A narrative review of CMC and WCF:

Implications for L2 writers in the academic writing centre

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Over the last decade, Canada has witnessed a significant increase in the number of international students choosing to study at Canadian colleges and universities. According to the Canadian Bureau for International Education (2018), since 2010, there has been a 119 percent increase in the numbers of international students, with a 20 percent increase occurring in 2017 alone. Currently, almost 500,000 international students attend Canadian colleges and universities, comprising approximately 11 percent of the total student population. A large number of international students come to academic institutions speaking first languages other than English[1]. Faced with the challenges of now having to write in a language that is not their mother tongue, they are showing up on the doorsteps of writing centres (WCs) across the higher education landscape, seeking help with grammar, vocabulary, and academic register (Thonus, 1993, 2014), thus compelling WCs to reevaluate how they provide service to this population (Williams, 2002).

With a recent call to consider WC tutors as "both second language writing tutors and as second language tutors" (Severino & Deifell, 2011, p. 26), there is a growing need to examine how written corrective feedback (WCF) is provided in the WC, particularly considering that corrective feedback has often been thought of as dealing with lower-order concerns, something WC tutors had been admonished to avoid at all costs (Bell & Elledge, 2008). WCs are now looking to the field of second language acquisition for insight (Williams, 2002), and they are finding a wealth of research into the effectiveness of corrective feedback on L2 writing (for a comprehensive review, see Bitchener & Ferris, 2012). In contrast to the position put forward by Truscott (1996, 2007), which posits the ineffectiveness and potentially damaging effects of WCF

on L2 learners' ability to use language in realistic ways and which calls for the abandonment of the practice, the consensus from more recent research is that written corrective feedback does have a significant effect on accuracy improvement in L2 writing (Russel and Spada, 2006; Storch, 2010, VanBeuningen, 2010; Bitchener & Ferris, 2011; Kang & Han, 2015). These positive findings have led to a growth of research into the role that computer-mediated communication (CMC) tools play in providing WCF (Lin, 2014, 2015; Sauro, 2011). At the same time, in order to meet ever increasing demands for access to service, WCs are turning to online tutoring services as a supplement to face-to-face sessions (Severino, Swenson, & Zhu, 2009). However, empirical investigation into the effect of online corrective feedback supplied by tutors within an WC context is almost non-existent.

The purpose of this literature review is to provide an overview of WCF research in relation to the provision of CMC feedback on L2 writing, from which I draw implications for the provision of WCF within an online WC context. I conclude by suggesting opportunities for future research.

Written Corrective Feedback

WCF refers to instances where L2 writers receive information indicating that their language production within a piece of text is ungrammatical (Bitchener & Ferris, 2012). Correction of a text's content, organization, vocabulary, grammar, and spelling has been a mainstay of most writing teachers' toolkits, in part because writing teachers recognize the pragmatic realities of a world that demands written text conform to an accepted standard, and in part because L2 students expect teachers to correct their errors to the fullest extent possible (Saito, 1994). To assist researchers studying this common pedagogical practice in a systematic manner, Ellis (2009) outlined a typology for WCF that is frequently used in written feedback

research. One of the key dimensions in this typology distinguishes between focused and unfocused feedback. Focused feedback targets specific language structures for correction, whereas, unfocused feedback addresses a comprehensive range of error categories. A second dimension differentiates between direct, or explicit, feedback and indirect, or implicit, corrective feedback (Ellis, Loewen & Erlam, 2006). Direct feedback requires explicitly correcting the linguistic form or structure by crossing out unnecessary words, inserting missing words, or writing the correct form near the incorrect form. Metalinguistic feedback, a subset of direct corrective feedback, includes grammar rules and examples of correct usage (Bitchener & Ferris, 2012). Codes are sometimes used to indicate the type of error; these codes are then inserted in the margins and linked to grammatical descriptions (Ellis, 2008). Indirect feedback draws the L2 writer's attention to the presence of an error through either: (1) marginal notations of the number of errors in a specific sentence, or (2) the underlining or circling of text. Overt explanation of what the error entails is not given, leaving the L2 writer to correct the error without further assistance (Bitchener & Ferris, 2012; Ellis, 2008).

Much of the research on WCF has revolved around investigations into the effectiveness of focused WCF, with mounting evidence providing support for this type of feedback in producing accuracy gains (Van Beuningen, 2010). For example, Bitchener and Knock's (2009) 10-month study into the effects of focused WCF on a targeted linguistic category using direct and metalinguistic feedback found a positive effect on grammatical accuracy that endured over time. Some research studies have examined the effectiveness of unfocused WCF or compared focused to unfocused WCF. In their study investigating the differential effects of focused versus unfocused WCF, Sheen, Wright, and Moldawa (2009) were able to show that while both types of error correction produced significant improvements in accuracy of articles, because the

unfocused WCF did not outperform the control group, the researchers were unable to demonstrate the benefits of providing unfocused over focused corrective feedback. Other studies have explored direct WCF compared with indirect WCF, although these results are somewhat inconclusive. Some researchers claim an advantage to direct WCF, particularly with regards to continued long-term effects on the acquisition of simple linguistic forms (Van Beuningen, de Jong & Kuiken, 2008; Bitchener & Knoch, 2009) while other researchers (Frear & Chiu, 2015) point to improvements in accuracy as a result of indirect WCF. Ferris (2010) suggests both direct and indirect feedback can deliver complementary results since both have the potential to induce L2 writers to become aware of and notice a mismatch between their own written production and target-like norms.

A concept that is particularly relevant to discussions of WCF is learner uptake. In their study examining teacher feedback on learners' spoken errors, Lyster and Ranta (1997) defined uptake as a student's response to the teacher drawing attention to some aspect of the student's language production. Students were found to either be able to repair, or not repair, incorrect utterances as a result of teacher feedback. Ellis, Basturkmen and Loewen (2001) expanded the definition to consider successful uptake as instances "in which a student correctly repaired a linguistic feature or clearly demonstrated understanding of an item" (p. 299). In L2 writing, learner uptake is seen as a measure of the effectiveness of corrective feedback, although it must be noted that uptake does not necessarily imply long term retention or language acquisition.

Computer-mediated Communication (CMC)

With mounting evidence pointing to the effectiveness of WCF, researchers are branching out to examine the role of technology in providing that feedback. Even before the advent of the Internet, language classrooms have used technology to deliver instruction or supplement lessons

(Lin, 2014), however, attention directed towards the use of CMC tools to provide WCF has only recently begun. Defined as "the processing of linguistic and other symbolic systems through the internet and allied technologies by interaction between sender(s) and receiver(s)" (Bodomo, 2010, p. 6), CMC can be categorized into synchronous and asynchronous tools, although this dichotomy is becoming somewhat blurred with the advent of even newer technologies. Language researchers are using synchronous tools (SCMC) such as wikis and chats (Elola & Oskoz, 2010; Sauro, 2009), which allow feedback to L2 writers in real time during the process of composing, and asynchronous tools (ACMC), including Track Changes in Word (AbuSeileek & Abualsha'r, 2014), email (Hosseini, 2012; Liu & Zhou, 2018; Tafazoli et al., 2014; Yoke, Rajendran, Sain, Kamaludin, Nawi, & Yusof, 2013), and web-based learning management systems (Ene & Upton, 2014; 2018), in which feedback is delayed until after L2 writers have completed their writing. Web-based collaborative editing programs, such as Google Docs, incorporate features of both SCMC and ACMC, wherein the L2 writer receives immediate feedback during instances when the writer and the teacher are online at the same time, and then delayed feedback when the teacher provides feedback at some point after the text has been electronically submitted (Shintani & Aubrey, 2016; Shintani, 2016).

