

E-MAIL AND WORD PROCESSING IN THE ESL CLASSROOM: HOW THE MEDIUM AFFECTS THE MESSAGE

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ABSTRACT

Computer-based media place new demands on language which can promote variations in language use (cf. Halliday, 1990). Electronic mail has assumed functions and formal features associated with spoken language as well as formal writing (Davis & Brewer, 1997; Maynor, 1994; Murray, 1996). This has implications for language instructors: If electronic mail does engender features of both written and spoken language, it is questionable that electronic mail writing will improve academic writing abilities. The present study attempts to provide insights into this issue. Non-native students in an intermediate pre-academic ESL course responded to writing prompts using electronic mail and word processing. Their writing was examined for (1) differences in use of cohesive features (Halliday, 1967; Halliday & Hasan, 1976), (2) length of text produced in each medium, and (3) differences in text-initial contextualization. Results indicate no obvious differences between students' electronic mail and word-processed writing. However, the electronic mail texts were significantly shorter than the word-processed texts, and text-initial contextualization was more prominent in the word-processed than in the electronic mail texts. The findings raise the question of whether electronic mail benefits students in terms of academic writing development.

INTRODUCTION

Halliday (1990) notes that "when new demands are made on language ... [and when] we are making language work for us in ways it never had to do before, it will have to become a different language in order to cope" (p. 82). It is arguable that computer-based media present new demands which have the potential of promoting variations in language use as Halliday predicts. Perhaps the demands are not novel per se, but it is rather the blurring, the amalgamation, of previous demands which may result in linguistic variations. Take, for instance, computer communication systems which have placed demands, often associated

with spoken language, on the production of written language. This reassignment is most observable in synchronous computer-mediated communication such as MOOs (MUD Object Oriented), MUDs (Multi-User Domain), and Chat. While the language takes on a written form, it is constrained by temporal limitations which require immediate responses. Conversely, this type of synchronous communication, which can be considered an essentially oral language (Collot & Belmore, 1996), is also constrained by norms -- including spelling norms -- most often associated with written language.

A similar blending of demands is imposed on asynchronous media such as some forms of electronic mail (Tella & Mononen-Aaltonen, 1998). The temporal constraint is usually not as acute as it is for synchronous communication, but e-mail nonetheless engenders an involvement/immediacy which other types of non-mediated writing do not (Danet, 1999). E-mail is also often subject to conventions restricting written language usage.

In addition to the various *demands*, Halliday (1990) further points out that variation in the *functions* which language serves is a factor of variation in language use. E-mail, as an example, has assumed functions which are in some cases associated with spoken language and in other cases associated with formal writing. One can, for instance, e-mail someone instead of telephoning or writing a letter or memorandum (Baron, 1998; Danet, 1999; Davis & Brewer, 1997).

A question which then follows in light of the integration of demands and functions imposed on computer-mediated communication is whether the formal properties of the language used vary accordingly as Halliday (1990) predicts. Of further interest is whether such variations in the formal properties of computer-mediated language constitute a distinct genre or register.

Research suggests that e-mail does exhibit distinct linguistic properties (Baron, 1998). Much recent literature describes e-mail as a hybrid of oral and written features (DuBartell, 1995; Marcus, 1995; Maynor, 1994; Murray, 1996; Uhlirova, 1994; Yates & Orlikowski, 1993).¹ As Davis and Brewer (1997) point out, it is probably too early to identify e-mail, or some type of e-mail, as a distinguishable genre or register. Because e-mail is still a relatively new medium which continues to change by incorporating hypertextual features as well as audio and visual material, there is not yet enough research on which to base such a judgment.

Of importance to language instructors are implications that these issues have for teaching and learning a language. Instructors should consider the possible results of incorporating e-mail into their classrooms. An assumption that is sometimes made by composition instructors is that the incorporation of e-mail writing exercises in curricula will necessarily have beneficial effects on students' academic composition abilities. However, if e-mail does engender features of both written and spoken language, it is questionable that their e-mail writing will necessarily improve their academic writing abilities. In order to address this question, this

study investigates whether student-produced writing in e-mail and word processing is similar or different with respect to the occurrence of coherence features, text length, and contextualizing information.

