage is manifested in language processing in terms of the different memory systems (Ullman, 2015, p. 145). As an example, people suffering from lesions limited to MTL, including the hippocampus, have been found to struggle with learning of declarative facts and events, in addition to L2 production. This correlates with one of the predictions made by Ullman (2015, p. 140) that states that the declarative memory is involved in learning of simple words and mappings, and that older L2 learners may depend more on this memory system than L1 learners (Ullman, 2001, p. 111). However, there are also some inherent challenges with conducting research on patients with

different forms of impairments. One is that one cannot control where the damage has been caused, nor are such lesions typically reduced to a single area or component of the brain. In addition, compensation of neural structures in the brain also reduces the time available for such studies, as other structures may adopt some functions that have been impaired by the lesion (Ullman, 2015, p. 146). This makes it difficult to accurately describe which structures are damaged, and how this is manifested in the processing of language.

Instead, other, more concrete measures of the brain have been employed to reveal the patterns of the declarative and procedural memory. One such method is to use Event-Related Potentials (ERPs) to measure electrical activity in different areas of the brain following different stimuli. For language processing, this method allows researchers to pinpoint, with millisecond measurements of cerebral activity, the temporal resolution of language processing. Still, these measurements do not reveal much about the actual structures involved in processing, and they are also quite sensitive to unwanted stimuli (Ullman, 2015, p. 146). To account for this, functional magnetic resonance imaging (fMRI) has also been used to detect neural activity in the brain by means of changes in blood oxygen levels. The basis for this method is that neural activity following stimuli causes blood oxygen level to change in a specific region associated with that stimuli. Unlike ERPs, fMRI allows for great spatial resolution, allowing researchers to measure activities in specific regions of the brain following the onset of stimuli. Although this method alone is not ideal for measuring real-time changes in the brain during processing, as changes to the blood are too slow, combining ERPs and fMRI offers a comprehensive picture of how the brain operates during language processing (Ullman, 2015, p. 148). For SLA research, these methods are important as they provide alternative measurements of linguistic knowledge besides observing learners' linguistic behaviour, which can often be influenced by external factors that prevent accurate descriptions of language development.

2.1.3 The question of interface

As there is ample empirical and theoretical evidence in support of a distinction between explicit and implicit knowledge, a discussion regarding a possible relationship between the two types of knowledge has ensued. Known as the interface question, this discussion refers to the theoretical notion that there are different ways in which explicit knowledge interacts with and influences the acquisition of implicit knowledge. This debate reflects two primary opposing views of how language is acquired and how it can potentially be affected by different factors. These views have been centred around two core questions, namely whether explicit knowledge can become implicit knowledge through a proposed interface between the two, and whether explicit instruction could lead to implicit linguistic knowledge through a process of facilitation (Suzuki & DeKeyser, 2017).

The distinction between acquisition and learning is important, as it emphasizes the crucial difference between what type of knowledge can be influenced by negative evidence and whether this knowledge could potentially become acquired implicit knowledge (Ellis & Sheen, 2006, p. 577). The acquisition of L2 is typically seen as involving development of implicit knowledge, yet any consensus to how this is achieved and what role explicit knowledge plays in this process remains to be defined (Ellis, 2005, p .143). Moreover, previous research has been unsuccessful in establishing a clear connection which can be used to argue for or against an interface between explicit and implicit knowledge (Roberts et al., 2018, p. 136). The interface debate can be therefore related to the fundamental question of the difference between learning and acquisition, and the relationship between explicit and implicit knowledge, which can be defined as central issues within most paradigms of SLA (Whong, 2013, p. 238).

Three separate positions have been claimed by researchers related to the interface between explicit and implicit knowledge, namely the *no interface position*, the *strong interface position*, and the *weak interface position*. The no interface position, advocated most notably by Krashen (1982; 1985), is characterized by a strict separation of explicit and implicit knowledge. The central claim held by proponents of this approach is that there is no interaction or conversion between the two forms of knowledge, and that explicit knowledge does not have any influence on the acquisition of implicit knowledge. For instance, although it is argued that explicit instruction may appear to affect implicit knowledge, such effects are attributed to learning of explicit knowledge instead of changes to the underlying linguistic competence (Suzuki & DeKeyser, 2017, p. 4; Umeda et al., 2019, p. 180). Further support of

the no interface position can be found in VanPatten (2016), who argues that explicit knowledge cannot become implicit knowledge on the basis that implicit knowledge differs fundamentally from what is learned through explicit instruction. He argues that there are no internal mechanisms for converting data from explicit knowledge into abstract and implicit linguistic knowledge, a necessity for claiming the existence of an interface position according to him (VanPatten, 2016, p. 654).

A similar position is also held by Schwartz (1993), who posits that explicit knowledge and instruction does not affect implicit knowledge, or linguistic competence, but rather a separate form of knowledge, *learned linguistic knowledge* (LLK). She further argues that one might learn aspects of language following target language exposure and memorization, yet this knowledge does not constitute core linguistic competence. This process may benefit from explicit instruction and exposure to negative evidence by means of CF, but the outcome is still hypothesized to be distinct from what can be understood as implicit knowledge. This view of linguistic knowledge then reflects formal approaches to language and the contrast between learning and acquisition. More specifically, in it lies the assumption that core linguistic competence is acquired, whereas peripheral properties are learned (Whong, 2013, p. 238).

In contrast, the strong interface position follows the argument that explicit knowledge does not only affect and facilitate the acquisition of implicit knowledge, but also that explicit knowledge is a necessary component of L2 acquisition (Ellis, 2005, p. 144). Contrary to the no interface position, the strong interface position maintains that there is a significant connection between explicit and implicit knowledge, and that the former affects or is the starting point of the latter. This position is also closely related to skill acquisition theories, who claim that learners progress through a series of stages. The first stage, obtaining declarative knowledge, involves learners developing explicit knowledge about the language. Through proceduralization of this knowledge, learners are hypothesized to reach a stage of automatization, where knowledge can be retrieved with complete fluency and spontaneity, and without the presence of awareness (Han & Finneran, 2013, p. 372). Skill acquisition theories are typically characterized by the assumption that learning a language is like learning any other skill, and that this is primarily a conscious process driven by exposure to explicit knowledge and instruction (DeKeyser, 2015). By consciously attending to the target language, learners are assumed to benefit from both explicit and implicit knowledge in L2 processing and production. In other words, there is a connection between the two types of knowledge in that learners are dependent on both in the L2 acquisition process, and that explicit instruction

and CF treatment may benefit the transition from declarative to automatized knowledge (Leeman, 2007, p. 117).

Lastly, proponents of a weak interface position acknowledge the possibility of explicit knowledge benefitting implicit knowledge, although there are differing accounts of how this process is achieved. Different approaches to the weak interface position have been proposed, including models that frame explicit knowledge as a facilitator for acquiring implicit knowledge and the possibility for explicit knowledge to convert into implicit knowledge (Ellis, 2005, p. 144). A typical feature of these positions is to maintain the difference between acquired implicit knowledge and learned explicit knowledge, although it is still assumed that both types of knowledge serve a role in acquiring L2 grammar (Whong, 2013, p. 238). Consequently, subscribing to the notion of a weak interface position does not entail similar emphasis on consciousness as the one found in the strong interface position. Although learners may benefit from increased consciousness during L2 acquisition, particularly in terms of noticing elements in the input, SLA is not argued to be driven by this alone (Han & Finneran, 2013, p. 373). Conversely, whereas the no interface position argues that learners do not benefit from explicit instruction, many proponents of a weak interface claim that instruction and CF may in fact be beneficial for the acquisition process. Thus, regarding how explicit and implicit knowledge are perceived as interfacing, in addition to the hypothesized role of CF and negative evidence, the weak interface positions constitute a somewhat intermediate stance between the previously mentioned positions.

2.2 The role of negative evidence and corrective feedback

Collectively, the three interface positions represent not only the fundamental opposing views of the relationship between explicit and implicit knowledge, but they also reflect the core assumptions regarding the potential role of negative evidence and CF in SLA. Although a controversial take on the SLA debate when published and in the decades that followed, Krashen's (1982; 1985) views of language acquisition have also found substantial support in fields of linguistics and neurobiology. Similarly, as discussed above, other researchers have claimed opposing or mediating views regarding the interface between explicit and implicit knowledge. These questions are therefore highly relevant for SLA research, as they define whether one should assume that CF and negative evidence could have any influence on linguistic competence, or whether explicit catering to language only serves to influence explicit knowledge about the target language.

Before proceeding to a more detailed discussion about CF in SLA research, it is necessary to outline and define what is meant by negative and positive evidence and how this relates to CF in the context of language acquisition. This distinction may seem intuitive on the surface, but the terminology surrounding the two terms is often vague and inconsistent. This is partially due to the substantial amount of research into the effects of positive and negative evidence in language acquisition, in addition to its significance for other fields of study, such as applied linguistics and language instruction. Based on this background, there is one key issue that serves to drive the debate of CF in SLA research, namely determining which types of input or linguistic evidence that should be treated as relevant for language acquisition (Leeman, 2003, p. 38).

2.2.1 Linguistic evidence in language acquisition

Linguistic evidence in the context of language acquisition refers to data available to learners about whether a specific construction is permitted in the target language or not. Chomsky (1981, p. 8) identified a set of three forms of evidence potentially available to learners: 1) positive evidence, e.g., in examples of target language word order; 2) (direct) negative evidence, for instance in the form of corrections; and 3) indirect negative evidence, stemming from the of absence of particular structures or rules from the input. Depending on context and purpose, learners are exposed to either positive evidence alone, such as in cases where only grammatical target language examples are provided, a combination of both positive and negative evidence by means of input *and* for instance correction, or the absence of positive evidence (i.e., indirect negative evidence), which in theory can be used to make inferences about the ungrammaticality of specific aspects of the L2. In short, linguistic evidence supplies learners with linguistic data and information about the target language through examples of L2 structures and responses to production (Leeman, 2007, p. 112).

Regarding the definition of the different types of linguistic evidence, it is also necessary to carefully consider what they entail. Positive evidence is defined by Bruton (2000) as "utterances which give the learner unconscious knowledge of what the language allows" (p. 121); it refers to linguistic input comprising of instances of well-formed sentences, which supplies learners with examples of what is permitted in the target language (Gass, 2003, p. 225). This linguistic input is part of what is also known as primary linguistic data (PLD), which constitutes the essential input for language acquisition (Schwartz, 1993). A central claim made by many formal approaches to language acquisition is that exposure to PLD alone cannot lead to language acquisition, as learners are able to produce significantly more

constructions than they would ever encounter. Because of this, some have argued that humans must possess some innate domain-specific system for language that makes humans particularly adaptive to language. In generative views of acquisition, it is thus argued that PLD from exposure to the target language interacts with this underlying domain-specific system of language, called Universal Grammar, to form the basis for language acquisition. This entails that although input may constitute an essential part of the foundation of linguistic competence, a system of language is also required to make use of this input (Bruton, 2000, p. 122).

In contrast, direct negative evidence, or simply negative evidence for the purposes of this thesis, is generally understood as information about what is not permitted in a target language, provided either implicitly or explicitly (Gass, 2003, p. 226). However, this is still a rather broad definition which does not accurately capture the essence of the term, as this can mean both metalinguistic information about target language expressions and negative responses to nontarget language production (Whong, 2013, p. 241). Some authors therefore make a distinction between these two, referring to the former as negative evidence and the latter as negative feedback (Ortega, 2009, p. 71), whereas others only differentiate between positive and negative evidence in language acquisition (e.g., Oliver, 2018). Still, regardless of whether one subscribes to the differentiation above, negative evidence in both senses of the term can be provided by means of CF and explicit instruction about the target language in the context of SLA research and language instruction (Ellis & Sheen, 2006, p. 585).

An often-cited issue regarding negative evidence in SLA-research is that it is not essential for acquiring a language, and that learners do not or cannot make use of negative evidence in the process of acquisition. This view is particularly prominent within approaches to language acquisition stemming from the no interface position, which have typically treated negative evidence as irrelevant for L2 acquisition (Gass, 2003, p. 226). For proponents of this view, this argument is supported by the apparent absence of negative evidence in the input available to learners (MacWhinney, 2004, p. 884). Consequently, negative evidence has historically occupied a more peripheral position than positive evidence in generative and more formal approaches to SLA (Whong, 2013, p. 240), a matter which will be discussed in subsequent sections.

Lastly, indirect negative evidence refers to instances where the absence of positive evidence without the presence of correction or other forms of negative evidence constitutes a form of negative evidence in itself. Although it is still debated how indirect negative evidence contributes to language acquisition, it could potentially serve as input in a probabilistic acquisition process by gradually reducing the probability of an expression to occur (Yang et al., 2017, p. 113). However, it is also important to note that examples of both grammatical and ungrammatical expressions are often absent from the input. In other words, if all absences of expressions are to be treated as indirect negative evidence, this would cause a significant size of the acquired language to be rejected as examples of ungrammaticality in the target language. This means that it is challenging to conclude whether the lack of a linguistic structure alone determines the grammaticality of other structures and rules in the target language.

2.2.2 Corrective feedback

As outlined in the previous section, negative evidence is a broad term that includes both metalinguistic explanations about what is permitted in a target language and negative responses to nontarget-like production. The latter is generally related to CF in contexts of language instruction and refers to the pedagogical aspect and corrective intention of an interlocutor (Ellis, 2009, p. 3; Leeman, 2007, p. 112). Thus, whereas negative evidence can encapsulate both explicit metalinguistic comments and locutionary responses, such as conversation breakdown or cues from body language, CF refers specifically to strategies – either written or oral – where some form of interaction is assumed (Bruton, 2000, p. 120; Ortega, 2009, p. 71). Furthermore, as opposed to other forms of negative evidence, CF is reactionary, meaning that it acts as a response to an ill-formed utterance in the target language (Oliver, 2018, p. 1). Therefore, CF is often viewed as specifically tailored towards providing learners with either implicit or explicit responses to draw attention to erroneous utterances in a target language, with the purpose of using this in a pedagogical context (Lee, 2013, p. 217). Still, it is important to note that although CF is most commonly associated with pedagogical settings, it can potentially occur in both instructional environments and in more naturalistic settings with interactions between native and non-native speakers. Thus, a distinction can be made between conversational and pedagogical feedback, with the former referring to instances of difficulty in negotiation of meaning in natural interaction, whereas the latter is used to highlight the pedagogical aspect of language instruction (Li, 2014, p. 374).

Research on CF has experienced considerable attention regarding its potential benefits in SLA and language development (Ellis, 2010, p. 335). This research has followed a progression from a predominantly descriptive tradition of establishing a taxonomy of CF to more experimental studies of CF effects in L2 acquisition contexts (Li & Vuono, 2019, p. 97). Moreover, due to the nature of CF and its relevance to multiple fields of SLA research, it follows that there are several approaches to the question of whether it matters to language acquisition or not. Theories derived from formal linguistic approaches to SLA and the no interface position posit a no-negative evidence view, and CF, as an extension of negative evidence and explicit instruction, is thus offered no significant role in driving acquisition. In contrast, by for instance interactionist approaches and skill acquisition theories, CF is seen as an important element in L2 acquisition, both in terms of facilitating interaction and negotiation of meaning and in assisting proceduralization of knowledge (Chen et al., 2016, p. 87; Ellis, 2010, p. 336).

2.2.2.1 Classifying corrective feedback

For language instruction, oral CF is most commonly condensed into six different strategies, as proposed by Lyster and Ranta (1997), and include recasts, clarification requests, metalinguistic feedback, elicitation, explicit correction, and repetition. Although the number of strategies may vary somewhat, it is generally held that these six comprise most situations where CF is provided:

1) *Recasts* are reformulations of an incorrect utterance, using the correct form in the target language, to highlight the error without providing explicit correction.

2) *Clarification requests* are phrases which are used to elicit either a repetition or a new utterance by the speaker/learner. Such phrases indicate that there is an error in the locutionary act that has caused some form of breakdown in conversation, or that the intended message was not understood. Examples of such phrases include "I'm sorry?", or "could you repeat that, please?".

3) *Metalinguistic feedback* can refer to either instances of cues or information that serve to provide the speaker with information about the target language, or comments to indicate that something is wrong. Both instances involve signifying that something in the utterance is ill-formed, without explicitly providing the correct form, for instance by remining learners of a key linguistic feature in the target language (e.g., "remember the passive voice").

4) *Explicit corrections* are instances where the interlocutor clearly states the nature of the error and provides an explicit correction of said error.

5) *Elicitations* refer to strategies used by an interlocutor to make learners self-correct or provide the correct form, for instance "how do you say X?"

6) When using *repetition*, the interlocutor will repeat the incorrect utterance to highlight the error to learners. In language instruction contexts, this is often accompanied by a change of emphatic stress or body language.

In addition to the above taxonomy, some researchers have also elected to classify these strategies according to four factors, namely input-providing or output-pushing CF, and implicit or explicit CF (Ellis, 2010, p. 338). The former is based on the desired outcome of the correction, and whether the purpose of the specific type of CF is to provide input or promote output (Li & Vuono, 2019, p. 96; Lyster & Saito, 2010a, p. 268). Following the taxonomy of CF above, recasts and explicit corrections constitute the input-providing forms of CF, which serve to provide the correct reformulation of the erroneous utterance. This is done by either explicitly explaining the nature of the error and providing the correct form, as in the case of explicit corrections, or by providing implicit examples of the target language structure, such as in recasts. In contrast, output-pushing CF types include clarification requests, elicitation, metalinguistic feedback, and repetition (Yang & Lyster, 2010, p. 237). This classification of different CF types according to their potential for output follows the notion that pushing learners to repair or self-correct may increase their metalinguistic awareness and make them tend to potential gaps in their interlanguage development (Ellis & Sheen, 2006, p. 590; Nassaji, 2019, p. 108). Taken together, the input-providing and output-pushing classifications thus draw on the distinction found in for instance interactionist theories of language, where input, output, and feedback are treated as central components of L2 acquisition by means of communication (Chen et al., 2016, p. 87; Ellis, 2010, p. 338).