The Academic Writing Centre

Academic writing centres have long been the providers of support services on college and university campuses. Originally conceptualized in the 1930s as centers for writing "remediation" (Williams & Severino, 2004, p. 165), the rise of the humanistic paradigm in education during the 1960s and 1970s produced a shift in focus towards facilitating the writing process through interaction and collaboration. Today, some WCs employ professional writers or faculty members who function in a teacher-like instructional capacity, whereas other WCs use paid or volunteer

graduate and/or undergraduate students, who work as tutors, consultants, or advisors (Moussu, 2013). Common to all conceptualizations of the WC tutor role is that of provider of strategies to help all students, including L2 students, become independent writers capable of locating and correcting their own errors (Harris & Silva, 1993).

A belief exists among many academic institutions that international students who have successfully met the required levels on standardized English language tests such as TOEFL and IELTS in order to gain admission into academic programs within higher education institutions must therefore possess English language proficiencies sufficient for the writing tasks they face (Corcoran, Gagné, & McIntosh, 2017). The unfortunate reality is that, for a wide variety of reasons, least of which include variables such as anxiety, age, motivation, past educational experiences and achievements, and other sociocultural factors (Moussu, 2013), many L2 students struggle with the writing demands at the postsecondary level. These struggles are coupled with "unrealistic expectations about language learning" (Myers, 2003, p. 52) and a culture of error as something to be eliminated which is deeply embedded within the academic milieu. As a result, more and more frequently, L2 students are visiting college and university writing support centres (WC) for help, either on their own accord or after having been referred by professors who feel these students' writing skills are not equivalent to students who learned English as their first language (L1) (Thonus, 1993; Williams, 2002; Moussu, 2013).

To many L2 students and their professors, WCs are "grammar repair shops" (p. 56) where L2 students can receive feedback on the grammatical, lexical, and syntactical aspects of their writing (Williams, 2002). This view is in stark contrast to the WCs' view of their role, which was originally designed to meet the needs of English L1 students, with a focus on higher-order concerns such as the writing process (Moussu, 2013; Bell & Elledge, 2008), organization,

and argumentation (Moussu, 2013; Severino, Swenson, & Zhu, 2009). Only as a last resort, with time permitting, and with great reluctance to discard traditional practices (Blau, Hall, & Sparks, 2002) and infringe on the principles of academic integrity, authorial voice, and writing authorship (Myers, 2003; Corcoran, Gagné, & McIntosh, 2017) have WC tutors concerned themselves with "editing and proofreading issues that address grammar" (Bell & Elledge, 2008, p. 21). Yet, it is precisely those lower level linguistic aspects of writing with which L2 writers need the most help (Myers, 2003).

Clearly, there exists a disconnect between L2 student needs and the traditional WC approach. This approach is based on the Socratic method of asking indirect, open-ended questions aimed at helping students find their own answers to writing problems. While admirably grounded in collaborative learning theory, the traditional WC approach assumes a similarity of language knowledge between L1 and L2 writers (Blau et al., 2002). Yet, the written texts of L2 students differ significantly in terms of composing processes, organization, syntactical and grammatical features (Silva, 1993). Furthermore, WC tutors hold information about language conventions that most writers who are fluent in English intuitively possess and that L2 writers do not, thus setting up an unequal power dynamic between the tutor and the L2 writer (Blau et al., 2000), with the tutor playing the role of 'keeper of all knowledge' who tries to elicit an answer from where none exists. The strategy of asking L2 writers to read aloud their papers in order to 'hear' their errors is illustrative of the futility of having the same expectations for L2 writers as L1 writers. This strategy does not work with L2 writers because they simply cannot recognize when something "sounds good" (Harris & Silva, 1993, p. 530), but it continues to be one of the most commonly used strategy within the WC environment, a truly frustrating experience for L2 students. L2 writers require more direct "attention to form through corrective feedback" (Ellis,

2005, p. 213) to help them notice specific linguistic items. Rather than clinging to the myth that L2 writers can be tutored in the same manner as L1 students, Thonus (2014) argues that WC tutors need to adjust their pedagogical orientation towards helping L2 writers locate and correct errors that impede the creation of meaningful English texts, particularly when those errors are considered "untreatable", for example, in instances where there is "no handbook or set of rules students can consult" in order to be able to correct the error themselves (Ferris & Roberts, 2001, p. 166).

Due to the importance of realigning approaches to L2 writers in the WC with the needs of L2 writers themselves, this literature sought to illuminate some of the findings from second language acquisition research and from studies on L2 writing that have implications for providing CMC-WCF within a WC environment.

Retrieval of Relevant Studies

I began my search for relevant articles by accessing the Summon database using Article Search. This interdisciplinary database allowed me to query a broad range of materials, including journals particularly relevant to this topic, such as *Computer Assisted Language Learning, System, CALICO Journal, Journal of Second Language Writing, Language Learning & Technology, Canadian Modern Language Review, Journal of Applied Linguistics, Studies in Second Language Acquisition, Language Learning, and TESOL Quarterly*. Because of the ability of the Summon database to simultaneously search multiple subscribed databases and to compile a unified results list, I deemed a manual search of individual journals unnecessary. To yield more in-depth and tailored results that captured relevant articles missed by the Summon database, I also conducted individual searches of specific databases in the fields of applied linguistics, language learning and teaching, and education, including *Linguistics and Language*

Behaviour Abstracts (LLBA), *Linguistics Abstracts Online*, *Scholars Portal*, *Education Resources Information Center* (ERIC), *Education Source*, and *JSTOR*.

As I wanted to focus on current CMC technologies, I limited the literature search to a date range of the year 2000 to the present. The key words used to perform the search included various combinations of the following: *second language (L2) writing*, *corrective/negative feedback/evidence*, *error correction*, *computer-mediated communication (CMC)*, *online/ asynchronous/synchronous*, *electronic or e-feedback*, *ESL/EFL*, and *writing centre/center*. Search results returned previous meta-analyses in computer-mediated communication and second language acquisition (Kang & Han, 2015; Lin, Huang, & Liou, 2013; Lin, 2014, 2015; Sauro, 2011); I analyzed the references from these meta-analyses to identify additional sources of potential studies.

