The Contingency of Recasts and Noticing

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ABSTRACT
Recasts are an important type of implicit negative feedback that has attracted much attention in both L1 research and SLA research. The utility of recasts in face-to-face interaction has been empirically established, and the contingency of recasts is argued to be the key. However, the efficacy of recasts in computer-mediated communication (CMC), text-based online chatting in particular, remains questionable due to the possible violation of this contingency factor in the "split negotiation routines" commonly observed in CMC discourse. This study used a repeated-measure design to examine the potential impact of the contingency of recasts on noticing as well as some contextual factors that might mediate the contingency effect on the noticing of recasts. In this study, 17 ESL learners were invited to chat with one researcher on two dyadic communication tasks, one preceded by prewriting and the other without. Think aloud protocols and stimulated recalls were used to measure the noticing of recasts. It was found that participants noticed contingent recasts significantly more often than noncontingent recasts. Furthermore, working memory and prewriting were found to mediate the contingency effect, and learner proficiency level was found neither pertinent to the noticing of recasts nor mediative of the contingency effect.

KEYWORDS
Computer-mediated Communication (CMC), Contingency of Recasts, Noticing, Working Memory, Prewriting

INTRODUCTION
Noticing is an important cognitive construct in second language acquisition. Decades of research in cognitive psychology have concluded that attention is essential for learning: "The orthodox position in psychology is that there is little if any learning without attention" (Schmidt, 2001, p. 11). The conscious registration of one’s attention, namely noticing, plays a crucial role in various current accounts of SLA, be it language acquisition theories or language pedagogy, and the interaction approach to SLA is without exception. The efficacy of any interactional feedback, recasts included, depends on it being noticed by the learners. Thus despite all existent conceptualization and evidence on their utility in SLA, recasts could lose the claimed benefits and amount to nothing if not attended to and perceived as having a corrective function during interaction (Long, 1996; Nicholas, Lightbown, & Spada, 2001). Therefore, it is important to identify various factors that facilitate or inhibit the noticing of recasts when talking about their efficacy. Literature has suggested a multitude of factors that might affect the noticing of recasts, ranging from the external factors, such as the interaction contexts, nature of the tasks, and feature of the recasts, to the learner internal factors such as learner proficiency and working memory capacity (Philp, 2003; Mackey, Philp, Egi, Fujii, & Tatsumi, 2002;
Révész, 2005). The contingency of recasts, in terms of the spacing between the erroneous turns and the recasts, might be another such factor that deserves some attention. Although not a likely issue in face-to-face interaction, it is crucial to computer-mediated communication (CMC), text-based online chatting in particular. Considering that CMC discourse is characterized by “the lack of strict turn adjacency” and “split negotiation routine” (Smith, 2003, p. 48), the juxtaposition between the recasts and the erroneous turns commonly observed in face-to-face interaction might be easily violated in this interaction context and thus might negatively impact noticing and make the utility of recasts in CMC questionable. This study attempts to examine the potential impact of the contingency of recasts in text-based CMC on noticing.

This paper is structured as follows. First, we briefly review the literature on the noticing hypothesis to highlight the importance of noticing on the efficacy of interactional feedback. Then, we focus on a specific type of interactional feedback, recasts, reviewing research on their utility in SLA and the variety of factors that have been suggested to affect their noticing. To extend this line of investigation, the issue of the contingency of recasts is raised as one possible add-on to this list of factors, and its practical and theoretical significance is justified. Next, we explain the research context and research methodology, elaborate on the research findings, and follow them with a discussion of the research findings and the possible implications of this study.

BACKGROUND
Recasts and SLA
Recasts are a type of implicit negative feedback that is held to be facilitative of SLA and the efficacy of recasts has become the foci of much recent L2 research. This type of negative feedback is beneficial for its dual function of not only providing negative feedback but also conveying positive evidence.

The construct of recasts originated in L1 research in the late 1960s, and since then ever increasing evidence has been presented to show that it is facilitative of child language development. It was not until the mid 1990s that the efficacy of recasts in SLA became the focus of investigation. Recasts have not only been observed to be used in dyadic interactions (Oliver, 1995; Braidi, 2002) but also consistently found to be the most favored type of feedback (60% and above) by language teachers in both foreign language classrooms and immersion classrooms (Doughty, 1994; Ellis, Loewen, & Basturkmen, 1999; Lyster & Ranta, 1997; Panova, 1999).

As for the utility of recasts in SLA, the picture is somewhat murky. Some classroom researchers have reported low uptake rate of recasts by the learners during the interaction (Lyster & Ranta, 1997; Lyster, 1998; Lochtman, 2000), and others have found unsatisfactory test performance after exposure to recasts (Havranek, 1999). However, a series of experimental studies in laboratory settings on the effects of recasts have yielded positive evidence in support of its facilitative role in L2 development. Development of various language structures have been found to be facilitated by recasts (Ishida, 2004; Iwashita, 2003; Long, Inagaki, & Ortega, 1998; Leeman, 2003). Mackey and Philp (1998) and Han (2002) showed sustained effects of recasts on L2 development. Moreover, Doughty and Varela’s (1998) experimental study in a classroom setting demonstrated that recasts lead to improved developmental progress, accuracy, and frequency of use of the past-time reference. Although current research on recasts does not lend itself to general conclusions about the efficacy of recasts in L2 development, the volume of positive evidence does suggest the value of recasts to SLA.
A Crucial Condition for Recasts to ‘Work’—Noticing

The realization of the claimed effects of recasts on SLA depends on whether the learners are able to notice recasts and incorporate them into their interlanguage systems. Thus, noticing is a crucial condition for the claimed utility of recasts.

