

Regular Past Tense Acquisition in L2 English:
The Roles of Perceptual Salience and Readiness

Victoria Dwight

Department of Education

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By: Victoria Dwight

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Signed by the final examining committee:

Elizabeth Gatbonton Chair

Pavel Trofimovich Examiner

Walcir Cardoso Examiner

Laura Collins Supervisor

Approved by Richard Schmid
Chair of Department

Bryan Lewis
Dean of Faculty

Date January 9, 2012

Abstract

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Victoria Dwight

The goal of the present study was to investigate two factors that might play a role in the acquisition of a challenging feature of English for second language learners: the regular simple past (*-ed*, as in *walked, learned*). The first was whether learners benefited more from instruction providing practice perceiving the past in running speech once they had demonstrated some emergent knowledge of the form (the learner readiness issue, Pienemann, 1989). The second was whether the greater sonority of the regular past tense allomorph /d/ (learned) compared with the lower sonority of /t/ (walked) would result in the /d/ allomorph being acquired earlier than the /t/ allomorph (the perceptual salience issue, Goldschneider & DeKeyser, 2001). It was predicted that, following the instruction, ready learners would be superior to unready in both regular past tense written and perception accuracy, and that the /d/ allomorph would be acquired earlier than the /t/ allomorph. The participants were 11-12 year old ($n = 35$) intensive ESL students in Quebec. The study followed a pre-test/post-test/delayed-post tense design, and took place over 10 weeks. The learners' ability to produce and perceive the regular past was assessed through contextualized listening and writing tasks. A mixed ANOVA compared performance of ready and unready learners, as well as perception accuracy of /d/ and /t/ allomorphs in the perceptual training tasks over time. Independent samples t tests compared gain scores of ready and unready learners in picture-prompted written tasks prior to and following the perceptual training. Findings showed that all learners' perception of simple past improved over time, with the more salient allomorph /d/ being perceived more accurately than /t/, thus supporting the hypothesis that

salience plays a role in acquisition not only in the order of grammatical morphemes in general, but also within allomorphs of the same morpheme. Results regarding readiness showed that ready learners did not demonstrate greater rates of acquisition in perception or in production compared to unready learners, suggesting that readiness might not be applicable to the acquisition of the regular past tense form. The discussion will consider the pedagogical implications of these findings, such as (a) whether instruction of the regular past might benefit from addressing the allomorphs separately by attending to the more salient allomorph prior to the more difficult allomorph, and (b) whether the quality of the practice might be more beneficial than readiness in terms of rate of acquisition given that all learners demonstrated great improvement in the skill that was practiced (i.e., perception).

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Chapter 1. Introduction

Why do second language (L2) learners find certain aspects of a language more difficult to acquire than others? The regular simple past tense in English has been found to be particularly difficult. It is acquired late, produced variably, and sometimes, even after years of immersion in the L2 environment, does not become a productive feature of a learners' interlanguage (Dietrich, Klein, & Noyau, 1995).

The regular past tense in English denotes actions occurring in the past that do not continue into the present (e.g., *Yesterday, he walked to school*). It takes one form orthographically (*-ed looked*) and three forms phonetically (/ɪd/ *hunted* /hʌntɪd/; /d/ *hugged* /hʌgd/; /t/ *asked* /æskt/). In the present study, the acquisition of the regular past tense by L2 learners of English will be investigated.

A number of studies have attempted to isolate certain factors to better understand why the regular past tense causes so much difficulty for L2 English learners (e.g., Bayley, 1994; Collins, Trofimovich, White, Cardoso, & Horst, 2009; Goldschneider & DeKeyser, 2001). Perceptual salience has been found to play a large role. Goldschneider and DeKeyser (2001) compiled a meta-analysis in order to account for various influences on acquisition, which included perceptual salience, semantic complexity, morphophonological regularity, syntactic category, and frequency. The results suggest that saliency is one of the largest determiners for the acquisition order of grammatical morphemes and may help explain why the regular past is acquired so late. Salience, however, is a broad term and should be more clearly defined.

In the present study the perceptual salience of the regular past tense allomorphs will be defined in terms of syllabicity (i.e., whether the allomorph is its own syllable (/ɪd/ in *wanted* /want.ɪd/) or a component of a syllable (/d, t/ in *grabbed, asked* /græbd, æskt/)), sonority (the

loudness of the sound (e.g., vowels are higher in sonority/louder while consonants are lower/quieter)), and vulnerability due to phonetic environment (via reduction/deletion strategies in running speech (e.g., *kissed me* /kɪsst.mi/ → /t/ deletion [kɪs.mi])). The regular past tense allomorphs, particularly /d, t/, show low perceptual salience as defined by the above criteria. The /d, t/ allomorphs demonstrate particularly low salience in running speech (the environment in which the regular past tense items are found in the present study). For this reason /d, t/ will be the focus of the present study. The relative salience of all three allomorphs (/ɪd, d, t/), however, will be further discussed in chapter 2 in order to better illustrate the reasons that the non-syllabic allomorphs (/d, t/) might be more problematic for learners in terms of perceptual salience than the syllabic allomorph (/ɪd/).

While perceptual salience is an important factor to consider when investigating the acquisition difficulties that L2 learners face with the regular past, other factors such as learner readiness may also play an important role. Learner readiness refers to a learner's ability to process the form being targeted. A learner is considered ready if the input is just above the current level of the learner and thus the targeted form is *processable*. However, any input that is too far beyond the learner's level will cause the form to be too difficult (*unprocessable*); in other words, the learner would be considered unready to acquire the form (Pienemann, 1989, 1999). In previous developmental stage research, ready learners showed greater rates of acquisition than unready learners (e.g., Mansouri & Duffy, 2005). The present study will seek to determine whether ready learners show greater benefits than unready learners in perception and production when provided input targeting the regular past.

In summary, the present study will investigate (a) whether ready learners show greater improvement in regular past tense written production accuracy compared to unready learners, (b) whether ready learners show greater improvement in regular past tense perception, (c) whether

there is a difference in perception accuracy of the /d/ and /t/ regular past tense allomorphs in contextualized listening tasks, and (d) whether ready learners perceive /d/ or /t/ differently than unready learners.

Contributions

The present study will address the following gaps in the literature: (a) whether salience can inform acquisition order within a single morpheme (between allomorphs /d/ and /t/) in perception, and (b) whether learners considered ready for the input will show greater rates of acquisition than unready learners not only in production but also in perception.

Previous research regarding the perceptual salience of the regular past tense has investigated its salience relative to other grammatical morphemes (e.g., Collins et al., 2009; Goldschneider & DeKeyser, 2001). The present study, however, investigated only the regular past tense morpheme to determine whether an acquisition order based on relative salience can be predicted not among grammatical morphemes but within one morpheme (i.e., between the /d/ and /t/ allomorphs of the regular past).

Very few studies have investigated the relative salience of the non-syllabic regular past tense allomorphs /d, t/ in terms of perception accuracy of L2 English learners in contextualized listening tasks (Cardoso, Collins, Horst, Trofimovich, & White, 2011; Solt, Pugach, Klein, Adams, Stoyneška, & Rose, 2004). While Solt et al. (2004) reported perception accuracy scores of /d/ and /t/, no conclusions regarding acquisition order of the two allomorphs could be made due to the fact that the perception accuracy of /d/ and /t/ was not tracked over time. By investigating perceptual accuracy of the /d/ and /t/ allomorphs over time, I will determine whether an acquisition order predicted by salience can be applied to the regular past /d, t/ allomorphs.

I would also like to determine whether learners who are ready to acquire the regular past tense benefit more from input targeting the regular past than unready learners, not only in

production but also in perception. While a number of studies have investigated whether ready learners benefit more than unready learners in terms of production (e.g., Pienemann, 1989), to the author's knowledge, no study has investigated whether ready learners show higher rates of development in perception accuracy of the regular past.

Pedagogically speaking, if the more salient allomorph is perceived more accurately prior to the low salient allomorph, this would support the fact that an acquisition order might exist within the regular past tense morpheme. In order to improve instruction, research could investigate whether it might be beneficial to teach one allomorph of the regular past (e.g., /d/ allomorph) prior to another (e.g., /t/ allomorph). Educators might consider exposing learners to the more salient allomorph of the regular past tense first, in order to ensure that the processing load is not too great and is at the appropriate level (in essence, learners would be “ready” for the form, potentially because it is more salient and thus easier to acquire). If readiness and salience do influence rate and order of acquisition, determining whether teaching the allomorphs of the regular past separately according to the level of the learner might help acquisition of this difficult form.

Very little research has specifically targeted the salience of the regular past and the role it may play in acquisition; therefore, this study seeks to contribute findings that could help to further expand this area of research.

In Chapter 2, a literature review will (a) provide further information regarding the low perceptual salience of the regular past tense and its role in acquisition order, (b) discuss the relative perceptual salience of the three regular past tense allomorphs (/ɪd, d, t/) in terms of syllabicity, sonority, and phonetic environment, and (c) determine whether input targeting the regular past tense is more beneficial to learners who are ready to acquire the past.

Chapter 2. Literature Review

Perceptual Salience and Regular Past Tense Acquisition

Recent studies have found that perceptual salience of grammatical morphemes helps predict the order that they will be acquired, with early acquired morphemes being the most salient such as *-ing* and late acquired morphemes being the least salient such as *-ed* (Collins et al., 2009; N.C. Ellis, 2006; Goldschneider & DeKeyser, 2001; Wolfram, 1985). Salience was more broadly defined in the study by Goldschneider and DeKeyser (2001), and incorporated both phonological and semantic salience. The present study will focus on a subcategory of salience (i.e., perceptual salience). While Goldschneider and DeKeyser defined perceptual salience by means of syllacticity, sonority, and number of phones, the present study will include the first two criteria, but not the latter (number of phones). Instead new criteria that is more applicable to the /d, t/ allomorphs will be added, that is, vulnerability due to phonetic environment. Including the influence of the surrounding environment in running speech will help account for external factors that may enhance or reduce the salience of the regular past tense allomorphs. The goal of this section is to provide more background information on the low perceptual salience of the regular past tense and how it may play a role in acquisition.

Collins et al. (2009) found that *-ed* was not very salient in a corpus of teacher talk compared to the early acquired *-ing*. The regular past was rarely stressed and was followed by the least salient phonetic environment (i.e., a consonant - *asked the*) approximately 75% of the time. In addition the regular past was marked with the non-syllabic (and thus less salient) /d/ or /t/ (*learned/asked*) allomorphs the majority of the time (78%). Within these instances of non-syllabic past, many cases of assimilation or deletion were noted, thus causing the final stop to lack saliency due to the phonetic environment (e.g., *walked to /wakt.tu/* → [wak.tu]). In contrast,

the early acquired morpheme *-ing* was never reduced or deleted and was sometimes made more salient by a following pause. These results suggest that a relationship between acquisition order and salience may exist.