The latter form of classification, explicitness and implicitness, entails differentiating CF based on whether attention is consciously drawn to the incorrect use of the target-language, to highlight erroneous aspects of the utterance. Here, CF strategies can be categorized along a continuum, ranging from more implicit to more explicit CF. Recasts are typically claimed to be implicit, as they generally do not provide learners with any explicit information about the nature of the error. On the other end of the continuum, explicit types of CF, such as explicit corrections or metalinguistic feedback, provide learners with detailed descriptions of the erroneous utterance and metalinguistic explanations of the target language structure (Russell

& Spada, 2006, p. 138). Research on both forms have found varying results in terms of saliency and effects on acquisition. For instance, implicit CF is often taken as an effective approach to increasing learner autonomy and maintaining the flow of communication, whereas explicit CF may be helpful for increasing metalinguistic awareness and the building of declarative knowledge, assumed by some to be the starting point of automatized knowledge (Chen et al., 2016, p. 89; Ellis, 2010, p. 338).

Whereas the input-output classification above is relatively straightforward in the sense of determining the class of each individual CF, the classification of explicit and implicit CF is more complicated. This is primarily because there are several factors influencing whether different CF types can be said to be explicit or implicit, such as learners' perceptions and instructors' intentions. In addition, other factors, such as discourse context and linguistic target, are all important elements that influence how CF can be perceived and classified (Ellis & Sheen, 2006, p. 592; Lyster & Saito, 2010a, p. 268). However, although this complicates the process of classifying CF, this also means that there is potentially ample room for modifications (Ellis et al., 2006, p. 348). As an example, even though recasts are primarily seen as implicit in CF research, modifications can be made to draw learners' attention towards the error by for instance increasing the emphatic stress on incorrect elements in the utterance or additional repetitions of the reformulation (Ellis & Sheen, 2006, p. 583).

2.3 Theoretical approaches to second language acquisition

Returning to the question of the relevance of CF and negative evidence in SLA, there are some key theories of L2 acquisition that require closer examination. Most notably, these include formal linguistic approaches related to the no interface position, such as the generative tradition, in addition to interactionist approaches and skill acquisition theories. The common factor for these theories is that they all impose certain constraints on how language instruction is assumed to influence L2 acquisition, particularly regarding how explicit and implicit knowledge may or may not interact. Moreover, these theories also entail different assumptions regarding the effects of CF and negative evidence on L2 acquisition, and whether such treatments can be claimed to be relevant for the acquisition of implicit knowledge. The remaining sections of this chapter are therefore devoted to examining the core principles of these approaches to SLA and the hypotheses they claim describe the process of L2 acquisition.

2.3.1 Formal and generative approaches to questions of SLA

As noted in previous sections, the position held by many formal and generative paradigms in SLA research has been to treat negative evidence as merely superfluous data, incapable of any significant changes to the internal linguistic system. Although learners can potentially be exposed to both positive and negative evidence through input, the general tendency of these approaches has been to treat negative evidence as peripheral, at best, to the process of L2 acquisition.

Historically, generative models of SLA have been largely shaped by research in the Chomskyan tradition, following the claim that human language is a biologically determined set of principles and parameters that account for all language development (Rankin & Unsworth, 2016). In this lies the assumption that humans possess some innate core linguistic knowledge which does not stem from external sources, meaning that it must be based on some form of linguistic predisposition (Whong, 2011, p. 44). This predisposition is explained in terms of an internal system of linguistic principles, referred to as Universal Grammar (UG), that serves to drive language acquisition processes independent on the availability of negative evidence (Chomsky, 1981; Schwartz, 1993). The core assumption of UG is that learners do not have to learn these principles, as they are embedded mechanisms entailed by the posited existence of UG. As such, they are universal constrains on grammar that applies to all humans, regardless of their L1s. In contrast, parameters account for the observed variability of language across languages. It is argued by proponents of UG that input data triggers parametric choices and determines the appropriate parameter value made available by UG (White, 2015, p. 38). Metaphorically, these parameters can thus be understood as switches or encoded values in UG that when set to a specific value allows for crosslinguistic variation.

Another important aspect of language acquisition stemming from the generative tradition is the distinction between *competence* and *performance*, which are terms that describe the underlying system of linguistic knowledge and how it is manifested. The former, competence, relates to the notion of UG and a system of innate linguistic knowledge, otherwise understood as the implicit knowledge of core structural properties of language, developed through the process of acquisition (Whong, 2011, p. 45). In contrast, performance is used to describe linguistic behaviour that stems from this knowledge. It is often understood as the manifestation of linguistic competence, and as such, it is susceptible to numerous extralinguistic factors outside core linguistic knowledge, such as errors, lack of attention, and other forms of noise. The relationship between the two is based on the notion that one cannot

observe competence or innate linguistic knowledge, only how it is manifested in performance through production of language (Schwartz, 1993, p. 150). Because of this distinction, the process of studying and understanding linguistic competence is made significantly more complicated, as it is argued that data obtained from production studies, i.e., studies of performance, may not accurately reveal the underlying systems of linguistic knowledge (White, 2003, p. 17).

The existence of UG has been motivated by what is known as the Poverty of the Stimulus argument (White, 2003, p. 4). Based on observable aspects of language acquisition, a mismatch can be found between what language learners are exposed to in the input and the output they will produce. This discrepancy is also understood as the logical problem of language acquisition, where UG is understood as the underlying mechanism that explains why learners acquire properties of grammar that is not present in the input. According to this view, the process of acquisition is argued to be primarily shaped by two factors. The first factor consists of genetic and innate domain-specific structures for processing language, meaning UG. The second factor involves exposure to PLD, meaning instances or examples of target language input from contextualized utterances – in other words, positive evidence (Rankin & Unsworth, 2016, p. 3; Schwartz, 1993, p. 148). As a consequence, one of primary aims of generative SLA has been to detail the relationship between innate structures of language and knowledge from exposure to target language input (Rothman & Slabakova, 2017, p. 3).

Regarding linguistic evidence obtained through input, it is assumed that only positive evidence through PLD leads to changes in competence, whereas negative evidence does not. It has been a long-standing position in formal and generative approaches to SLA that linguistic competence and internal language systems cannot be affected by negative evidence, and therefore CF and explicit instruction have been argued to be irrelevant for language acquisition (Chen et al., 2016, p. 88). Proponents of this view of linguistic evidence have cited observational and experimental data which suggest that research cannot rely on negative evidence for a universal theory of language acquisition. Specifically, observations from multiple settings show that negative evidence is oftentimes limited or altogether absent from the input. Even when negative evidence is present in the input, it may be faulty, too ambiguous, or simply ignored by learners, suggesting that negative evidence cannot be part of the core factors necessary for acquisition (Leeman, 2007, p. 114; Yang et al., 2017, p. 112).

Following the above view, any changes to performance following exposure to negative evidence must be accounted for through different means than changes to linguistic competence. To tackle this question, some researchers, such as Schwartz (1993), have proposed a reanalysis of the distinction between competence and performance. She differentiates between performance, which is knowledge that stems from linguistic competence, and learned linguistic behaviour (LLB), which is the result of learned linguistic knowledge (LLK). Like most generative linguists, she argues that negative evidence does not affect linguistic competence, hence UG is only driven by positive evidence (Schwartz, 1993, p. 153). However, she also hypothesizes that there is a separate system for knowledge which is activated during L2 acquisition. This knowledge, LLK, is manifested in LLB, meaning that any changes in what would previously constitute performance are rather reanalysed as effects on this separate system of knowledge. Following this logic, negative evidence does not affect linguistic competence, which can only be influenced by positive evidence, but rather LLK (Schwartz, 1993, p. 152). Consequently, changes in L2 behaviour does not necessarily mean that the underlying linguistic competence has been changed, but rather a separate system which can be modified by both positive and negative evidence.

2.3.1.1 Access to Universal Grammar in L2 acquisition

Overall, contributions of generative approaches to SLA have been significant in shaping how the internal mechanisms of language acquisition are assumed to function, both in considering the role of negative evidence and CF, but also in how L2 learners are hypothesized to progress from their initial L1 to the L2 grammar. Still, it is also necessary to consider the topic of UG in L2 acquisition and the question of whether UG is accessible to L2 learners or not. Several researchers have devoted extensive research to the role of UG in L2 acquisition (e.g., White, 2003; Schwartz, 1993; Schwartz & Sprouse, 1996). The motivation behind this question lies in the fact that L2 learners appear to face tasks and challenges similar to those faced by L1 learners, especially in terms of poverty of the stimulus and access to target language structures and rules (Rothman & Slabakova, 2017, p. 4). As noted above, the existence of UG is primarily motivated by learnability arguments in that the exhaustive L1 system of grammar surpasses any available input to which learners may be exposed. Thus, this argument of the poverty of the stimulus is used to emphasize that there must be underlying structures that aid learners in acquiring language, and that these structures are present in all humans (White, 2003, p. 4).

However, even though similar inferences can be drawn from observations in L2 acquisition, it is not entirely clear how and to what extent the role of UG may be of relevancy for this process, and whether the L2 grammar is constrained by UG at all. A further question that needs to be asked is also how learners acquire L2 and whether their L1s influence this process. If L2 acquisition follows the same patterns as L1 acquisition, the question is whether one should expect that UG plays a similar role in the former as it is assumed to do in the latter. This question has led some to argue that certain properties of both L1 and L2 grammar must be constrained by UG (White, 2003, p. 8). Furthermore, as remarked by White (2015, p. 36), there is evidence showing that L2 acquisition faces the same logical problems as L1 acquisition, for instance where linguistic properties are undetermined in the target language input.

One such case of undetermined linguistic properties comes from wh-questions with ambiguous interpretations. Consider the following examples from White (2015, p. 35):

1) a. *When did the boy say (that) he got a bruise?*
    b. *When did the boy say how he got a bruise?*

In (1a), the meaning of the question is ambiguous: it can either be a question about the injury, or a question about the boy's utterance itself. For (1b), the meaning is not ambiguous; the main clause is the question, as reading it as a question of the embedded clause renders it ungrammatical. The difference in these two sentences illustrates what White (2015, p. 36) refers to as the logical problem of acquisition. Although the difference between the two sentences is just one word (*how*), the intended meaning is restricted to only one interpretation for (1b), whereas (1a) has two possible meanings. In other words, there is a question of how learners can identify the ambiguity of some sentences, whereas structurally similar sentences are interpreted as unambiguous. In fact, this logical problem is true for both L1 and L2 acquisition, as noted by White (2003; 2015), as there should be no reason to assume that the L2 input is more informative about such constructions than the L1 input, unless there is some form of specific instruction. One possible explanation is that it is not direct access to UG in the L2, but rather some influence of learners' L1s on the *interlanguage* (White, 2015, p. 36) – a term used to describe the language of L2 learners, separate from the L1 and L2 and equipped with its own underlying linguistic system, or grammar (White, 2003, p. 277).

Alternatively, learners may have some access to UG when acquiring L2, which means that the process of acquisition is constrained by certain principles of UG that limit possible interpretations, like in L1 acquisition (White, 2015, p. 36). Following this notion, several different suggestions have been made as to how, if at all, L2 learners have access to UG during the L2 acquisition process and whether their L1s are involved. One such approach to this question is the *Full Transfer Full Access* hypothesis suggested by Schwartz and Sprouse (1996), which posits that the final state of L1 acquisition is the initial state of L2 acquisition. In this model, learners transfer their L1 grammar for it to function as the starting point of the L2 acquisition process. If learners encounter or are exposed to target language input that cannot be generated by this initial L2 grammar, it is then argued that some form of restructuring must occur to account for this (Schwartz & Sprouse, 1996, p. 41). In contrast, others have argued that the L1 should not play a role in L2 acquisition if UG is involved in the process, as implicating L1 parameters is seen as incompatible with the notion that L2 acquisition is driven by UG (White, 2015, p. 42). It is therefore also possible to assume a full access but without transfer position, wherein L1 is not expected to be the initial state nor implicated in interlanguage representation. Following this position then, parameters are set to L2 values independently of the L1, as UG is posited to interact with L2 input only.

Regardless of whether one subscribes to the notion of both full access and transfer or simply UG access only, the key takeaway from these positions is that it is possible to view L2 acquisition as constrained by UG, like in L1 acquisition. Questions which are returned to later then, are how input through for instance explicit instruction containing negative evidence can be argued to influence the process of progressing from L1 to L2, whether only positive evidence can be claimed to drive the L2 acquisition process, and whether the claim that negative evidence cannot influence this process can be empirically supported.

2.3.1.2 Baker's paradox and the consequences of a no-negative evidence approach

As remarked previously, a significant observation has been made in research on L2 acquisition and the role of linguistic evidence, namely that learners seem to be able to acquire language in the absence of negative evidence (MacWhinney, 2004, p. 884). This seems to support the notion that L2 acquisition is not dependent on negative evidence, and as an extension, CF and explicit instruction containing negative evidence should not be considered a core component of L2 acquisition. However, investigating aspects of SLA through positive evidence only also entails certain conflicts, particularly regarding questions of target language restrictions and issues of overgeneralization of linguistic forms.

The issue lies in how learners can distinguish acceptable grammar from the unacceptable and recover from instances of overgeneralization based solely on positive evidence. Known as *Baker's paradox* (Baker, 1979), this question has come to represent one of the core conflicts in a positive evidence-only approach to language acquisition. A learner might internalize a certain rule of the target language grammar, for instance the ability to contract *is* (e.g., "she's gone"), through exposure to positive evidence. This acquired feature of the target language will then be reinforced as the learner is exposed to further instances of such contractions, which helps strengthening the hypothesis. The issue arises when learners extend rules to other constructions that are not permitted in the target language grammar; how do learners recover from such instances of overgeneralization without the aid of negative evidence to establish boundaries in the target language? As Hsu et al. (2013, p. 36) explain, if a learner has crossed the threshold of including both grammatical and ungrammatical examples of a particular structure, every instance of a correct use of that structure will reinforce both forms. Although explicit corrections through feedback or implicit conversational cues might help the learner correct this misconception, such instances of negative evidence are also judged as inconsequential in some fields of SLA.

The question of Baker's paradox is therefore very much a logical problem in that one can infer that some form of boundary needs to be established in a language, otherwise learners would overgeneralize and overextend linguistic rules to encompass aspects of grammar that create ungrammaticality (Chater & Vitányi, 2007, p. 136; Schwartz, 1993, p. 148). In other words, there must be an explanation to how learners can recover from instances of overgeneralization and exposure to positive evidence only. This question has puzzled researchers for decades and a consensus remains to be reached. The issue thus lies in defining and incorporating this mechanism into a comprehensive theory of SLA, whilst defining the possibilities and limitations of linguistic evidence – both positive and negative.

2.3.2 Interactionist approaches and skill acquisition theories

The fundamental claim of the no interface position and generative approaches to SLA as discussed thus far is that positive evidence is the only form of linguistic evidence relevant for L2 acquisition. Following this premise, language instruction and attempts at targeting the acquisition of L2 should focus on providing exposure to positive evidence through sufficient input, whilst avoiding CF treatment and negative evidence, as this is seen as only interacting with explicit knowledge (Li, 2010, p. 311).

Contrasting the above claims about L2 acquisition and the factors that influence this process, other theoretical approaches have been suggested which have instead posited CF and negative evidence as relevant for SLA. Amongst such claims, interactionist approaches and skill acquisition theories have emerged and occupied central positions within studies of both L2 acquisition and language instruction (Ellis, 2021). For theories of SLA, both these traditions include their own set of assumptions regarding the role of linguistic evidence and the mechanisms that drive language acquisition. In terms of language instruction, these theories entail a challenge of the no interface position typically associated with formal and generative paradigms of SLA, and consequently, how explicit instruction can be argued to influence L2 acquisition and implicit knowledge.

The first of these, interactionist approaches, attempt to account for language acquisition by exploring concepts such as feedback, input, output, which are all processes that occur during interaction, following the assumption that language is developed through communicative necessities (Chen et al., 2016, p. 87; Gass & Mackey, 2015, p. 182). This perspective on L2 acquisition stems from the argument that learners acquire language primarily through interaction and by engaging with input and output, and that feedback and certain cognitive processes, such as noticing and attention, can aid this process (Nassaji, 2020, p. 4). The interactionist approaches thus subsume some aspects of the Input Hypothesis, as proposed by Krashen (1985), in that acquisition is primarily driven by exposure to input that is made comprehensible to learners. However, according to interactionist models of SLA, input alone is insufficient for acquisition, as participation by means of language production is also argued to be an important factor in L2 development (Leeman, 2003, p. 43). Therefore, interactionist approaches also draw on Swain's Output Hypothesis (Swain, 1985), which states that language production can encourage learners to notice the gap between their own utterances and the target language, in addition to aiding hypothesis testing and syntactic processing through output and subsequent feedback (Gass, 2003, p. 227; Gass & Mackey, 2015, p. 185; Nassaji, 2016, p. 3). Moreover, interactionist approaches also emphasize cognitive processes such as noticing and attention, which are argued to facilitate L2 acquisition by making learners tend to nontarget L2 production by modifying their output (Gass & Mackey, 2015, p. 181; Leeman, 2003, p. 43).