REVIEW OF THE LITERATURE

Research into the nature of e-mail writing, following Baron's (1984) claim that computer-mediated communication influences not only what is expressed but also how it is expressed, has invariably pointed to the hybrid nature of e-mail, which combines features of spoken as well as written discourse (DuBartell, 1995; Marcus, 1995; Maynor, 1994; Murray, 1996; Uhlirova, 1994; Yates & Orlikowski, 1993). Murray (1988) warns that the orality-literacy distinction with respect to e-mail must be considered carefully because some e-mails may share many characteristics of spoken language, and other e-mails may share characteristics of written language -- just as some writing (e.g., a note to a family member) may be more oral in nature than other writing (e.g., a term paper). Thus, according to Murray (1988), it is "the result of the specific context of the situation" (p. 370) which determines oral or written features in any discourse.

Nevertheless, a number of studies investigating asynchronous e-mail writing and word-processed writing have found that comparable writing, when done in both media, differs (Lepeintre, 1995; Murray, 1995, 1996; Yates & Orlikowski, 1993). Tella (1992) investigated cohesive structures, lexicon, and rhetorical features (i.e., style, organization, and phatic elements) in the e-mail writing of Finnish secondary students writing in English. The results suggest that e-mail texts resemble oral communication in that ellipsis and colloquialisms were more prominent in e-mail texts than in word-processed essays. A greater occurrence of cohesive lexical items was observed in word-processed texts. In addition, Tella found that in general the students' word-processed texts were longer than their e-mail texts.

Lepeintre (1995), in a study with university students learning English as a second language, investigated the salience and deployment of textual features which Ochs (1979) associates with planned and unplanned speech.² She found that phrase structures were more common in the students' e-mail messages than in their in-class essays and suggests, similarly to Tella (1992), an investigation of cohesive lexical items and syntactic features as potential differentiators between students' e-mail and word-processed writing.

Cohesion has been the focus of numerous studies investigating the nature of written discourse (see, e.g., Biber, 1988; Chafe, 1985; Morrow, 1989). It is defined as "the use of explicit linguistic devices to signal relations between sentences and parts of texts" (Connor, 1996), these devices being linguistic "resources ... for creating texture" (Halliday & Hasan, 1976, p. 2). Such "text connectives, which help readers recognize how texts are organized, and how different parts of the text are connected to each other functionally or semantically" (Connor, 1996, p. 49), are referred to as cohesive ties (Halliday & Hasan, 1976). According to Halliday and Hasan,

The concept of a tie makes it possible to analyze a text in terms of its cohesive properties, and give a systematic account of its pattern of texture ... Various types of question [sic] can be investigated this way, for example concerning *the difference between speaking and writing*, [italics added] the relationship between cohesion and the organization of written texts into sentences and paragraphs, and *the possible differences among different genres* [italics added] and different authors in the numbers and kinds of ties they typically employ. (p. 4)

The use of cohesive ties has been found to differ not only for spoken and written discourse (cf. Beaman, 1984; Biber, 1988, 1992; Gumperz, Kaltman, & O'Connor, 1984), but also cross-culturally (Connor, 1996; Johns, 1984; Scarcella, 1984). Thus, it is reasonable to assume that the "packaging of information in sentences and in texts" (Biber, 1992, p. 215) is also likely to differ when two different writing media are involved, as in e-mail and traditional word processing. Gonzalez-Bueno (1998) observes that language produced electronically results in "discourse somewhat different from both written and oral communication" (p. 58), and Murray (1988) suggests that such differences may be the result of the context of the situation. In other words, "audience factors, topic factors, and setting factors" (p. 355) combined may be responsible for differences in cohesion and other syntactic features in e-mail and word-processed writing. Thus, an awareness of who one's audience is, what knowledge can be assumed to be shared with that audience, as well as the mode of transmission of information to that audience may influence the discourse output. Connor (1996) also reports on cross-cultural differences in rhetorical organization as well as linguistic features such as cohesive devices. However, none of the research she cites investigates the effect of the specific medium on the writing produced by non-native speaker students.