The studies cited above provide evidence suggesting that salience may be a factor in the late acquisition of the regular past tense; however, all of these studies compared the acquisition order of the regular past to other grammatical morphemes. The present study will investigate whether salience can also play a role in acquisition order within a single morpheme (i.e., the regular past tense allomorphs /d/ and /t/). If perceptual salience does play a role, there is a possibility that the allomorphs of the regular past may also be subject to an acquisition order, with the more salient allomorph being acquired prior to the less salient allomorph.

The following section will determine the relative salience of the three regular past tense allomorphs (/ɪd, d, t/). The allomorphs will be compared in order to determine whether the difference in salience among allomorphs might inform the order of acquisition.

Syllabicity. According to the perceptual salience hypothesis, “A second language learner will perceive and produce a syllabic grammatical suffix more accurately than a non-syllabic grammatical suffix because a syllable is more perceptually salient than a consonant (or cluster of consonants)” (Klein, Stoyneshka, Adams, Rose, Pugach, & Solt, 2004, p.3). If the perceptual salience hypothesis is correct, in other words, if a syllabic grammatical suffix is more salient than a non-syllabic grammatical suffix, then we would assume that the regular past tense syllabic allomorph /ɪd/ (*printed*) would be more salient than the non-syllabic /d/ (*learned*) and /t/ (*kissed*). If perceptual salience in terms of syllabicity does play a role in acquisition order, we could say that the syllabic /ɪd/ would be acquired before the non-syllabic /d/ and /t/ allomorphs. In this case, /d/ and /t/ would be equal in salience as defined by their syllabicity. Past studies have supported the perceptual salience hypothesis’ claim that /d/ and /t/ are more difficult to perceive than /ɪd/

(Collins et al., 2009; Goldschneider & DeKeyser, 2001; Klein et al., 2004; Solt et al., 2004).

Different findings, however, were reported in a study by Marchman (1997) who found that children (aged 3;8 to 13;5) were much more likely to produce the base form of the verb (zero marking) rather than the appropriate past tense marker when the base form ended in a alveolar stop. In other words, the children marked more for regular past tense with the non-syllabic allomorphs /d/ (*leaned*) and /t/ (*baked*) than for /ɪd/ (*melted*). The lack of marking with the more salient /ɪd/ compared to the less salient /d/ and /t/ is contrary to the assumption than the syllabic /ɪd/ is more salient and thus acquired earlier than /d, t/. However, given that the study focused on irregular and regular verbs, only three syllabic regular verbs were included (*melt, seat, mend*), one of which was later eliminated (*seat*) due to confusion with the verb *sit*. Given that the remaining two items were much more infrequent than the /d, t/ verbs chosen, it is possible that frequency influenced the results. Frequency has also been shown to be one of the major factors in acquisition order (e.g., Goldschneider & DeKeyser, 2001). The present study will attempt to eliminate this variable by using only highly frequent regular past tense verbs.

The preceding section has established that /d/ and /t/ are the least salient allomorphs of the regular past tense by means of syllabicity. The following section will investigate consonant cluster deletion strategies and other ways in which the surrounding phonetic environment may further reduce the salience of /d/ and /t/ in running speech.

Reduction due to phonetic environment. In discussing saliency, it is perhaps useful to examine research regarding consonant cluster simplification in running speech. The strategy of word-final stop deletion in certain consonant clusters is common among L1 and L2 speakers of English. The regular past tense /d/ and /t/ are frequently found in word-final consonant clusters and may undergo deletion of the stop, in other words, deletion of the past tense marker. Speaker strategies are relevant to the discussion regarding perceptual salience because many of these

strategies reduce the salience of the regular past tense in running speech. For this reason, the listener might find the /d, t/ allomorphs even more difficult to perceive (i.e., less salient) in running speech than in isolation.

Wolfram (1985) acknowledges that many factors influence the way in which learners mark tense, but that special attention should be paid to surface constraints, such as the shape of the suffix of the past tense as well as the phonological environment. Wolfram (1985) found that L1 Vietnamese speakers learning English had a tendency to delete word-final /d/ and /t/, particularly in consonant clusters (e.g., /st/ in *kist/ kissed* → [kɪs]). Both lexical clusters (e.g., /st/ in *list*) and regular past tense morpheme clusters (e.g., /st/ in *kissed*) were examined and deletion was evident in both. This suggests that phonological, not just grammatical unmarking plays a role in the deletion of the past tense marker /d/ and /t/ in the regular past. Furthermore, Wolfram (1985) suggests that this same process of unmarking occurs in L1 speakers of English, particularly when the word-final stop is followed by a consonant (e.g., /stm/ in *kist.mi/ kissed me* → /sm/ in [kɪs.mi]).

Other studies have also shown evidence of deletion strategies in syllabic codas, particularly stops in word-final position. Anderson (1987) investigated syllabic codas and found that Mandarin speakers most commonly deleted /t/ or /d/ in word-final position of consonant clusters. Broselow, Hurting, and Ringen (1987) discovered that voiced stops were rarely produced correctly, and deletion, devoicing, and/or epenthesis were often evident. It has been documented that in certain environments both L1 and L2 speakers of English perform deletion of the least sonorant element in a consonant cluster in coda position (Pennington & Ku, 1993). In the case of the regular past tense morpheme, deletion of the least sonorant element in the consonant cluster would be deletion of the entire past tense marker (i.e., /d/ or /t/). Because it is suggested that syllabic codas “desire” to remain high in sonority and because consonant clusters

in English often end in low sonority, Ohala (1999) suggests that, in coda position, clusters are often reduced to the consonant that demonstrates the minimal descent in sonority from its preceding nucleus. For instance, in the word *laughed* /laeft/, within the consonant cluster coda /ft/, the more sonorant element of the coda is /f/. Because /f/ is higher in sonority than /t/, /f/ is retained while /t/ is reduced or deleted. Hansen (2001) found similar results with Mandarin Chinese speakers of English, suggesting that high rates of word-final stop deletion occur in liquid-nasal-stop consonant clusters (e.g., /rnd/ in *learned*), in which the more sonorant /rn/ is retained while the less sonorant /d/ is deleted. Hansen also shows evidence for the Universal Canonical Syllable Structure (UCSS), which suggests that all three-member consonant clusters lend themselves to deletion strategies because all complex consonant clusters violate the UCSS (Carlisle, 1999). Therefore, deletion strategies would be a means to “correct” the violation of a three-member consonant cluster to a more acceptable two-member cluster. Because the regular past tense markers /d, t/ are often combined with complex structures which violate the UCSS, the regular past tends to be quite vulnerable to deletion strategies.

Weinberger (1987) also found that the length of codas had a negative relationship to the production accuracy. In Mandarin speakers, 42% of three-member codas were modified in some way, many by means of deletion. Because complex consonant clusters are rare in most languages, they are considered to be marked and more difficult to acquire. The English regular past is frequently combined with complex consonant clusters which may help to explain its vulnerability to deletion (Kager, 1999). The low salience of the regular past tense may be partly due to its reduction in these phonetic environments.

Evidence that preceding consonant clusters may influence the salience of the past tense marker has been discussed; however, as Collins et al. (2009) suggest, it is possible that the

following phonetic environment may also influence salience due to strategies such as co-articulation with the following consonant (e.g., *learned the* /lərnd.ðə/ → [lərn.ðə]). Wolfram (1985) even eliminates homorganic stop samples from his data (e.g., *banned dogs*) due to the inability to determine “whether the past tense was phonetically marked or not” (p. 231). If trained researchers have difficulty perceiving the past tense then it is perhaps fair to assume that native speakers and especially L2 speakers of English would have difficulty as well. In fact, a recent study by Collins, Trofimovich, and Bell (2011) has found evidence for just this, revealing that both L1 and L2 speakers of English have difficulty perceiving the past tense form.

The goal of discussing speaker strategies is to show that both L1 and L2 speakers systematically delete the regular past tense markers /d, t/ in certain phonetic environments. This deletion may further reduce the salience of the regular past tense for the listener and impede the acquisition of /d, t/.

The above sections have provided ample evidence as to the possible reasons for the low salience of the regular past tense and in particular the low salience of /d/ and /t/. However, it should be noted that almost all of the cited studies focused on oral production of the regular past tense rather than perception. In the present study perception will be investigated. In addition to this, almost all of the research above has treated /d/ and /t/ as one category (regular past non-syllabic allomorphs). What has not yet been established in this literature review is whether there is a difference in perceptual salience between /d/ and /t/ and whether this difference in salience will play a role in order of acquisition of these segments. Next, the relative salience of the past tense allomorphs /d, t/ will be discussed by means of sonority.

Sonority. The perceptual salience of a morpheme not only includes the syllabicity and the surrounding phonetic environment, but also the sonority. Sonority can be defined as “the degree

of openness of the vocal apparatus during speech production" (Goldsmith, 1990, p.110-11).

Sonority can also refer to the loudness of the sound and whether the sound is voiced or unvoiced (Clements, 1990). Laver (1994) discusses a sonority hierarchy in which stops (e.g., /t/ in *tap* /tæp/) are rated as having the lowest sonority, while vowels (e.g., /æ/ in *tap* /tæp/) are rated as having the highest (p.504). Hogg and McCully (1987) refer to this sonority hierarchy (see figure 1) to discuss how the sonority of a phoneme can influence its salience. In other words, the higher the sonority of a phoneme, the higher the salience of it.

Sounds	Sonority values	Examples
Low vowels	10	/a,æ/
Mid vowels	9	/e,o/
High vowels (and glides)	8	/i,u/
Flaps	7	/ɾ/
Laterals	6	/l/
Nasals	5	/m,n,ŋ/
Voiced fricatives	4	/v,ð,z/
Voiceless fricatives	3	/f,θ,s/
Voiced stops	2	/b,d,g/
Voiceless stops	1	/p,t,k/

Figure 1. Sonority hierarchy (Hogg & McCully, 1987, p.33).