Regarding the role of CF and negative evidence, it is posited by interactionist approaches that by engaging in communication, learners benefit from both feedback on production and from the process of modifying their output following such feedback. In other words, output and feedback can be seen as closely associated concepts in that the basis for feedback is the language produced by learners, who in turn may benefit from the linguistic information in improving L2 comprehension and modification of output (Gass & Mackey, 2015, p. 183). In addition, input is argued to be the fundamental drive behind the acquisition process by both revealing ungrammatical aspects of the target language, for instance through CF, and by providing examples of grammatical target language structures. For interactionist views of SLA then, both forms of linguistic evidence are relevant for L2 acquisition; positive evidence constitutes the core linguistic input necessary for acquiring language by means of exposure to target language structures and rules, whereas negative evidence is necessary for the process of noticing gaps in language knowledge and for arriving at the correct hypotheses about the target language in response to output (Li, 2010, p. 311). For interactionist approaches to SLA, CF and negative evidence thus promote L2 acquisition by making input more comprehensible, by drawing learner's attention to potential mismatches between the interlanguage and the target language, or by promoting modification of output.

An alternative approach to SLA and the question of negative evidence and CF in language acquisition is through skill acquisition theories. According to this perspective, learners progress through three distinct cognitive stages when acquiring an L2: building of declarative knowledge, proceduralization of knowledge, and finally, automatization. Drawing on research from cognitive psychology, this process of learning language is thus treated like learning any other cognitive skill, based on the notion that learners progress from controlled to automated processing, and with each stage entailing a decline of the cognitive load required for processing language (Chen et al., 2016, p. 87; Leeman, 2007, p. 116).

During the initial stage, building of declarative knowledge, it is hypothesized that learners accumulate explicit knowledge about the language, and that this knowledge is consciously available and retrievable. Following this process, learners progress through proceduralization of said knowledge, in which changes to cognitive structures involved entail the addition of multiple procedures, resulting in the implementation of increasingly complex skills. In the final stage, knowledge is argued to be automatized and requires minimal effort in retrieval. In this stage, the declarative knowledge has become internalized and effortless, resulting in practically error-free performance (Leeman, 2007, p. 117).

From this perspective, the core assumption regarding language acquisition is that the basis for implicit knowledge or linguistic competence is explicit or declarative knowledge. In other words, skill acquisition theories reflect the strong interface position in that it is assumed to be a close relationship between explicit and implicit knowledge. Following this notion, CF and negative evidence, provided by means of explicit language instruction, constitute central factors for the L2 acquisition process. For the declarative stage, this is argued to be most prominent in terms of avoiding acquisition of incorrect forms and ungrammatical structures in the target language by consciously monitoring the information utilized for acquisition. For the subsequent proceduralization, CF and negative evidence are hypothesized to aid L2 acquisition by indicating which forms learners need to pay attention to and for assisting re-evaluation of L2 hypotheses (Ellis, 2010, p. 336). Consequently, CF is seen as a facilitator of implicit knowledge, although the question of which type is the most effective during the different stages remains to be settled (Chen et al., 2016, p. 87; Leeman, 2007, p. 117).

As opposed to formal and generative claims, the common factor for both theoretical approaches discussed in this section, and other perspectives positing the relevancy of CF and negative evidence in SLA, is the assumption that such factors may function as facilitators or catalysts for L2 acquisition. For interactionist approaches, this happens primarily through noticing of gaps between learners' current interlanguage development and the target language, whereas skill acquisition theories treat CF and negative evidence as important for building and proceduralizing grammatical L2 structures and rules. Considered collectively then, both these models of SLA and language development reflect the core assumption that L2 acquisition is driven by more than simply exposure to positive evidence alone. In this also lies a notion of successful L2 use, in that L2 acquisition can be judged by whether learners are able to use the L2 during interaction with others. This is particularly prominent for fields of language instruction and pedagogy, but also interactionist approaches, where the ability to communicate meaning in context can be seen as an important goal of the SLA process. This then stands in stark contrast to what is commonly assumed by paradigms stemming from the no interface position.

As discussed in previous sections, skill acquisition theories are typically associated with the strong interface position, based on the assumption that explicit or declarative knowledge are important components for developing implicit knowledge. Interactionist approaches to SLA reflect a lesser focus on explicit knowledge, although both noticing and attention are emphasized as cognitive factors that facilitate L2 acquisition, and that learners may benefit from consciously attending to ungrammatical aspects of their interlanguage development by modifying their output (Han & Finneran, 2013). These foundations and assumptions entail different approaches to the question of whether explicit knowledge and instruction can influence the development of implicit knowledge. Nonetheless, the important element to consider is that both skill acquisition theories and interactionist approaches can be understood as positing a role for CF and language instruction, and as an extension, both negative and positive evidence in SLA.

The different theories discussed here also entail differences in terms of what form of CF is emphasized, depending on how L2 acquisition is posited to occur. For instance, following the distinction between explicit and implicit CF, as discussed previously, some crucial inferences can be drawn regarding their role in interactionist approaches and skill acquisition theories. For the former, implicit CF can be treated as particularly relevant, as such CF types both maintain a non-interruptive flow of communication whilst allowing for negotiation of meaning (Zhao & Ellis, 2020, p. 2; Gass & Mackey, 2015, p. 187). For the latter, an emphasis can be found on explicit CF and how it can be argued to aid the process of establishing and proceduralizing declarative knowledge (Ellis, 2010, p. 336). This is not to say that these theoretical approaches deny the relevancy of certain types of CF in L2 acquisition, like the argument claimed by formal and generative traditions, but rather that the focus is differentiated regarding which types of CF are posited to be more effective. Still, it is also important to note that the theories discussed here are diverse, and that within both skill acquisition and interactionist traditions there are individual approaches that deviate somewhat from the general perspectives discussed above (Chen et al., 2016, p. 87). This also signifies, as discussed later in light of the studies reviewed in this thesis, that there are significant differences between the individual CF types and how they can be claimed to influence L2 acquisition.

Summarizing the theoretical background that provides the foundation for further discussions, there are essentially two opposing positions. The first follows formal and generative approaches to language in that L2 acquisition is driven by positive evidence, and the no interface position in that implicit knowledge and linguistic competence cannot be affected by explicit knowledge and instruction. The second position takes the form of several different theoretical approaches that share the belief that L2 acquisition is in some form influenced by factors such as negative evidence and CF, either directly or indirectly, and can thus be attributed to either strong or weak interface positions. Regardless, it should be noted that the opposing views of SLA questions discussed thus far are primarily theoretical. The following chapters therefore detail and discuss some key empirical findings related to these theoretical assumptions, and what such studies entail for SLA research and the role of CF and negative evidence.

3.0 Reviewing previous studies

The following chapter includes a review of previous research on CF and negative evidence in L2 acquisition, stemming from the theoretical approaches to SLA discussed in the previous chapter. These studies sought to answer questions about the role of negative and positive evidence in L2 acquisition, the overall effectiveness of providing CF compared to no CF, potential factors that influence CF effectiveness, and the relative effectiveness of different types of CF.

One factor that has been argued to influence the CF effectiveness in SLA is the research setting. CF research has generally been conducted in either classroom or laboratory settings, depending on scope and purpose of the study, and several studies have found a larger effect size for CF treatment in laboratory settings compared to classroom settings (Lyster & Saito, 2010a, p. 267; Plonsky & Oswald, 2014, p. 897). For this thesis, both classroom and laboratory studies were included to maintain a broad perspective on the topic, although the difference in effect sizes are commented on in later chapters. Another key variable that has been identified in CF and SLA research is the type of CF, as noted in the previous chapter. This is particularly relevant for the subordinate research questions for this thesis, and therefore studies that have compared the different types were included, with a specific focus on the distinction between both explicit and implicit CF and input-providing and output-pushing CF. Studies that focused only on explicit instruction with positive evidence, such as Trahey (1996) and White et al. (1996), were not included, as the primary purpose of this thesis was to investigate the potential effects of negative evidence in SLA, not positive evidence.

Due to the extensive volume of papers published on the topic of CF and SLA research, a relatively broad scope of journals and databases were examined for this thesis in order to obtain previously conducted studies on the topic. Research on CF and negative evidence has been produced across multiple fields related to SLA, which has resulted in findings that have been relevant to various paradigms but also spread across several publications. Because of the research questions for this thesis, it thus followed that engaging with several sources was crucial for identifying relevant studies for the review and discussion. Thus, the studies reviewed here are relevant for the specific research questions discussed here, but also for providing a representative picture of previous findings of CF and negative evidence in SLA.

Consequently, this thesis includes studies of oral CF and language instruction published in multiple academic journals (e.g., *Applied Linguistics, Language Learning, Language Teaching Research, Second Language Research, Studies in Second Language Acquisition, etc.*), accessed through electronic database searches (e.g., JSTOR, ScienceOpen, and Springer), or by using search engines (e.g., Google Scholar, ORIA, and Semantic Scholar). For a full account of the databases, search engines, and academic journals included, in addition to a description of the search method and a list of searched keywords, see the appendix. Moreover, retrieved studies or papers were also utilized for chain search, meaning that the reference lists of previously acquired studies were used to find additional studies. For this process, search engines also provided additional access to studies that were not localized in the listed databases.

Several meta-analyses and literature reviews have been conducted on the role of CF in L2 acquisition. For instance, Russell and Spada (2006) performed a meta-analysis of 56 classroom and laboratory studies of the effects by CF on L2 learning. Their findings support an overall beneficial role of CF in L2 learning, yet the results do not necessary entail that CF can be directly implicated in the building of linguistic competence, as the effects could potentially be attributed to activation of explicit knowledge instead. Russell and Spada (2006, p. 152) also reported that the studies that included delayed post-testing reported medium or large effects of CF. Still, compared to the total number of studies reviewed in this meta-analysis, there were few studies that included delayed post-testing, which complicates the process of determining lasting effects of CF. In another meta-analysis of both laboratory and classroom studies, Li (2010) found an overall medium effect of CF on L2 learning, with explicit CF in the form of metalinguistic feedback and explicit correction having the largest immediate effects. However, he also found that implicit CF, particularly recasts, yielded larger long-term effects. This has led some researchers to suggest that implicit CF types are better suited for acquisition and long-term retainment of knowledge, as noted by Li and Vuono (2019, p. 98).

Lyster and Saito (2010a) also found a positive effect on L2 learners' production and interlanguage development in their meta-analysis of studies on recasts, prompts, and explicit correction. However, in contrast to Li (2010) and Russel and Spada (2006), Lyster and Saito (2010a) only included classroom studies. They concluded that from an instructional perspective, learners may benefit more from the negative evidence and potential for output provided by prompts, as opposed to recasts, although they cited positive effects for all types of CF (Lyster & Saito, 2010a, p. 290). Due to limitations of space, not all meta-analyses are included here, but for a more detailed discussion of CF research in previous decades, see for instance Goo (2020), Lyster and Saito (2010b), Nassaji, (2016), and Norris and Ortega (2000).

Despite overall evidence in support of CF in SLA, it should also be noted that CF consists of a diverse group of strategies. Thus, it is untenable to generalize results of one type of CF, for instance recasts, across all forms of CF. Because of this, some studies have sought to determine the relative effectiveness of different CF strategies compared to one another, based on effect size, longevity, noticing, in addition to factors such as explicitness, input, and output. Other studies have taken a more fundamental approach, investigating the role and relevancy of linguistic evidence in SLA by comparing the effects of providing only positive evidence to instruction containing both positive and negative evidence. Although these studies investigate some theoretical assumptions that are outside the immediate scope of more CF-related research, studies on negative evidence and explicit instruction should nonetheless be considered highly relevant for theoretical and applied approaches to CF in L2 acquisition, due to the close relationship between these concepts. In the following sections, different studies of both negative evidence in SLA and specific CF-related studies are detailed, focusing on the purposes and overall structures, treatment and testing procedures, and the reported results of each study. These studies then function as a foundation for the subsequent discussion of the role of CF and negative evidence in SLA.

3.1 Studies of negative evidence and language instruction

One study that has attracted significant attention in research of negative evidence in SLA is White's (1991) investigation of English adverb placement and verb raising. She examined the effects of negative evidence on the acquisition of the verb movement parameter by 10-12-year-old L2 learners. The experimental group was exposed to negative evidence in the form of explicit instruction about the ungrammaticality of subject-verb-adverb word order (SVAO)

and positive evidence for the target structure subject-adverb-verb (SAVO), whereas the comparison group received positive evidence only. They were tested twice, once immediately after instruction and again five weeks later. In addition, some of the learners were tested one year later as part of a follow-up. Tests included a written grammaticality judgement task, a written preference task, and a sentence manipulation task. The results of the study showed that the group receiving both negative evidence and positive evidence was more effective in mastering the target structures, whereas positive evidence alone proved to be insufficient. Despite this, the follow-up testing also revealed that the effects were not long-term, indicating that neither treatments (i.e., both negative and positive evidence, and positive evidence alone) led to changes in the learners' linguistic competence (White, 1991, p. 158). Furthermore, as the long-term effects showed that the learners who received only positive evidence did not retain the effects either, White concluded that this signified that this treatment alone is insufficient for long-term retention of knowledge (White, 1991, p. 158), a conclusion that has caused much debate in subsequent papers (see Schwartz & Gubala-Ryzak 1992), White (1992), and White (2003) for further discussions of the results).

Additionally, two similar studies were conducted by Snape and Yusa (2013) and Izumi and Lakshmanan (1998). The latter focused on explicit instruction of English passives to adult L2 learners, where the experimental group received negative and positive evidence in the form of explicit instruction on the impossibility of indirect passives in English, whilst the control group received positive evidence only. Learners were post-tested five days after instruction and again eight weeks later, by using a translation test, a picture-cued production test, and a grammaticality judgement task. Like White (1991), Izumi and Lakshmanan (1998) found that the learners who received negative evidence outperformed the control group that did not receive this instruction. However, no long-term post-test was included in this study, as learners were only post-tested five days and eight weeks later; in addition, very few learners participated in the second post-test (Izumi & Lakshmanan, 1998, p. 77). These results indicate that the effects of negative evidence and explicit instruction may have a short-term effect on L2 acquisition and knowledge, but the results of this study are nonetheless inconclusive to the extent of which explicit or implicit knowledge was implicated in the process.

Snape and Yusa (2013), in their study of definiteness, specificity, and genericity of English articles, also provided adult L2 learners in their experimental group with explicit instruction consisting of both negative and positive evidence. A forced-choice elicitation task, a grammaticality judgement task, and a transcription task was administered the first day of instruction, three weeks later, after instruction was completed, and again a week after that. As opposed to Izumi and Lakshmanan (1998) and White (1991) however, Snape and Yusa (2013) found no additional gains for the experimental group, compared to the control group. They concluded that this may have been due to task complexity, inadequate time for instruction, or that learners resorted to explicit knowledge when performing tasks, signifying that linguistic competence was not implicated (Snape & Yusa, 2013, p. 178). Like the study by Izumi and Lakshmanan (1998), Snape and Yusa (2013) did not include a long-term post-test either, which makes comparing the results of this study to the one by White (1991) significantly more challenging in terms of effects on implicit knowledge.

Another study that investigated the long-term effects of explicit instruction is Umeda et al. (2019). Here, adult L2 learners were provided explicit instruction about generics, definiteness, and specificity in L2 English articles. The instruction included metalinguistic information consisting of both positive and negative evidence, in the form of explicit information about grammatical and ungrammatical aspects of English articles. Learners were divided into three groups; one non-native speaker group received instruction, whereas the other two groups, consisting of either non-native speakers or native speakers, functioned as control groups. Four post-tests were administered, consisting of a grammaticality judgement task. Post-test 1 was conducted during the third week, following instruction on article generics but before further instruction on definiteness and specificity; post-test 2 was conducted one week after instruction and a review session was completed; post-test 3 followed twelve weeks after post-test 2; and post-test 4 was completed one year after post-test 3. Umeda et al. (2019) found positive effects of explicit instruction up until post-test 3, which differs from the results of Snape and Yusa (2013). There were two central design features that separated these studies, which Umeda et al. (2019, p. 195) argued may be the reason why the learners in their study performed better for post-test 1-3. First, the learners in Umeda et al. (2019) received instruction in their L1s, Japanese, as opposed to L2 English in Snape and Yusa (2013). Second, the study by Umeda et al. (2019) also had a longer duration, with a total of nine weeks of instruction compared to Snape and Yusa's (2013) three weeks. Despite these changes in study design, Umeda et al. (2019) found that the instruction group ratings had

declined by post-test 4, one year later. Umeda et al. (2019, p. 195) thus concluded that the positive effects of explicit instruction on L2 English article semantics could only be found in short-term knowledge.

3.2 Studies of corrective feedback

In addition to studies exploring the general effectiveness and relevancy of negative evidence and explicit instruction in SLA, numerous studies have also examined the role of CF in SLA to determine whether such treatments can be said to have any effect on linguistic competence and language acquisition.