Another way in which cohesion is created in texts is through distribution of information in sentences. According to Halliday (1967), each sentence consists of two information units: the topic, which in English typically corresponds to the subject noun phrase, and the comment, which provides information about the topic and corresponds to the remainder of the sentence in what Halliday calls the "unmarked sequence" (p. 211). This distinction between topic and comment has also been referred to as the given-new distinction, with given information being that which the reader can be assumed to know and recover from preceding text, and new information being what the reader does not know and cannot recover from the text (Chafe, 1976; Vande Kopple, 1986). It has been found that if the topic, that is, given information, occurs before the comment, that is, new information, in a sentence, information from a text can be better recalled and is perceived as more cohesive (Faigley & Witte, 1983; Kieras, 1980; Thompson, 1985; Vande Kopple, 1986). Given information, recoverable from preceding text, is realized in the subject position of sentences through lexical means (Halliday & Hasan, 1976). This concept also extends to assumptions about the consciousness of addressees (Chafe, 1976). In that broader sense, writers need to distinguish between

"knowledge which the speaker assumes to be in the consciousness of the addressee at the time of [writing]" and "what the [writer] assumes he [or she] is introducing into the addressee's consciousness" (Chafe, 1976, p. 30).

Our own analysis into ESL students' e-mail and word-processed writing has shown that students' use of grammatical and lexical cohesive devices may be influenced by a complex interplay of medium, task situation and audience, and native language, as well as language proficiency and familiarity with e-mail (Biesenbach-Lucas & Weasenforth, 1997). A more focused investigation of inter- and intra-sentential linking devices (Biesenbach-Lucas & Weasenforth, 1998) found that these links did not clearly differentiate between the two media although they occurred slightly more frequently in e-mail writing. The same study also found that students provided more text-initial contextualization -- that is, topic-related background information -- for the reader in word-processed texts than in e-mail texts, thus suggesting awareness of perceived audience differences. In another study (Biesenbach-Lucas, Meloni, & Weasenforth, 2000), which extends the analysis to a larger number of students, only some cohesive devices were found to differentiate between writing done in the e-mail and word-processed medium, while text length clearly differentiated between the two media with word-processed writing being longer.

STATEMENT OF PURPOSE

With an interest in determining to what extent students' use of e-mail might be beneficial in developing their proficiency in writing academic essays, the present study was designed to contrast students' academic writing assignments, produced via e-mail and word processor. It was expected that students' texts would be different with respect to selected cohesive features as well as length and inclusion of contextual material. These textual characteristics are identified and discussed along with guiding hypotheses in the following section.

METHODS

Textual Features

Cohesive devices function as "textual metadiscourse" (Vande Kopple, 1985), which has "an enabling function, that of creating a text" (Halliday, 1973, p. 66). While not focusing on content or attitudinal aspects, cohesive devices help readers make sense out of propositional information by providing explicit links among ideas the writer presents. According to Connor (1996), cohesive devices have been the object of frequent investigations because they are "easy to quantify" (p. 82) and thus provide an objective quantitative comparison between texts (cf. Halliday & Hasan, 1976). Therefore, cohesion has been examined with respect to textual differences (cf. Biber, 1988, 1992; Biesenbach-Lucas, 1994) and cross-cultural differences among writers from different language backgrounds (cf. Connor, 1996).

In the present study, cohesive devices are examined following two frameworks: Halliday and Hasan's (1976) influential work on cohesive ties, and Halliday's (1967) theory of information distribution in texts. The following assumptions guided the investigation: (a) if e-mail is indeed a hybrid of spoken and written discourse as some research suggests (e.g., DuBartell, 1995; Maynor, 1994), one could expect cohesive devices typically associated with spoken discourse in students' e-mail writing; (b) if the medium of e-mail produces its own "new register" (Halliday, 1990, p. 44), this difference may be evident in the ways in which writers connect ideas in grammatically and lexically meaningful ways; (c) if the context of the situation and the audience as well as students' cultural background influence how writers encode information (cf. Connor, 1996; Murray, 1988), one might expect similar use of cohesive devices as both e-mail and word-processed writing situations shared some characteristics to be outlined further below; (d) if writers need to make assumptions about what information is shared with their readers and what is not, one might expect that those assumptions are reflected in the resulting texts by including less context for an audience which is familiar with the topic. This might be the case for the readers of the students' e-mail texts, but not for the potentially broader audience of readers of students' word-processed texts.