Using the sonority rating scale, /d/ has a rating of 2 (voiced stop) and /t/ has a rating of 1 (voiceless stop). Therefore, according to the sonority hierarchy /d/ is more salient than /t/. Solt et al. (2004), however, did not find this to be true. For high proficiency learners, /t/ was perceived

more accurately than /d/. Here is a clear example of where perceptual salience as defined by the structure itself diverges from the actual perceptual performance of the learner. The finding that only high proficiency learners showed a significant difference between /d/ and /t/ suggests that other factors may have played a role in the results. This will be further addressed in the discussion section.

Perceptual salience has been defined in the above sections by means of the structure itself (syllability and sonority) and the surrounding phonetic environment (vulnerability to deletion/reduction). Based on these criteria, it can be concluded for the purpose of the present study that /d/ is more perceptually salient than /t/ due to its higher sonority.

While much of the past research has suggested that salience may be a factor in the late acquisition of the regular past as measured by past tense marking in oral production, to the author's knowledge, no study has determined whether the low salience of the regular past may play a role in late acquisition of the regular past as measured by accuracy in perception. In the present study contextualized listening tasks will be used to measure past tense perception accuracy for the /d, t/ allomorphs.

The following section will discuss factors other than salience that may play a role in regular past tense acquisition; more specifically, the role that learner readiness and processing load may play on rate of acquisition.

Processing Load and Acquisition

When bombarded with a great deal of linguistic information (as would occur within a contextualized listening task), learners are found to attend only to the most relevant and important information. VanPatten (2004) suggests that the regular past tense morpheme might not be highly

relevant because learners may be able to comprehend the concept of pastness without noticing or using the regular past tense morpheme. Learners may instead rely on lexical items (e.g., *yesterday*) that express the concept of pastness without the need for morphological marking (i.e., *-ed*). VanPatten suggests that, “for learners to process either redundant meaningful grammatical forms or nonmeaningful forms, the processing of overall sentential meaning must not drain available processing resources” (p.11). In other words, learners who are unable to comprehend the overall meaning will not be able to process forms like the regular past tense, which has been suggested to be redundant. Low level learners may find the regular past less salient in a given context due to processing overload, while high level learners may actually benefit from the context, perhaps because they are free from the burden of lower level processing constraints and are able to use the additional grammatical and lexical cues to predict the use of regular past in the story (N.C. Ellis, 2006).

Solt et al. (2004) showed support for this in a study dealing with salience of the regular past in which low proficiency learners yielded higher accuracy rates in a decontextualized perception test (68.2%) compared with a contextualized perception test (52.6%) while high proficiency learner scored higher on a contextualized test (90.6%) than a decontextualized test (74.5%). The results show that high level learners seem to benefit from contextual clues while low level learners seem to be impeded by it. Solt et al. suggest that the low proficiency group may have been subject to a heavy processing load in the contextualized test that may have led to the regular past tense being less salient. In contrast, the high proficiency group may have drawn on grammatical knowledge and other cues from the context to enhance the salience of the regular past.

The above studies suggest that perceptual salience may be definable not only by the structure itself (syllabicity, sonority) and its surrounding phonetic environment, but also by the processing load imposed on a learner in a given context. Thus, overall salience becomes a subjective experience, based not just on the structure itself but based on the individual learner and the weight of the processing load in the input (N.C. Ellis, 2006).

Pedagogically speaking, if salience of a form is dependent on how ready a learner is to process the input in which the targeted form is found, educators can attempt to provide input that will be at the appropriate level for the learners in order to enhance rate of acquisition. In the present study whether or not the regular past tense is more salient for ready learners compared to unready learners in contextualized listening tasks will be investigated. The next section will further discuss the notion of readiness and rate of acquisition.

Learner Readiness and Acquisition

The idea that rate of acquisition may increase if input is at the level for which learners are ready has been widely explored in developmental stage research. Pienemann's teachability hypothesis (1984, 1989, 1999) postulates that learners who are developmentally ready to process the input will show higher rates of acquisition than learners who are not developmentally ready to do so. Pienemann (1999) asserts that the type of instruction is not particularly important if the appropriate input (i.e., input for which the learner is ready) is applied.

The teachability hypothesis shares similar characteristics with Krashen's (1985) input hypothesis and the well-known concept of *i+1*, which suggests that input provided just above the current level of the learner is the best way for learners to acquire a given structure. Similar to the teachability hypothesis, the input hypothesis suggests that anything too far above the learner's

ability will not be acquired due to the fact that the input will be unprocessable or incomprehensible. The difference between the teachability hypothesis and Krashen's notion of *i+1* is that Krashen suggests that no type of targeted language instruction is necessary and that learners will be naturally exposed to language features necessary to move on to the next level with no instructional intervention. Conversely, the teachability hypothesis emphasizes the role of instruction in aiding the progress of learners from one developmental stage to the next. Both concepts, however, emphasize the importance of developmental readiness. If the learner does not have the processing capabilities to acquire the form, the learner is not ready and will be unable to acquire the form. Many studies have been conducted to determine whether the teachability hypothesis is a plausible standpoint to improve the effectiveness of instructional intervention in the development of L2 acquisition (e.g., Dyson, 1996; R. Ellis, 1989, 1994; Mackey & Philp, 1998; Mansouri & Duffy, 2005; Pienemann, 1984, 1989, 1999; Spada & Lightbown, 1999).

Mansouri and Duffy (2005) investigated the role of instruction on word order developmental stage progression and questioned whether learners would move more quickly through developmental stages if they were ready for the input. Six beginner adult ESL learners enrolled in an EAP course in Australia were divided into two groups: a ready group and an unready group. Results showed that learners were only able to process structures for which they were developmentally ready. This shows support for the teachability hypothesis. Mackey and Philp (1998) found similar results while investigating question formation in interaction with feedback (recasts).

Some studies have shown evidence against the teachability hypothesis, however. Research targeting relative clauses (Doughty, 1991; Eckman, Bell, & Nelson, 1988; Gass, 1982) and possessive determiners (Zobl, 1985) in particular have suggested that learners may benefit

more from input targeting stages far beyond their current level, possibly because learners are then able to extrapolate rules to lower stages. The difference in findings might be explained by varying methodology. For instance, Doughty (1991) found that it was more beneficial to teach relative clause structures beyond the level for which learners were considered ready, thus essentially disproving the teachability hypothesis. However, Doughty's categorization of ready learners differed from Pienemann's (1984, 1989, 1999) original concept of readiness which states that learners who show any emergence of the regular past in oral production have already demonstrated acquisition of the form and are thus "over ready". Doughty categorized learners as ready based on 90% emergence of a lower level relative clause structure, but all participants, even unready learners, had shown at least 30% emergence at the outset. According to Pienemann (1999), all participants in Doughty's study had already acquired the relative clause structure prior to the treatment; therefore, the design of the study was not set up to test the teachability hypothesis. The differences in methodology among studies might be a factor in conflicting results.

Spada and Lightbown (1999) showed mixed results for the importance of learner readiness on acquisition. Five intact intensive grade 6 classes consisting of 150 francophone learners were examined in terms of their progress through developmental stages of English question formation. The instructional intervention involved exposure to stage 4 and 5 question formation. The purpose was to determine whether ready learners would show greater rates of acquisition (by means of moving through developmental stages) than unready learners. The results were not clear-cut. The oral production task revealed that most students did not improve from the pretest to the posttest. In other tests, some students who were considered ready did not improve while other unready students did. Spada and Lightbown (1999) emphasize that the lack

of explicit rule teaching of question formation may have been the reason for the lack of clear-cut results. A similar experiment with a similar population was conducted earlier by Spada and Lightbown (1993) but with explicit rather than implicit rule teaching. In this earlier study learners were found to achieve higher rates of acquisition than in the later study. Therefore, the lack of explicit rule teaching may have been a factor influencing the rate of acquisition. The present study shares similarities methodologically with Spada and Lightbown's (1999) more current study. Explicit rule teaching of the target form is not provided and a number of measurements, not only oral production are utilized to analyze the development of the participants.

In the present study, the participants will be divided into two groups prior to receiving input targeting the regular past: the first group will consist of learners who are considered ready to acquire the regular past and the second group will consist of unready learners. Whether or not readiness for the input helps predict rate of acquisition will be determined based on measures of production and perception of the regular past. Perception accuracy of ready and unready learners will be examined in order to determine whether possible effects of processing load might influence overall salience of the regular past (potentially hindering unready learners due to the fact that the processing load might be too heavy). If processing load influences the salience of the allomorphs for ready and unready learners in running text, it is possible that the ready group will perceive the /d/ and /t/ allomorphs differently than the unready group. Pedagogically speaking, if results show that ready learners benefit more from input compared to unready learners, teachers could provide input at the appropriate level of the learners in order to enhance rate of acquisition of a given structure. In the present study whether or not ready learners benefit more from the input perceptually and productively will be investigated.

Research Questions

In SLA research, the late and variable acquisition of the regular past has in part been attributed to its low perceptual salience. The present study will further investigate the perception accuracy of the regular past tense allomorphs /d/ and /t/ to determine whether an acquisition order based on relative salience can be determined. In addition, the role of learner readiness will be investigated; that is, whether ready learners benefit more than unready learners from input targeting the regular past in terms of perception and production accuracy. In order to address these issues, the following research questions have been posed:

1. Do ready learners benefit more from input (contextualized listening tasks) targeting the regular past than unready learners in terms of written production accuracy of the regular past?
2. Do ready learners benefit more from input (contextualized listening tasks) targeting the regular past than unready learners in terms of perception accuracy of the regular past?
3. (a) Is there a difference in perception accuracy of regular past tense allomorphs /d/ and /t/ in contextualized listening tasks?
(b) Do ready learners perceive /d/ or /t/ differently than unready learners?

Hypotheses

1. If the teachability hypothesis can be applied to acquisition as measured by written production, ready learners will benefit more from input than unready learners in written production accuracy of the regular past.
2. If the teachability hypothesis can be applied to acquisition as measured by perception, ready learners will show higher perception accuracy than unready learners.
3. (a) Due to its higher sonority (salience), /d/ will be perceived more accurately than /t/ in contextualized listening tasks by all learners.
(b) No hypothesis is entertained for this research question. Due to the lack of previous research, it is difficult to hypothesize whether ready learners will perceive /d/ or /t/ differently than unready learners. Solt et al. (2004) found that high proficiency learners perceived /t/ > /d/, while low proficiency learners did not show a difference in perception accuracy between allomorphs; however, the present study cannot easily be compared to Solt et al. due to the fact that (i) learners were grouped based on readiness rather than proficiency, and (ii) the phonetic environment for target items differed greatly between studies (see discussion for a more detailed explanation).