For instance, Carroll and Swain (1993) conducted an experimental laboratory study of various forms of CF on learning of English dative alternation, focusing on adult L2 learners' abilities to generalize the rule to novel items and apply appropriate constraints to avoid overgeneralizations. The learners were assigned to one of five groups, with the fifth functioning as a control group. The treatment consisted of exposure to training stimuli of alternating sentences, and the learners were tested by measuring the percentage of correct responses to similar constructions twice during the study; once, immediately following treatment, and a second time, one week later. Group A received explicit metalinguistic feedback, group B were explicitly told their utterance was wrong (i.e., explicit utterance rejection, but no correction), group C received a model of the response desired along with implicit negative evidence that their response was incorrect (i.e., recasts), and group D were asked if they were sure about their response (i.e., indirect metalinguistic feedback). The results of both tests showed that all feedback-receiving groups, both explicit and implicit, outperformed the control group in applying learned knowledge and generalizing the abstract rules to novel items. Furthermore, group A, who received explicit metalinguistic feedback, surpassed all the other groups for both post-tests (Carroll & Swain, 1993, p. 370). However, as the delayed post-test was performed only a week later, it is difficult to discern whether the results can be attributed to acquisition or short-term retention of explicit knowledge. Carroll and Swain (1993, p. 372) also noted that the short time between the treatment and the second post-test made it difficult to generalize the results outside of the study.

Moving past investigating whether providing CF is more beneficial for L2 development than no CF, other studies have sought to determine the relative effectiveness of different CF types and variables that may potentially influence L2 acquisition. One common distinction made by CF studies is between implicit and explicit CF, often manifested as a comparison of recasts and either metalinguistic feedback or explicit corrections.

One example comes from the study by Ellis et al. (2006), who found that metalinguistic feedback was more effective compared to recasts for developing the English past tense morpheme -ed for adult L2 learners. Learners completed different communicative tasks designed to encourage the use of the target structure and make use of linguistic resources. Ellis et al. (2006) found that the effects increased between the immediate post-test and delayed post-test twelve days later, which were conducted using an elicited imitation test, an untimed grammaticality judgement task, and metalinguistic knowledge to determine the influence on explicit and implicit knowledge. Results of this study indicated that metalinguistic feedback led to greater gains in both implicit and explicit knowledge than recasts, but also that both treatments proved to be more effective than the no-CF control group.

Like Ellis et al. (2006), Rassaei et al. (2012) also compared the effectiveness of metalinguistic feedback and recasts, but focusing on the acquisition of English definite article *the* and indefinite *a*. Here, adult L2 earners participated in a story retelling task where the purpose was to elicit utterances by the learners which were subsequently corrected by the instructor, using either metalinguistic feedback or recasts. In addition, a control group that did not receive CF was also included. Rassaei et al. (2012) used timed and untimed grammaticality judgement tasks and an elicited imitation test to measure the effects on implicit and explicit knowledge. Post-testing was conducted one day after instruction and again two weeks later. The results of this study mirrored that of Ellis et al. (2006) in that the learners who received metalinguistic feedback outperformed the other groups in both explicit and implicit knowledge of the target structure, although the recast group also proved more successful than the control group.

Other studies of explicitness and implicitness in CF and SLA have opted to focus on other types of CF instead of metalinguistic feedback. For instance, Rassaei (2013) conducted a study of explicit corrections and recasts on adult L2 learners' development of English definite *the* and indefinite *a* articles. The results were recorded by means of a writing task, an untimed grammaticality test, and an error correction test, which were conducted at the end of treatment. The study showed that the learners who received explicit corrections outperformed

both the group receiving recasts and the control group. Still, as opposed to for instance Ellis et al. (2006), Rassaei (2013) did not conduct a delayed post-test, only an immediate post-test, making it difficult to conclude whether the CF treatments had any long-lasting effects.

A slightly different and more nuanced picture was found by Li (2014), who investigated the relative effectiveness of different CF types based on multiple variables, such as explicitness, learner proficiency, and linguistic target. In this study, university-level L2 learners received either metalinguistic feedback, recasts, or no CF on nontarget-like production of Chinese classifiers and perfective -le. Post-testing was conducted immediately following treatment and again seven days later, and consisted of an untimed grammaticality judgement task and an elicited imitation test. Overall, results showed that for perfective -le, metalinguistic feedback was more effective than recasts for both proficiency levels, whereas for classifiers, there was a higher effect size for metalinguistic feedback only for the low-proficiency learners. Li (2014, p. 393) thus concluded that the effectiveness of CF appears to be constrained by variables such as the type of linguistic target, CF explicitness, and learner proficiency, but also the measures utilized for testing.

Drawing on the distinction often associated with interactionist approaches to SLA, other studies have compared the effects of input-providing and output-pushing types of CF. For such studies, input-providing CF is commonly operationalized as recasts, whereas output-pushing CF, often referred to as *prompts*, typically includes metalinguistic feedback, elicitation, repetition, clarification requests, or a combination of these. In one such study, Yang and Lyster (2010) investigated adult L2 learners' acquisition of regular and irregular verb structures in L2 English following either prompts or recasts. The treatment consisted of four form-focused production activities that were administered over the course of two weeks. This was followed by an immediate post-test and a delayed post-test two weeks later, consisting of an oral narrative retelling task and a written narrative production task. Yang and Lyster (2010) found that prompts – operationalized as metalinguistic clues, repetitions, clarification requests, and elicitations – led to larger gains in accuracy in the use of regular verb structures than recasts. For the irregular verb structures, the effects were more similar between the two experimental groups, although both outperformed the control group. Considering these results, Yang and Lyster (2010, p. 259) concluded that the overall benefits of prompts over recasts could be attributed to the greater saliency of the former.

In another study, Lyster (2004) investigated the relative effectiveness of prompts and recasts during form-focused instruction activities directed at L2 French gender assignment. Over a period of five weeks, 10-11-year-old L2 learners received form-focused instruction containing either input-providing CF consisting of recasts, or prompts which were operationalized as metalinguistic feedback, repetitions, clarification requests, and elicitations. Following the treatment, learners were post-tested immediately and again approximately two months later, using written binary-choice and text-completion tests, and oral object-identification and picture-description tests. The results showed that providing CF was more effective than no CF in terms of developing knowledge about French gender assignment. Furthermore, prompts as CF produced overall higher scores for all tests compared to recasts and no CF, although the difference between the CF-receiving groups were larger for the written tests and oral picture-description test, compared to the oral object-identification test. Lyster (2004, p. 428) thus concluded that for language instruction and acquisition, recasts may not be the most effective form of CF.

Like the above-mentioned studies, Ammar and Spada (2006) also investigated the relative effectiveness of prompts and recasts. They focused on providing 10-11-year-old L2 learners with instruction targeted at English third-person possessive determiners *his* and *her*. Post-testing was conducted immediately following the treatment and a delayed post-test was administered four weeks later, with both tests consisting of a written passage-correction task and an oral picture-description test. As opposed to Yang and Lyster (2010) and Lyster (2004), prompts were operationalized to only include metalinguistic feedback, elicitation, and repetition, not clarification requests, which made prompts more explicit and salient, according to Ammar and Spada (2006, p. 563). The results showed that both CF types were more effective than providing no CF and indicated that prompts were more effective than recasts on learning the target language determiners. However, like the results found in Li (2014), the study by Ammar and Spada (2006) also showed that high-proficiency learners benefitted more from both CF types, compared to low-proficiency learners, who benefitted more from prompts than recasts. Ammar and Spada (2006, p. 563) partially attributed these results to the greater explicitness and saliency found in prompts compared to recasts, factors which they argued would assist low-proficiency learners in L2 development.

Contrasting the findings in the above studies, Nassaji (2019) reported that adult L2 learners who received recasts on English relative clauses outperformed those who received prompts, which were operationalized as different types of clarification requests. Nassaji used a picture-cued oral production task to elicit the use of the target structure and uptake, i.e., immediate repairs made by the learners following prompts or recasts (Nassaji, 2019, p. 111). Learners completed background questionnaire, language proficiency test, pre-tests, treatment, and immediate post-tests during the first week, and delayed post-tests three weeks later. The results of Nassaji's study showed that although the prompt group were more inclined to respond with uptake, the rate of successful repair was higher for the group receiving recasts. Nassaji (2019, p. 120) concluded that this suggested that pushing learners to produce output did not necessarily lead to successful production, and that prompt-receiving learners depending on declarative knowledge may not have benefitted from pushed output when faced with complex structures.

In another study, Leeman (2003) investigated the effects of enhanced saliency combined with the potential negative and positive evidence found in recasts on Spanish noun-adjective agreement. In her study, first-year university L2 learners were divided into four groups; the first group received recasts as negative and enhanced positive evidence, the second group received negative evidence only, the third group received positive evidence with enhanced salience consisting of increased stress and intonation, and a control group received positive evidence only, without enhanced salience. During treatment, learners engaged in information-gap activities designed for communicative interaction, where the purpose was to target learners' knowledge of Spanish noun-adjective agreement. The learners completed a pre-test, immediate post-test, and a delayed post-test one week later. Testing was conducted using a picture-description task, designed for eliciting a communicative need for noun-adjective agreement. Leeman (2003) found that only the recasts and enhanced salience group performed significantly better than the control group during post-testing, suggesting that the benefits of recasts in L2 acquisition may lie in the potential positive evidence, rather than the negative evidence.

Although several studies have found promising results regarding both the general role of CF in SLA and more specific differences between CF types, there are studies that have found less conclusive results. For instance, Zhao and Ellis (2020) found no significant differences between providing adult L2 learners implicit or explicit CF for English third-person -s, although the experimental groups did outperform the control group. In this study, the implicit CF group received implicit recasts only, whereas the explicit CF group received a combination of repetition and explicit recasts. In addition, one group engaged in the same learning activities as the CF-receiving groups, but without CF, and one group only completed the tests, functioning as a control group. The learners participated in oral activities for four weeks, followed by an immediate post-test and a delayed post-test five weeks later. The study used an elicited imitation test to measure the effects on implicit knowledge, and an untimed grammaticality judgement task for determining explicit knowledge. Results showed that all three experimental groups improved compared to the control group. However, for the experimental CF groups, the results indicated that learners receiving CF improved regardless of CF type, as no significant differences between the two groups were recorded for the elicited imitation test and the grammaticality judgement task. Consequently, Zhao and Ellis (2020, p. 18) entertained the possibly that the effects of implicit and explicit CF are context-dependent, and that there may be no advantage of explicit over implicit CF in some contexts.

3.3 Trends in studies of corrective feedback and negative evidence

What the above studies show is that there is convincing evidence can be found in favour of treating CF as beneficial for SLA to some extent; however, the question of relative effectiveness for different CF types and the longevity of such effects remains unsettled. Numerous factors that have been argued to influence the effectiveness of CF include for example learner proficiency (e.g., Ammar & Spada, 2006; Nassaji, 2019), focus on meaning or form (e.g., Zhao & Ellis, 2020), explicitness and implicitness (e.g., Ellis & Sheen, 2006), and the type of linguistic evidence provided (e.g., Ellis & Sheen, 2006; Leeman, 2003), in addition to learners' ages and linguistic background. This is also noted in Lyster et al. (2013), who concluded in their review of research on oral CF in L2 classroom contexts that providing CF was more effective than no CF, but the variables involved in assessing the influence of CF types are many. They cited evidence from different studies of for instance recasts, metalinguistic feedback, and explicit correction, showing that the effects varied depending on the research context (i.e., classroom vs. laboratory studies), which linguistic targets were the foci of the studies, and feedback preferences.

From the results of the meta-analyses and the individual studies reviewed here, there seems to be overall tendencies of viewing explicit types of CF, particularly metalinguistic feedback and explicit corrections, as more effective than recasts and more implicit CF. Regardless, the studies reviewed here were included to provide a broad perspective on the current field of study regarding CF and negative evidence. Thus, contrasting results have been found, particularly regarding the effectiveness of recasts compared to other types of CF, which entails a discussion of which type of CF can be claimed to best target L2 acquisition. Additionally, another key finding of this review was the lack of long-term testing of the effects of CF, explicit instruction, and negative evidence. Of these studies, only White (1991) and Umeda et al. (2019) included long-term delayed post-tests of a year or more following initial treatment. Contrasting this, most of the studies reviewed here included either delayed post-tests a few days or weeks following treatment, or no such testing at all, such as Rassaei (2013). Thus, in terms of determining the effects of CF and negative evidence on implicit knowledge and linguistic competence, and by extension, answering one of the core research questions for this thesis, this lack of long-term delayed post-testing may complicate such matters, a point which will be returned to in the subsequent chapter.

4.0 Discussion

As the preceding chapters show, significant research has been conducted in order to determine whether CF and language instruction containing negative evidence could influence the process of L2 acquisition. Although most researchers agree that CF can be beneficial for learning explicit knowledge, the real question SLA research is concerned with is whether CF can also be said to influence acquisition of implicit knowledge (Swain & Suzuki, 2008, p. 561). As discussed previously, one fundamental claim against CF and other forms of negative evidence in SLA lies in the potential absence of such evidence. In other words, as not all L2 learners can be said to be exposed to negative evidence, it should not constitute what is necessary for L2 acquisition in the sense of grammar restructuring, as opposed to PLD, which is argued to be the essential part of this (Ortega, 2009, p. 72). From this stance, it is difficult to argue that negative evidence and CF is necessary for SLA. However, although the theoretical foundation that underlies the no interface position and formal and generative approaches to SLA questions occupy a central position in linguistic research, such paradigms cannot disregard the findings of studies that are directly aimed at determining whether there is an interplay between explicit and implicit knowledge in L2 acquisition.

The purpose of this chapter is to further examine the findings of the studies reviewed here, based on the primary research question for this thesis, namely how different theories of SLA compare regarding the role of CF and negative evidence and what research evidence can be claimed in favour of the different approaches. The structure of this chapter also follows the secondary research questions; first, by detailing and discussing different factors that may influence the relative effectiveness of different CF types, followed by an examination of the role of CF and negative evidence and whether such treatments can be argued to cause changes to learners' linguistic competence, or not.

4.1 Explicitness and noticing in corrective feedback

One method used to differentiate between the various types of CF and their effects is by focusing on factors such as explicitness and noticing. As noted in chapter two, the different types of CF can be classified according to their explicitness, which consequently provides researchers with a foundation for exploring the role of explicit knowledge and instruction in SLA. In terms of relevancy for SLA research then, comparing implicit and explicit types of CF does not only inform about the relative effectiveness of the different CF strategies, but it

may also contribute to the theoretical foundation of SLA due to the type of processing upon which the different types of CF can be argued to depend (Lyster & Saito, 2010a, p. 269). This was also evident in the studies reviewed in this thesis, as most of the studies investigating the relative effectiveness of CF did so based on explicitness as a factor in SLA; either directly, by comparing recasts and metalinguistic feedback or explicit corrections (Ellis et al., 2006; Li, 2014; Rassaei, 2013; Rassaei et al., 2012), or indirectly, by comparing recasts with prompts, when operationalized to include metalinguistic feedback (Ammar & Spada, 2006; Lyster, 2004; Yang & Lyster, 2010).

Within studies reporting the effectiveness of CF, there is evidence indicating that explicit types of CF could be argued to be more effective than more implicit forms (Chen et al., 2016, p. 89; Li & Vuono, 2019, p. 95). Such conclusions can often be attributed to arguments found in for instance skill acquisition theories or interactionist approaches to SLA, where CF has been argued to be important in limiting the scope of acquired language or for directing attention towards specific aspects of the L2 input (Ellis, 2010; Gass & Mackey, 2015). The findings of these studies show a similar pattern, with results deviating significantly from the theoretical assumptions claimed by formal approaches to SLA and the no interface position. Moreover, of these studies, the results of Ellis et al. (2006), Li (2014), and Rassaei et al. (2012) offer perhaps the most convincing contradicting evidence to previous assumptions regarding CF and negative evidence in SLA, showing that metalinguistic feedback seemingly led to greater benefits for L2 acquisition. Ellis et al. (2006) and Rassaei et al. (2012) tested their learners by using timed grammaticality judgement tasks and elicited imitation tasks, both of which have been argued to be reliable for measuring implicit knowledge because they limit learners' access to explicit knowledge during processing (Spada et al., 2015). Similarly, Li (2014) also included an elicited imitation test, but importantly, no timed grammaticality judgment task. Although Li (2014) included testing targeted at implicit knowledge through elicited imitation, the lack of additional testing to determine changes to learners' L2 grammars does limit the scope of this study in terms of revealing changes to implicit knowledge, which is a point that is returned to in later sections.

The results of these studies seem to challenge the no interface position, which at its core rejects the existence of a relationship between explicit and implicit knowledge. Although all the experimental groups in these studies experienced gains compared to non-CF control groups, explicit CF in the form of metalinguistic feedback proved more beneficial for acquiring implicit knowledge than implicit CF in the form of recasts. Thus, despite the no interface position's prediction that there can be no influence on implicit knowledge and linguistic competence following explicit instruction, the findings of Ellis et al. (2006), Li (2014), and Rassaei et al. (2012) appear to contradict such claims. Furthermore, learners in these studies were exposed to explicit information containing the nature of the error, and therefore also negative evidence. If L2 acquisition is driven by PLD and UG alone, as argued by formal and generative approaches to SLA, it follows that CF treatment consisting of negative evidence should not influence this process. However, as the findings for these three studies seemingly showed positive effects by negative evidence in L2 acquisition, this appears to challenge the fundamental argument of the positive evidence-only view of SLA. Still, there are some factors that may have influenced the results of studies like Ellis et al. (2006), Li (2014), and Rassaei et al. (2012), such as the duration of the studies and methods used. This discussion is returned to below, but first it is necessary to consider why explicit CF may benefit SLA.