The following provides a list of cohesive features analyzed, together with a brief overview of relevant research on each feature. In addition, examples from the non-native speaker students' e-mail (EM) and word-processed (WP) texts are provided to illustrate the features.³

Inter- and Intra-Sentential Cohesion

Halliday and Hasan (1976) label this category "conjunction" (p. 226). In their framework, conjunctive ties are identified based on semantic categories (additive, adversative, causal, temporal). However, in the present study, such ties are identified based on their grammatical function in the sentence or clause, which corresponds to the terminology typically applied in ESL/EFL textbooks and to the curricular content that is taught in the classes of students participating in this study.

Sentence Connectors. These are lexical items which connect two independent sentences/clauses, such as *however*, *therefore*, and *moreover* (they are often called "conjuncts"). They explicitly mark logical relations between sentences/clauses and are associated with discourse with a highly informational focus, such as academic prose (Biber, 1988).

Moreover, it is very difficult for the government to translate English to these minorities. (WP)

Morrow (1989) suggests that cohesive ties marking relationships between ideas tend to be more explicitly marked through sentence connectors in formal academic discourse, and Ochs (1979) notes that sentence connectors are associated with planned rather than unplanned

discourse. Thus, sentence connectors could be expected to be more frequent in the students' word-processed writing than in their e-mail writing. However, our own research (Biesenbach-Lucas et al., 2000) has found sentence connectors to be more salient in ESL students' e-mail writing, contrary to expectations.

Clause Coordinators. These lexical items connect two independent clauses: *and*, *or*, *but*, *yet*, *so*, and *for*. In the present analysis, only those coordinators connecting clauses were included in our frequency counts; those simply connecting phrasal material were not counted:

America has to be multiculturalism. And America has to be multiple languages ...
(EM)

Considered "general purpose connective[s]" (Biber, 1988, p. 245), clause coordinators were expected to be the most frequently used connecting device in both e-mail and word-processed essays. Biesenbach-Lucas (1994) found clause coordinators to occur most frequently in scientific journal articles and popularized versions of those articles. In addition, clause coordinators were also expected to be more frequent in e-mail than word-processed writing since the simple chaining of ideas in coordinating fashion has been found to be more typical of spoken than of written discourse (Chafe, 1982, 1985).

Clause Subordinators. These lexical items connect an independent clause and a dependent clause, such as *when*, *because*, *while*, *even though*, and *if*. Similar to sentence connectors, they explicitly indicate informational relations in texts.

The United States has many religion because there are many different immigrants here. (EM)

Biber (1988) reports that research investigating the use of subordinate clauses has been inconclusive. Some studies suggest that certain subordinators are more frequent in written than in spoken discourse (Altenberg, 1984; Tottie, 1985) while other studies suggest the opposite (Beaman, 1984; Biber, 1986; Tottie, 1985). It was hoped that the present study would shed light on the potentially differential use of this feature.

Phrase Subordinators. These lexical items, such as *because of*, *according to*, and *in spite of*, connect phrasal material with an independent clause.

Many times, people have hard time immigrate to other country, because of immigration regulations of country. (WP)

Biesenbach-Lucas (1994) found phrase subordinators to be infrequently used in written academic discourse. Thus, among the sentence/clause connecting devices, they were expected to be used least frequently in both e-mail and word-processed texts.

Demonstrative Reference

Demonstrative Pronouns. According to Halliday and Hasan (1976), *this*, *these*, *that*, and *those* create referential cohesion in a text by referring to a previous referent in the text, either a single entity or an entire concept (Kurzon, 1985):

If America still lets more the immigrants to come, the more unemployment will be increasing. This will effect on criminal problems, homeless an probably famine in the US. (EM)

Chafe (1985) has found that directly recoverable nominal referents of demonstrative pronouns are often missing in spoken discourse, but not in written discourse, due to the faster production and the lack of editing associated with speech. However, Ochs (1979) has noticed that demonstrative pronouns often replace articles in unplanned discourse. Therefore, demonstrative pronouns might be slightly more frequent in students' e-mail writing than in their word-processed writing. Biesenbach-Lucas (1994) has found that demonstrative pronouns occur infrequently in formal academic discourse; therefore, they might occur infrequently in the students' word-processed writing, particularly when compared to other devices that also contribute to textual cohesion.