Chapter 3. Methodology

The data from the present study are a subset from an ongoing project by the ALERT team of Collins, Trofimovich, Cardoso, White, and Horst (Concordia University) which was designed to investigate the learning benefits of two types of listening tasks that targeted the regular past tense in more salient contexts (/d/ verb + vowel - *wanted a*) and less salient contexts (/d/ or /t/ verbs + consonant - *looked toward*). In the present study, the least salient listening tasks (non-syllabic past tense allomorphs /d/ and /t/) will be investigated. The design and implementation of the study will be discussed in this chapter. Information detailing the participants, context, testing/treatment instruments, and testing/treatment procedure will follow.

Participants

Grade 6 (11-12 year old) francophone students (n=35) in 5-month intensive English as a second language (ESL) programs in Quebec took part in this study. The students were taken from three intact classes from three schools in French-speaking regions of Quebec.

Context

The intensive ESL program is a unique situation, different from regular immersion in the sense that it is not content-based. Students spend half of the school year learning ESL (approximately 400 hours) and the other half doing regular content-based subjects (e.g., math, social studies) in French.¹ Prior to the Grade 6 intensive ESL program, participants studied ESL on average one hour per week beginning in Grade 3.

¹ For more information on intensive ESL see Collins, Halter, Lightbown, and Spada (1999).

Data Collection

This section will discuss the testing/treatment schedule, the instruments, and the procedure.

Testing/Treatment schedule. The study was conducted over a period of 10 weeks. The first session (session A) involved testing participants on production accuracy of the regular past in contextualized oral and written tasks. Session A occurred approximately one week prior to the start of eight listening tasks taking place over a period of four weeks. Session B and session C occurred one week and one month following the completion of the listening tasks respectively, following the same procedure as session A (see table 1).

Table 1

Data Collection Schedule

Timeline	Session A	Time 1	Time 2	Time 3	Time 4	Session B	Session C
Data Collected	Oral test	Listening Task #1 (WW)	Listening Task #3 (WW)	Listening Task #5 (WW)	Listening Task #7 (WW)	Oral test	Oral test
	Written test	Listening Task #2 (FIG)	Listening Task #4 (FIG)	Listening Task #6 (FIG)	Listening Task #8 (FIG)	Written test	Written test

Note. WW = wrong word activity. FIG = fill in the gap activity.

Instruments and procedure. The following sections will describe the oral, written, and listening tasks used in the study.

Oral picture description task. Initially, the oral task was intended to be a production measure to determine the development of ready and unready learners from session A to session B and C. However, following data processing, it was discovered that no participant had

demonstrated emergence of the regular past tense in oral production in session A, B, or C. Therefore, the oral data scores were not included in the analyses. The oral task remains in the study for the purpose of eliminating over ready learners in session A (see *oral data* section for a more detailed description).

Oral picture description task instruments. The picture description task (see Appendix A for sample) elicited the regular past tense in obligatory contexts (for a more detailed description of scoring, see *Data Processing* section). Three sets of four pictures depicting a bedroom, classroom or kitchen were used. Each set consisted of one “messy” version of the room and three partially “tidied up” versions. Two of the three different sets of pictures were used for each session. Eight base form of the verbs (e.g., *clean*, *fold*) were provided on the picture along with the start of the sentence *Yesterday, I...* (e.g., *Yesterday, I cleaned my desk*). Base forms of all three allomorphs of the regular past (/ɪd/, d, t) were represented on the picture (e.g., *fold* (/ɪd/), *clean* (/d/), *wipe* (/t/)) as well as 3 irregular verbs as distractors. Students were recorded using Olympus DS-2 Digital Voice Recorders with Sony ECM-T6 clip-on microphones.

Oral picture description task procedure. The oral task was administered during session A, B and C. Research assistants worked with each student individually. The task was presented as a guessing game. Using the messy bedroom set as an example, the research assistant would say: “Your bedroom is very messy. Yesterday, your mother/father said, ‘X (student’s name) clean up your room!’ Using the words on the picture, tell me, what did you do?” The participant was asked to choose one of the three partially tidied up pictures and to tell the research assistant what was done to tidy up the room. The research assistant guessed which picture the student had based on the description. If the participant did not start the sentence with “Yesterday, I...”, she/he was asked to repeat the sentence using the prompt on the picture. At no point were the participants explicitly told that they were to use the past tense.

Written narrative task. The purpose of the written narrative in session A was to categorize the participants into two groups: ready and unready. The purpose of the written narrative in all sessions (A, B, C) was to address research question 1, which asked whether ready learners showed greater rates of acquisition than unready learners in written production.

Written narrative task instruments. Two handouts were given to the participants. The first had 15 pictures depicting a story. The base forms of 10-11 verbs were provided (3-4 /t/, 3-4 /d/, 2-3 /d/) as well as 4-5 irregular verbs as distractors, one under each picture. The second handout included written instructions of the task and space for the participants to write the story (see Appendix B for sample handouts). The prompt “Yesterday...” was provided to begin the story. In session A, for instance, the pictures depicted a boy who awoke to a strange noise. He thought that it was a burglar and called the police. When the police arrived they discovered that it was only a cat trapped in the closet. A different set of pictures was used for every session. All followed the same format.

Written narrative task procedure. The written narrative task was administered at session A, B, and C. A research assistant distributed two handouts and briefly discussed each of the 15 words under each picture with the class to ensure that the participants understood the meaning of the target words. The participants were then told to write a story using the series of 15 pictures depicting the action of the story and to begin with “Yesterday...”. Participants were asked to use all of the words provided in a written narrative. They were told that they could change the form of the words if necessary and were provided an example using an irregular verb (e.g., “*Eat* could be changed to *eating* or *ate*”). No aids (e.g., dictionaries, help from teacher) were allowed. The instructions given by the research assistant were the same as the written instructions that the participants received on the handout.

Listening tasks. The purpose of the listening tasks was to determine the perception accuracy of the regular past tense allomorphs /d/ and /t/ and to investigate whether ready and unready learners differed in perception accuracy. This addressed research questions 2, 3a, and 3b.

Listening task instruments.

Recordings. Eight listening tasks were recorded on a CD. Three versions of each story were recorded using a male and female voice alternatively. The first recording was read at a normal speed. The second recording contained a pause after each target item. The third recording contained a shorter pause after each target item. Each story was 2-4 minutes in length.

Participants listened to the stories on a Sony CFD-S05 CD Radio Cassette Recorder.

Listening task handouts. Handouts presented a written version of the listening task as either a wrong word or fill in the gap activity (see Appendix C for sample handouts). Both consisted of 8-11 target items (the non-syllabic regular past tense /d/ or /t/ followed by a noun, preposition, adverb, etc. beginning with a consonant (e.g., *listened to*) and 3-4 distractor items (e.g., *she said*)). The distractor items were also two words and included a variety of parts of speech (e.g., *very sweet, he was*). All targets were high frequency, telic regular past tense verbs² (/d/ or /t/) to control for the potential influences of lexical aspect and lexical frequency (see Appendix D for a list of verbs used in the listening tasks).

Wrong word. In the wrong word version, the target items were underlined. If the target words matched what the participants heard from the recording, they were asked to leave it unchanged. If the target words differed from what they heard, they were asked to make the correction (e.g., *He went far away from home...* → correct: *He traveled far away from home...*).

² Past research suggests that telic verbs are acquired earlier than atelic verbs (Bardovi-Harlig, 2000; Collins, 2002; Klein et al., 2004). Thus, telic verbs are perhaps more appropriate for learners in the incipient stages of acquiring the regular past tense.

Target items that did not differ from the recording and thus required no change from the participant were eliminated from analysis due to the ceiling effect (nearly all scores were 100% for all items).

Fill in the gap. In the fill in the gap version, the target items were eliminated and the participants were asked to listen to the story and fill in the words that they heard (e.g., *The boy _____ the woman → walked toward*).

Listening task procedure. The perceptual training consisted of eight listening tasks targeting the regular past tense /d, t/ over a period of 4 weeks. The classroom teacher administered each listening task at least two days apart. Strict instructions were provided. The teacher was not to mention any sort of grammar explanation. In fact, the teacher was not provided with the purpose of the research. Each treatment session began with a brief class discussion relating to the story. The students listened to the story for the first time and then answered comprehension questions orally as a class. The purpose of listening for comprehension was to minimize the processing load of overall comprehension in order to ensure that learners could focus on the targeted form in subsequent listenings. For the second listening, the students were given either the wrong word (for listening tasks 1,3,5,7) or fill in the gap (for listening tasks 2,4,6,8) handout. They listened to the story and completed the handout. For the third listening, students were asked to check their answers and to complete any items that they may have missed.

Upon completion of the listening task, the students were provided the correct answers in one of two ways. For listening tasks 1,3,5, and 7, students were provided the correct answers from the teacher. For listening tasks 2,4,6, and 8, students were asked to share answers in a small group and come to a consensus. Following this, the teacher provided the correct answers.

Data Processing

The following section will present the scoring procedure of the oral, written, and listening data, as well as the categorization of learners based on readiness. Participants who were absent from any task (oral, written, or listening) were eliminated from the study.

Oral data. Only participants who showed zero emergence of the regular past in the session A oral picture description task were included in this study. By ensuring that no learner had demonstrated oral production of the regular past in session A, the study could focus on the intended population (i.e., ready and unready learners, not “over ready” learners). If participants had shown emergence of the regular past in oral production, they would have been “over ready” in the sense that they would have already shown evidence of regular past tense acquisition. Recall that the definition of a ready learner is one who has not yet demonstrated acquisition (in oral production) but possesses the processing capabilities to acquire the form. Therefore, learners who showed emergence of the regular past in oral data in session A were eliminated from the study.

After entering the data, it was found that no participant had orally produced the regular past in session A, B, nor C. Therefore, the oral data was not included in the data analyses except to eliminate “over ready” participants in session A.

Two research assistants listened to the recorded oral picture description task student responses. A written record of each obligatory context for the regular past was completed. Obligatory contexts were defined as contexts in which the use of the regular past was necessary in order for the sentence to be grammatically and semantically correct. A student who received a score of 0/1 would have created an obligatory context for the regular past but failed to produce it accurately within the context (e.g., *Last night, I watch TV*). In contrast, a score of 1/1 would demonstrate correct use of the regular past in an obligatory context (e.g., *Last night, I watched*

TV). Scores were converted to percentages for analyses. Inter-rater reliability was 93.00%.