Inclusion Criteria

Because of the breadth of research in the area of language learning and technology, I chose to narrowly focus this review on experimental studies that addressed CMC and WCF on L2 writing in a post-secondary setting. Participants in the studies needed to be either ESL or EFL students. Although case studies face limitations due to their lack of representation and generalizability, I chose to include the case studies in this review because of their complex and rich portrait of L2 writing development and the impact of CMC feedback on that development (Shintani, 2016), and because of their relevance to a WC context (Severino & Prim, 2016; Severino & Deifell, 2011). Finally, all studies needed to be reported in English.

Exclusion Criteria

Although the exclusion of unpublished studies such as doctoral dissertations, master's theses, conference proceedings, reports, and articles in edited books ignores their valuable

contributions to WCF research, and introduces concerns of publication bias, a comprehensive analysis of the literature was out of scope for this review. Studies investigating the use of CMC to provide error correction in collaborative writing and interactional studies were excluded, primarily because they tend to focus on peer feedback or on conversations between teacher and student in a face-to-face environment. Studies, such as Shang (2017), which examined students conducting self-error editing using a synchronous interface providing corrections in the L1 were not included due to the similarity with computer-mediated language correction tools and automated writing evaluation software. I also chose to exclude studies on computer-assisted language learning courses, CMC oral feedback, and class-based online language exchanges and telecollaborations. Other studies were excluded because the primary research focus was on student/teacher perceptions of and attitudes toward CMC.

A total of twelve studies were included in this narrative review. These studies vary regarding the role of the individual providing the feedback (Source of Feedback), the scope and type of feedback (Type of Feedback), and whether the CMC tool used was synchronous or asynchronous (CMC Tool) Although there is clearly cross-over between categories, to simplify organization, I have chosen to discuss studies only in the category that seemed to yield insight into the topic of that discussion. Table 1 classifies these twelve studies according to category.

Table 1

Organization of studies by category of discussion

Source of Feedback	Type of Feedback	SCMC and ACMC
Sauro (2009)	Hosseni (2012)	Yoke et al. (2013)
Severino & Deifell (2011)	Saadi & Saadat (2015)	Tafazoli et al. (2013)
Severino & Prim (2015)	Ene & Upton (2014)	Shintani & Aubrey (2016)
Severino & Prim (2016)		Shintani (2016)
		Ene & Upton (2018)

Analysis of Studies

Source of Feedback

The current body of research on WCF using CMC tools in a tutoring environment is limited. Within the date range limiting this review, only four studies on electronically-provided tutor feedback were found in the literature; one empirical study, two case studies, and one data analysis study. Discussion of these four studies follows.

Sauro (2009) investigated the immediate and sustained effects of two different types of direct feedback: metalinguistic feedback and recasts. The focus was limited to the English zero article with abstract noncount nouns. 23 first year undergraduate Swedish students took part in the study, completing two writing tasks while receiving SCMC feedback from English L1 graduate student tutors using the Virtual Classroom chat system on the learning management system, Blackboard. The metalinguistic condition was provided direct feedback and incorporated meta-language into the description of what was to be corrected. The recast condition was provided with a correctly formulated version of the erroneous statement, without explicit error identification. The control condition was given content statements only. Participants in the metalinguistic condition demonstrated a mean gain in accuracy scores in the immediate post-test, although scores dipped slightly on the delayed post-test. Participants in the recast condition showed an increase in scores from the immediate post-test to the delayed post-test. There was a lack of improvement for the control group. Both recasts and metalinguistic feedback delivered through SCMC were found to be helpful in noticing and recalling previously known items, although neither type was significantly more effective than the other, either immediately or over time.

In a case study of an advanced 21-year-old L2 writer's texts from a Rhetoric course (Severino & Deifell, 2011), the researchers compared two feedback modes – ACMC tutoring using email and face-to-face tutoring – to determine which was more likely to result in uptake of corrections on lexical errors. To achieve a more comprehensive picture of the L2 writer, the research methodology used both qualitative methods (questionnaire and interviews), and quantitative methods (error and uptake counts). The tutor providing feedback gave direct correction by supplying the correct word or form after first prompting to elicit self-correction. Findings revealed that, although there was a large percentage of uptake, there was a non-significant difference between ACMC and face-to-face WCF, leading the researchers to conclude that neither mode is superior to the other, but are instead complementary.

Severino & Prim (2016) accessed data obtained from previously provided ACMC feedback using MSWord. They examined word choice errors and the type of error correction made by WC tutors in 40 drafts from Chinese students enrolled in degree programs in the university. A final sample of 200 word-choice errors was produced. The researchers classified tutor responses as either direct (Correction, Question, Options), metalinguistic (Explanation), or indirect (Error Indication). They discovered that the type of correction provided was overwhelmingly direct, with only five percent of correction being indirect indications of error. The researchers concluded that the relatively low percentage of metalinguistic correction may have been due to WC tutors' lack of knowledge about English lexical items, which in turn, may have encouraged them to provide direct correction. Because this study was a data analysis, no conclusions were reached regarding effectiveness of correction or uptake.

In a follow-up study to Severino and Prim (2015), Severino and Prim (2016) conducted a data analysis of a Chinese L2 writer who was a frequent user of the asynchronous online tutoring

services in the WC. Seeking to understand the extent to which a tutor's feedback influences short- and long-term L2 writing development, draft-to-revision analyses were performed on texts provided to the WC over the course of two years. ACMC tutor-provided marginal and in-text comments were analyzed to determine error type: direct correction, which also included questions, suggestions, or options; indirect correction, involving an indication that an error existed; and metalinguistic, in which an explanation was provided. An unfocused approach was taken, with comments coded as Rhetoric, Syntax, Expression, Lexis, Grammar, or Mechanics. The researchers found that 88 percent of marginal comments reflected linguistic errors. Although successful revision of errors does not prove that learning has occurred, the participant's overwhelmingly successful uptake of 76 percent of tutor feedback is indicative of at least some short-term learning. Issues at the discourse level of Grammar were most responsive to direct correction, whereas direct error correction was less likely to have an influence on problems of Syntax or Rhetoric.

Type of Corrective Feedback

As evident from the previous four studies, Kang & Han's (2015) meta-analysis noted that far more studies of error correction investigate direct, as compared to indirect, feedback. Advocates of direct correction argue that this type of corrective feedback leads to a minimization of risk for L2 learners unable to accurately correct their own errors (Bitchener & Knoch, 2009, Chandler, 2003). They suggest that direct error correction is particularly applicable for lower-proficiency level students who do not yet have sufficient linguistic knowledge to self-correct (Bitchener & Ferris, 2012). The following five studies describe some aspect of direct corrective feedback.

Two studies opted to compare unfocused, direct corrective feedback on grammatical errors with ACMC, using Microsoft Word, against feedback provided using a conventional red pen and paper approach. Yoke et al. (2013) assessed a writing assignment with drafts from 44 Malay students in academic English writing classes. Tafazoli et al. (2014) performed a similar investigation with 86 Iranian university students. Both studies included a control group, which received handwritten feedback on their drafts. Analysis involved tabulating the number of errors in participants' final versions or post-tests. The results revealed a statistical improvement in grammatical error frequency from first draft to final version or post-test for participants' receiving emailed direct feedback, leading the researchers to conclude that ACMC corrective feedback resulted in uptake, and that computer-mediated feedback, overall, is beneficial for improving grammatical accuracy, a conclusion that supports the findings of an earlier project by Bitchener, East, and Carter (2010). Their unpublished research report looked at focused, direct and metalinguistic ACMC error correction in students' blog entries, and considered uptake retention levels over a five-week period following an immediate post-test. Findings revealed that the provision of metalinguistic feedback in the form of coded feedback on rule-governed, partially acquired linguistic forms, such as singular/plural nouns and subject-verb agreement, yielded a small benefit for participants and that the improvements were maintained over time.