Noticing hypothesis

Schmidt (1990) first proposed the noticing hypothesis, which argues that the emergence of new forms should be preceded by their being noticed in the input. In other words, conscious noticing of the mismatch between one’s language production and the target form is a necessary and sufficient condition for SLA. Schmidt (2001) put forth a strong argument for noticing and stated, “noticing requires of the learner a conscious apprehension and awareness of input” and “while there is subliminal perception, there is no subliminal learning” (p. 26). Tomlin and Villa (1994) acknowledged the significance of focusing on attentional resources in SLA and further analyzed attention in terms of three distinct components: alertness, orientation, and detection. According to Tomlin and Villa, detection is the key attentional moment that enables learners to use the detected grammatical instances as data to formulate and test hypotheses about L2 grammar and hence facilitates SLA. Their view differs from Schmidt on the importance of awareness in SLA, and holds that detection, both with and without awareness, is sufficient for learning. Robinson (1995) gave the strictest definition of noticing and conceived noticing as “what is both detected and then further activated following the allocation of attentional resources” (p. 275). Gass (1997) regarded noticing (“apperception”) as a necessary condition under which input gets transformed into intake.

Although these definitions of noticing differ in the degrees and levels of awareness that are deemed necessary for SLA, the researchers all agree on the importance of noticing in SLA. In both the strong version of the noticing hypothesis (noticing is necessary and sufficient for second language acquisition) and the weak version of the noticing hypothesis (noticing is a necessary but not sufficient condition for second language acquisition), noticing is designated a significant role in SLA. In Gass and Selinker’s (2001) view, noticing or selective attention is “at the heart of the interaction hypothesis” (p. 298) and is one of the crucial mechanisms in the negotiation process. To some extent, noticing could be argued as a prerequisite for the facilitative role of any type of negotiated interaction in SLA. Since noticing is conceptualized to play such a crucial role in the knowledge reconstruction process and in the transition from input to output, researchers feel compelled to empirically test its role in SLA.

A series of studies have attempted to test these theoretical arguments and have demonstrated a link between noticing of a target structure and its intake (Izumi, Bigelow, Fujiwara, & Fearnow, 1999; Izumi, 2002; Leow, 2000, 2001; Mackey, Gass, & McDonough, 2000; Rosa & O’Neil, 1999). Furthermore, Gass, Svetics, & Lemelin (2003) have found differential effects of noticing on the development of different linguistic structures. These research findings have substantiated noticing as an important cognitive construct in SLA.

What affects the noticing of recasts?

Once we agree on the essential role of noticing in the utility of recasts, we might want to look closely at what factors would affect the noticing of recasts.

Robinson (2001) offered a general conceptualization that not only individual differences (e.g., pattern recognition ability and memory of contingent input), but also different
learning conditions and tasks that impose different demands on language-processing load might affect the noticing of L2 knowledge gap and hence lead to different learning outcomes. Researchers have identified a variety of factors that may affect the noticing of recasts. Philp (2003) found that over 70% of recasts provided during interaction were accurately recalled by her participants, and, more important, the length of a recast affected its noticing (learners noticed the shorter recasts more often). In addition, she found that the number of changes made in the recast might impose a negative impact on its noticing, which corroborated with the findings of many other researchers (Farrar, 1992; Kim, 2006; Oliver, 1995; Nelson, Denninger, Bonvillian, Kaplan, & Baker, 1984). Nabei and Swain’s (2002) case study on an adult EFL student’s noticing of recasts occurring during her English class showed that the linguistic elements of the recasts (e.g., grammatical vs. lexical) also affected noticing. Kim (2006) reported that the degree of explicitness of recasts affected noticing: 74% of isolated declarative recasts triggered noticing, in contrast to 28% of isolated interrogative recasts.

Not only do the internal features of recasts have an effect on whether they will be attended to, but “the context or the task can influence the extent to which the recast is attended to” as well (Nicholas et al., 2001, p. 731). In Philp’s (2003) study, learner readiness to learn was identified as one such example. Révész (2005) found that story-writing tasks yielded a much higher rate of noticing of recasts on morphosyntactic features than story-telling and jigsaw tasks, and that learners’ familiarity with task content also played a role.

One important variable that has not been investigated is the effect of the contingency of recasts on noticing. The contingency of recasts might have an effect on noticing because according to Cowan (1988), “verbal short-term memory is limited in the duration of storage as well as the number of items” (p. 166). To make the cognitive comparison between their original utterances and the reformulated version of input, learners need to store and process the information long enough in their working memory. Thus, in the case of a noncontingent recast in which a recast does not immediately follow the erroneous turn, the chance of conducting this cognitive comparison would be greatly reduced and hence more likely to remain unnoticed. This factor has never been investigated previously due to the fact that the majority of the studies on the noticing of recasts are in the context of face-to-face interaction, where recasts are almost always provided in a contingent fashion, that is, immediately following trigger turns. However, this issue becomes pressing with the ever increasing use of computer-mediated communication in second language classrooms and is also quite interesting for its theoretical implications.