Written data. In order to address research question 1, the written narrative tasks in session A, B, and C determined whether ready learners showed greater gains from perceptual training than unready learners in terms of written production. Written data were coded in terms of “correct/appropriate” versus “incorrect” use of the regular past in obligatory contexts. Appropriate instances involved spelling errors or phonetic spelling that did not eliminate the past tense marker (e.g., *explennd; askt*). Correct/appropriate answers received a score of 1; incorrect answers received a score of 0. Inter-rater reliability was 96.87%.

Categorization of ready and unready learners. Learners were categorized as (a) ready if they showed accurate production (2+ instances) of the regular past in obligatory contexts in written production, and (b) unready if they did not show accurate production (0-1 instances) of the regular past tense in obligatory contexts. Only participants who provided five or more obligatory contexts (regardless of correct usage within these contexts) for the regular past were included in the study to ensure sufficient numbers for analysis. Due to the fact that none of the participants produced high numbers of regular past tense contexts, it was not necessary to create a maximum cutoff for number of contexts.

Recent studies investigating readiness have looked for at least two instances of emergence of the targeted form, both different from one another, in order to avoid miscategorization of learners who have merely produced an unanalyzed formulaic chunk rather than having demonstrated real processing of the linguistic structure (e.g., Mackey, 1999). Therefore, in the present study, unready learners could produce one instance of the regular past correctly and still be considered unready due to the fact that it may have been an unanalyzed chunk. Only participants who used a minimum of 2 different types of the regular past were included in the ready group (e.g., *looked, screamed*). Participants who used two or more tokens but only one type

were placed within the unready group (*liked* used in two different contexts → unready group).

Learners were categorized as ready to acquire the regular past when they showed emergence of the regular past in written production but not in oral production. Written production is not considered evidence of full acquisition due to the possibility that learners are using strategies such as “monitoring” and self-correction which suggest that procedural knowledge may be present but automatic knowledge may still be missing (Anderson, 1993; Krashen, 1985). However, written production may help determine whether learners have an awareness of the regular past in their underlying grammatical knowledge (R. Ellis, 1987). Thus in the present study learners were considered ready if they demonstrated some awareness of the regular past tense as measured by emergence in written production. Learners who showed no awareness of the regular past (no emergence in written production) were considered unready.

It is important to note that emergence of a structure is not synonymous with mastery of a structure. Emergence merely indicates that the learner has some capability to process and produce the structure, although not necessarily in 100% of the instances. The benefit of using emergence is that it allows us to capture the incipient stages of acquiring a form and it accepts that variability in production is a natural part of acquisition.

Listening data. Given that the data in the present study is a subset of a larger study, several adjustments needed to be made. By dividing the items from the listening tasks into two groups (/d/ and /t/) a potential problem arose: each listening task did not elicit a sufficient number of items per allomorph. In order to address this issue, the eight listening tasks were combined into time 1, time 2, time 3, and time 4. Time 1 includes listening task one (wrong word) and listening task two (fill in the gap). Time 2 includes listening task 3 and listening task 4, and so on.

Listening data were coded in terms of “correct/appropriate” versus “incorrect” use of the regular past in obligatory contexts. Correct/appropriate answers received a score of 1; incorrect answers received a score of 0.

Summary of Methodology

In summary, contextualized oral, written, and listening tasks were used to measure regular past tense acquisition over the course of ten weeks. In order to measure perceptual accuracy of the /d, t/ allomorphs, to determine whether ready and unready learners differed in perception of /d/ or /t/, and to determine whether ready learners showed higher overall perception accuracy than unready learners, contextualized listening tasks consisting of wrong word and fill in the gap activities were administered over the course of four weeks. In order to determine whether ready learners benefited more than unready learners from input, contextualized written tasks in session A, B, and C were used to measure accuracy in regular past tense production. The following section will discuss the results.

Chapter 4. Results and Analyses

This chapter is divided into two sections: (a) production data results, and (b) perception data results. An alpha level of .05 was set for all analyses. Participants' percentage accuracy scores were used in analyses.

Production Data

In order to answer research question 1, which asked whether ready or unready learners would benefit more from aural input in terms of regular past tense written production, gain scores of ready and unready learners at writing sessions A - B, sessions B - C, and sessions A – C were compared using an independent samples *t* test. Because ready and unready learners were not equal in terms of emergence of the regular past tense in session A, gain scores between sessions rather than percentage scores at each session were used to compare the ready and unready groups. Table 2 displays mean gain scores and standard deviations for ready and unready learners. Within group variation was very high, and no between-group statistical differences were found in sessions A – B, $t(33) = -1.48, p = ns$, sessions B – C, $t(33) = .17, p = ns$, or sessions A-C, $t(33) = -.99, p = ns$.

Table 2

Comparison of Ready vs. Unready Gain Scores in Regular Past Tense Written Production

Session	Readiness	
	Ready (n = 14)	Unready (n = 21)
A - B	5.11 (22.75)	19.78 (31.99)
B - C	5.58 (45.38)	3.16 (36.86)
A - C	10.70 (36.37)	22.93 (35.22)

Note. Standard deviations are listed in parentheses below means.

The hypothesis that ready learners would show greater improvement than unready learners in written production was not supported.

Perception Data

In order to analyze the perception accuracy of ready and unready learners over time using a mixed between-within-subjects ANOVA, learners needed to be equivalent in perception at the outset (time 1). An independent samples *t* test showed no significant difference between groups (ready versus unready) at time 1 for perception accuracy of the /d/ allomorph, $t(33) = -.209$, $p = ns$, nor the /t/ allomorph, $t(33) = .348$, $p = ns$; therefore, a mixed between-within-subjects ANOVA was conducted.

The mixed between-within-subjects ANOVA of the perception data yielded results for both research questions 2 and 3. Research question 2 asked whether ready learners would benefit more from input than unready learners in terms of perception accuracy; research question 3a, asked whether there would be a difference in the perception accuracy of the regular past tense

allomorphs /d/ and /t/ in contextualized listening tasks, and research question 3b, asked whether ready learners would perceive /d/ or /t/ differently than unready learners. Mauchly's Test indicated that sphericity can be assumed for time, $\chi^2(5) = 8.242, p = .144$, and the interaction of time and /d/ vs. /t/, $\chi^2(5) = 3.945, p = .557$. Therefore, univariate test results are reported without adjustment. Table 3 displays the results for the between-subjects effects test, which shows no significant difference between ready and unready learners, and the within-subjects effects test, which reveals a main effect of time, $p < .001$, $\eta_p^2 = .761$, and allomorph (/d/ vs. /t/), $p < .05$, $\eta_p^2 = .17$. There was also a significant interaction between time and allomorph, $p < .001$, $\eta_p^2 = .182$. While time shows a large effect size, the effect size for allomorph and the interaction between time and allomorph is relatively small. No significant interactions were found between readiness and time nor readiness and allomorph. In order to further investigate the interaction between /d/ vs. /t/ and time, post hoc analyses were conducted.

Table 3

Mixed ANOVA for Readiness (Ready vs. Unready), Time (Times 1 – 4), and Allomorph (/d/ vs. /t/)

Source	SS	df	MS	F	η_p^2
<u>Between subjects</u>					
Readiness	3140.02	1	3140.02	1.80	.05
Error	57518.69	33	1742.99		
<u>Within subjects</u>					
Time	143758.67	3	47919.56	105.24**	.76
Time x Readiness	1453.98	3	484.66	1.06	.03
Error	45089.22	99	455.45		
Allomorph	2239.41	1	2239.41	6.74*	.17
Allomorph x Readiness	70.12	1	70.12	0.21	.01
Error	10969.90	33	332.42		
Time x Allomorph	5174.27	3	1724.76	7.34**	.18
Time x Allomorph x Readiness	471.50	3	157.17	0.67	.02
Error	23258.76	99	234.94		

* $p < .05$, ** $p < .001$.

Post hoc analyses. Because a significant interaction was found for time and /d/ vs. /t/, post hoc analyses for /d/ vs. /t/ at each time were carried out using the Bonferroni adjustment for the number of pairwise comparisons. Differences between /d/ and /t/ were significant at time 1, time 2, and time 3, but not at time 4. At time 1 and time 3, /d/ was perceived significantly more accurately than /t/. At time 4, /d/ was also perceived more accurately than /t/ but did not reach

significance. In contrast, /t/ was perceived significantly more accurately than /d/ at time 2. Table 4 displays the mean scores of /d/ and /t/ at each time.

Table 4

Comparison of /d/ and /t/ at Each Time

Time	Allomorphs		<i>MD</i> (/d/ - /t/)
	/d/	/t/	
1	27.679 (4.271)	11.190 (3.422)	16.488 (3.570)**
2	54.762 (3.686)	62.381 (4.359)	- 7.619 (3.322)*
3	83.185 (3.637)	73.810 (4.289)	9.375 (4.184)*
4	75.680 (3.065)	70.833 (4.457)	4.847 (4.522)

Note. Standard Error values are listed in parentheses.

* $p < .05$, ** $p < .001$.

Figure 2 provides an illustration of /d, t/ accuracy over time. All differences between times were significant ($p < .001$) except between time 3 and time 4. There was significant improvement in perception accuracy of the /d/ allomorph between all times, $p < .001$, except from time 3 - 4. For the /t/ allomorph, there was significant improvement between time 1 - 2, time 1 - 3, and time 1 - 4, $p < .001$, but no significant difference between time 2 - 3, time 2 - 4, or time 3 - 4. For both allomorphs, there was no difference in perception accuracy between time 3 and 4.