In studies reporting greater effects for explicit CF, the difference in effects size is often attributed to arguments corresponding to the weak interface position, i.e., the notion that CF and instruction on different L2 target structures can facilitate the process of acquisition (Norris & Ortega, 2000, p. 420). For instance, Ellis et al. (2006) and Rassaei et al. (2012) argue that the effectiveness of metalinguistic feedback may be due to its saliency, and that learners may benefit from explicit CF because it is perceived as overtly corrective. Explicit CF, such as metalinguistic feedback and explicit corrections, typically provide clear indications of where and how error has occurred by means of explicit information. Explicit CF can therefore be argued to be beneficial by making learners aware of the nature of an erroneous utterance, which may aid learners in identifying and correcting the error (Han & Finneran, 2013, p. 373). By comparison, the corrective intention of recasts and other implicit types of CF may be overlooked or missed in discourse, as learners may simply perceive them as an echo of their utterances. As a result, recast may be too ambiguous for learners to notice them when used interchangeably with other pedagogical strategies, such as non-corrective repetition (Russell and Spada, 2006, p. 139).

This saliency and overtness of explicit CF can be directly related to the notion of noticing in L2 acquisition, which has been hypothesized by some to be an important factor for CF effectiveness in SLA (Mackey, 2006, p. 408). The core argument posited for noticing is that it may aid learners in recognizing a mismatch between their own utterances and that of the target language, which in turn drives the acquisition process. The assumption is that learners may benefit from awareness and attention to input and own production in identifying problematic aspects of their own interlanguage and the L2 (Mackey, 2006, p. 408). Furthermore, some researchers argue that the degree of explicitness in CF is directly associated with the noticing of input as part of the acquisition process (Russell & Spada, 2006, p. 137). As CF strategies can be organized along a continuum based on explicitness (Lyster & Saito, 2010a, p. 278), it follows that the different strategies also differ in terms of potential for noticing and the effects on L2 acquisition.

Some researchers have also claimed that noticing the gap between one's interlanguage and the target language may function as a trigger for parameter resetting (Mackey, 2006, p. 408; Schmidt, 1990, p. 149). The reasoning for this is that learners may encounter and notice mismatches between their current interlanguage grammars and constructions in the L2, which in turn may trigger a restructuring of grammar to accommodate this discrepancy. This can be related to the concept of anticipation of cues for resetting, as remarked by White (2003, p. 160). As she argues, for triggering to be a viable explanation of parameter resetting, learners' grammars should in some sense be expecting a cue for a particular parameter value in the input. As learners are primed for noticing differences between their own erroneous utterances and the target language during language instruction (Ellis & Sheen, 2006, p. 578), noticing of input by means of CF can therefore be argued to be a necessary component in this process.

This argument is particularly relevant for theories of interactionist approaches to SLA, where noticing gaps between the interlanguage and the target language during communication is posited as a core component of L2 acquisition. Consequently, some studies have attempted to compare the effects of different CF types and the potential for noticing that they offer. Recall the studies by Ellis et al. (2006) and Rassaei et al. (2012), wherein the difference in effects of explicit and implicit CF can be attributed to the greater awareness-raising nature of metalinguistic feedback. Following the notion above, metalinguistic feedback can be argued to be more likely to lead to noticing, because it offers more explicit information about the error than for instance recasts (Ellis et al., 2006, p. 363). This can be related to what Yang and Lyster (2010, p. 256) refer to as *CF saliency*, a term used to explain why certain CF types are

more likely to affect L2 acquisition. Metalinguistic feedback and other forms of explicit CF are typically seen as offering more in terms of saliency as opposed to more implicit CF, such as recasts, which are more likely to be overlooked or misinterpreted as something else than CF (Yang & Lyster, 2010, p. 257). The corrective aspect carried by more explicit types of CF is thus argued to influence the process of acquisition by activating learners' cognitive comparison and abilities to notice the gap between the target language and their erroneous utterances.

It is important to emphasize that for the studies discussed above, it is possible to hypothesize that the promising results of CF and negative evidence did not stem from acquisition of implicit knowledge, but rather that the treatment simply made learners more aware of the test items and thus benefitted explicit knowledge only. To account for this, studies such as Ellis et al. (2006) reported to have asked learners whether they were aware of the test items, whereupon only one learner was able to identify the target structure. The reasoning was that if learners could not claim to have been aware of the target structures during testing, then this may indicate that the learners were not consciously retrieving knowledge. This may be a viable solution to the issue of determining awareness during testing, as one can argue that one of the core characteristics of explicit knowledge is that it can be verbalized (Ellis, 2005). However, this method is not without flaws, as learners may believe that they acted unconsciously and based on intuition, while they were in fact relying on some previously learned rule. If learners report that processing has occurred without awareness, then there is no way to determine whether this was the case aside from the learners themselves. In terms of reliability of the tests, this alone cannot be treated as sufficient for verifying that learners do not accidentally tap into explicit knowledge. In addition, as noted by Ullman (2015), explicit or declarative knowledge and implicit or procedural knowledge often have redundant functions, with each memory system potentially active during language processing. Thus, asking whether learners are aware during testing may not be sufficient for uncovering the subtle nuances between different types of knowledge and the processes upon which they depend (Ellis & Roever, 2018, p. 4).

Still, what makes the results indicating an advantage for explicit CF in Ellis et al. (2006) and Rassaei et al. (2012) more convincing than the similar findings of for instance Ammar and Spada (2006), Lyster (2004), Rassaei (2013), and Yang and Lyster (2010), are the methods used to measure implicit knowledge. As stated above, Ellis et al. (2006) and Rassaei et al. (2012) used both timed grammaticality judgement tasks and elicited imitation tasks to target implicit knowledge in their studies, which arguably target learners' access to implicit knowledge. In contrast, the study by Rassaei (2013) did not include any concrete measures for implicit knowledge, only tests that may allow for more access to metalinguistic or explicit knowledge, such as untimed grammaticality judgement tasks. Similarly, Ammar and Spada (2006), Lyster (2004), and Yang and Lyster (2010) all relied on production tasks in measuring the effects on L2 acquisition. Such methods have been criticized for not being suited for measuring implicit knowledge, as learners have potentially total access to consciously learned knowledge during processing (Whong et al., 2014, p. 556). This point is returned to later in this chapter, as a key issue found in these studies is that methods used to measure implicit knowledge and L2 acquisition vary significantly, which complicates the process of generalizing the results of explicit CF in SLA. In addition, the fact that none of the reviewed studies targeting explicit CF included long-term testing of such treatment further challenges the conclusion that implicit knowledge was implicated. This is a question of great concern to SLA and relevant for most studies reviewed in this thesis, hence it is returned to in more detail in later sections.

4.1.1 The case for recasts

Although the overall results of the review show that both single studies and meta-analyses of CF have favoured explicit CF and prompts over implicit CF, some studies reviewed here have claimed otherwise. This is exemplified in Leeman (2003) and Nassaji (2019), who found that recasts seemed to be better suited than explicit CF and prompts for targeting L2 acquisition under certain circumstances. Compared to other forms of CF, studies and meta-analyses of CF research have found that recasts are by far the most preferred form of CF by instructors (Lee, 2013; Lyster & Ranta, 1997). This may be due to the inherent non-intrusiveness nature of recasts, as they allow for uninterrupted communication in instructional contexts compared to more explicit types of CF (Ellis & Sheen, 2006, p. 578; Li, 2014, p. 375). Nassaji (2019, p. 120) also hypothesizes that recasts may be more beneficial for complex target structures because learners need not rely on prior knowledge, as opposed to prompts. In other words, for prompts to be effective, learners need to have some type of knowledge, usually declarative,

for them to be able to produce output. This seems to be a reasonable assumption, as learners receiving prompts in the study by Nassaji (2019) produced more output, but the rate of success was lower than the group receiving recasts.

Furthermore, another possible argument in favour of recasts in SLA is that they allow for a direct comparison between the target language and learners' own erroneous utterances (Ellis & Sheen, 2006, p. 578). The assumption is that learners who receive recasts in an instructional setting are already primed for noticing the discrepancy between forms, and that offering an implicit correction immediately following the error is beneficial for the development of linguistic competence (Ellis et al., 2006, p. 341). Regardless, as noted above, this is not unique to recasts, as other types of CF, such as metalinguistic feedback, have been posited as beneficial for L2 acquisition based on the same quality. This signifies that the effects of recasts may in some sense be tied to the effects of noticing, much like metalinguistic feedback; however, this cannot be the sole factor in differentiating the effects of CF types.

It is important to consider the fact that like most types of CF, recasts do not constitute a homogenous group, and they can be either implicit or explicit, depending on whether learners recognize the corrective intent. For instance, as noted by Ellis and Sheen (2006, p. 583), recasts in instructional settings tend to be more explicit, often incorporating elements of stress and focus of attention to highlight the important aspects of the utterance. In such cases, recasts may become more explicit and carry more emphasis on correction than in other communicative contexts. Still, whether explicitness as a factor in recasts influence the outcome of the treatment remains a topic of debate. Zhao and Ellis (2020) found no differences between explicit and implicit recasts in their study, and both forms of CF proved to be more effective than no CF for the acquisition of English third person -s. This may signify, as other studies have suggested, that the effectiveness of recasts may lie in other factors besides the distinction between explicit and implicit CF.

Instead of positing recasts as more effective for L2 acquisition based on their inherent implicitness then, it may be more feasible to consider what type of linguistic evidence offered by recasts. As different authors have argued, CF can provide different types of linguistic evidence, depending on context, learner awareness, and linguistic target (Goo & Mackey, 2013; Leeman, 2003; Lyster & Saito, 2010a). In the case of recasts, the reformulated utterance does not only indicate that an error has occurred, thus functioning as negative evidence, but it also provides learners with positive evidence through target language examples. Recasts may therefore serve as potential input for L2 acquisition not because of the

negative evidence typically associated with error correction, but because of the inherent positive evidence offered by this type of CF (Ellis & Sheen, 2006, p. 597).

This exemplified in Leeman (2003), who found that two of the experimental groups that received either recasts with enhanced positive evidence or positive evidence with enhanced salience performed significantly better than the two other groups, who received either negative evidence only or positive evidence without enhanced salience, when tested on Spanish noun-adjective agreement. Following the assumption that the effectiveness of recasts is related to the potential for positive evidence, the results of this study indicate that ensuring access to salient positive evidence may assist the process of acquisition, at least for the target structure in her study. Thus, by reanalysing recasts as a primary source of positive evidence rather than negative evidence, empirical evidence in support of recasts corresponds well with the claim that SLA is driven by positive evidence. Consequently, studies like Leeman (2003) could potentially help bridge the gap between formal approaches to SLA and paradigms of applied linguistics and language instruction (Ellis & Sheen, 2006, p. 597).

However, despite the potential benefits of recasts when reanalysed as providing positive evidence, a significant issue can still be identified in the fact that most studies reviewed in this thesis did not find recasts to be more effective than other types of CF. This means that if recasts are to be used as evidence for the potential benefits of CF *and* the role of positive evidence in SLA, other factors need to be identified that may explain why recasts, in most cases, seem to not entail greater L2 acquisition. To this question, Ullman (2015) may provide a conceivable explanation; he hypothesizes that the procedural memory, which is argued to underlie implicit knowledge, requires gradual learning that eventually results in rapid and automatic processing. In contrast, the declarative memory related to explicit knowledge is argued to be more active initially due to its accessible processing abilities (Ullman, 2015, p. 139). If this is true for L2 acquisition, then it is still possible to hypothesize that the long-term effects of recasts could potentially be some form of acquisition of implicit knowledge. Further support of this argument can be found in Li (2010), who found in his meta-analysis of CF that the effects of implicit CF, such as recasts, were less likely to decrease over time, compared to explicit CF. Thus, the positive effects of explicit CF types discussed previously could be attributed to activation of the declarative memory and explicit knowledge, whereas the effects of recasts would require more time to become more prominent.

Still, it is difficult to fully conclude if and how recasts may benefit SLA precisely because of the lack of long-term testing in the studies reviewed here. In White (1991), none of the learners retained their knowledge of English adverb placement, regardless of whether they received a combination of positive evidence and negative evidence, or positive evidence only. As neither Leeman (2003) nor Nassaji (2019) included long-term delayed post-testing, it is difficult to compare their results to those of White (1991). This may indicate that even if learners are provided positive evidence during instruction, observable effects need not be indicative of acquisition and changes to linguistic competence. Furthermore, as with studies of explicit CF, another factor to consider is the possibility that the studies claiming recasts to be more effective did so based on tests that may not be specifically targeted towards implicit knowledge. As discussed previously, production tasks can be argued to be ill-suited for measuring acquisition, because they cannot accurately determine what source of knowledge learners rely on (Whong et al., 2014, p. 556). As both Leeman (2003) and Nassaji (2019) included such testing, without manipulation of factors such as time and attention, there may be reason to suspect that the learners in these two studies could potentially have resorted to explicit knowledge.

4.1.2 Additional factors influencing corrective feedback

The reviewed studies show that several different claims regarding the relative effectiveness for implicit and explicit CF can be made, especially for the difference between recasts and metalinguistic feedback or explicit correction. In truth, however, it is difficult to fully conclude what type of CF can be said to best target L2 acquisition, regardless of what form of categorization is used for this effort. Nonetheless, it can be seen from the results of both the individual studies and the meta-analyses that CF researchers have generally found explicit CF and prompts to be more beneficial for L2 acquisition than for instance recasts, although any conclusive results from studies targeting such CF remain heavily debated.

One factor that seem to have a significant impact on determining the effects of CF, as remarked previously, is the fact that CF can be understood as a broad category of strategies that can to a certain extent be manipulated. This means that the different CF types identified in this thesis, which were based on the taxonomy by Lyster and Ranta (1997), can be either expanded or condensed depending on the scope of the individual study. This is exemplified by the studies that have opted for comparing recasts with the broader classification of prompts, often consisting of CF types such as metalinguistic feedback, clarification requests, elicitations, and repetitions (Ammar & Spada, 2006; Lyster, 2004; Yang & Lyster, 2010).

This means that any comparison of individual studies of CF must also account for the operationalization of CF, in addition to the findings themselves.

The results of the individual studies may depend on other variables as well, such as the choice of linguistic targets, age, operationalization of implicit and explicit knowledge, research context, and further (Lyster et al., 2013). For instance, Li (2014) found that for acquiring Chinese classifiers, metalinguistic feedback was more effective for the low-proficiency learners than high-proficiency learners. Similarly, Ammar and Spada (2006) found that prompts, operationalized to include metalinguistic feedback, proved more beneficial for low-proficiency learners for English third-person possessive determiners. Li (2014, p. 391) attributes this to the difference in linguistic targets and the fact that classifiers may be salient enough to work with implicit CF types such as recasts, whereas other linguistic targets, such as perfective -le, are not. The sum of the reviewed studies signifies that there are numerous factors that influence whether, or if at all, acquisition is achieved. This does not only complicate the process of comparing different CF types, but it also makes any attempts at generalization across CF types significantly more difficult.

4.2 Linguistic evidence and corrective feedback in L2 acquisition

In essence, the above discussion highlights a key issue regarding CF and negative evidence in SLA, namely whether such treatments can actually be said to influence and cause changes to the underlying grammar, not just linguistic behaviour. This entails that if one assumes that the underlying grammar can be restructured, it is also necessary to discuss how this is achieved and what elements constitute necessary components for this process. One approach to this question is by assuming that learners undergo some form of parameter resetting when acquiring L2. As noted in chapter two, to account for crosslinguistic variation, proponents of UG have proposed a set of parameters that are typically understood as binary values that can be set according to the input learners are exposed to. It is then assumed by proponents of UG that acquisition is based on a setting of these parameters, meaning that learners acquire language by setting the values corresponding to the target language (Snape & Yusa, 2013, p. 169).

Furthermore, if one follows models of UG access and L1 transfer posited by for instance the Full Transfer Full Access by Schwartz and Sprouse (1996), the concept of parameter resetting in L2 acquisition presupposes that there is a change in initial L1 parameter values following exposure to L2 input. This change may then manifest itself differently at different times, depending on where learners are in the L2 acquisition process and interlanguage development (White, 2003, p. 103; White, 2015, p. 42).

However, although parameters can be observed to be set at certain values at different times through representations in the grammar, this does not tell us about the nature of this development. Thus, a theory about parameter resetting and grammar restructuring needs to account for this change and the relationship between input and the setting of parameters in L2 acquisition (White, 2003, p. 152). Because input can be ambiguous in terms of what syntactic representation gives rise to the intended surface string of an utterance, this has caused some to argue that there must be certain cues or triggers in input that serve to instigate parameter resetting (White, 2003, p. 159). The motivation behind this is that if the L2 input requires different parameter settings than the values set in the L1 grammar, then there will be a conflict in the parsing of the L2 input. In other words, sentences or elements in the L2 input that cannot be parsed will function as cues or triggers for resetting parameters, as long as certain aspects have been partially processed and assigned a syntactic representation (White, 2003, p. 158).

This argument also entails that sentences that do not carry the structural cues necessary for initiating parameter resetting do not constitute the required components for this process (White, 2003, p. 163). This has been one of the key arguments against the role of CF and other forms of negative evidence in SLA; the claim is that as opposed to positive evidence and PLD, negative evidence, particularly in the form of explicit CF, does not provide any structural cues, but instead provides learners information *about* the language (Schwartz, 1993; White, 2003). Analysing this in the light of the no interface view of CF and negative evidence, Whong et al. (2013, p. 204) state that sentences functioning as corrections, such as "this sentence is ungrammatical", may aid learners in attaining knowledge about the language, i.e., declarative and metalinguistic knowledge, but the content and facts of the utterances themself are not expected to become part of one's linguistic competence. A consequence of this position is that explicit instruction, which often consists of elements of CF and other aspects of negative evidence, is hypothesized to be irrelevant for language acquisition, at least in the sense proclaimed by Krashen (1982; 1985).