Demonstrative Noun Phrases. These are demonstrative pronouns followed by a noun phrase, such as *these new policies*. They create cohesion in similar ways to demonstrative pronouns as they also refer back to a previously mentioned entity or concept in the text:

The studying of diversity of religions in the country is important to the government, native people, and immigrants themselves. For the government, this research project helps the govenment to plan how to deal with them. (EM)

Demonstrative noun phrases have been found to be preferred to demonstrative pronouns in academic writing (Biesenbach-Lucas, 1994). In a study investigating the use of cohesive devices by ESL students writing in both e-mail and word-processed media, demonstrative noun phrases were found to occur more frequently in word- processed writing (Biesenbach-Lucas et al., 2000).

Lexical Cohesion

These categories fall under what Halliday and Hasan (1976) refer to as "reiteration" (p. 277). "All these instances have in common the fact that one lexical item refers back to another, to which it is related by having a common referent" (p. 278). In the present study, in order to investigate information distribution and resulting cohesion, all instances of lexical cohesion are examined in their occurrence in the position of topic, or given information, that is, the

subject position in the sentence (cf. Faigley & Witte, 1983; Vande Kopple, 1986; Weisberg, 1984). The subject position was defined as either the first sentence element, or the first element after an adverbial phrase or after an inter- or intra-sentential cohesive device that provided a transition.

Lexical Repetition. In the present study, lexical repetition is defined as the repetition of the exact same noun or noun phrase.

Even though [the Chinese] are a small number of people, the U.S. must not ignore them. So, the U.S. must not change basic immigration policy. (EM)

Weisberg (1984) found lexical repetition to be the most frequently used cohesive device in this category for the written academic texts he examined. Similarly, this type of cohesion has been found to be favored in written academic discourse by native speaker writers in order to avoid ambiguity (Biesenbach-Lucas, 1994). Biber (1992) in comparing spoken and written genres found fewer lexical repetitions in spoken discourse than in written discourse. It was hoped that the present study would provide additional evidence for the relative occurrence of lexical repetition in spoken and written texts.

Synonyms. Synonyms are defined as the use of an equivalent noun or noun phrase.

In many countries, it always has many people who come from different culture mixing together. The mingle took place for long times. (WP)

Weisberg (1984) found far fewer synonyms than lexical repetition in the academic writing he examined, but synonyms were the second most frequently used cohesive device in this category. Halliday (1990) suggests that more synonymous verbs are used in speech than in writing. In Biber's (1992) study the relative frequency of synonymous anaphoric items did not reliably distinguish spoken genres from written ones. Since non-native students of English may not have the lexical flexibility necessary to select appropriate synonymous nouns or noun phrases, synonyms could be expected to occur infrequently in both the students' e-mail and word-processed writing. Given the inconclusiveness of the literature and the fact that no known investigation focuses specifically on synonymous nouns or noun phrases, we took an exploratory stance, not positing a hypothesis regarding the relative frequency of synonyms.

Pronouns. In the present study, the following pronouns were considered: *he, she, it, they, one of them, some of them, and most of them*. These refer to an explicitly mentioned item in the previous sentence/clause.

Nowadays, there are many immigrants from another countries come to the U.S; they also bring their religion with them. (EM)

Biber (1988) notices that in speech these pronouns are often used imprecisely, making it difficult to recover the referent. Biber (1992) found that "spoken genres tend to have more referring expressions than written genres" (p. 226). Weisberg (1984) found them to be the third most frequently used cohesive device in this category. The present study may show whether this feature is used differently in e-mail and word-processed writing.

Ellipsis. Ellipsis is defined as the omission of any implied lexical item which would be in the subject position of the following clause. Although omitted, the implied referent is directly recoverable in the preceding clause.

We know exactly that the U.S. postal Service should or Ø should not issue a Jewish stamp... (WP)

The effect of ellipsis is that it compacts the surface structure without disrupting clarity. Biesenbach-Lucas (1994) found ellipsis to occur infrequently in formal academic texts. Tella (1992) found ellipsis to be more prominent in e-mail than in word-processed texts. Therefore, ellipsis was expected to be more frequent in students' e-mail than in their word-processed writing.