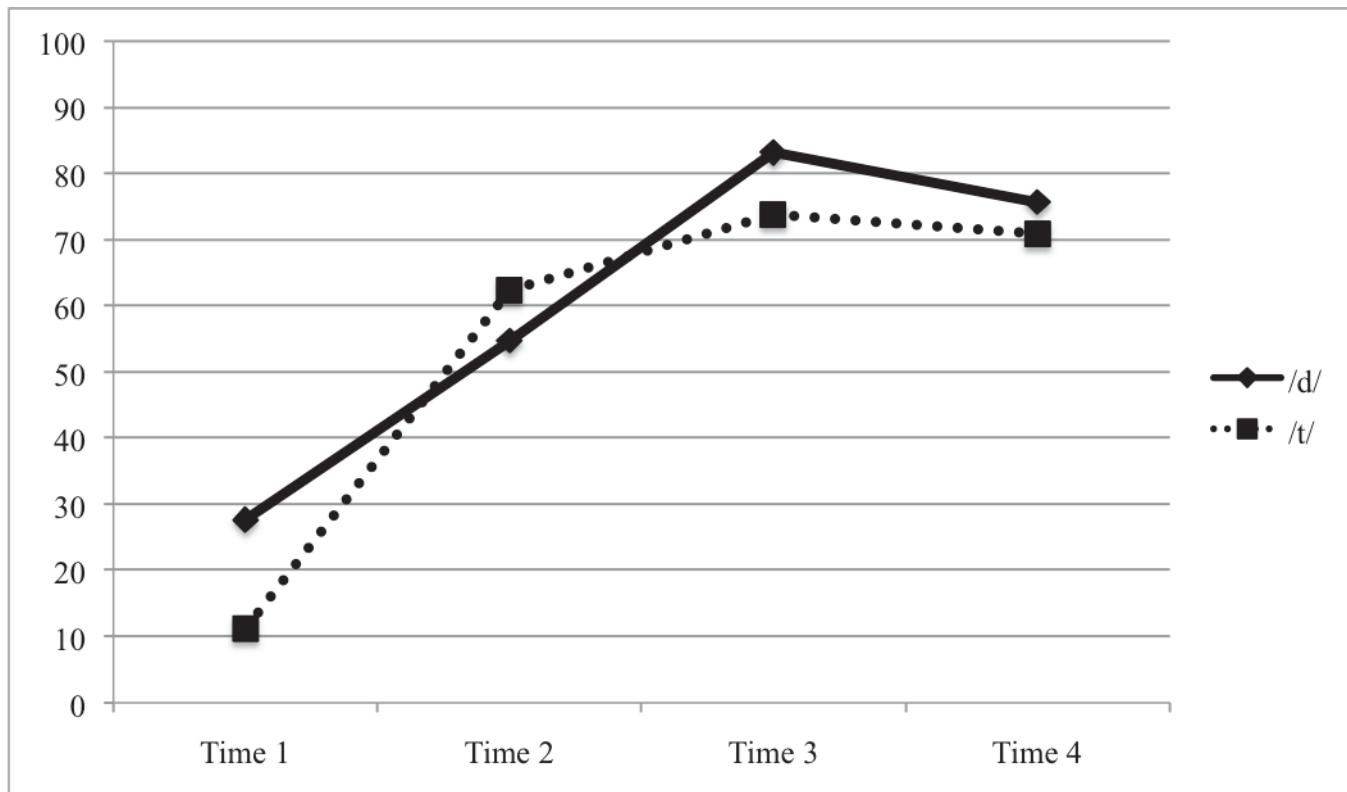


Figure 2. Perception accuracy (%) of /d/ and /t/: Time 1 – 4

Based on the results discussed in this chapter, it can be concluded that the hypotheses related to research questions 1 and 2, that is, ready learners when provided with the appropriate level of input would show greater benefits in perception and production accuracy, were not borne out. Readiness did not seem to predict learner accuracy in perception or production of the regular past tense, nor did ready and unready learners demonstrate a difference in perception accuracy of either allomorph (research question 3b). In contrast, the hypothesis for research question 3a was supported by the results, revealing that the more salient allomorph (/d/) was more accurately perceived. The following chapter will interpret the results and put forth suggestions for future research.

Chapter 5. Discussion

In this chapter each research question will be addressed in turn, and the importance of the findings will be discussed in relation to the roles of readiness and salience in regular past tense acquisition. Possible directions for future research will also be discussed.

Readiness and Regular Past Tense Written Production

Results indicated that ready learners did not show greater benefits from the input in regular past tense written production. Thus, the first hypothesis stating that learners who were more ready for the input would show greater rates of acquisition was not supported. There are several possible explanations for these findings. To begin, it is possible that the role of readiness cannot be applied to the acquisition of the regular past tense form. Since no previous study investigating readiness has targeted the regular past tense, it is unclear how this form fits in with the theoretical concept of readiness and its role in acquisition. While there is a great deal of evidence supporting the concept that ready learners will benefit more than unready learners, it has been suggested that the acquisition of certain linguistic structures might not fit well into the framework of the teachability hypothesis and readiness, as demonstrated by past research investigating relative clauses (e.g., Doughty, 1991) and possessive determiners (e.g., Zobl, 1985). Lightbown (1998) perhaps would not be surprised by the lack of difference between ready and unready groups, warning that readiness and the teachability hypothesis might not be applicable to the acquisition of all structures and should not be incorporated into pedagogical contexts until further evidence is provided. Indeed, it may be the case that the regular past tense form is a structure ill-fitted for inclusion within the concept of readiness.

While readiness did not inform acquisition rates of the regular past tense in written

production, there is a possibility that readiness could be applied to regular past tense acquisition in terms of lexical aspect. As previously mentioned, lexical aspect may play a role in acquisition order (Bardovi-Harlig, 2000; Collins, 2002; Klein et al., 2004). It has been found that telic verbs (verbs with a clear end point/goal, e.g., *He walked to the store.*) are acquired earlier than atelic verbs (verbs with no clear endpoint, e.g., *He liked school*). Although readiness might not be applicable to the acquisition order of the regular past tense allomorphs, future research might consider investigating whether readiness might be applicable to the acquisition of the regular past as categorized by lexical aspect.

Another possible explanation for the lack of difference between ready and unready groups is that learners were grouped according to emergence of the regular past in written production with the assumption that learners who showed emergence in writing but not in oral production were one stage below regular past tense acquisition. Previous research has suggested that written data may demonstrate a learner's ability to produce a form without truly having acquired the form via strategies such as monitoring and self correction which may reflect procedural skills but not necessarily automatic knowledge (Anderson, 1993; Krashen, 1985), while emergence in oral production reflects "true" acquisition (Meisel, Clahsen, & Pienemann, 1981). If, however, true acquisition can only be reflected in oral data, the fact that neither group produced the regular past tense in oral data even in sessions B and C, might suggest that neither group achieved acquisition (as defined by Pienemann) of the regular past within the time span of the study. It is possible that neither group was ready to acquire the form. Perhaps both groups were too far below the stage of acquiring the regular past at the outset. This would help explain the lack of difference between groups. If the participants were not ready, the input would have been too difficult for both groups, being too far above the present stage of the learners, thus one group would not have shown greater benefits than the other.

Future research might consider determining the effects of readiness over a longer period of time. Because the regular past is a morpheme that does not always emerge until later in a learner's interlanguage, there is a possibility that the low proficiency level of the participants and the time span for this research did not properly allow for any significant results in regular past tense production. Although the present study did investigate regular past tense development over three months, a much longer time period than many classroom-based studies, it is possible that even three months was not a substantial amount of time to document significant development. Therefore, future research might consider implementing a longitudinal study that spans for longer than three months in order to determine whether benefits of the input (listening tasks) might show more delayed effects for ready learners; however, it was beyond the scope of the present study to do so.

Finally, the variance within each group was quite large, indicating that the difference between the ready and unready groups at the outset might not have been great enough to show significant differences in the data analyses. Future research might consider categorizing ready learners as those who show a higher level of emergence at the outset; for instance, learners might be required to produce 4+ correct instances of the regular past tense to be considered ready as opposed to 2+ correct instances, which was the requirement in the present study. With the data in this study, however, this type of analysis was not possible due to the low number of emergence in both ready and unready groups in session A.

Readiness and Regular Past Tense Perception

The following section will address research question 2, which asked whether ready learners would show greater benefits from the input in terms of perception accuracy. In contrast to the hypothesis, ready learners did not show greater perception accuracy than unready learners. Even though ready learners showed emergence in written production in session A while unready learners did not, in perception accuracy at time 1 there was no significant difference between groups. These results suggest that greater emergence of the regular past in production does not necessarily ensure a greater ability to perceive the same form. Judging from the lack of difference between groups at time 1, it could be argued that although one group was more ready than the other in production ability, they were not more ready in perception ability. Therefore, given that their readiness was not reflected in time 1 perception, it is perhaps not surprising that the groups yielded similar perception accuracy results.

DeKeyser and Sokalski (1996) might agree, arguing that comprehending and producing must be acknowledged as two separate skills - in order to better comprehend input, the learner must practice comprehending input; in order to better produce output, the learner must practice producing output. The fact that ready learners were equal to unready learners in perception while demonstrating higher abilities in production supports the suggestion that dominance in one skill does not necessarily ensure dominance in another. Therefore, it is possible that all learners improved equally in perception because they were all equally ready (at time 1), and because perception was the skill that they practiced over time. Perhaps if learners had instead been exposed to production tasks over the same time period, all learners would have shown improvement because they were practicing production skills, but ready learners would have shown greater improvement because they were more ready for production in session A. Future

research might consider categorizing learners into ready and unready groups based on each skill individually, thus allowing for the possibility that a learner might be ready for one skill (e.g., comprehension), but not for another (e.g., production).

Readiness and /d, t/ perception. The following section will address research question 3b, which asked whether ready learners would perceive /d/ or /t/ differently than unready learners. Results showed that no difference was found. These results contradict Solt et al. (2004), who found that higher proficiency learners perceived /t/ more accurately than /d/. The measurement used for grouping students in Solt et al.'s study, however, differed from the present study. Solt et al.'s learners were categorized based on a short form of the Michigan Test of English Language Proficiency while learners in the present study were not grouped according to overall proficiency, but rather by readiness to acquire the regular past. It is interesting to note, however, that in Solt et al.'s study it was the /t/ allomorph rather than the /d/ allomorph which was perceived more accurately for the high proficiency learners. The results are difficult to compare to the present study given that Solt et al. followed the target verb with a word beginning with a vowel (e.g., *kissed a*) while the present study followed the target word with a word beginning with a consonant. When /d, t/ are followed by a word beginning with a vowel, they become syllabified onsets (i.e., the beginning of a syllable), thus causing them to be more salient than in their original coda position (Blevins, 2004). Furthermore, onsets prefer lower sonority (Steriade, 1988). For this reason, a learner would be more likely to expect to hear /t/ in the onset position due to its lower sonority. It is perhaps not surprising that the higher proficiency learners (who have presumably been exposed and have more experience in listening to English) have demonstrated a greater ability to perceive the more expected /t/. The different phonetic environment of the target items in Solt et al.'s study compared to the present study could

demonstrate a large difference in salience for the regular past tense /d, t/ in running speech and for this reason it is difficult to accurately compare findings.