Another study investigated the relative effectiveness of different combinations of direct feedback. Saadi & Saadat (2015) compared direct and metalinguistic feedback, although this time, the emphasis was on using ACMC tools and the provision of unfocused, comprehensive feedback on micro-level (grammar, spelling, and punctuation), and macro-level (content and organization) aspects of writing. The researchers in this mixed-methods study randomly placed 29 Iranian EFL university students into either a direct correction group in which feedback was

provided through a free punctuation and spell checker software program called *Ginger*, or a metalinguistic correction group in which feedback was provided through a Windows program called *Markin4*, which allowed researchers to insert corrective comments. Findings indicated that both groups made overall improvements in accuracy, with the metalinguistic group achieving higher vocabulary gain scores. However, while the metalinguistic group attained higher scores, there was no statistically significant difference between the two types of correction. Only the metalinguistic group achieved higher vocabulary gain scores. The researchers concluded that both direct and metalinguistic feedback were equally effective in developing overall writing accuracy. They did note, though, that the results of their study contrasted findings from other studies indicating either direct or metalinguistic error correction to be more effective. Their findings support Chandler's (2003) study, in which he argued that direct error correction helped L2 learners notice a "mismatch between their interlanguage and the target language [which] might well facilitate second language acquisition" (p. 293).

Theoretical arguments have also been advanced by proponents in favour of indirect feedback. Advocates of indirect error correction suggest this type of feedback allows L2 learners to engage in deeper language processing because they must draw upon their own linguistic knowledge to make the correction. The implication is that indirect correction is more likely to lead to long-term language acquisition (Bitchener & Knoch, 2009). Two studies incorporating indirect as well as direct feedback in their investigations are highlighted in the next section.

Hosseini (2012) looked at the effectiveness of ACMC focused, explicit (direct) and implicit (indirect) feedback on the accuracy of preposition use. 45 adult beginner-proficiency Iranian university students were randomly placed into two experimental groups, one for each feedback condition, or into one control group. Participants submitted written paragraphs, using

MSWord and email, and they received the feedback type for their group before resubmitting their modified text. A post-test was conducted to assess uptake. A statistically significant improvement in the correct use of prepositions was reported for the direct feedback group as compared to the other two groups, which the researchers attributed to the effectiveness of the correction in helping participants notice the differences between their output and the target structure, a finding supported by other studies examining the effect of feedback types (Bitchener, Young, & Cameron, 2005). The researchers also noted that indirect corrective feedback did not outperform either the direct group or the control group; this result contradicts previous research that has found support for the value of indirect correction (Ferris & Roberts, 2001).

With the aim of looking at the type of feedback L2 writers receive in a naturalistic classroom environment, Ene and Upton (2014) conducted an observational cohort study with L2 university students from either a basic developmental writing course (W1) or a first-year composition course (W2). Three teachers with MA degrees in TESOL provided ACMC feedback on three separate essays, each with a sequence of three drafts prior to a final version, using Microsoft Word comments and Track Changes. The teachers were asked not to modify the way they normally provided feedback; feedback was unfocused and directed at a wide variety of target structures, ranging from process and content to grammar and mechanics. Analysis of uptake showed a 69.9 percent adoption of teacher feedback with the W1 group, with a statistically significant lower rate of 49.3 percent for the more advanced W2 participants. Participants in W1 did receive more feedback, however, the difference in amount between W1 and W2 was not significant. The researchers suggest this variation in successful uptake was due to the increasing complexity of L2 writing expected at more advanced levels of writing. Feedback at this level is typically targeted at structures that are more difficult to improve, such as

idea formation and content, and so, students find this type of feedback more challenging to implement. Analysis of feedback revealed that, while indirect feedback was provided, there was a considerable preference by the teachers for direct feedback, including metalinguistic explanations of rules and suggestions for correct usage aimed at content and organizational concerns, with less focus on grammatical errors. The highest rate of successful uptake, at 75 percent, however, was in response to direct feedback on grammar.

Synchronous and Asynchronous CMC

While the nine other studies in this review used either SCMC or ACMC, the following three studies chose to compare the different CMC tools in the provision of CMC feedback in order to shed light on whether SCMC or ACMC was more effective. These researchers measured the effectiveness of feedback as indicated by uptake scores, and the impact of timing of feedback on accuracy.

In Ene & Upton's (2018) study, 64 participants were selected from L2 students enrolled in either a basic/developmental level course, or a university-required first year composition course. Participants in both courses completed three essays each. For the ACMC condition, participants submitted drafts of their essays through the university's learning course management system. Three teachers with advanced TESOL degrees downloaded the drafts in Microsoft Word, used Track Changes to provide primarily direct corrective feedback, and then returned the corrections to the participants for inclusion in the final essay version. In the SCMC condition, participants were assigned a specific time to log onto the learning course management system, where student and teacher conferenced for 15-20 minutes using text-chat. The researchers analyzed and classified the feedback based on type and scope, and compared the results to data indicating uptake of feedback, which was determined through analysis of subsequent revisions.

While both SCMC and ACMC feedback were found to be effective, uptake was significantly higher for WCF through ACMC than through SCMC. The researchers noted that the combined use of ACMC and SCMC allowed for a focus on higher-order concerns as well as on grammatical and lexical issues.

Shintani and Aubrey (2016) were interested in determining the effectiveness of timing of CMC feedback on the accurate use of the hypothetical conditional. 76 Japanese university students were randomly assigned to three groups: asynchronous WCF, synchronous WCF, and a comparison group. Using Google Docs, a free web-based collaborative application, participants completed a pre-test, two written tasks including differential treatment, an immediate post-test, and a delayed post-test. Participants in the ACMC group completed their writing uninterrupted by the researcher, before being given direct correction on the target structure only. In the SCMC group, direct error correction was provided while participants were composing their texts. Students in the comparison group completed the task without receiving any feedback. The findings from this study revealed that the ACMC group yielded an initially significant advantage over the comparison group, although that advantage decreased in the delayed post-test. The SCMC group showed a similar pattern of improvement from pre-test to immediate post-test, with a subsequent decline in the delayed post-test. The researchers attributed these finding to an indication that the treatment produced explicit knowledge of the grammatical structure, and acknowledged that this type of knowledge is known to decay over time. The SCMC group, however, was able to maintain a statistical advantage over the comparison group in the delayed post-test. The implication is that synchronous WCF has a more durable effect on accuracy than asynchronous WCF due to the fact that participants had opportunities to immediately improve

their texts while in the process of composing, and to then use those improvements as correct referents for subsequent hypothetical conditional sentences.