Text Length

Previous research regarding variations in text length is inconclusive. While some research (Hidi & Hildyard, 1983; Lepeintre, 1995; Wang, 1993) indicates that e-mail is generally longer than word-processed texts, Tella (1992) and Biesenbach-Lucas and Weasenforth (1997) have found that students' e-mail texts tended to be shorter. It was hoped that the present study would provide further evidence in terms of identifying trends in the length of texts. Text length was defined in this study as the number of words per text.⁴

Contextualization

Tella (1992) and Biesenbach-Lucas and Weasenforth (1997) have suggested that e-mail writing appears to be less contextualized and organized than word-processed writing. In the present study, it was assumed that the students might contextualize e-mail and word-processed writing differently based on their assumptions of the immediate readership of their essays. In other words, since e-mail is a rather private medium of communication between sender and recipients, and since the students in our study knew that their teachers were familiar with the text given as a prompt for their e-mail response, students might also be expected to take this awareness for granted and not perceive a necessity to provide background information on the topic. In contrast, students might be expected to provide more topic background in word-processed writing, given the potentially wider audience, which may not be familiar with the topic.

Therefore, each e-mail response and word-processed essay was examined for evidence of writers' attempts at providing context initially in their writing for the reader. For the purposes of this study, we restricted our investigation to basic contextualization clues although it became apparent that essay-initial contextualization is much more complex than what the present analysis suggests. In the present investigation, we defined those cases as a lack of text-initial contextualization in which the writer immediately responded to the essay prompt question by providing a personal opinion. In contrast, contextualization was achieved if the writer made some attempt at letting the reader know something about the topic or the text to which he/she referred to in the essay.

DATA COLLECTION

The present study was conducted over the course of one semester at The George Washington University. It involved two intermediate, intensive ESL classes and two teachers from each of these classes. Students were asked to write one assignment in e-mail (using *Pine* [1992]) and one assignment using a word processor (using *Word Perfect 6.1* [1995]) on each of three topics: immigration, religion, and multiculturalism. These coincided with topics covered in the students' textbooks used in their classes. For each assignment, students were first given an authentic text on that topic and were asked to write a response in class to a prompt provided by one of the teachers (see [Appendix A](#)). Students then sent their written responses to both teachers. Three days later, students received another authentic text on the same topic and were asked to write a response to a similar prompt using Word Perfect during class time (see [Appendix A](#)). Again, it was made clear that the essays would be read by both teachers. Thus, it was assured that the target audience was the same in both e-mail and word-processed situations, and divergent results would not be due to divergent audiences. For the purposes of the analysis, only the first drafts of both types of writing samples were considered.

The potential influence of a practice effect was considered; in other words, the students' e-mail writing may have affected students' word-processed writing. In order to counteract this effect, three days intervened between the writing tasks, thus minimizing the effect somewhat. Also, while the prompts were on similar topics, they were not based on the same article, thus making it more difficult to simply transfer the writing task to the second medium. As in many authentic classroom situations where data collection is an issue, the present study had to be integrated into an ongoing curriculum in order not to disrupt curricular goals. Access to computer facilities was not universally available, and cooperating instructors were not willing to give up too much of their own class time. These institutional restrictions thus prevented a reverse study, in which students would have written the word-processed text first, and then e-mail, but text prompt selection and a three-day interval between writing tasks will likely have offset any pronounced practice effect.

SUBJECTS

Fourteen students from two ESL classes participated in the study; five students were from Thailand, three from Taiwan, two from China, two from Korea, one from Indonesia, and one from Saudi Arabia. If all students had been present on all occasions for e-mail as well as word-processed writing for the three topics, a total of 42 essay pairs (14 e-mail and word-processed pairs for each topic) would have been obtained. However, due to student absences, text pairs could not be collected in all instances. A total of 25 pairs were finally obtained. In the analysis, all texts were considered; however, in cases where direct comparison of writers' e-mail and word-processed texts was required, only the pairs were examined. Information questionnaires were given to the students at the beginning of the semester to assess their familiarity with e-mail and word processing and the extent of their experience.

Due to the small sample size, it is difficult to draw generalizations. The present study represents an exploration into the differences between ESL students' e-mail and word-processed writing. In this study, the students' writing was examined by looking at writing in response to three topics to observe effects of medium across topics. Other research (Biesenbach-Lucas et al., 2000) focuses on a much larger pool of subjects but only one of the three topic areas.