Perceptual Salience of /d/ and /t/ Allomorphs

Results for research question 3a, which asked whether there was a difference in perception accuracy between /d/ and /t/, showed that the more salient /d/ was perceived more accurately, thus supporting the concept that salience can help predict acquisition order. However, results were not consistent at every time. At time 1, 3, and 4, /d/ was perceived more accurately than /t/, but differences were not significant at time 4. Only at time 2 was /t/ perceived significantly more accurately than /d/. Looking more closely at the regular past tense verbs used at time 2, it is evident that one target /d/ item yielded an unusually low number of responses. Nearly 50% of the students left the target item *answer* blank. For items at all times it was quite rare for a student to leave an answer blank. Students generally guessed even if incorrectly. When averaging all of the students' responses for this item, the percentage accuracy was 8.57%. The next lowest scoring response at time 2 was nearly triple this percentage score. By removing this low scoring /d/ item outlier, it is likely that /d/ and /t/ would have yielded more similar scores. Perhaps the most simplistic explanation for this item left blank would be one of organization. In the handout in which participants completed the wrong word activity at time 2, the target item *answer* was very close to the start of the second page. It is possible that learners simply could not hear the item due to flipping the page.

A more theoretical explanation would be that the difficult orthography (i.e., non-phonetic spelling) of the target verb *answer* caused the processing load to be too heavy, thus hindering the participant's ability to complete the item. Here, a limitation of the study should be mentioned. While it was the perception accuracy of the learners being analyzed, the listening tasks required

the participants to write what they heard; therefore, they were required not only to perceive but also to produce the form. Future research should eliminate the variable of orthography and production in general when assessing perception. Given that the data analyzed was a subset of a larger data set, this limitation could not be corrected within the present study, but it is important to note as an intervening variable. As can be seen with the item *answer* mentioned above, it is possible that the processing load of producing the form might have interfered with perception ability.

In addition to this, because the regular past only has one orthographical form (*-ed*), it is possible that the learners recognized that the word should be in the regular past without having actually perceived a difference between /d/ and /t/. This is another reason that future research investigating potential perceptual differences between the two forms should include measurements in which the learner is asked to perceive /d/ or /t/ without being required to produce it. Due to the restrictions of working within an existing data set, a perception test independent of the variable of production could not be included.

Perception accuracy over time. Another interesting finding was that there was a great deal of improvement in perception accuracy of both /d/ and /t/ allomorphs from time 1 to time 4. Pedagogically speaking, this is quite a positive result, which seems to suggest that providing exposure to low salience items yields significant improvement in learners' perception accuracy over time.

Although the improvement was quite large from time 1 to 4, there was no apparent improvement in perception accuracy from time 3 to time 4 for both allomorphs. This may be due to a ceiling effect, given that the scores at time 3 were 83.19% (/d/) and 73.81% (/t/). Participants would have needed near perfect scores to yield significant improvement between times 3 – 4.

Perceptual salience of /d, t/ in running speech. The listening tasks (stories) were recorded by native speakers on CD; therefore, the targeted regular past tense items were found in running speech. For this reason, it is important to discuss perceptual salience of the regular past in running speech and to consider common speaker strategies that often result in the lowered salience of the regular past tense allomorphs /d, t/.

While the focus of this study was to analyze perception, it is important to include the role that speaker strategies might play in the salience of the regular past allomorphs in running speech. If the regular past is investigated in terms of ease of articulation for the speaker, there are a number of reasons why /d, t/ might be reduced, some of which were discussed in chapter 2. According to the ease of articulation hypothesis (Shariatmadari, 2006), some combinations of sounds are difficult to articulate, thus, speakers use strategies to ease articulation, such as consonant cluster simplification which reduces/eliminates the least sonorant element in the cluster (often the regular past /d, t/). Because of this, it is possible that some items were harder for the participants to perceive not only based on the difference in salience of /d/ and /t/ in isolation but also based on whether the speaker used strategies to make articulation of difficult sound strings easier.

Two low scoring items (~ 25% accuracy) from time 2 will be discussed in order to illustrate some potential speaker strategies that may have lowered the salience of the allomorphs. The first item was *phoned to*. The most common incorrect response was simply the base form of the verb (*phone to*). While there are likely a number of factors influencing the salience of this item, one explanation is similar to that discussed in the literature review: codas want to remain high in sonority; therefore, low sonority items are often deleted (e.g., Clements, 1990). In this case the lowest item in sonority would be the past tense marker /t/.

If we also take into account the following word that begins with a consonant, another

related explanation could be applied. In a stop-cluster sequence followed by a vowel (CCV), the last consonant in the cluster will be more salient due to the fact that it is followed by a vowel and can be fully released. Thus, it will “overtake” the stop preceding it. In other words, using the item *phoned to* we can take the CCV pattern crossing word boundaries /dtu/ to see that the /d/ would be overtaken by the last consonant /t/ because /t/ is followed by a vowel (Blevins, 2004). As a result the /d/ would be deleted in running speech and the target item would be perceived as *phone to*, which is precisely the response that the majority of students provided. Note here that although the /n/ is a member of the consonant cluster being discussed it is not very susceptible to this sort of reduction due to its high sonority (Shariatmadari, 2006). In terms of ease of articulation, the more sonorant the phoneme the easier it is to articulate and the less likely it will be altered in some way by the speaker. If it is not reduced by the speaker, it will likely be more salient to the listener as well.

The second item to be discussed, *announced loudly*, also yielded a similar score to *phone to*, but the student responses were quite different in nature. Many students produced answers such as *adone*, *adown*, *daindown*. Here we can see that not only is the regular past tense marker /t/ missing, but the preceding phoneme /s/ is missing as well. While the students retained the /n/ in the consonant cluster in the coda position of the verb, the last two phonemes /st/ were lost. Again, it is possible that the least sonorant items in the cluster were deleted; however, this is the only item at all times in which more than just the last phoneme /d, t/ of the cluster was not present in student responses.

This deletion of both /s/ and /t/ can perhaps be explained by the Universal Canonical Syllable Structure (UCSS) which states that the syllable should rise to the height of sonority in the nucleus and then gradually decline in the coda. If this is violated, words are often difficult to pronounce and strategies are utilized to make articulation easier when speaking. In other words,

“extreme displacements and extreme velocities [in sonority] are avoided [in running speech]” (Lindblom, 1981, p. 231). If sonority levels rapidly drop or rapidly rise, sound strings are more difficult to articulate, thus a speaker might use strategies to reduce these extreme variations. Because both /s/ and /t/ are much lower in sonority than /n/, the rapid drop in sonority may have lead to the deletion of both /s/ and /t/. Since both the /n/ (preceding /st/) and the /l/ (onset of the following word *loudly*) are much more sonorant and thus more salient than /st/, it is likely that even if the /st/ phonemes were carefully articulated, they would be quite difficult to perceive due to loudness (sonority) of the /n/ and /l/ phonemes surrounding /st/. As can be demonstrated with these two sample items, speakers use strategies in attempts to make articulation easier and as a result the salience of the regular past tense may be impeded.

Future research investigating the perceptual accuracy of /d, t/ in running speech might consider looking beyond just the regular past tense allomorphs and consider the influence of the surrounding phonetic environment. Perhaps it is too simplistic to claim that the perceptual salience of /d/ and /t/ in isolation might predict the perception accuracy of it in running speech. Although the present study revealed that the higher salience of /d/ in isolation did predict its higher perception accuracy in running speech, the data also indicated variability at time 2 when /t/ was perceived more accurately than /d/, and time 4 when no difference in perception accuracy was found between allomorphs. This is likely due to the influence of the surrounding phonetic environment.

Chapter 6. Conclusion

Previous research has generally focused on the perceptual salience of the regular past compared to other grammatical morphemes. The present study has contributed to the literature by demonstrating that salience can also inform the acquisition order of allomorphs within a single morpheme. The more salient allomorph /d/ was found to be more accurately perceived, suggesting that perceptual salience can inform acquisition order. Although /d/ was perceived more accurately than /t/, it seems as though both allomorphs might deserve some attention in the classroom since both are found in phonetic environments that may lower their salience in running speech. As Solt et al. (2004) state, learners “simply do not consistently produce what they do not consistently perceive” (p. 10). If these listening tasks could help learners more consistently perceive the regular past, perhaps they could more consistently produce it, although a more longitudinal study may be needed to determine whether this is true since the regular past has been shown to sometimes not emerge, even after a year of immersion in the L2 (Zhang & Widystuti, 2010).

The present study has also contributed by demonstrating that categorizing a learner as ready or unready by means of emergence in production does not necessarily reflect readiness in perception. The concept of readiness has previously been measured by emergence in production only (e.g., Pienemann, 1989), but the present study has widened the definition to include perception ability as well. While no significant results were found regarding readiness and acquisition in the present study, future research might consider categorizing ready and unready learners in both perception and production in order to determine whether readiness is skill specific (e.g., ready in perception but not in production) or more holistic.

Alternatively, it is possible that readiness is simply not as beneficial for rate of acquisition

as practice. While no difference between ready and unready groups was found, both groups demonstrated great improvement in perception accuracy, the skill that was practiced. This in fact could be quite a positive finding from a pedagogical perspective, given that it would be much more feasible to enhance practice opportunities in a classroom context than it would be to provide appropriate input for the level of readiness for each individual learner.

An additional contribution of the study also concerns potential pedagogical implications. The past tense tasks used in the study were ecologically valid, as they were integrated into a real classroom environment and were well received by the learners. If classroom based material targeting the regular past can be incorporated to encourage more opportunities to practice regular past tense perception, which as mentioned earlier is a form used very minimally by the classroom teacher during classroom instruction (Collins et al., 2009), this exposure to the regular past may lead to improvement in perception accuracy and potentially regular past tense acquisition in general.

The listening tasks also allow students to hear the regular past from three different voices: the teacher during post-task feedback, and the recorded male and female voices telling the story. Past studies have demonstrated that learners who were exposed to “high-variability” perceptual training (i.e., listening to different speakers use the targeted phonemes in different phonetic environments), were much more able to comprehend the phonemes from novel speakers and contexts at later times (e.g., Lively, Logan, & Pisoni, 1993). The fact that learners were exposed to different speakers and different contexts for the regular past may actually be quite beneficial to improving perceptual ability, perhaps also explaining the overall success rate by all students on the perception tasks over time. Whether this is also beneficial for overall acquisition and oral production of the form may require a longer study to observe progress.

In addition to the listening tasks, pedagogical activities might include speaking tasks in

order to address the potential difficulties in pronouncing the regular past, especially in difficult phonetic environments such as consonant clusters. It might be effective to present classroom activities that not only focus on listening but also on “noticing the gap” between what is being said (i.e., reduced past tense marker) and what is being heard (i.e., no regular past tense marker). It might be useful to help learners practice pronunciation of difficult consonant clusters containing the regular past tense allomorphs in order to promote awareness of speaker strategies that lead to the lowered salience of the regular past in running speech. Perhaps this output practice would help enhance the ability to better perceive the form in even minimally salient environments.