However, recall the case of recast discussed previously, where one of the aspects attributed to this type of CF is the potential for positive evidence. Recasts undoubtedly carry a corrective aspect, such as in Leeman (2003) and Nassaji (2019), but they also consist of L2 reformulations and examples of the target language. Similarly, consider instances where learners receive explicit corrections or metalinguistic feedback about the L2, such as in Ellis et al. (2006), Li (2014), Rassaei (2013), and Rassaei et al. (2012). In such cases, learners are provided negative evidence through the correction, but they may also be exposed to target language examples through the phrasing of the correction, depending on instructional factors, such as context and target structure. This means that it may be possible to reanalyse other types of CF than recasts in terms of their potential for positive evidence, because the corrected utterance itself may serve as input for acquisition (Whong et al., 2013, p. 205). A similar claim is made by Paradis (2009), who argues that the function of negative evidence and CF in SLA may be to serve as means for indirect influence on linguistic competence. He claims that the potential effects of different CF types on L2 acquisition is not due to their corrective aspect, but rather because such treatments provide constructions which over the course of repeated exposure can be statistically tallied for acquisition (Paradis, 2009, p. 85).

At first glance, this may be a feasible approach the question of how CF can be of relevance to L2 acquisition, as it combines formal approaches to SLA regarding the necessity of positive evidence and empirical studies that have found apparent positive effects of L2 instruction through CF. Despite this, there are still some significant challenges regarding this argument. For the studies reviewed here, only recasts and explicit corrections can be said to naturally contain positive evidence, due to their definition as reformulations of erroneous utterances (Lyster & Saito, 2010a, p .267). In contrast, repetitions repeat the incorrect utterance, and contain therefore neither grammatical target language examples nor positive evidence. Metalinguistic feedback, clarification requests, and elicitations on the other hand, may contain elements of the L2, depending on how such responses are structured; however, such target language examples are not inherent to the function of these types of CF and should be considered coincidental at best. Moreover, this does not really inform SLA theories and research. It can offer some clarification of CF in terms of the potential for positive evidence, but as discussed previously in the case of recasts, this alone does not necessarily signify that CF can lead to acquisition because there seems to be other factors that may influence CF effectiveness.

Alternatively, another possible explanation to why CF may have affected L2 acquisition in the studies reviewed here lies in whether learners are able to utilize L2 knowledge to restrict their grammar and avoid overgeneralization of rules. This argument follows the issue of Baker's paradox (Baker, 1979) and the assumption that negative evidence, for instance through CF, can be used in L2 acquisition by limiting acquired structures and rules, thus functioning as a tool for avoiding nontarget-like acquisition (Hsu et al., 2013, p. 36). This was investigated by Carroll and Swain (1993), who attempted to determine whether providing CF could help learners arrive at appropriate abstract constraints on an overgeneralized rule of English dative alternation. As the findings of this study show, learners who received metalinguistic feedback were more apt at arriving at the correct generalization to novel items and avoiding overgeneralization (Carroll & Swain, 1993, p. 372). Similarly, White (1991) also attempted to determine whether explicit instruction containing negative and positive evidence could lead to correct generalization of English adverb placement rules. Here, the initial results indicated that the learners benefitted from the instruction and that providing a combination of negative and positive evidence was more effective for mastering the L2 target structures compared to positive evidence only. Based on studies like these and the other studies that show greater effects of CF and negative evidence compared to no CF or positive evidence only, there seems to be some support of the notion that this may benefit L2 acquisition.

Notwithstanding, there are issues related to this approach, and perhaps even more so for the study by White (1991). Although the initial results of this study were positive regarding the role of negative evidence in SLA, White also found that such treatment did not lead to long-lasting changes to the learners' knowledge of English adverb placement. As the supposedly acquired knowledge in the initial treatment was not retained a year later, this may indicate that the learners' underlying linguistic competence was not implicated and that grammar restructuring did not occur. This is also remarked by Schwartz and Gubala-Ryzak (1992), who claim that the results of White (1991) must be attributed to factors outside changes to linguistic competence, as learners in White's study both overgeneralized the rules of adverb placement and did not sustain their knowledge.

Similar inferences can also be made by examining the study by Umeda et al. (2019), which sheds additional light on the short-term effects of explicit instruction. Here, the results show that there were initially positive effects following the treatment, and that these effects were present at least up until the thirteenth week after instruction. However, like White (1991), the supposedly acquired knowledge was not retained by the learners one year later in the study by

Umeda et al. (2019). As implicit knowledge is argued to be more stable and retained for a longer duration of time compared to explicit knowledge, this means that empirical evidence showing decreased effects following initial gain is often explained as activation of explicit knowledge (Schwartz & Gubala-Ryzak, 1992; Umeda et al., 2019; Whong et al., 2014).

4.2.1 Duration of studies and the lack of long-term testing

The absence of long-term delayed post-testing is also noted by Carroll and Swain (1993) themselves, who remark that the results of their study cannot be generalized across all aspects of L2 acquisition due to the relatively short duration of their study. On the topic of long-term delayed post-testing, most studies, when discussed, reported like Izumi and Lakshmanan (1998, p. 91) that the lack of long-term measures was due to circumstances such as learners being unavailable or other practical matters that made this problematic. As most studies investigating the role of CF or negative evidence reviewed in this thesis only conducted their delayed post-testing a few days or weeks after instruction, excluding White (1991) and Umeda et al. (2019), it must therefore be questioned whether the reported effects of CF and negative evidence could be considered durable. Furthermore, Whong et al. (2013, p. 207) remark that a lack of long-term post-testing prevents the observation of any potential lasting effects following CF treatment and language instruction. This means that seemingly positive results on L2 acquisition by CF and negative evidence in most of the studies discussed here could potentially be argued to stem from short-term memorization of explicit knowledge, rather than changes to linguistic competence.

The issue of longevity can be extended to include aspects of both time between instruction and testing, as discussed above, and the duration of the treatment itself. Most of the reviewed studies included treatment lasting only a few days or weeks in total. If one assumes that implicit knowledge stemming from the procedural memory requires more time than explicit knowledge to form, as argued by Ullman (2015), it is possible to argue that the instruction and CF treatment in the studies reviewed here did not last long enough for this to happen. This can also be seen as a potential drawback of the studies by for instance Ellis et al. (2006) and Rassaei (2013), wherein learners only received between two to four days of instruction followed by testing, which can be argued be too short for the procedural memory to be activated. Further support of the claim that treatment length influences activation of different memory systems can also be found in the difference in results of Umeda et al. (2019) and Snape and Yusa (2013). Although the former did conclude that instruction did not lead to long-term knowledge retention, as noted previously, they nonetheless found more lasting

effects than the comparably shorter study by Snape and Yusa (2013). This signifies that at least for the target structures in these two studies, there is some evidence that supports the claim that treatment length may be an important factor in how long knowledge it retained.

Moreover, there is also the question of how longevity is operationalized whenever this concept is accounted for. For instance, the meta-analysis of CF by Li (2010) operationalized long-term delayed post-tests as happening thirty days or later following treatment, whereas for White (1991) and Umeda et al. (2019), long-term delayed post-testing meant minimum one year later. It can be argued that thirty days or a few months is not enough time to uncover any long-term changes to linguistic competence, especially if one follows the claim that such changes require more time to be established (Trahey, 1996, p. 117). There are evidently several different perspectives of what constitutes lasting effects and long-term treatments, but this also complicates the process of distinguishing short-term results from long-term results. This difference in how longevity is measured must therefore be considered a crucial factor that may significantly influence the outcome of studies of CF and negative evidence in SLA.

Consequently, three potential inferences can be made from the lack of long-term testing and instruction in the studies reviewed here. The first follows the point made by Whong et al. (2013) in that the absence of long-term testing can only inform of the short-term effects of instruction, resulting in an incomplete description of the acquisition process. This does not provide any information about whether acquisition has occurred or not, only that the lack of long-term testing in the studies reviewed here and in general should be considered a drawback of studies that attempt to determine the full range effects of CF and negative evidence.

Second, following the results of White (1991) and Umeda et al. (2019), it is possible to argue that CF treatment and explicit instruction containing negative evidence do not lead to L2 acquisition in the sense of restructuring of grammar and long-term retention of knowledge. This entails the assumption that if the studies reviewed here had included long-term delayed post-tests, the results may have been similar to those of White (1991) and Umeda et al. (2019). This approach also follows the fundamental claims by formal linguistics and no interface proponents in that explicit knowledge cannot lead to changes in linguistic competence or implicit knowledge, and therefore such instruction should not be relevant for L2 acquisition.

The third approach, which must be treated as hypothetical under the current conditions, could be to assume that the lack of long-term testing does not necessarily entail a lack of long-term results. In other words, it can be hypothesized that the results of studies showing short-term effects may have been lasting had instruction and testing continued, if one assumes that implicit knowledge and the procedural memory may require longer time to be activated. This also entails that one must account for the lack of lasting results in White (1991) and Umeda et al. (2019), and that this may have been due to other factors, such as target structures, instructional methods, or lack of long-term treatment. Nonetheless, as the factors surrounding L2 acquisition remains a heavily debated topic, it is difficult to assume a clear position on such matters.

4.3 Explicit knowledge in second language acquisition research

However, if one adopts the position that CF and negative evidence do not influence L2 acquisition in the sense of grammar restructuring, this poses another challenge in determining exactly what function, if any, such treatments may have in SLA. As the studies of CF reviewed here undoubtedly found changes in linguistic behaviour following CF treatment, a question must therefore be asked of what may have caused such changes. To account for this, Schwartz (1993) claims that changes to learners' linguistic behaviour following exposure to negative evidence and explicit data must be ascribed to changes in LLK, which is distinguished from the implicit structures of linguistic competence. According to Schwartz (1993, p. 150), explicit knowledge and negative evidence can be utilized to revise declarative and encyclopedic knowledge, but this does not affect the core linguistic competence of the learners. To account for this hypothesis, Schwartz (1991) claims that language is domain specific and that input which does not correspond with the language module cannot be used for restructuring grammar, as opposed to PLD and positive evidence. In the case of for instance metalinguistic feedback, which consists of explicit information about the target language, the argument is that the information contained in such corrections does not feed into the language module, only LLK, meaning that it should be considered irrelevant for the process of L2 acquisition. For other types of CF, such as explicit corrections and recasts, only the reformulated utterances themselves could potentially be used for L2 acquisition, if one follows the argument of potential positive evidence discussed above. The corrective aspect, however, is posited to exist outside of the language module and becoming part of LLK (Schwartz, 1993, p. 157).

Consequently, the central claim made by Schwartz (1993) is also that of a strict no interface position; she assumes that learners cannot acquire language by paying explicit attention to aspects in the input or by means of information about the language, including negative evidence, and that explicit learning can never lead to implicit knowledge (White, 2015, p. 49). As learners can be observed to modify their linguistic behaviour and comprehension following exposure to explicit knowledge and instruction, as in Ellis et al. (2006), Li (2014), Rassaei (2013), and Rassaei et al. (2012), it can thus be argued that this was not due to acquisition of implicit knowledge, but rather influence by the learners' learned explicit knowledge or LLK. Although this may solve the apparent issue of why negative evidence and CF only appear to change aspects of learners' L2, it also entails a question of efficiency regarding language processing and production. More specifically, the assumption that learners possess two near identical, but also qualitatively different systems for processing linguistic input entails a necessity for a more thorough discussion of how this would be manifested.

As discussed previously, some researchers have drawn on the difference between the procedural and declarative memory systems when describing the relationship between explicit and implicit knowledge in learning and acquisition. For instance, Paradis (2009) maintains that the systems underlying explicit and implicit knowledge, i.e., the declarative and procedural memory systems, respectively, are distinct from one another and involved in different aspects of acquisition. As he states, only explicit or declarative knowledge can be conscious, whereas implicit or procedural knowledge cannot become part of one's awareness (Paradis, 2009, p. 68). This means that implicit knowledge cannot be measured through means of consciousness, only by making inferences based on linguistic behaviour. Although the exact mechanisms that underlie knowledge are debated, the claim that there must be a separation is rather uncontroversial, as most researchers from all sides of the interface debate assume that there are fundamental differences in how aspects of language must be stored and accessed (e.g., Ellis et al., 2006; Krashen, 1982). It is therefore difficult to argue against claims of no interface between explicit and implicit knowledge, such as those made by Schwartz (1993) and Paradis (2009), precisely because of the issue of measuring and determining the difference between rapid and accessible explicit knowledge and implicit knowledge.

The study that best exemplifies this predicament of determining the influence explicit and implicit knowledge is the study by Rassaei (2013), wherein learners who received explicit corrections outperformed learners who received recasts and the control group. Although the study was designed to target acquisition of English articles, the results of this study can be argued to stem from explicit knowledge, rather than implicit knowledge. There are essentially two arguments for this if one follows the notion of the no interface position. First, one must look at the testing measures used in the study by Rassaei (2013), which included a writing test, an untimed grammaticality judgement task, and an error correction test. As discussed previously, production tasks, such as the writing test for this study, arguably target learners' explicit knowledge, as there are potentially no measures for controlling whether learners draw on implicit or explicit knowledge during testing (Whong et al., 2014, p. 556). Similarly, untimed grammaticality judgement tasks and error correction tests could be considered more suitable for measuring learners' metalinguistic knowledge rather than underlying linguistic competence in the L2.

Moreover, learners who performed best during post-testing in this study were exposed to explicit information that their utterances were incorrect, followed by an immediate correction that provided the correct target language sentence. If one assumes the theoretical position that explicit instruction does not constitute PLD, and if the findings in the above study can be attributed to explicit knowledge, then the study by Rassaei (2013) does not directly challenge the position by formal and generative approaches in SLA. This follows from the assumption that the learners are unable to acquire metalinguistic knowledge as part of the input necessary for acquisition. Therefore, although the results of Rassaei's (2013) study indicated that the learners' knowledge of articles was improved, this may have simply been because learners had access to their previously learned explicit knowledge at the time of post-testing (Ellis & Sheen, 2006, p. 595).

4.3.1 L2 acquisition, declarative memory, and automatized explicit knowledge

As indicated previously, the notion of automatized explicit knowledge is particularly relevant to the issue of differentiating between explicit and implicit knowledge. Some researchers (e.g., DeKeyser, 2015; Suzuki, 2017) argue that through the proceduralization of declarative knowledge, learners may arrive at knowledge that can be retrieved automatically and without significant consciousness or effort. In other words, automatized explicit knowledge can be argued to be functionally equivalent to implicit knowledge and that the former can potentially become as rapid and accessible as the latter (DeKeyser, 2015, p. 110). This means that for

language production and testing methods using production data, automatized explicit knowledge and implicit knowledge may be indistinguishable from one another in how they are manifested in learners' linguistic behaviour. Ambiguity in results stemming from studies of CF and negative evidence in language instruction is a recurring issue in SLA research, as noted in the discussion thus far. The fact that implicit knowledge tends to be measured indirectly makes any attempts of precisely describing changes to linguistic competence virtually impossible, although researchers may be able to make inferences based on a broad set of measurements and tests (White, 2003, p. 17).

Thus, whether the effects of the studies reviewed here were due to memorized and consciously retrieved explicit knowledge or automatized explicit knowledge, the conclusion is virtually the same; that is, the results of studies reviewed here showing a beneficial role for CF and negative evidence in language instruction can be attributed to either explicit knowledge or implicit knowledge, depending on the theoretical approach one assumes. Still, there is nonetheless the matter of what one should expect from studies of CF and negative evidence in SLA research. If for instance automatized explicit knowledge can be argued to be indistinguishable from implicit knowledge in terms of retrievability and efficiency in production, it may be that the development of automatized explicit knowledge could be posited as the natural development of L2 learners.

As remarked in chapter two, Ullman (2001; 2015) proposes that there is a difference between L1 and L2 learners regarding which memory system is accessed during language processing. He argues that L1 learners depend predominantly on the declarative memory for accessing the mental lexicon, whereas the mental grammar is thought to be connected to the procedural memory. L2 learners, however, are argued to be more dependent on the declarative memory, either in the form of memorized grammatical rules in the lexicon or grammatical rules and structures learned by the declarative memory (Ullman, 2001, p. 109). Moreover, Ullman (2001; 2015) also hypothesizes that such changes in memory system dependence should follow the age of the individual L2 learner. As learners progress past late childhood and puberty, it is assumed that their capacity for learning through the procedural memory declines, which causes older L2 learners to be more reliant on their declarative memory (Ullman, 2001, p. 108).

Taking these factors into consideration has a significant impact on how the results of the reviewed studies can be interpreted. For example, only three of the individual studies included what can be argued to be younger learners, namely Ammar and Spada (2006), Lyster (2004), and White (1991), whereas the other studies included learners who were between 18 and 45 years old. Regardless, even for the studies including younger learners, it can be argued that these were past the ideal age of exposure for native-like activation of the procedural memory for morphosyntactic computation, as these learners were all in the ages of late childhood (Ullman, 2001, p. 108). Thus, if one follows the argument that older learners are more likely to draw on the declarative memory in processing language, then a likely interpretation of the reviewed studies would be that the learners could indeed have resorted to explicit knowledge. Furthermore, as the declarative memory can be argued to be more rapidly accessed than the procedural memory, this may entail that learners will draw on the former during relatively short treatment periods (Ullman, 2015, p. 142), such as in the studies reviewed here.