**Why the Contingency of Recasts and Noticing?**

The issue of contingency of recasts and noticing is closely related to the current argument over the working mechanism of recasts. At present, researchers have proposed several possible explanations on why and how recasts could benefit L2 development. Saxton (1997) put forth the direct contrast hypothesis and pinpointed that one essential function of recasts is to provide negative evidence, that is, raising learners’ awareness of their errors through immediately contrasting the corrective forms with their erroneous forms:

> When the child produces an utterance containing an erroneous form, which is responded to immediately with an utterance containing the correct adult alternative to the erroneous form (i.e., when negative evidence is supplied), then the child may perceive the adult form as being in contrast with the equivalent child form. Cognizance of a relevant contrast can then form the basis for perceiving the adult form as a correct alternative to the child form. (p. 155)
The universal grammar model of language acquisition provides an alternative explanation for the effectiveness of recasts: the power of recasts is not much for their role as negative evidence, but rather for their role as positive evidence. According to this framework, “the benefit of the recast would be that the appropriate positive evidence was presented in an accessible way in the input the learner was exposed to” (Nicholas et al., 2001, p. 722). Although there is still controversy over these two competitive explanations, Leeman (2003) pointed out that the enhanced salience of the linguistic forms is the key no matter whether recasts work because of negative evidence or positive evidence. She reasoned that “the juxtaposition of the recast and the learner utterance may highlight whichever target forms appear in the reformulation but were missing from the nontarget original” (p. 45) and thus may either promote the comparison between target forms and erroneous forms and ultimately lead to the rejection of the erroneous ones (in the case of negative evidence) or enhance the noticing of the target form and ultimately lead to its incorporation into the developing grammar (in the case of positive evidence). Thus an investigation into the contingency effect of the noticing of recasts would provide an interesting venue to test the current theoretical arguments on the working mechanism of recasts. If we find such evidence, then it will lend support to the current theoretical arguments on the working mechanism of recasts; otherwise, it will suggest that the working mechanism of recasts might not have much to do with the enhanced saliency as current theories have suggested.

Investigation of the issue of contingency of recasts and noticing is also of great practical significance considering that computer-mediated communication (CMC) has been increasingly used in language classrooms and that more and more research espouses the facilitative role of CMC in SLA. With CMC discourse, especially that of text-based online chatting, characterized by its “split negotiation routine” (Smith, 2003), the contingency of recasts becomes pertinent and critical. If the contingency of recasts does affect whether the recasts get noticed or not, then the efficacy of recasts provided in this communication context might be threatened and become questionable.

In effect, it may not be fair to say that the impact of contingency on noticing has never been examined before. One study conducted by Sakai (2004) compared the noticing of recasts and that of models. But her operationalization of the model condition was different from the other model studies (Izumi et al., 1999; Izumi & Bigelow, 2000) in that the models provided in the subsequent picture identification task were tailor-made based on learners’ utterances in a previous picture description task. So to some extent the models she provided in her study were “recasts” that were a few minutes behind the original erroneous utterances. In this study, she found the contingency effect on noticing: learners noticed the recasts more often than they noticed the tailor-made models (noncontingent “recasts”). Of course, the contingency condition created in her study was different from what typically occurs in CMC. In her study, learners’ original utterances were responded to with expressions like “I see,” “OK,” and “Yes” during the interaction, and the tailor-made models (noncontingent “recasts”) were provided after the whole interaction task was completed. In the case of text-based online chatting, the recasts were intended as immediate responses to the erroneous utterances but only appeared to be delayed and split due to the commonly observed concurrent typing from both interlocutors during online chatting. However, Sakai’s study does provide some basis for arguing for the contingency effect on the noticing of recasts. To briefly summarize this section, the contingency of recasts is an important issue that has not yet been fully explored and deserves research attention.

**RESEARCH QUESTIONS**

This study was intended to fill this gap by examining whether the contingency of recasts is a
variable that affects noticing and, furthermore, how other learner variables or task variables might mediate this contingency effect. Specifically, two questions were addressed:

1. Would the contingency of recasts have any effect on noticing?
2. How would other learner variables and task variables mediate the contingency effect?

Two learner variables were examined: learners’ working-memory capacity and their L2 proficiency. These two variables were targeted because they were frequently reported to affect the noticing of recasts in the literature. A task variable, prewriting, was also examined to see whether this instructional intervention could help mediate the contingency effect because previous research has shown that pretask planning enhances focus on form (Ortega, 1999). Prewriting might contribute to the noticing of recasts on two accounts: through freeing learners’ attentional resources and/or through making learners become more attentive to the feedback on their utterances given by their interlocutors.

**METHOD**

**Participants**

Seventeen English as second language (ESL) learners from an ESL intensive program at a large Midwestern university in the US participated in this study. Six of the participants were at higher intermediate proficiency level and the other 11 were at lower intermediate proficiency level. The proficiency level of the participants was determined based on their performance on the institute placement test. The participants were from three L1 backgrounds: Korean, Chinese, and Arabic. Their ages ranged from 18 to 27, with an average of 23. The majority of them had been in the US for less than 7 months. All except one had previous online text chatting experience, mainly in their native language, with a few of them chatting online on a regular basis (several hours per week). Their net typing speed ranged from 5 wpm to 39 wpm, with an average of 17 wpm.

**Materials**

**The chat program**

MSN, a commonly used text-based chat program, was selected as the communication medium.