Clearly there is much to be studied in regards to the roles that readiness and salience play in regular past tense acquisition. It is hoped that this study has presented some interesting findings and illuminated some issues to be explored in future research.

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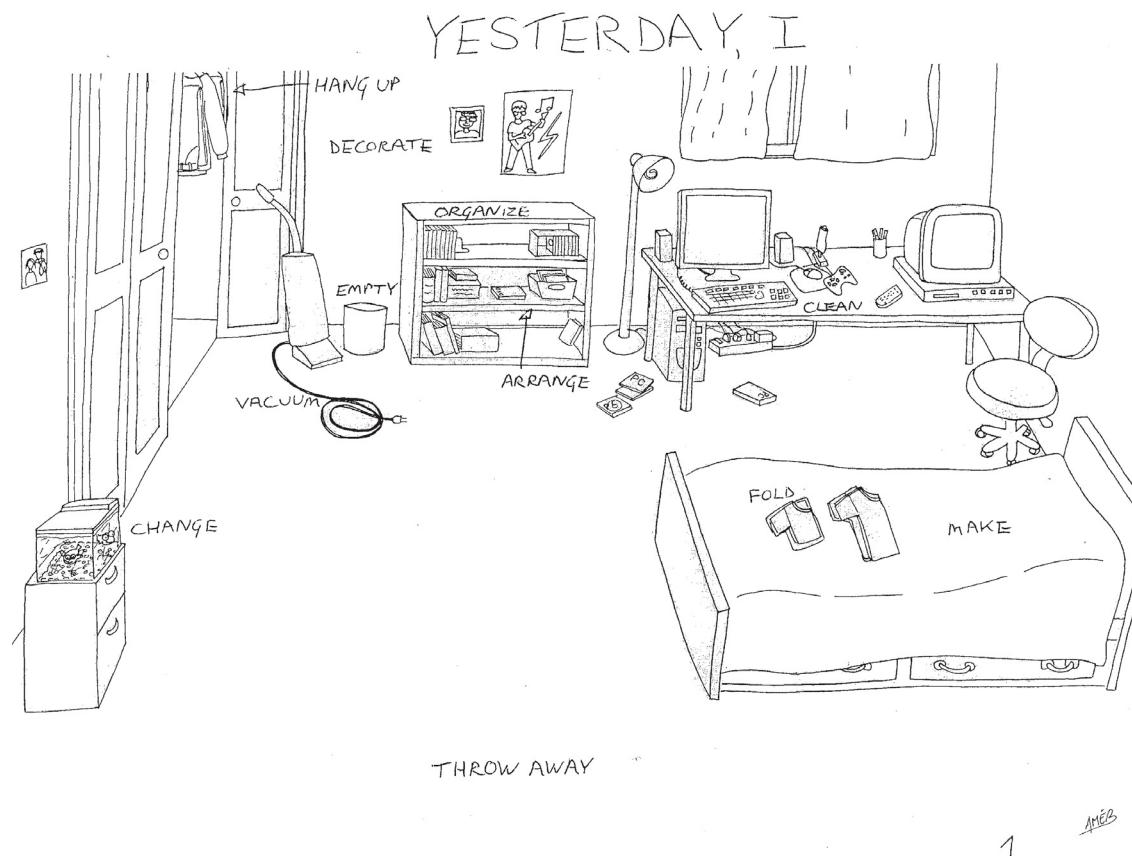
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Appendices

Appendix A

Oral Picture Description Task



Appendix B

Written Narrative Task

Name: _____ **Teacher's Name:** _____

Write a story!

Look at the pictures and decide on the ending (picture #16) - Use your imagination!

Now write the story! Choose names for the girls. Write a title. Give as many details as you can.

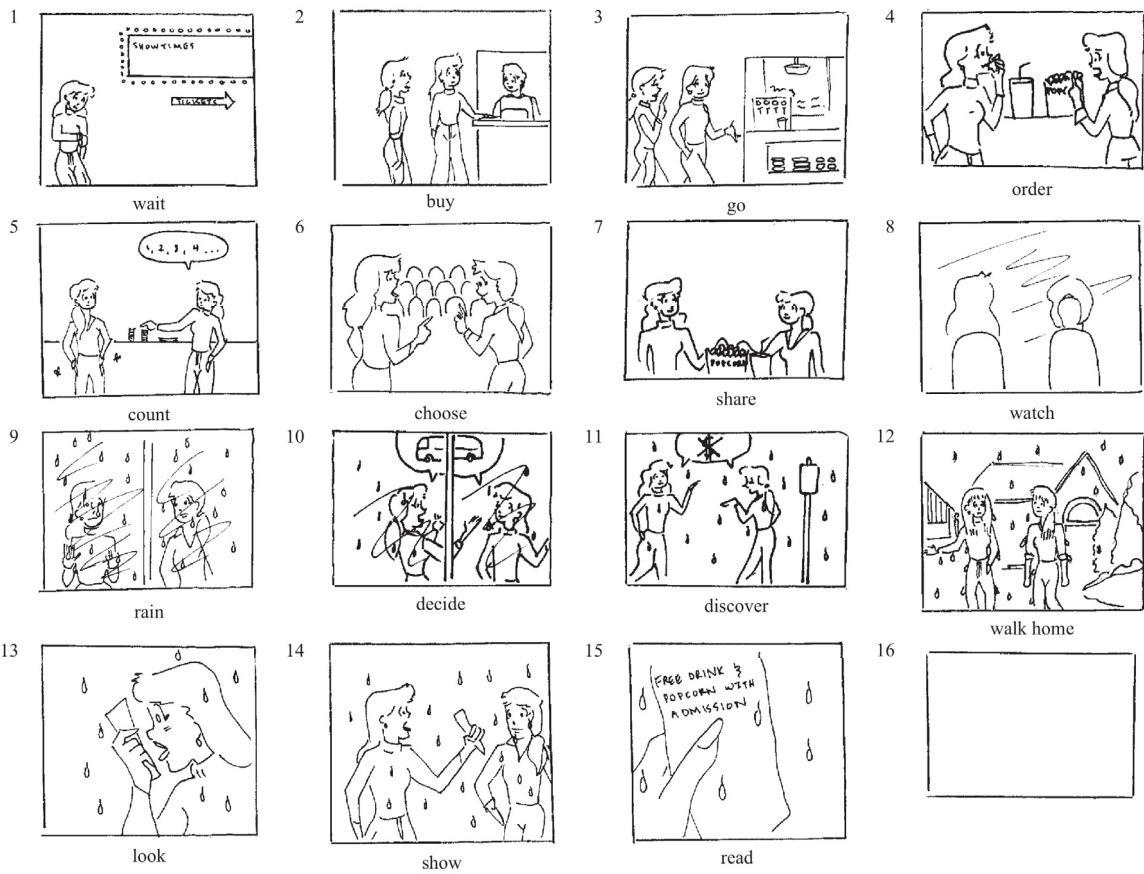
Use the words under the picture in your story. You can change the form of the word if you like:
(example: EAT - you can write *eat, eats, ate, etc.*)

No dictionaries! If you don't know a word in English, use a French word. Put " " to identify any French words you use. Example: A really good "poutine".

Title:

Last weekend, _____

_____ (con't to second page)



Appendix C

Listening Tasks: Wrong Word and Fill in the Gap Activities (student copy)

Wrong Word

Instructions: Listen to the story. The underlined words might be correct or incorrect. Sometimes the FIRST word is incorrect, sometimes the SECOND word is incorrect, sometimes BOTH words are INCORRECT and sometimes both words are CORRECT.

If you think a word is incorrect, cross it out and write the correct word.

For example: blue glass OR blue glass OR blue glass OR blue glass
Good Luck! cup red red cup

Airplane

A pilot and four passengers were flying in an airplane. The passengers were the premier of Quebec, a university professor, a schoolboy, and a nun. All of a sudden the plane began to fall. The pilot ¹shouted quickly. “Passengers! Your attention, please. We are going down! I’m sorry but ²there are only four parachutes for the five of us.” Then the pilot took a parachute and ³jumped out the plane to safety. Now there were only ⁴three parachutes.

“I am the most important man in Quebec,” said the Premier. He ⁵ took the second
parachute and jumped out shouting “I must live! I must live!” all the way to the
ground.

Now there were only ⁶ two parachutes.

"I am the most intelligent man in Canada," ⁷stated the university professor. "I, too, must live". Then he took a parachute jumped out of the plane too.

The nun ⁸turned to the schoolboy, "You take the last parachute, my son. I ⁹am ready to die." She smiled because she was thinking about her new life in heaven. "It's OK," said the schoolboy. "There are two parachutes left."

“How can that be?” the nun ¹⁰ said in surprise. “There were only four parachutes for the five of us.”

“That’s right,” ¹¹ replied the schoolboy as he ¹² strapped the parachute to his back.

“But the most intelligent man in Canada jumped out of the airplane with

¹³ my backpack.

Fill in the Gap

Instructions: Listen to the story and fill in the blanks. There are always 2 words to write. Good Luck!

Baby Food

A four-year-old boy named Joey sat in the doctor's waiting room with his mother. He watched ¹ _____ on the wall. One second, two seconds, three seconds...² _____ bored. Then he saw a pregnant woman on the other side of the room. Joey ³ _____ the seconds on the clock to look at the woman. He stood up and ⁴ _____ the chair where she was sitting. He was very curious and asked, "Why is your stomach so big?"

The woman ⁵ _____ a laugh, "Because I'm having a baby."

Joey looked surprised and ⁶ _____, "Is the baby in your stomach?"

"Yes, of course!" said the woman. She ⁷ _____ boy's hand and put it on her stomach, "⁸ _____ feel the baby kick?" Joey felt something move inside the woman's stomach and ⁹ _____ hand away.

"But is it a good baby?" Joey ¹⁰ _____ a confused look on his face.

"Oh, yes. I'm sure it's a really good baby," said the woman.
"_____¹¹ _____ sure this baby will become a good little boy like you!"

At this point, Joey looked very scared. He ¹² _____

_____ two steps and asked, “If he is such a good baby, then why did you eat him?”

Appendix D

Verb Types Used in Listening Tasks

/d/	/t/
travel; receive; explain; reply; grab; pull; question; move; cry; answer; deliver; open; phone; call; arrive; kill; happen; carry; follow; nail	ask; pick; stop; walk; announce; tap; talk; place; jump; step; finish; approach; look;