However, the argument made by Ullman (2001; 2015) also entails that learners should in fact be expected to depend more on explicit and declarative knowledge in L2 acquisition, as the transition from procedural to declarative memory can be argued to be a natural development of L2 learners. This argument is also supported by neuroimaging and research on neurotrauma, which show that L2 learners struggle with L2 production following lesions to MTL, which is hypothesized to underlie the declarative memory (Ullman, 2001, p. 111). If CF and negative evidence lead to successful L2 use, as the studies reviewed here indicate, then this could be argued to be beneficial for L2 acquisition in the sense proclaimed by applied linguistics and other theoretical approaches that favour the use of such treatments. From this perspective then, CF and negative evidence do play a significant role in L2 acquisition in that such factors benefit the development of declarative knowledge, even if it cannot be conclusively determined that linguistic competence has been involved.

4.4 The issue of measuring linguistic knowledge

A recurring element of most studies and theoretical assumptions discussed here is the difficulty of determining with accuracy the effects language instruction and CF have on implicit knowledge and linguistic competence. As the preceding sections show, empirical evidence and positive effects of CF and negative evidence could potentially be attributed to either explicit or implicit knowledge, but the exact influence such treatments have on L2 acquisition remains a debated topic. In addition, as Whong et al. (2013, p. 207) remark, results

of studies intended to measure the effects of CF and negative evidence can sometimes be ascribed to the influence of incidental positive evidence. The fact that the instruction itself often includes some form of positive evidence means that drawing any inferences from the results of studies is difficult. Although it is theoretically possible to design studies where learners are only ever exposed to the intended input, whether this is explicit instruction provided with negative evidence or explicit CF treatment, this is nonetheless difficult to control in practice. This is especially relevant for classroom studies where instruction typically contains a wide variety of target language examples. Consequently, learners are almost always guaranteed some exposure to positive evidence in such contexts, either implicitly or explicitly.

Thus, one possible conclusion that can be drawn from the varying effects of empirical studies and theoretical approaches is that there are several different variables involved in determining the role of CF and negative evidence in SLA research. As White (2003, p. 17) argues, the inherent challenge of investigating implicit knowledge or linguistic competence lies in the fact that it cannot be measured directly, hence researchers must look to other sources of evidence regarding the acquisition of language. This means that for investigating implicit knowledge and linguistic competence, one must draw inferences from a person's linguistic behaviour, whilst also making predictions about which forms of behaviour constitute explicit or implicit knowledge (Ellis & Roever, 2018, p. 2).

As the results of a study are only as reliable as the methods used, this entails an additional emphasis on designing tests that can be argued to measure the type of knowledge in question. One possible method that can be argued to target implicit knowledge is the elicited imitation test, as used in Ellis et al. (2006), Rassaei et al. (2012), Li (2014), and Zhao and Ellis (2020). This method involves reading an utterance or sentence and having learners repeat it as closely as possible. The reasoning behind this lies in the notion that if learners receive input containing a specific erroneous target language structure and subsequently correct it during imitation, then this can be taken as evidence that the structure in question has become part of learners' L2 grammar (Ellis et al., 2009, p. 66). However, this method for testing linguistic knowledge does not come uncriticized. A key issue is whether learners are required to process and interpret the input before responding, or if they can merely repeat the utterance without comprehension. An important aspect to consider, then, is whether elicited imitation tests can be considered repetitive or reconstructive (Spada et al., 2015, p. 726).

To counter the issue of repetition, there are potentially multiple methods for constructing elicited imitation tests that target learners' reconstructive abilities, rather than their capacity for repetition. Two factors have been argued to influence this process, namely memory and internalized grammar. The first factor can be related to learners who, through sufficient exposure to the L2, can replicate both the target structure and any errors included in the stimulus. In such cases, elicited imitation tests must be considered repetitive, as learners are merely replicating the utterance in its uncorrected form. The second factor is related to learners who can be seen manipulating the grammatical structures in the stimulus in a manner consistent with their own interlanguage grammar (Spada et al., 2015, p. 726). Here, learners are exposed to sentences containing aspects of ungrammaticality, as this is believed to target learners' implicit knowledge by requiring them to spontaneously reformulate erroneous sentences. In other words, if learners correct ungrammatical aspects of the stimulus, this could signify that some form of processing has occurred, instead of rote repetition (Spada et al., 2015, p. 727; White, 2003, p. 93). Another solution is to draw attention to meaning rather than form, as this can be argued that to force comprehension of content instead of offering learners the opportunity to just repeat the structures mechanically. This can be done by expanding the test to include responses to truth-value statements, thus requiring learners to process meaning as well as reconstruct the stimulus (Ellis & Roever, 2018, p. 8).

All the studies reviewed here that used elicited imitation tests show that the issue of rote repetition was accounted for by means of the methods mentioned above. The tests included both grammatical and ungrammatical sentences to determine whether learners resorted to simply repeating the stimuli or correcting ungrammatical aspects. Regarding comprehension and focus on meaning, two of the studies included responses to truth-value statements, namely Li (2014) and Rassaei et al. (2012), wherein learners first heard the statements and then decided whether it was true or not before imitating the utterance. For the remaining two studies, Ellis et al. (2006) and Zhao and Ellis (2020), they chose to draw attention to meaning by asking learners to respond whether they agreed or disagreed with the test sentence statement. In terms of targeting implicit knowledge through elicited imitation tests then, these studies found that learners appeared to correct, rather than simply imitate the ungrammatical sentences, which signifies that some form of comprehension and internalization could have occurred (Spada et al., 2015, p. 726).

These factors coincide with the alterations posited by Rassaei et al. (2012) to elicit implicit knowledge. They argue that by manipulating degree of awareness, time available for the task, and focus of attention, it is possible to differentiate and target both implicit and explicit knowledge. For instance, a central difference between timed and untimed grammaticality judgement tasks lies in that the latter arguably measures explicit knowledge rather than implicit knowledge. This is exemplified by for instance Ellis et al. (2006), Rassaei et al. (2012), and Li (2014), who all included untimed grammaticality judgement tasks in their studies, in addition to elicited imitation tests, to differentiate between the effects on explicit and implicit knowledge by CF and negative evidence. In such cases, untimed grammaticality judgement tasks and other tests that arguably measure explicit knowledge can be used as a benchmark to find any effects of CF and negative evidence on explicit knowledge, as in the studies above. In contrast, to measure implicit knowledge, timed grammaticality judgement tasks have been posited as a viable option. Compared to untimed grammaticality judgement tasks, timed grammaticality judgement tasks are argued to limit the time available for learners to consciously access linguistic knowledge, thus forcing them to rely on rapidly accessed knowledge. As a result, untimed grammaticality judgment tasks can be understood as encouraging learners to draw on their explicit knowledge, whereas timed grammaticality judgement tasks inhibit learners' access to explicit knowledge, thus being more likely to tap into implicit knowledge (Ellis & Roever, 2018, p. 11).

Still, some researchers have questioned the validity of the methods discussed above, particularly the manipulation of time as a factor, on the basis that it serves to target automatized explicit knowledge rather than implicit knowledge. Considering untimed grammaticality judgement tasks again, such methods arguably draw learners' attention to form, as per their core function, and thus they may be more inclined towards measuring explicit knowledge (Suzuki & DeKeyser, 2017, p. 3). However, by including time as a factor, the result is that learners are required to process language automatically and rapid. One could argue that this is sufficient for targeting implicit knowledge, but as remarked by Suzuki and DeKeyser (2017), this may also result in learners drawing on automatized explicit knowledge when available. Consequently, as noted in previous sections, a central issue can be identified in the fact that both implicit and automatized explicit knowledge can be accessed rapidly by learners, which makes drawing any conclusions from tests of L2 acquisition a significant challenge.

4.4.1 Consequences for second language acquisition research

Returning to the primary research question of this thesis, namely how formal and applied linguistic theories compare regarding the role of CF and negative evidence in SLA, and what evidence exists in favour of such approaches, there are a few key aspects that can be extracted from the discussion above. Considering the results of the studies reviewed here, there seem to be evidence that CF and negative evidence may benefit L2 production or performance, but such effects have also been found to be either only short-term or inconclusive due to a lack of long-term testing. This entails a greater focus on long-term studies to determine whether CF and negative evidence can lead to lasting changes to learners L2 grammar, or if such effects are more likely to be short-term only, as in White (1991) and Umeda et al. (2019).

An issue also lies in whether these effects can be said to indicate changes to linguistic competence or simply increased explicit knowledge. For this question, the results of the reviewed studies are inconclusive; it is possible to hypothesise that the apparent benefits of CF and negative evidence in language instruction were because of grammar restructuring and acquisition of implicit knowledge, but these effects can also be attributed to explicit knowledge and, to some extent, memorization of target structures. As a result, the studies and results discussed in this thesis illustrate a sense of circularity regarding how effects of CF and negative evidence in SLA can be attributed. In other words, researchers and studies from both sides of the interface debate may claim the evidence supplied by empirical studies of explicit and implicit L2 knowledge, and studies claiming positive effects of CF on L2 acquisition may find it difficult to fully conclude that linguistic competence has in fact been involved.

There is also the question of what one should expect from the outcome of L2 acquisition and the underlying mechanisms that shape this process. Considering the question of how different theories of SLA compare regarding the relevancy of CF and negative evidence then, there are fundamental differences in how L2 acquisition is assumed to progress depending on the results of the studies here. For several applied approaches and other theories that posit CF and negative evidence as beneficial for L2 development, the question of whether such treatments lead to changes in linguistic competence may not be as central. If learners' L2 production and communicative skills benefit from CF and negative evidence, applied and interactionist approaches may find studies showing improved or successful L2 use as promising, especially if such effects can be attributed to noticing of linguistic targets in input and output (Ellis, 2021; Leeman, 2003; Rassaei et al., 2012).

Moreover, consider the argument that older L2 learners are more likely to draw on the declarative memory and explicit knowledge during L2 processing. If this type of knowledge can become virtually indistinguishable from implicit knowledge in terms of accessibility and rapidity, this may entail that this type of knowledge may be sufficient for successful L2 acquisition according to some theoretical approaches to SLA. If additional results from studies of CF can be conclusively determined to stem from automatized explicit knowledge, this could potentially serve as support of the claim made by for instance skill acquisition theories in that CF may assist learners in establishing declarative knowledge that is later proceduralized (Ellis, 2010, p. 336).

In contrast, for formal and generative models of SLA, the core assumption is that acquisition is driven by exposure to input containing positive evidence, i.e., PLD, and that providing learners with CF and negative evidence does not influence the underlying linguistic competence or lead to grammar restructuring (Schwartz, 1993). Thus, effects on explicit knowledge and linguistic behaviour may be seen as insufficient, as this does not answer the question of whether negative evidence – and CF by extension – can be claimed to have any effect on linguistic competence. Formal and generative approaches seek to determine the underlying mechanisms that drive acquisition; therefore, if studies show that CF leads to improved L2 behaviour based on explicit knowledge, or even automatized explicit knowledge, this should not be relevant for these paradigms and their theories about the development of linguistic competence.

5.0 Conclusion

The purpose of this thesis was to compare the fundamental differences between theories stemming from formal and applied approaches to SLA and discuss whether there is evidence to support the individual claims made by the respective theories. As the preceding chapters show, the main difference between these theoretical approaches culminates in whether one assumes that factors such as explicit instruction, negative evidence, and CF can be used to cause changes to learners' underlying linguistic competence. This is a complicated matter, as linguistic competence and implicit knowledge are by definition unconscious. This means that to measure whether L2 acquisition has occurred, researchers must draw inferences from learners' linguistic behaviour, which can often be attributed to explicit knowledge instead.

The secondary research question asked whether it can be concluded from the reviewed studies that there is a type of CF that can be said to better target L2 acquisition than others. To answer this question, one can either compare the individual CF types to one another, or one can classify and compare them according to factors such as explicitness and implicitness. Overall, explicit CF types, and particularly metalinguistic feedback and explicit corrections, have been argued to be better than more implicit CF, such as recasts, because they draw attention to specific aspects of the target language. This was also one of the findings of the studies reviewed here, as explicit CF seem to benefit learners by promoting noticing and saliency.

However, determining the relative effectiveness of CF in this study is also constrained by the numerous factors that influence the use and reception of such treatment. This can be found in both the meta-analyses and the individual studies reviewed here, where for instance treatment length, potential for positive and negative evidence, testing methods, target structure, age, and language proficiency have all been identified as factors that may either limit or increase the potential effects of CF. This means that from the studies reviewed here, but also following the conclusions of previous studies and meta-analyses, the question of what type of CF is more effective remains unsolved.

The numerous factors that influence CF effectiveness can also be directly related to the secondary research question and whether it can be concluded from the studies reviewed here that providing CF and negative evidence can lead to changes in underlying linguistic competence. One possible conclusion is that CF and negative evidence did in fact lead to acquisition of the target structures in question, as the results of the individual studies and tests showed that learners' L2 behaviours and comprehension were changed following treatment. As some of the studies arguably measured learners' implicit L2 knowledge following language instruction, it is therefore possible to argue that the positive effects following CF treatment was because of successful L2 acquisition. Conversely, changes in L2 behaviour can also be explained in the sense of the no interface position and the argument that language is domain specific and the process of L2 acquisition is driven by UG and PLD. Following this perspective then, the above results regarding CF and negative evidence did not stem from changes to linguistic competence, but rather learners drawing on their explicit knowledge and declarative memory in comprehending and producing L2.

Whether this ambiguity should be attributed to the inherent elusiveness of implicit knowledge, testing methods, or the structure of instruction and treatment is a matter of debate. However, one important conclusion that can be made from the review and subsequent discussion is that there is a significant lack of long-term measurements of L2 learners' knowledge following instruction and language exposure. This is particularly prominent for studies of CF, where no study reviewed here included delayed post-testing past a few days or months at the longest. As long-term retention of knowledge is one of the fundamental features of acquired language, this means that the absence of tests to determine whether this has occurred makes any attempts at drawing inferences from the results discussed here significantly more challenging.

5.1 Limitations and suggestions for further research

To compare and discuss results of different approaches to SLA questions, a relatively broad scope of studies was maintained. However, this also meant a lack of a full examination and discussion of the different factors involved in the individual studies and how this may influence the process of L2 acquisition. Moreover, due to the scope and length of this thesis, this meant that some CF types were discussed more thoroughly than others. This was primarily because previous studies have already identified certain types or categories of CF as more significant for SLA research, particularly the difference between explicit and implicit CF, such as metalinguistic feedback, explicit corrections, and recasts. Although a more

thorough comparison of each individual type of CF would have been an interesting approach, this would ultimately have entailed an entirely different focus for this thesis.

Except from theories about the relationship between procedural and declarative memory and explicit and implicit knowledge, this thesis did not include further research on neurobiological factors and mechanisms that may shape the process of L2 acquisition. Additional steps towards combining formal and applied linguistic theories with fields of neurobiology and psychology, including various testing methods from multiple fields of research, such eye movements, ERPs, and fMRI, should be taken in future SLA research. This, taken together with more long-term studies – both in treatment and testing – could potentially lead to a better understanding of the role of CF and negative evidence in SLA.

6.0 References

Ammar, A., & Spada, N. (2006). One size fits all? Recasts, Prompts, and L2 Learning. *Studies in Second Language Acquisition, 28*(4), 543-574. https://doi.org/10.1017/S0272263106060268

Baker, C. (1979). Syntactic Theory and the Projection Problem. *Linguistic Inquiry, 10*(4), 533-581.

Bruton, A. (2000). What exactly are positive and negative evidence in SLA? *RELC Journal, 31*(2), 120-133. https://doi.org/10.1177/003368820003100206

Carroll, S., & Swain, M. (1993). Explicit and implicit negative feedback. *Studies in Second Language Acquisition, 15*(3), 357-386. https://doi.org/10.1017/S0272263100012158

Chater, N., & Vitányi, P. (2007). "Ideal learning" of natural language: Positive results about learning from positive evidence. *Journal of Mathematical Psychology, 51*(3), 135-163. https://doi.org/10.1016/j.jmp.2006.10.002

Chen, J., Lin, J., & Jiang, L. (2016). Corrective feedback in SLA: Theoretical relevance and empirical research. *English Language Teaching, 9*(11), 85-94. https://doi.org/10.5539/elt.v9n11p85

Chomsky, N. (1981). *Lectures on government and binding*. Foris Publications.

DeKeyser, R. M. (1993). The effect of error correction on L2 grammar knowledge and oral proficiency. *The Modern Language Journal, 77*(4), 501-514. https://doi.org/10.1111/j.1540-4781.1993.tb01999.x

DeKeyser, R. M. (2015). Skill acquisition theory. In B. VanPatten, & J. Williams (Eds.), *Theories in second language acquisition: An introduction* (2nd ed., pp. 94-112). Routledge. https://doi.org/10.4324/9780203628942

Ellis, R. (2005). Measuring implicit and explicit knowledge of a second language: A psychometric study. *Studies in Second Language Acquisition, 27*(2), 141-172. https://doi.org/10.1017/S0272263105050096

Ellis, R. (2009). Corrective feedback and teacher development. *L2 Journal*, *1*(1), 3-18. https://doi.org/10.5070/l2.v1i1.9054

Ellis, R. (2010). Epilogue: A framework for investigating oral and written corrective feedback. *Studies in Second Language Acquisition, 32*(2), 335-349. https://doi.org/10.1017/S0272263109990544

Ellis, R. (2021). A short history of SLA: Where have we come from and where are we going? *Language Teaching 54*(2), 190-215. https://doi.org/10.1017/s0261444820000038

Ellis, R., Loewen, S., Elder, C., Reinders, H., Erlam, R., & Philp, J. (2009). *Implicit and explicit knowledge in second language learning, testing and teaching*. Multilingual Matters.