**Typing speed test**

A free online typing speed test tool was used and was accessed at http://www.typingtest.com/test/default.asp.

**Working memory test**

A test on each participant’s working memory capacity was administered. The working memory test used in this study was self-made reverse digit span test (30 items). This language-independent working memory test was constructed to eliminate the possibility of confounding learners’ linguistic ability with their working memory capacity in most other language-depen-
dent working memory tests (Cherry, Elliott, & Reese, 2007; Marchand, Lefebvre, & Connolly, 2006; Palladino & Cornoldi, 2004).

**Communication tasks**

One spot-the-difference task was used for the practice session and two other spot-the-difference tasks were used for the treatment sessions. Spot-the-difference tasks are the communication tasks in which each of the dyadic interlocutors has a slightly different version of the same picture and they are expected to interact with each other to figure out the differences between the two pictures. This type of communication task was selected because it meets the four criteria that were conceptualized to be facilitative of negotiated interaction (Pica, Kanagy, & Falodun, 1993). The two tasks used during the treatment sessions have been used in previous ESL research on negotiated interaction (Mackey et al., 2000; Lai & Zhao, 2006). Each participant worked consecutively on two spot-the-difference tasks with one of the researchers, one with prewriting and the other without. In the prewriting condition, the participants typed their description of the picture in a word document for 10 minutes before interacting with the researcher to find out the differences in their pictures. Around half of the participants did the prewriting condition first and the other half the no-prewriting condition first in order to eliminate sequencing effect. The two tasks were assigned to each participant in a random order to eliminate the possible effect caused by differences in task difficulties, and the prewriting condition was randomly assigned to one of the two tasks.

**Procedure**

This study was conducted in a computer lab in 2-hour sessions. The participants first completed a background questionnaire on personal information and their previous online chatting experience and then took a typing speed test online. Afterwards, the participants were asked to practice chatting with one of the researchers via MSN over a practice spot-the-difference task and were requested to say aloud whatever came to their mind at any moment while chatting so that they could get familiar with both the communicative task and think-aloud protocols. Prior to the practice session, the think-aloud protocol was explained and modeled for the participants. One example of think-aloud on the chatting content and on linguistic form was given during the explanation. The think-aloud training was done on a practice online communicative task rather than on traditional mathematical problems because the training task was more pertinent to the treatment tasks, making it easier for the participants to transfer the trained skill to the treatment sessions. The practice sessions lasted around 5 minutes and ended when the participants indicated that they felt comfortable with the communication task and the think-aloud protocol.

The participants then individually chatted with one of the researchers on two spot-the-difference tasks, one preceded by 10-minute prewriting and the other without prewriting. Each chatting task was stopped after 15 minutes. The participants and their interlocutor (the chatting researcher) were in different rooms, and the participants were not informed of the language background and proficiency level of their interlocutor. While chatting online, the participants were instructed to think aloud; another researcher (the monitoring researcher) sat behind them and, when there was a long silence, reminded them to say aloud whatever came to their minds. The chatting researcher provided recasts to the participant’s nontarget-like utterances whenever it seemed natural to do so, and the monitoring researcher noted the recast episodes as they occurred during the conversation. Both chat sessions were recorded using Camtasia Studio 3. The think-aloud protocols were both audiotaped and captured by Camtasia Studio 3.
After the two chatting tasks were completed, the participants sat down with the monitoring researcher to conduct the stimulated recall (Gass & Mackey, 2000) on the recasts that occurred in the chat sessions. The stimulated recall was conducted on the recordings of the two chat sessions, and the recall sequence was the same as that of the treatment sessions. During the stimulated recall, participants and the researcher reviewed the video of the two chat sessions together, and the researcher paused at each instance of a recast and invited the participants to recall what they were thinking. The participants were also told to feel free to pause the video at any moment where they wanted to make a comment. The stimulated recall session was also audiotaped. Like any other type of verbal protocol, the validity of stimulated recall has been heavily debated and discussed (see Ericsson & Simon, 1993; Gass & Mackey, 2000). Notwithstanding, stimulated recall has been widely used in psychology, education, and L2 writing research, and Mackey et al. (2000) used it in L2 interaction research. Aware of the limitations and potential problems of stimulated recall, we used both the think-aloud protocol and stimulated recall to triangulate the measurement of noticing in order to obtain a more comprehensive view of the measurement (Camps, 2003). Immediately after the stimulated recall the participants took a working memory test. Table 1 summarizes the sequence and duration of each task.

Table 1
Sequence and Duration of Each Task

<table>
<thead>
<tr>
<th>Experiment Stage</th>
<th>Participants</th>
<th>Tasks</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation and Practice</td>
<td>All participants</td>
<td>Background questionnaire</td>
<td>Around 5 min.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Typing speed test</td>
<td>1 min.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Practice on the communication task</td>
<td>Around 5 min.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and think-aloud protocol</td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>Half participants</td>
<td>Prewriting of communication task 1</td>
<td>10 min.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Communication task 1 + think-aloud protocol</td>
<td>15 min.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Communication task 2 + think-aloud protocol</td>
<td>15 min.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stimulated recall of both chat sessions</td>
<td>Around 40 min.</td>
</tr>
<tr>
<td></td>
<td>Half participants</td>
<td>Communication task 1 + think-aloud protocol</td>
<td>15 min.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prewriting of communication task 2</td>
<td>10 min.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Communication task 2 + think-aloud protocol</td>
<td>15 min.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stimulated recall of both chat sessions</td>
<td>Around 40 min.</td>
</tr>
<tr>
<td>Exit</td>
<td>All participants</td>
<td>Working memory test</td>
<td>Around 20 min.</td>
</tr>
</tbody>
</table>