Shintani (2016) conducted a follow-up to the Shintani and Aubrey (2016) study, using a qualitative case-study approach to examine L2 writers' responses to ACMC and SCMC feedback. As with the previous study, the focus was on one grammatical structure, the hypothetical conditional. The researcher used a video-recording to capture the process undertaken by two Japanese university students completing a writing task using Google Docs, and with feedback provided either immediately (SCMC) or after the writing was completed (ACMC). A stimulus recall interview was held after the task with both case study participants. 15 additional participants from an intensive English course were also included in the study. They were randomly assigned to a synchronous, asynchronous, or comparison group where they completed the same task as the case study participants. The results from this study supported the findings from Shintani and Aubrey (2016). Participants' knowledge of the grammatical structure consolidated in the SCMC feedback condition, and became increasingly accurate in new productions, whereas consolidation in the ACMC condition was limited and did not lead to the participant's ability to self-correct.

These three studies provide conflicting results regarding the question of which type of CMC feedback allows for greater uptake of correction, although it may be possible to account for this discrepancy by attending to the scope of the feedback. Ene and Upton (2018) used an unfocused comprehensive approach, and thus, corrected more linguistic features as well as content and organization errors. These researchers also provided significantly more feedback through the electronically exchanged drafts (ACMC) than through the online chat (SCMC). Thus, it would be reasonable to conclude that ACMC provides more opportunities for successful

uptake. A limitation of their study, however, is that the SCMC was not truly synchronous; participants had completed their writing and engaged in the chat only as a revision activity, invalidating the distinction between SCMC and ACMC feedback. As a result, participants in the Ene and Upton (2018) study did not accrue the same benefits of consolidation and of scaffolding of writing development towards self-correction as did the L2 writers receiving SCMC in Shintani and Aubrey (2016) and Shintani (2016). On the other hand, these latter researchers narrowly focused their studies on a single linguistic category, and so the amount of feedback was relatively limited. Also, this narrow focus raises the question of the ability to extend the findings to other linguistic structures. The results of these three studies, however, do yield a consensus that both computer-mediated feedback conditions lead to successful uptake of corrections, and both conditions provide opportunities for noticing linguistic forms that L2 writers can use to begin to self-correct.

Table 2, in the Tables section at the end of this review, summarizes the research aim, the source of feedback, the CMC tool, the type of feedback, the focus of the feedback and any associated target structures, and main findings for all 12 studies.

Discussion

Two themes with implications for WCs arise from the review of these studies: (1) effectiveness of CMC provided corrective feedback, and (2) learner uptake as a result of noticing.

As Severino & Deifell (2011) note, “providing feedback, either face to face or online, is one of the primary functions of a writing center tutor” (p. 29). With the exception of one study (Severino & Prim, 2015), which only analyzed the type of feedback provided and did not address the question of uptake, the remaining studies in this review all found at least short-term

improvements in grammatical accuracy as a result of CMC feedback. This finding held true regardless of whether the feedback targeted a single linguistic structure or multiple linguistic categories. While this improvement is not a guarantee of language acquisition, L2 writing development is more likely to occur following short-term gains (Ferris & Roberts, 2001).

Corrective feedback in these review studies was overwhelmingly direct, with all studies reporting this type of feedback, and with direct correction being the most frequently proffered type. Direct feedback coupled with metalinguistic comments was found to produce the most significant gains. There is debate amongst SLA researchers and L2 writing researchers regarding the superiority of direct as compared to indirect feedback (Ferris, 2010), with several studies suggesting that direct feedback results in more successful uptake (see Bitchener & Ferris, 2012). However, the studies in this review were not able to provide much evidence to contribute to that debate because of a lack of investigation into indirect feedback.

In terms of determining which mode of CMC feedback produced the greatest gains in uptake, only three studies compared the use of one mode over the other, and both modes were found to be effective. With the exception of Sauro (2009) who only studied SCMC, the most frequently investigated CMC tool was asynchronous, which mirrors the common use of online tutoring in WCs. SCMC was found to offer opportunities for teacher/tutor and L2 writer to collaboratively engage with the writer's text in a way that promotes visual saliency of erroneous forms (Sauro, 2009). By allowing L2 writers to notice the gap between their form and correct output from which they then made revisions, correct referents are made available to the L2 writer for productions of the same structure in subsequent sentences, leading to a consolidation of learning (Shintani, 2016; Shintani & Aubrey, 2016). Asynchronous WCF was found to not only yield a significantly higher quantity of feedback than that offered through synchronous chat (Ene

& Upton, 2018), but it offered a less intimidating environment for L2 writers (Saadi & Saadat, 2015), with reduced time pressures and an enduring record of the feedback that allowed L2 writers more opportunities for reviewing the feedback before producing revisions.

Amongst WC tutors, however, there is a prevalent mistrust of tutoring conducted through asynchronous means, a mistrust that "is rooted in the pedagogy of student-centred, non-directive tutoring" (Angelov & Ganobscsik-Williams, 2015, p. 49). The negative discourse that surrounds asynchronous tutoring rests on the belief that there exists a lack of dialogic interaction with students in asynchronous modes, which ultimately results in too much focus on lower-level concerns and editing practices. Myers (2003) notes that L2 writers' requests for help with grammar are often misconstrued as requests for proofreading by tutors who don't recognize the instructional benefits in providing direct and metalinguistic corrective feedback. WC tutors' attempts at being indirect and minimalistic in their feedback in the hopes of leading students to uncover the answers for themselves often ultimately results in their feedback being totally incomprehensible to the L2 writer (Thonus, 2014; Blau et al., 2002). This traditional, Socratic questioning approach to tutoring ignores the reality of the L2 writer's inability to perform at the same level as L1 writers and the need for L2 writers to receive more explicit scaffolding of their writing (Thonus, 2014) by addressing lower-order concerns along with feedback on higher-order concerns (Silva, 1993). Indeed, Thonus (2014) argues that denying L2 writers direct, explicit feedback on grammatical and lexical items could even be construed as unethical.

The findings from the studies in this review should provide WC tutors with confidence to realize that providing CMC feedback is not just proofreading; direct corrective feedback serves a valuable purpose as it enables the tutor to draw students' attention to the error, helping them to notice it and make changes to subsequent output. The findings of successful uptake in these

review studies are evidence in support of Schmidt's (1990) Noticing Hypothesis, which claims that second language acquisition occurs through a process of becoming consciously aware of, intentionally noticing, and paying close attention to relevant linguistic data. As Spada (2011) notes in her examination of the benefits of form-focused instruction, the best way to help L2 learners' language acquisition is to assist them in first noticing the error, and second, to encourage them to repair the error.