Ellis, R., Loewen, S., & Erlam, R. (2006). Implicit and explicit corrective feedback and the acquisition of L2 grammar. *Studies in Second Language Acquisition, 28*(2), 339-368. https://doi.org/10.1017/S0272263106060141

Ellis, R., & Roever, C. (2018). The measurement of implicit and explicit knowledge. *The Language Learning Journal, 49*(2), 160-175. https://doi.org/10.1080/09571736.2018.1504229

Ellis, R., & Sheen, Y. (2006). Reexamining the role of recasts in second language acquisition. *Studies in Second Language Acquisition, 28*(4), 575-600. https://doi.org/10.1017/S027226310606027X

Gass, S. M. (2003). Input and interaction. In C. J. Doughty & M. H. Long (Eds.), *The handbook of second language acquisition* (pp. 224-255). Blackwell Publishing Ltd. https://doi.org/10.1002/9780470756492

Gass, S. M., & Mackey, A. (2015). Input, interaction, and output in second language acquisition. In B. VanPatten, & J. Williams, *Theories in second language acquisition: An introduction* (2nd ed., pp. 180-206). Routledge. https://doi.org/10.4324/9780203628942

Goo, J. (2020). Research on the role of recasts in L2 learning. *Language Teaching, 53*(3), 289-315. https://doi.org/10.1017/S026144482000004X

Goo, J., & Mackey, A. (2013). The case against the case against recasts. *Studies in Second Language Acquisition, 35*(1), 127-165. https://doi.org/10.1017/S0272263112000708

Han, Z., & Finneran, R. (2013). Re-engaging the interface debate: strong, weak, none, or all? *International Journal of Applied Linguistics, 24*(3), 370-389. https://doi.org/10.1111/ijal.12034

Hsu, A. S., Chater, N., & Vitányi, P. (2013). Language learning from positive evidence, reconsidered. A simplicity-based approach. *Topics in Cognitive Science, 5*(1), 35-55. https://doi.org/10.1111/tops.12005

Izumi, S., & Lakshmanan, U. (1998). Learnability, negative evidence and the L2 acquisition of the English passive. *Second Language Research, 14*(1), 62-101. https://doi.org/10.1191/026765898675700455

Krashen, S. (1982). *Principles and practice in second language acquisition*. Pergamon

Krashen, S. D. (1985). *The input hypothesis: Issues and implications*. Longman.

Lee, E. J. (2013). Corrective feedback preferences and learner repair among advanced ESL students. *System, 41*(2), 217-230. https://doi.org/10.1016/j.system.2013.01.022

Leeman, J. (2003). Recasts and second language development: Beyond negative evidence. *Studies in Second Language Acquisition, 25*(1), 37-63. https://doi.org/10.1017/S0272263103000020

Leeman, J. (2007). Feedback in L2 learning: Responding to errors during practice. In R. DeKeyser (Ed.), *Practice in a second language: Perspectives from applied linguistics and cognitive Psychology* (pp. 111-138). Cambridge University Press. https://doi.org/10.1017/CBO9780511667275.007

Li, S. (2010). The effectiveness of corrective feedback in SLA: A meta-analysis. *Language Learning, 60*(2), 309-365. https://doi.org/10.1111/j.1467-9922.2010.00561.x

Li, S. (2014). The interface between feedback type, L2 proficiency and the nature of the linguistic target. *Language Teaching Research, 18*(3), 373-396. https://doi.org/10.1177/1362168813510384

Li, S., & Vuono, A. (2019). Twenty-five years of research on oral and written feedback in System. *System, 84*, 93-109. https://doi.org/10.1016/j.system.2019.05.006

Lyster, R. (2004). Differential effects of prompts and recasts in form-focused instruction. *Studies in Second Language Acquisition, 26*(3), 399-432. https://doi.org/10.1017/S0272263104263021

Lyster, R., & Ranta, L. (1997). Corrective feedback and learner uptake. *Studies in Second Language Acquisition, 19*(1), 37-66. https://doi.org/10.1017/S0272263197001034

Lyster, R., & Saito, K. (2010a). Oral feedback in classroom SLA: A meta-analysis. *Studies in Second Language Acquisition, 32*(2), 265-302. https://doi.org/10.1017/S0272263109990520

Lyster, R. & Saito, K. (2010b). Interactional feedback as instructional input: A synthesis of classroom SLA research. *Language, Interaction and Acquisition, 1*(2), 276-296. https://doi.org/10.1075/lia.1.2.07lys

Lyster, R., Saito, K., & Sato, M. (2013). Oral corrective feedback in second language classrooms. *Language Teaching, 46*(1), 1-40. https://doi.org/10.1017/S0261444812000365

Mackey, A. (2006). Feedback, noticing and instructed second language learning. *Applied Linguistics, 27*(3), 405-430. https://doi.org/10.1093/applin/ami051

MacWhinney, B. (2004). A multiple process solution to the logical problem of language acquisition. *Journal of Child Language, 31*(4), 883-914. https://doi.org/10.1017/S0305000904006336

Marcus, G. F. (1993). Negative evidence in language acquisition. *Cognition*, 46(1), 53-85. https://doi.org/10.1016/0010-0277(93)90022-N

McLaughlin, B. (1987). The Monitor Model: Some methodological considerations. *Language Learning, 28*(2), 309-332. https://doi.org/10.1111/j.1467-1770.1978.tb00137.x

Mitchell, R., Myles, F., & Marsden, E. (2013). *Second language learning theories*. Routledge.

Nassaji, H. (2016). Anniversary article Interactional feedback in second language teaching and learning: A synthesis and analysis of current research. *Language Teaching Research, 20*(4), 535-562. https://doi.org/10.1177/1362168816644940

Nassaji, H. (2019). The effects of recasts versus prompts on immediate uptake and learning of a complex target structure. In R. DeKeyser, & G. P. Botana (Eds.), *Doing SLA research with implications for the classroom: Reconciling methodological demands and pedagogical applicability* (pp. 107-126). John Benjamins Publishing Company. https://doi.org/10.1075/lllt.52

Nassaji, H. (2020). Assessing the effectiveness of interactional feedback for L2 acquisition: Issues and challenges. *Language Teaching, 53*(1), 3-28. https://doi.org/10.1017/S0261444819000375

Norris, J. M., & Ortega, L. (2000). Effectiveness of L2 instruction: A research synthesis and quantitative meta-analysis. *Language Learning, 50*(3), 417-528. https://doi.org/10.1111/0023-8333.00136

Oliver, R. (2018). Negative versus positive evidence. In J. I. Liontas (Ed.), *The TESOL Encyclopedia of English Language Teaching* (pp. 1-8). John Wiley and Sons. https://doi.org/10.1002/9781118784235.eelt0083

Ortega, L. (2009). *Understanding second language acquisition*. Routledge.

Paradis, M. (2009). *Declarative and procedural determinants of second languages*. John Benjamins Publishing Co.

Plonsky, L., & Oswald, F. L. (2014). How big is "big"? Interpreting effect sizes in L2 research. *Language Learning, 64*(4), 878-912. https://doi.org/10.1111/lang.12079

Rassaei, E. (2013). Corrective feedback, learners' perceptions, and second language development. *System, 41*, 472-483. https://doi.org/10.1016/j.system.2013.05.002

Rassaei, E., Moinzadeh, A., & Youhanaee, M. (2012). The effect of corrective feedback on the acquisition of implicit and explicit L2 knowledge. *The Journal of Language Teaching and Learning, 2*(1), 59-75. https://dergipark.org.tr/en/download/article-file/209061

Rankin, T., & Unsworth, S. (2016). Beyond poverty: Engaging with input in generative SLA. *Second Language Research, 32*(4), 563-572. https://doi.org/10.1177/0267658316648732

Roberts, L., González Alonso, J., Pliatsikas, C., & Rothman, J. (2018). Evidence from neurolinguistic methodologies: Can it actually inform linguistic/language acquisition theories and translate to evidence-based applications? *Second Language Research, 34*(1), 125-143. https://doi.org/10.1177/0267658316644010

Rothman, J., & Slabakova, R. (2017). The generative approach to SLA and its place in modern second language studies. *Studies in Second Language Acquisition, 40*(2), 417-442. https://doi.org/10.1017/S0272263117000134

Russell, J., & Spada, N. (2006). The effectiveness of corrective feedback for the acquisition of L2 grammar. In L. Ortega & J. M. Norris (Eds.), *Synthesizing research on language learning and teaching* (pp. 133-164). John Benjamins Publishing Co. https://doi.org/10.1075/lllt.13

Schmidt, R. W. (1990). The Role of Consciousness in second language learning. *Applied Linguistics, 11*(2), 129-158. https://doi.org/10.1093/applin/11.2.129

Schwartz, B. D. (1993). On explicit and negative data effecting and affecting competence and linguistic behavior. *Studies in Second Language Acquisition, 15*(2), 147-163. https://doi.org/10.1017/S0272263100011931

Schwartz, B. D., & Gubala-Ryzak, M. (1992). Learnability and grammar reorganization in L2A: against negative evidence causing the unlearning of verb movement. *Interlanguage Studies Bulletin (Utrecht), 8*(1), 1-38. https://doi.org/10.1177/026765839200800102

Schwartz, B. D., & Sprouse, R. (1996). L2 cognitive states and the full transfer/full access model. *Second Language Research, 12*(1), 40-72. https://doi.org/10.1177/026765839601200103

Snape, N., & Yusa, N. (2013). Explicit article instruction in definiteness, specificity, genericity, and perception. In M. Whong, K. Gil, & H. Marsden (Eds.), *Universal grammar and the second language classroom* (pp. 161-183). Springer. https://doi.org/10.1007/978-94-007-6362-3

Spada, N., Shiu, J. L.-J., & Tomita, Y. (2015). Validating an elicited imitation task as a measure of implicit knowledge: Comparisons with other validation studies. *Language Learning, 65*(3), 723-751. https://doi.org/10.1111/lang.12129

Suzuki, Y. (2017). Validity of new measures of implicit knowledge: Distinguishing implicit knowledge from automatized explicit knowledge. *Applied Psycholinguistics*, 38(5), 1229-1261. doi:10.1017/S014271641700011X

Suzuki, Y., & DeKeyser, R. (2017). The interface of explicit and implicit knowledge in a second language: Insights from individual differences in cognitive aptitudes. *Language Learning, 67*(4), 747-790. https://doi.org/10.1111/lang.12241

Swain, M. (1985). Communicative competence: some roles of comprehensible input and comprehensible output in its development. In S. Gass, & C. Madden (Eds.), *Input in second language acquisition* (pp. 235-253). Newbury House.

Swain, M., & Suzuki, W. (2008). Interaction, output, and communicative language learning. In B. Spolsky & F. Hult (Eds.), *Handbook of educational linguistics* (pp. 557-570). Blackwell Publishing Ltd. https://doi.org/10.1002/9780470694138

Trahey, M. (1996). Positive evidence in second language acquisition: some long-term effects. *Second Language Research, 12*(2), 111-139. https://doi.org/10.1177/026765839601200201

Ullman, M. (2001). The neural basis of lexicon and grammar in first and second language: The declarative/procedural model. *Bilingualism: Language and Cognition, 4*(2), 105-122. https://doi.org/10.1017/S1366728901000220

Ullman, M. T. (2015). The Declarative/Procedural Model: A neurobiologically motivated theory of first and second language. In B. VanPatten, & J. Williams (Eds.), *Theories in second language acquisition: An introduction* (2nd ed., pp. 135-158). Routledge. https://doi.org/10.4324/9780203628942

Umeda, M., Snape, N., Yusa, N., & Wiltshier, J. (2019). The long-term effect of explicit instruction on learners' knowledge on English articles. *Language Teaching Research, 23*(2), 179-199. https://doi.org/10.1177/1362168817739648

VanPatten, B. (2016). Why explicit knowledge cannot become implicit knowledge. *Foreign Language Annals*, 49(9), 650-657. https://doi.org/10.1111/flan.12226

White, L. (1991). Adverb placement in second language acquisition: some effects of positive and negative evidence in the classroom. *Interlanguage Studies Bulletin (Utrecht), 7*(2), 133-161. https://doi.org/10.1177/026765839100700205

White, L. (1992). On triggering data in L2 acquisition: a reply to Schwartz and Gubala-Ryzak. *Interlanguage Studies Bulletin (Utrecht), 8*(2), 120-137. https://doi.org/10.1177/026765839200800202

White, L. (2003). *Second language acquisition and universal grammar*. Cambridge University Press.

White, L. (2015). Linguistic theory, Universal Grammar, and Second Language Acquisition. In B. VanPatten, & J. Williams (Eds.), *Theories in second language acquisition: An introduction* (2nd ed., pp. 34-53). Routledge. https://doi.org/10.4324/9780203628942

White, L., Hirakawa, M., & Kawasaki, T. (1996). Effects of instruction on second language acquisition of the Japanese long-distance reflexive zibun. *Canadian Journal of Linguistics/Revue Canadienne de Linguistique, 41*(3), 235-254. https://doi.org/10.1017/S0008413100016418

Whong, M. (2011). *Language teaching: Linguistic theory and practice*. Edinburgh University Press.

Whong, M. (2013). Applied generative SLA: The need for an agenda and a methodology. In M. Whong, K., Gil, & H. Marsden (Eds.), *Universal grammar and the second language classroom* (pp. 231-247). Springer. https://doi.org/10.1007/978-94-007-6362-3

Whong, M., Gil, K.H., & Marsden, H. (2014). Beyond paradigm: The 'what' and the 'how' of classroom research. *Second Language Research, 30*(4), 551-568. https://doi.org/10.1177/0267658314526749

Whong, M., Marsden, H., & Gil, K.H. (2013). How we can learn from acquisition: the acquisition-learning debate revisited. In J. C. Amaro, T. Judy, & D. Pascual y Cabo (Eds.), *Proceedings of the 12th generative approaches to second language acquisition conference* (pp. 203-210). Cascadilla Press. http://www.lingref.com/cpp/gasla/12/index.html

Yang, C., Crain, S., Berwick, R. C., Chomsky, N., & Bolhuis, J. J. (2017). The growth of language: Universal Grammar, experience, and principles of computation. *Neuroscience & Biobehavioral Reviews, 81*, 103-119. https://doi.org/10.1016/j.neubiorev.2016.12.023

Yang, Y., & Lyster, R. (2010). Effects of form-focused practice and feedback on Chinese EFL learners' acquisition of regular and irregular past tense forms. *Studies in Second Language Acquisition, 32*(2), 235-263. https://doi.org/10.1017/S0272263109990519

Zhao, Y., & Ellis, R. (2020). The relative effects of implicit and explicit corrective feedback on the acquisition of 3rd person -s by Chinese university students: A classroom-based study. *Language Teaching Research*, 1-21. https://doi.org/10.1177/1362168820903343

Appendix: Documenting search strategies

For this study, the databases and providers below were searched to find published studies of CF and negative evidence in SLA research. The searches were conducted sporadically between September 2019 and May 2021.

Institute of Education Sciences of the United States Department of Education
ERIC: Educational Resource Information Center

Johns Hopkins University Press	**JSTOR**
Project MUSE	*JSTOR: Journal Storage*
NTNU	**ScienceOpen Inc.**
NTNU Universitetsbiblioteket	*ScienceOpen*
Springer	**The Open University (OU)**
SpringerLink	*CORE*

In addition to the individual databases, other search engines were utilized for finding studies and gaining access to additional sources. These included:

CiteSeerX	**Google Scholar**
Semantic Scholar	**ORIA**

Searched terms

The following keywords were used to find relevant studies. Keywords are clustered according to relevancy and topic:

1:   *SLA; second language acquisition; L2 acquisition; language acquisition*

2:   *Corrective feedback; negative feedback*
Explicit instruction; language instruction; L2 instruction

3:   *Negative evidence; positive evidence; linguistic evidence; indirect negative evidence*

4:   *Implicit knowledge; explicit knowledge; linguistic knowledge*
Linguistic competence; linguistic performance
Procedural memory; declarative memory

5:   *Universal Grammar; UG; Generative grammar*
Parameter restructuring; parameter resetting; L2 grammar restructuring
Generalization; overgeneralization
L2 learnability; poverty of stimulus

6:   *Noticing; awareness; attention; conscious processing*
Input; output; interaction

7:   *Interface position*
No interface; non interface; strong interface; weak interface

8:   *Elicited imitation task; grammaticality judgement task*
L2 grammar measurement; measuring implicit knowledge; measuring linguistic competence

The search strategy consisted of either searching for single terms or a combination of terms, within the same or belonging to different clusters. For example:

- "Universal Grammar" *AND* "Parameter resetting" *AND* "Generalization"
- "Corrective feedback" *AND* "SLA" *AND* "Noticing"

Keyword searches produced studies published in the following journals:

Applied Linguistics	*Language Teaching Research*
Applied Psycholinguistics	*Linguistic Inquiry*
Bilingualism: Language and Cognition	*Journal of Child Language*
Canadian Journal of Linguistics /Revue Canadienne de Linguistique	*Journal of Mathematical Psychology*
Cognition	*Neuroscience & Biobehavioral Reviews*
English Language Teaching	*RELC Journal*
Foreign Language Annals	*Second Language Research*
Interlanguage Studies Bulletin (Utrecht)	*Studies in Second Language Acquisition*
International Journal of Applied Linguistics	*System*
L2 Journal	*The Language Learning Journal*
Language, Interaction and Acquisition	*The Journal of Language Teaching and Learning*
Language Learning	*The Modern Language Journal*
Language Teaching	*Topics in Cognitive Science*