**Data Analyses**

**Data coding**

The recasts in the interactions in both treatment sessions were coded on whether they were contingent recasts or noncontingent recasts. The contingency of recasts actually had two
connotations: physical proximity and meaning contiguity and thus could potentially be coded on these two ways. Physical proximity was judged on the physical position of the recast with respect to its trigger turn. A contingent recast in this context referred to recasts that immediately followed the trigger turn and appeared just below the trigger turn on the screen. Meaning contiguity was defined on whether the recast and its trigger turn were interrupted by discussion or comment about a different point in the picture. Although the participants sometimes typed constituent words or phrases of a sentence in separate lines as a strategy to compensate for their slow typing speed to continue leading the turn taking, they usually interpreted the whole sentence as a single turn. The recast was often given and interpreted as a response to the whole sentence, and it made much more sense to code the contingency of such recasts based on meaning contiguity rather than physical proximity.

The excerpts below illustrate contingent and noncontingent recasts.

1. Contingent recasts
(recasts that immediately followed nontarget-like utterances, those that were separated by some noncontent-related discussion/comments (e.g., "oh, it's hard to describe"), or those that were separated by typing one sentence over several lines)

   a. Student: Yes, I mea like a point
      Student: I can’t description the goods
      Researcher: I can’t tell. In mine, it seems to be shaped like a cylinder.

   b. Student: Here is 4 glsddes
      Student: 4 glasses
      Student: and 3 cup
      Student: and 1 box
      Researcher: I see 5 glasses and 3 cups.

2. Noncontingent recasts
(recasts that were separated from the nontarget-like utterances by discussion or comment about a different point in the picture)

   a. Student: There is 6 building
      Student: Yes, I have a statue
      Researcher: Yes, there are 6 buildings.

   b. Student: a man holding a box
      Researcher: right
      Researcher: He is holding a box
      Student: glasses box
      Student: yes [this YES is a response to “he is holding a box”]
      Researcher: a box with “GLASSES” written on it.

One researcher coded all the conversational data for the contingency of recasts, and another researcher independently coded 20% of randomly selected data. The interrater reliability was 83%.

Instances of noticing were coded on the basis of whether they were reported as noticed in the think-aloud protocols and stimulated recalls. If statements made by the participants either in their think-aloud protocols or the stimulated recall of the episodes indicated
that they realized their linguistic problems when they saw the researcher’s recasts at the time of chatting, those statements were counted as evidence of reported noticing. If the participants stated that they could not remember what happened during the episode or if their recall was mainly about the content of the picture, then those instances were taken as no reported noticing.

The excerpts below illustrate reported noticing and no reported noticing.

1. Reported noticing
   (Indicators that the participant noticed the linguistic forms in the think-aloud protocols, including repeating the word several times, using affirmative markers like “aha,” or repeating once in rising intonation, and so on; or the participant remarked on the linguistic form in the stimulated recall episodes)

   [stimulated recall episode]
   Researcher: When you saw F typed this sentence, what was in your mind? What were you thinking?
   Student: I didn’t know how to describe this and she said “drying”. Ah “Dry-ing”. I thought.

2. No Reported Noticing
   (the participant made no remarks during think-aloud protocol; or the participant could not recall anything about the episode in the stimulated recall, indicated that he/she did not think about anything at the moment of chatting, or commented mainly on the picture in the stimulated recall)

   [stimulated recall episode]
   Researcher: My question is, when you saw F typed this sentence, what was in your mind?
   Student: It’s the same thing.

One researcher coded all the think-aloud protocols and stimulated recall episodes for evidence of reported noticing, and another researcher independently coded 20% of randomly selected data. The interrater reliability was 86%.

The score of the working memory test was a composite score of the 30 items. For each item, one point was subtracted for each wrong number, each missing number, each added number, and if two numbers or two sets of numbers were correct but in the wrong order.

Data analysis
Due to the small sample size, a nonparametric test Wilcoxon Signed Rank Test was used to compare the noticing of contingent recasts and that of non-contingent recasts to examine whether the contingency of recasts affected their noticing. A Wilcoxon Signed Rank Test was also conducted on the noticing of recasts in the prewriting context versus the non-prewriting context to test whether prewriting, as an instructional intervention, had an impact on the noticing of recasts.

Correlations of working memory and proficiency level with the noticing of contingent versus noncontingent recasts were also calculated to investigate whether working memory
and learner L2 proficiency level had differential impacts on the noticing of contingent and non-
contingent recasts. Furthermore, the noticing of contingent recasts in the prewriting condition
and in the non-prewriting condition were compared, using the Wilcoxon Signed Rank Test, and
the same was done on the noticing of noncontingent recasts to see whether the prewriting
condition had a differential impact on the noticing of the contingent recasts and noncontingent
recasts.

RESULTS AND DISCUSSION

There were altogether 290 instances of recasts in the CMC sessions, among which 132 were
noticed. Thus, 46% of the recasts were noticed. Although this rate was comparatively lower
than the 70% reported in face-to-face interaction (Philp, 2003), it should be remembered that
in Philp’s study noticing was measured by cued immediate recall (to repeat the recast), the
immediacy (immediately after each recast) and intensity of the cue (a knock on the desk) of
which might have induced more recall of the recasts.