A limitation of many of the studies in this narrative review is that they tended to examine the extent of uptake only as quantified by revisions; researchers did not investigate the use of the target structure in new pieces of writing, a criticism that has been made against previous WCF research (Bitchner & Ferris, 2012). Results would have been more robust had there been an opportunity to study the lasting effect of WCF as provided through ACMC or SCMC using a free-writing activity rather than just a controlled one. Furthermore, the relatively limited amount of WCF provided in some cases makes it difficult to make judgements about long-term consolidation of the corrected form. These two limitations present particular challenges for WCs because the tutor-L2 writer interaction often only involves one instance of writing; the tutor rarely sees revised work, and so, is unable to make determinations about the success of uptake. Tutor confidence in the effectiveness of online WCF resulting in uptake will only develop from robust experimental research that is able to identify affordances for the WC. Finally, within the WC context, more longitudinal case studies, such as that by Severino and Prim (2016) are necessary to determine the sustained effects of CMC feedback on L2 writing, and to examine the conflicts in perspectives between tutors and L2 writers regarding the provision of CMC feedback.

With technology changing at a rapid pace, new visual tools and cloud data storage are offering support for the affordances provided by CMC feedback. Séror (2012) speaks of his struggles as a writing instructor to realize the potential of providing clear and precise feedback to L2 writers in an efficient and effective manner until he began using the CMC tool, screencasting, to provide feedback. In the area of writing, screencasting involves creating a video that captures a writing instructor's comments and actions in the moment of responding to a student's written text. Future research could investigate the effects of using screencasting to provide both oral and written CMC feedback along with text enhancements on the production of a revised texts and on the production of subsequent texts.

Conclusion

In closing, it would seem that even in the face of limited investigation into the use of CMC tools in the provision of corrective WCF, there are affordances to be realized for WCs. Researchers, as evidenced through the studies in this review, are continuing to ask questions regarding how best to support L2 writers and their language acquisition, and WCs are implored to consider the results of those studies in order to implement best practices in support of an increasingly diverse writing clientele.

Endnotes

1. There is much discussion over the binary terminology of native vs. non-native English users (Corcoran, Gagné, & McIntosh, 2017), particularly in light of considering who constitutes a native user. For the sake of brevity, I refer to those for whom English is not their first language as L2 students/learners/writers, although these individuals may have a plurality of languages of which English may perhaps be a third or fourth language. This conceptualization of the English L2 student is somewhat problematic because it does not differentiate between international or immigrant learners from non-English speaking countries, Generation 1.5 learners, and speakers of a World English variety; the assumption is that L2 students are a uniform group, which is not the case (Williams, 2002; Williams & Severino, 2004; Thonus, 2014).

References

AbuSeileek, A., & Abualsha'r, A. (2014). Using peer computer-mediated corrective feedback to support EFL learners' writing. *Language Learning & Technology, 18*(1), 76-95. doi:10125/44355

Angelov, D. & Ganobcsik-Williams, L. (2015). Singular asynchronous writing tutorials: A pedagogy of text-bound dialogue. In G. Rijlaarsdam (Series Ed.) & M. Deane, & T. Guasch (Vol. Eds.), *Studies in Writing: Vol. 29, Learning and Teaching Writing Online*, (pp. 46-64). [Electronic resource]. Leiden: Brill. doi: 10.1163/9789004290846_005

Bodomo, A. B. (2010). Definitions and Basic Conceptual Notions. In A. Bodomo (Ed.), *Computer-Mediated Communication for Linguistics and Literacy: Technology and Natural Language Education* (pp. 1-8). [Electronic resource]. Hershey, PA: IGI Global. doi:10.4018/978-1-60566-868-0.ch001

Bell, D., & Elledge, S. (2008). Dominance and peer tutoring sessions with English language learners. *Learning Assistance Review, 13*(1), 17-30. Retrieved from https://eric.ed.gov/?id=EJ818224

Bitchener, J., East., M. & Cartner, H. (2010). *The effectiveness of providing second language (L2) writers with on-line written corrective feedback.* Wellington, NZ: Ako Aotearoa. Retrieved from https://ako.ac.nz/knowledge-centre/the-effectiveness-of-providing-second-language-l2-writers-with-on-line-written-corrective-feedback/

Bitchener, J., & Ferris, D.R. (2012). *Written corrective feedback in second language acquisition and writing.* New York: Routledge.

Bitchener, J., & Knock, U. (2009). The contribution of written corrective feedback to language development: A ten-month investigation. *Applied Linguistics, 31*(2), 193-214. doi:10.1093/applin/amp016

Bitchener, J., Young, S., & Cameron, D. (2005). The effect of different types of corrective feedback on ESL student writing. *Journal of Second Language Writing, 14*(3), 191-205. doi: 10.1016/j.jslw.2005.08.001

Blau, S., Hall, J., & Sparks, S. (2002). Guilt-free tutoring: Rethinking how we tutor non-native-English-speaking students. *The Writing Centre Journal, 23*(1), 23-44. Retrieved from https://www-jstor-org.myaccess.library.utoronto.ca/stable/43442160

Canadian Bureau for International Education. (2018). *Facts and figures: Canada's performance and potential in international education.* Retrieved from: https://cbie.ca/media/facts-and-figures/

Chandler, J. (2003). The efficacy of various kinds of error feedback for improvement in the accuracy and fluency of L2 student writing. *Journal of Second Language Writing, 12*(3), 267-296. doi:10.1016/S1060-3743(03)00038-9

Corcoran, J., Gagné, A., & McIntosh, M. (2017). A conversation about "editing" plurilingual scholars' thesis writing. *Canadian Journal for Studies in Discourse and Writing/Rédactologie*, 27,114-138. doi:10.31468/cjsdwr.589

Ellis, R. (2005). Principles of instructed language learning. *System, 33*(2), 209-224. doi:10.1016/j.system.2004.12.006

Ellis, R. (2009). A typology of written corrective feedback types. *ELT Journal, 63*(2), 97-107. Doi:10.1093/elt/ccn023

Ellis, R., Basturkmen, H., & Loewen, S. (2001). Learner uptake in communicative ESL lessons. *Language Learning, 51*, 281-326. doi:10.1111/1467-9922.00156

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

Elola, I., & Oskoz, A. (2010). Collaborative writing: fostering foreign language and writing conventions development. *Language Learning & Technology, 14*(3), 51-71. doi:10125/44226

*Ene, E., & Upton, T.A. (2014). Learner uptake of teacher electronic feedback in ESL composition. *System, 46,* 80-95. doi:10.1016/j.system.2014.07.011

*Ene, E., & Upton, T. (2018). Synchronous and asynchronous teacher electronic feedback and learner uptake in ESL composition, *Journal of Second Language Writing, 41*, 1-13. doi:10.1016/j.jslw.2018.05.005

Ferris, D. (2010). Second language writing research and written corrective feedback in SLA: Intersections and practical applications. *Studies in Second Language Acquisition, 32*, 181-201. doi:10.1017/S0272263109990490

Ferris, D. R., & Roberts, B. (2001). Error feedback in L2 writing classes: How explicit does it need to be? *Journal of Second Language Writing*, *10*(3), 161–184. doi: 10.1016/S1060-3743(01)00039-X

Frear, D., & Chiu, Y. (2015). The effect of focused and unfocused indirect written corrective feedback on EFL learners' accuracy in new pieces of writing. *System, 53*, 24-34. doi:10.1016/j.system.2015.06.006