Among the recasts provided in the sessions, 177 were provided in a contingent fash-
ion and 113 were provided in a noncontingent fashion. 93 out of the 177 contingent recasts
(53%) were noticed, whereas 39 out of the 113 noncontingent recasts (35%) were noticed. A
rough comparison of the noticing rate suggested contingency of recasts might have an impact
on students’ noticing.

The majority of the recasts were on word choice and this category was also most often
noticed by the participants. Sixty percent of the noticed recasts were about word choice; 66%
of the noticed contingent recasts were about word choice and 46% of the noticed nonconti-
gent recasts were about word choice in spite of the fact that only 35% of all the contingent
recasts and 23% of all the noncontingent recasts were about word choice. Table 2 summarizes
the distribution of different categories of noticed recasts.

Table 2
Noticed Recasts by Category

<table>
<thead>
<tr>
<th>Category</th>
<th>Contingent</th>
<th>Noncontingent</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
</tr>
<tr>
<td>Word Choice</td>
<td>61</td>
<td>66%</td>
<td>18</td>
</tr>
<tr>
<td>Morphosyntax</td>
<td>15</td>
<td>16%</td>
<td>6</td>
</tr>
<tr>
<td>Reformulation of fragmented</td>
<td>12</td>
<td>13%</td>
<td>13</td>
</tr>
<tr>
<td>sentences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spelling</td>
<td>5</td>
<td>5%</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>93</td>
<td>100%</td>
<td>39</td>
</tr>
</tbody>
</table>

Comparison of the Noticing of Contingent and Noncontingent Recasts

It was found that contingent recasts were noticed significantly more often than noncontingent
recasts ($z = 1.965$, $p = 0.049$, $d = 0.59$; see Table 3). Since this comparison was based on
the percentage score of noticed recasts of the total number of recasts, the differences in the
total number of the two types of recasts did not bias the result.
Table 3
Noticing of Contingent Recasts Versus Noncontingent Recasts

<table>
<thead>
<tr>
<th></th>
<th>Total number</th>
<th>Number noticed</th>
<th>M</th>
<th>SD</th>
<th>z</th>
<th>Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contingent recasts</td>
<td>177</td>
<td>93</td>
<td>.539</td>
<td>.208</td>
<td>1.965*</td>
<td>0.59</td>
</tr>
<tr>
<td>Noncontingent recasts</td>
<td>113</td>
<td>39</td>
<td>.391</td>
<td>.288</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p = .049

Note: M is the mean of the ratio of noticed recasts to the overall instances of recasts during the interactions.

Furthermore, the plotting of each participant’s noticing of recasts (Figure 1) shows that 14 out of 17 participants noticed contingent recasts more.

Figure 1
Plot of Participants’ Noticed Contingent Recasts

This finding of contingency effect on the noticing of recasts confirms the current theoretical arguments on the core of the working mechanism of recasts, that is, the saliency of the evidence—positive and negative—that recasts carry. However, at the same time, this finding questions the utility of recasts in text-based online chatting: if it is true that recasts in text-based online chatting are often provided in a noncontingent fashion as observed by other researchers (Smith, 2003) and if it is true that the noticing of noncontingent recasts is relatively
low as found in this study, then it is possible that the recasts provided in this communication context would be less likely to be noticed and thus less likely to be beneficial to SLA.

**Mediation Effect of Contextual Factors**

**Working memory and the contingency of recasts**

Spearman’s rho was used as the measure of correlation in this study due to the small sample size. It was found that working memory was significantly correlated with the noticing of recasts ($\rho = 0.58, p < 0.05$). More important, working memory had differential effects on the noticing of the contingent recasts and that of the noncontingent recasts. Working memory was strongly correlated with the noticing of noncontingent recasts ($\rho = 0.79, p < .001$). However, although working memory was also positively correlated with the noticing of contingent recasts, the correlation was weak and not significant ($\rho = 0.28, p > .05$).

![Correlation of Contingent and Noncontingent Recasts with Working Memory](image)

The correlation between working memory and the noticing of recasts corroborated with previous research findings (Mackey et al., 2002). This finding seems to suggest that working memory is a robust influential factor on the noticing of recasts since both a language-independent measure (used in this study) and a language-dependent measure (used in Mackey et al.’s study) yielded similar results. However, the weak (nonsignificant) correlation between working memory and the noticing of contingent recasts is puzzling since, if it is true that recasts in face-to-face interactions are always provided in a contingent fashion, then we would expect this correlation to be strong, as suggested in Mackey et al.’s study. This discrepancy suggests two possibilities. First, the recasts in face-to-face interactions (at least in Mackey et al.’s (2002) study) may be de facto not all contingent. It might be true that the contingency issue is not exclusive to text-based online chatting and thus should be used as a...
construct to differentiate the recasts provided in face-to-face communication context as well. Second, if the noncontingency of recasts is not the case, then the seeming harmony between this study’s finding (contingent plus noncontingent recasts) and Mackey et al.’s finding (contingent recasts alone) on the impact of working memory and noticing of recasts may not hold. The contradiction between the weak correlation between working memory and the noticing of contingent recasts in this study and the significant impact of working memory on the noticing of contingent recasts in Mackey et al.’s study might suggest that the measure of working memory may be crucial. There may well be a need to look closely at the language-dependent and language-independent measures of working memory since they seem to yield different research findings concerning its impact on the noticing of recasts.

The differential effect of working memory on the noticing of the two types of recasts suggests that working memory does mediate the effect of contingency on the noticing of recasts. The strong linear relationship between working memory and the noticing of noncontingent recasts indicates that learners with higher working memory capacity are more likely to notice noncontingent recasts than learners with lower working memory capacity, whereas the weak correlation between working memory and the noticing of contingent recasts indicates that working memory does not matter that much in the noticing of contingent recasts. This differential effect indicates that higher working memory might alleviate the contingency effect. A plot of relationship between working memory and the difference score between the noticing of contingent recasts and noncontingent recasts confirmed this alleviating effect (see Figure 3).

Figure 3
The Relationship Between Working Memory and Difference Score Between the Noticing Rate of the Contingent and the Noncontingent Recasts

Figure 3 shows that the higher working memory a participant had, the lower the difference between his/her noticing rate of the contingent and noncontingent recasts. This finding makes sense in that higher working memory might enable learners to store more information for a longer duration and thus enhance the possibility of cognitive contrast between the
noncontingent recasts and their trigger turns, which would otherwise be unlikely in the case of lower working memory capacity. Although the same reasoning could apply to the noticing of contingent recasts, as indicated by the positive correlation between these two, the boosting effect might not be as strong and salient as in the case of the noticing of noncontingent recasts.

**Learner proficiency level and the contingency of recasts**

The correlation between learner proficiency level and the noticing of recasts was very small and insignificant \( (\rho = -0.20, p > 0.05) \). The correlation between learner proficiency level and the noticing of contingent recasts was near zero \( (\rho = -0.04, p > 0.05) \), and the same held for the correlation between learner proficiency level and the noticing of noncontingent recasts \( (\rho = -0.004, p > 0.05) \).

This finding is the opposite of findings in the literature on the positive impact of learner proficiency level and the noticing of recasts (Philp, 2003; Mackey et al., 2002). One possible reason might be that both these two studies focus on question forms and use a much more precise and targeted measure of learner proficiency—learners’ grasp of question forms. However, the study described here used a much more general and rough measure of learners’ proficiency, which may explain the lack of a proficiency effect on noticing recasts. For the same reason, we need to be cautious with the interpretation of the finding that learner proficiency level does not have differential effects on the noticing of the contingent and the noncontingent recasts.

**Prewriting and noticing recasts**

For the effect of prewriting on the noticing of recasts, we found that prewriting did not have a significant effect on the overall noticing of recasts \( (z = 0.54, p > 0.05, d = 0.14) \). However, although prewriting did not have a significant effect on the noticing of noncontingent recasts \( (z = 1.52, p > 0.05, d = 0.43) \), it did on the noticing of contingent recasts \( (z = 2.203, p < 0.05, d = 0.57) \).

As hypothesized in the research question section, prewriting might be contributive to the noticing of recasts through freeing learners’ attentional resources or through drawing learners’ attention to the feedback provided by their interlocutors. If the first case is true, then prewriting should have more of an effect on the noncontingent recasts than on the contingent recasts, not the other way around as shown in this study’s finding. It was found that working memory helped the noticing of the noncontingent recasts more than that of the contingent recasts. Thus, the first explanation does not hold much strength. Therefore, it might be that the function of prewriting is not so much of freeing attention resources but rather of making learners become more attentive to the feedback given on their utterances by their interlocutors. It follows that attending to contingent recasts is easier than noncontingent recasts (as suggested in previous findings in this study), and thus prewriting can be seen to have a significant effect on the noticing of contingent recasts but no effect on noncontingent recasts. This explanation sounds more plausible and suggests that helping learners to notice the “hole” in their interlanguage through prewriting could facilitate their noticing of the “gap” between their own interlanguage and the target form indicated by the interactional feedback—recasts in this case (Sakai, 2004).
Summary of Findings

This study found a significant effect of the contingency of recasts on participants’ noticing, that is, learners noticed contingent recasts significantly more often than they noticed noncontingent recasts. Furthermore, this study found working memory and prewriting could potentially mediate the contingency effect of recasts. Working memory was significantly correlated with the noticing of noncontingent recasts, and prewriting before chatting online led to a significantly higher noticing rate of contingent recasts.

LIMITATIONS AND FUTURE RESEARCH

Since this was an exploratory study based on small sample size, the research findings need to be interpreted with caution. The study used a general measure of learner proficiency, the level of class at which each individual participant was enrolled, which might have limited its power in revealing the effect of learner proficiency in the noticing of recasts as well as its potential differential effects on the noticing of the contingent and the noncontingent recasts. Future studies should use more precise measures of learner proficiency to examine this issue. By more precise measures we do not necessarily mean measures that target one specific linguistic aspect as have been used in previous studies since we do not often want to restrict study to one specific linguistic feature, say question forms. Rather, we may think of using learners’ actual production data in the study as a measure to triangulate and weight their proficiency level deduced from the institute-made placement test. Or at the very least, we may need to use their actual scores in the institute-made placement test as proficiency level measure rather than using the rough measure of the level of class at which they were placed.