Harris, M., & Silva, T. (1993). Tutoring ESL students: Issues and options. *College Composition and Communication, 44*(4), 525-537. doi:10.2307/358388

*Hosseini, S. (2012). Asynchronous computer-mediated corrective feedback and the correct use of prepositions: Is it really effective? *Turkish Online Journal of Distance Education-TOJDE, 13*(4), 95-111. Retrieved from https://eric.ed.gov/?id=EJ1000416

Kang, E., & Han, Z. (2015). The efficacy of written corrective feedback in improving L2 written accuracy: A meta-analysis. The Modern Language Journal, 99(1), 1-18. Retrieved from https://www.jstor.org/stable/43651875

Lin, H. (2014). Establishing an empirical link between computer-mediated communication (CMC) and SLA: A meta-analysis of the research. *Language Learning & Technology, 18*(3), 120-147. doi:10125/44387

Lin, H. (2015). A meta-synthesis of empirical research on the effectiveness of computer-mediated communication (CMC) in SLA. *Language Learning & Technology, 19*(2), 85-117. doi:10125/44419

Lin, W., Huang, H., & Liou, H. (2013). The effects of text-based SCMC on SLA: A meta-analysis. *Language Learning & Technology, 17*(2), 123-142. doi:10125/44327

*Liu, X., & Zhou, C. (2018). The effect of online feedback types on foreign language writing. *Theory and Practice in Language Studies, 8***(**7), 733-741. doi:10.17507/tpls.0807.03

Lyster, R., & Ranta, L. (1997). Corrective feedback and learner uptake: Negotiation of form in communicative classrooms. *Studies in Second Language Acquisition, 19*(1), 37-66. Retrieved from http://resolver.scholarsportal.info/resolve/02722631/v19i0001/37_cfalu

Moussu, L. (2013). Let's talk: ESL students' needs and writing centre philosophy. *TESL Canada Journal*, 30(2), 55-68. Retrieved from https://eric.ed.gov/?id=EJ1018830

Myers, S. (2003). Reassessing the "proofreading trap": ESL tutoring and writing instruction. *The Writing Centre Journal, 24*(1), 51-70. Retrieved from https://www-jstor-org.myaccess.library.utoronto.ca/stable/43442189

Russel, J., & Spada, N. (2006). The effectiveness of corrective feedback for the acquisition of L2 grammar: A meta-analysis of the research. In J.M. Norris & L. Ortega (Eds.), *Synthesizing research on language learning and teaching* (pp. 133-164). Amsterdam: Benjamins.

*Saadi, Z., & Saadat, M. (2015). EFL learners' writing accuracy: Effects of direct and metalinguistic electronic feedback. Theory and Practice in Language Studies, 5(10), 2053-2063. doi:10.17507/tpls.0510.11

Saito, H. (1994). Teachers' practices and students' preferences for feedback on second language writing: A case study of adult ESL learners. *TESL Canada Journal, 11*(2), 46-70. Retrieved from https://eric.ed.gov/?id=EJ493131

* Sauro, S. (2009). Computer-mediated corrective feedback and the development of L2 grammar. *Language Learning & Technology, 13*(1), 96-120. doi:10125/44170

Sauro, S. (2011). SCMC for SLA: A research synthesis. *CALICO Journal, 28*(2), 369-391. Retrieved from https://www-jstor-org.myaccess.library.utoronto.ca/stable/calicojournal.28.2.369

Schmidt, R. (1990). The role of consciousness in second language learning. Applied Linguistics, 11(2), 129-158. Retrieved from https://eric.ed.gov/?id=EJ410427

Séror, J. (2012). Show me! Enhanced feedback through screencasting technology. *TESL Canada Journal/Revue TESL du Canada, 30*(1), 104-116. Retrieved from https://eric.ed.gov/?id=EJ1001893

*Severino, C., & Deifell, E. (2011). Empowering L2 tutoring: A case study of a second language writer's vocabulary learning. *The Writing Centre Journal, 31*(1), 25-54. Retrieved from https://www-jstor-org.myaccess.library.utoronto.ca/stable/43442356

Severino, C., Swenson, J., & Zhu, J. (2009). A comparison of online feedback requests by non-native English-speaking and native English-speaking writers. *The Writing Center Journal, 29*(1), 106-129. Retrieved from https://www-jstor-org.myaccess.library.utoronto.ca/stable/43442316

*Severino, C., & Prim, S. (2015). Word choice errors in Chinese students' English writing and how online writing center tutors respond to them. *The Writing Center Journal, 34*(2), 115-143. Retrieved from https://www-jstor-org.myaccess.library.utoronto.ca/stable/43442807

*Severino, C., & Prim, S. (2016). Second Language Writing Development and the Role of Tutors: A Case Study of an Online Writing Center "Frequent Flyer". *The Writing Center Journal,35*(3), 143-185. Retrieved from http://www.jstor.org.myaccess.library.utoronto.ca/stable/43965693

Shang, H. (2017). An exploration of asynchronous and synchronous feedback modes in EFL writing. *Journal of Computing in Higher Education, 29*(3), 496-513. doi:10.1007/s12528-017-9154-0

Sheen, Y., Wright, D., & Moldawa, A. (2009). Differential effects of focused and unfocused written correction on the accurate use of grammatical forms by adult ESL learners. *System, 34*(4), 556-569. doi:10.1016/j.system.2009.09.002

*Shintani, N. (2016). The effects of computer-mediated synchronous and asynchronous direct corrective feedback on writing: A case study. *Computer Assisted Language Learning, 29*(3), 517-538. doi:10.1080/09588221.2014.993400

*Shintani, N., & Aubrey, S. (2016). The effectiveness of synchronous and asynchronous written corrective feedback on grammatical accuracy in a computer-mediated environment. *The Modern Language Journal, 100*(1), 296-319. doi:10.1111/modl.12317

Silva, T. (1993). Toward an understanding of the distinct nature of L2 writing: The ESL research and its implications. *TESOL Quarterly, 27*(4), 675-677. doi:10.2307/3587400
Spada, N. (2011). Beyond form-focused instruction: Reflections on past, present and future research. *Language Teaching, 44*(2), 225-236. doi:10.1017/S0261444810000224

Storch, N. (2010). Critical feedback on written corrective feedback research. *International Journal of English Studies, 10*(2), 29-46. doi:10.6018/ijes.10.2.119181

*Tafazoli, D., Nosratzadeh, H., & Hosseini, N. (2013). Computer-mediated corrective feedback in ESP courses: Reducing grammatical errors via email. *Procedia – Social and Behavioral Sciences, 136*, 355-359. doi:10.1016/j.sbspro.2014.05.341

Thonus, T. (1993). Tutors as teachers: Assisting ESL/EFL students in the writing center. *The Writing Center Journal, 13*(2), 13-26. Retrieved from http://www.jstor.org.myaccess.library.utoronto.ca/stable/43441927