This study used intensive recasts in response to learners’ nontarget-like turns, and this consistency in the provision of recasts might have made recasts less ambiguous to perceive and thus boosted their likelihood of being noticed (Kim, 2006). It is likely that this boosting effect, like the effect of prewriting, might have a greater impact on the noticing of the contingent recasts than on the noncontingent recasts due to the high threshold of the noticing of noncontingent recasts. This is definitely an issue that deserves further investigation.

This study combined think-aloud protocols and stimulated recall to measure noticing. The relatively low proficiency level of the participants made it hard to elicit think-aloud protocols. Although the participants were encouraged to use their L1s for think-alouds, the majority of them still chose to think-aloud in English, and the amount of information in their think-alouds was quite limited. Furthermore, the stimulated recall was done in English, which might have limited the amount of noticing compared to what could have been reported if conducted in the participants’ native languages. Nonetheless, this study showed that combining an “online” measure of noticing and an “offline” measure of noticing is quite necessary since there were cases in which the learners indicated noticing in one measure but not in the other. There were several cases in which a participant repeated the recast several times during think-aloud at the time of chatting but gave no comment during stimulated recall. Future research to examine contextual factors that affect the elicitation of the different measures of noticing and to explore the combination of various measures of noticing for different research contexts are much needed to improve and safeguard the quality of research on noticing and SLA.

In spite of these limitations, the finding of contingency effect on the noticing of recasts suggest that we should look carefully into the seriousness of the occurrence of noncontingent recasts in all sorts of natural text-based online chatting situations. Moreover, we may take
this construct more seriously and use it as a dimension to analyze the provision of recasts in face-to-face conversations as well since it may be true that the provision of recasts in face-to-face conversations is not as simple as we might expect it to be in terms of contingency of recasts. As a matter of fact, recasts in face-to-face interaction could be as likely to be non-contingent as those in online chatting. In online chatting, the interlocutors are always eager to throw something out on the screen to keep each other engaged to keep the conversation going. During online chatting, people may use a lot of compensation strategies such as typing out a sentence in several turns to compensate for the slow typing speed. Although in face-to-face interaction, with the physical presence of the interlocutors and with speaking being much faster than typing, people are not under the pressure to produce broken sentences to either keep the turn taking or sustain the conversation; they may tend to delay handing over the turn taking by producing long turns with several sentences in each, which might as well cause recasts to be noncontingent. Therefore, it is quite likely that in face-to-face interactions, especially in the context of negotiation in communication tasks like picture description tasks, the recasts may, to a large extent, be noncontingent, which could have increased the difficulty of noticing face-to-face recasts. Thus, it is important to examine the contingency of recasts in face-to-face interaction on communication tasks as well.

Furthermore, this study used a language-independent measure of working memory and got findings different from those in previous research that used a language-dependent measure, which suggests that this might be a productive line of research. It could be interesting to use both language-independent and language-dependent measures of working memory in the same study and compare the findings. This issue is important in that much of the current research in SLA relies solely on language-dependent instruments to measure working memory, which could confound the measure of learners’ language proficiency, both in the L1 and L2, with the measure of learners’ working memory. An investigation into this issue might yield a more precise measure of working memory for future research.

**CONCLUSION**

This study has provided empirical evidence in support of potential contingency effect on the noticing of recasts, and supported the current arguments on the working mechanism of recasts: the saliency of the linguistic evidence, positive and/or negative, provided through recasts. It has also identified some contextual factors that can mediate the contingency effect.

The study identified a new construct that might potentially affect the noticing of recasts, hence the utility of recasts, in text-based online chatting. It sends a note of caution to the prevalent positive remarks on the potential of text-based online chatting on SLA. It reminds us that while exploring the affordances of text-based online chatting, we need also to look into the constraints and potential problems of this medium in terms of SLA. It further argues that the construct of contingency of recasts should be watched carefully in its occurrences in text-based online chatting, audio and video conferencing, and even face-to-face communication contexts.

This study also suggested a possible way to boost the noticing of recasts. Requiring some sort of output (e.g., prewriting) before engaging learners in communicative activities could guide learners to pay more attention to the interactional feedback from their interlocutors. Furthermore, it pointed out that some learner variables (e.g., working memory) might have an impact on the contingency effect; learners with greater working memory might fare better as far as noticing of recasts goes.
NOTES

1 Students at the higher intermediate proficiency level were those who were studying at level 3 and level 4 at this intensive English institute, and students at the lower intermediate proficiency level were those who were studying at level 1 and level 2.

2 Net typing speed is a measure of typing speed that takes into consideration both gross typing speed and accuracy rate.

3 The following instruction on think-aloud was given: “While you are chatting with your partner, your mind must be actively thinking about your picture and about what your partner is saying. When your partner typed something, you might be thinking ‘that’s interesting!’ or you might be thinking ‘oh, right. Chasing. He’s chasing the dog.’ So when you chat with your partner, talk out aloud whatever you are thinking at any moment.”

4 Prior to the study, the researchers piloted the provision of recasts during online chatting on the communication tasks with an ESL learner from the potential participant pool. They discussed the strategies of providing recasts based on the pilot chatting data.

5 The Camtasia Studio 3 program is screen capture software that records each keystroke in a video file. It also captures the voices of those in front of the computer and stores them in the same video file.

6 The participating researchers were instructed to constantly provide recasts whenever it was natural to do so. Prior to the experiment, they piloted online chatting with an ESL student to refine their techniques in providing recasts.

REFERENCES


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