Thonus, T. (2014). Tutoring multilingual students: Shattering the myths. *Journal of College Reading and Learning,44*(2), 200-213. Retrieved from http://myaccess.library.utoronto.ca/login?url=https://search-proquest-com.myaccess.library.utoronto.ca/docview/1556323519?accountid=14771

Truscott, J. (1996). The case against grammar correction in L2 writing classes. *Language learning, 46*(2), 327-369. doi:10.1111/j.1467-1770.1996.tb01238.x

Truscott, J. (2007). The effect of error correction on learners' ability to write accurately. *Journal of Second Language Writing, 16*(4), 255-272. doi:10.1016/j.jslw.2007.06.003

Van Beuningen, C. (2010). Corrective feedback in L2 writing: Theoretical perspectives, empirical insights, and future directions. *International Journal of English Studies, 10*(2), 1-27. doi:10.6018/ijes.10.2.119171

Van Beuningen, C., de Jong, N., & Kuiken, F. (2008). The effect of direct and indirect corrective feedback on L2 learners' written accuracy. *International Journal of Applied Linguistics, 156*(1), 279-296. doi:10.2143/ITL.156.0.2034439

Williams, J. (2002). Undergraduate second language writers in the writing center. *Journal of Basic Writing, 21*(2), 73-91. Retrieved from https://www-jstor-org.myaccess.library.utoronto.ca/stable/43744176

Williams, J., & Severino, C. (2004). The writing centre and second language writers. *Journal of Second Language Writing, 13*(3), 165-172. doi:10.1016/j.jslw.2004.04.010

*Yoke, S., Rajendran, C., Sain, N., Kamaludin, P., Nawi, S., & Yusof, S. (2013). The use of online corrective feedback in academic writing by L1 Malay learners. *English Language Teaching, 6*(12), 175-180. doi:10.5539/elt.v6n12p175

Yu, S., & Lee, I. (2016). Peer feedback in second language writing (2005-2014). *Language Teaching, 49*(4), 416-493. doi:10.1017/S0261444816000161

* empirical studies included in the review

Tables

Table 2

Empirical studies examining the effectiveness of CMC in providing written corrective feedback to L2 writers

Author/s	Participants	Research Aim	Source of Feedback	CMC Tool	Feedback Type	Scope and Target Structure	Main Finding
Ene & Upton (2014)	12 undergraduate students - ESL	Types of e-feedback and effect on successful uptake	Teacher	Asynchronous -MS Word	Direct Indirect Meta-linguistic	Unfocused - organization of ideas, grammar, vocabulary, mechanics, writing process	Teacher e-feedback was overwhelmingly direct, with focus primarily on content, organization, and subsequently, on grammar. Rate of successful uptake was high, particularly with corrections on grammar.
Ene & Upton (2018)	64 students in basic developmental writing course, and 1st year university composition course -ESL	Use, effectiveness, and perceptions of e-feedback	Teacher	Asynchronous - MS Word Synchronous -Text-based chat	Direct Indirect	Unfocused - natural teacher feedback on organization of ideas, grammar, vocabulary, mechanics, writing process	Both ACMC and SCMC were effective in producing uptake, though successful uptake was significantly higher in ACMC; combined use of ACMC and SCMC facilitated a focus on higher-order concerns as well as on grammar and vocabulary
Hosseini (2012)	45 Iranian beginner language learners - EFL	Effectiveness of CMC feedback on correct use of prepositions	Teacher	Asynchronous - email	Direct Indirect	Focused - prepositions	Statistically significant improvement for students who received explicit feedback; no significant results for students receiving implicit feedback.
Saadi & Saadat (2015)	29 Iranian sophomores - EFL	Efficacy of CMC tools in providing electronic feedback; attitudes towards use of CALL	Teacher	Asynchronous - Markin4 - Ginger	Direct - Meta-linguistic	Unfocused - micro-level: grammar, spelling, punctuation - macro-level: content & organization	Metalinguistic electronic corrective feedback gained higher scores on accuracy, structure, and punctuation. Vocabulary gain scores were statistically significant.
Sauro (2009)	23 Swedish 1st year undergraduates - EFL	Immediate and sustained effects of types of corrective feedback	Tutor	Synchronous - Virtual Chat	Direct - Recasts - Meta-linguistic	Focused - English zero article	Both types of feedback generated gains in target form knowledge in familiar contexts, although neither type was significantly more effective than the other; significant immediate gains for metalinguistic feedback in familiar contexts provides evidence for the effectiveness of CMC feedback in helping L2 writers notice errors.
Severino & Deifell (2011)	1 (case study) Chinese sophomore - ESL	Effect of mode of feedback on the acquisition of vocabulary	Tutor	Asynchronous - email	Direct	Focused - vocabulary, content	High percentages of uptake in both modes, however, there was a non-significant difference between uptake in face-to-face mode as compared to online, suggesting

							neither is superior, but rather, are complementary.
Severino & Prim (2015)	40 Chinese texts submitted to the WC - ESL	Word choice errors and tutor corrective response	Tutor	Asynchronous - MS Word	Direct Indirect Meta-linguistic	Focused - vocabulary	11% of tutors' corrective feedback related to word choice errors, and the majority of those errors arose due to difficulties with the semantic features of English; direct corrections were the most common type of error correction
Severino & Prim (2016)	1 (case study) Chinese student (graduated) - ESL	Influence of online tutor feedback on short- and long-term writing development	Tutor	Asynchronous - MS Word	Direct Indirect Meta-linguistic (Other)	Unfocused - rhetoric, syntax, expression, lexis, grammar, mechanics	Greater number of successful uptakes of direct corrective feedback on grammatical, lexical, and mechanical errors indicates short-term learning.
Shintani (2016)	2 (case studies) and 15 Japanese 2nd year university students -EFL	Differences in uses and responses to written CMC feedback	Teacher	Asynchronous & Synchronous - Google Doc	Direct Indirect	Focused - hypothetical conditional	Both SCF and ACF promoted noticing of the gap, although self-correction was more successful in SCF. SCF has potential advantages over both oral CF and ACF.
Shintani & Aubrey (2016)	76 Japanese 2nd year university students - EFL	Timing of feedback on accuracy of written production	Teacher	Asynchronous & Synchronous - Google Doc	Direct	Focused - hypothetical conditional	Both asynchronous and synchronous feedback yielded initial gains in accuracy of the target structure, but effectiveness diminished over time. Only the synchronous group maintained a statistical advantage in the post-test.
Tafazoli et al (2014)	86 Iranian sophomore students - EFL	Impact of e-feedback as opposed to print feedback; attitudes towards e-feedback	Teacher	Asynchronous - email/MS Word	Direct	Unfocused - grammar	A statistically significant decrease in number of grammatical errors was reported students' writing that received e-feedback.
Yoke et al (2013)	44 Malay tertiary level university students -EFL	Comparison of online corrective feedback to conventional corrective feedback	Teacher	Asynchronous - email/MS Word	Direct	Unfocused - sentence structure, grammar, vocabulary	Significant decrease in the number of errors when online corrective feedback given, particularly with regards to grammatical improvement.