ANALYSIS

The analysis involved establishing raw frequency counts and normalized counts for each of the features. First, to obtain the raw count numbers, the actual occurrences of each feature were identified -- at least two analysts per essay to guarantee reliability -- and tallied for each individual essay. The tallies were then added and averaged for each group of e-mail and word-processing texts (per topic), then for all e-mail responses and word-processed essays together. Next, the raw counts were normalized to arrive at comparable frequencies.⁵ It was decided to normalize text length to 100 words since all essays, with the exception of two, were at least 100 words long. Normalized frequencies were determined for the features of each individual essay; then averages were determined for each group of essays (per topic), then for e-mail responses and word-processed essays as a whole.

RESULTS

Cohesive Features

Following Halliday (1990), the basic assumption guiding the present study has been that the difference in the mode of production between e-mail and word processing "impose[s] different grids on [the writing] experience" and that one does not "simply [duplicate] the functions of the other" (p. 93). As a result, it was expected that different patterns of grammatical and lexical cohesion would emerge in e-mail and word-processed texts. In other words, writing was not considered "a new way of doing old things with language" (Halliday,

1990, p. 44) in an academic writing class, but rather the mode of production was expected to result in different registers, "determined by what [writers were] doing at the time" (Halliday, 1990, p. 44). Cohesive devices had been selected as the target of this investigation since cohesion is considered an important quality of academic discourse (Halliday & Hasan, 1976, 1990). This is evidenced in the curricular goals for pre-academic university ESL courses.

The analysis of the cohesive devices of this research appears to support some of our initial assumptions while not upholding others. Our first assumption considered the potentially hybrid nature of e-mail (e.g., Baron, 1998; DuBartell, 1995; Maynor, 1994) and speculated that cohesive devices typically associated with spoken discourse might be more prominent in the students' e-mail writing. However, no obvious differences between e-mail and word-processed writing can be observed when the normalized averages for each feature are considered (see [Appendix B](#)). Overall, all features occur with slightly greater frequency in the students' e-mail texts than in word-processed texts, but since the frequencies involved are so small (between 1 and 3 times per 100 words), these differences seem almost negligible. Among all cohesive devices, grammatical cohesion in the form of sentence connectors, clause coordinators, and clause subordinators, as well as lexical cohesion in the form of pronoun referents, are used most often by the students, regardless of the medium in which the texts were produced. The only notable exception is demonstrative noun phrases, which in this study are used slightly more frequently in word-processed than in e-mail writing. It is also the only feature for which the frequency trend is reversed. But again, the difference between 1.35 (the mean frequency for demonstrative noun phrases in all word-processed essays) and 0.92 (the mean frequency for demonstrative noun phrases in all e-mail responses) is too small to be statistically significant (see [Figure 1](#)).

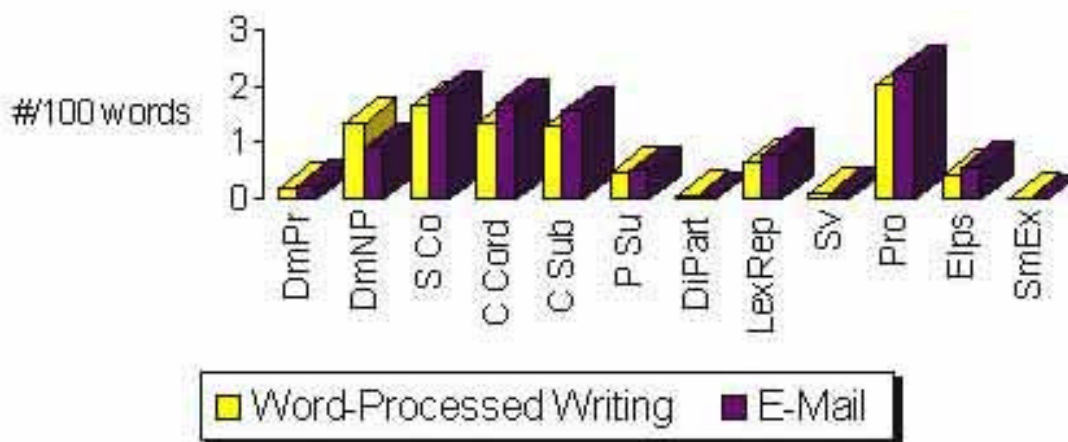


Figure 1. Normalized averages for features

These average frequencies, however, erroneously give the impression that all cohesive devices were used by all writers in their e-mail writing as well as their word-processed writing to similar extents. Yet, this is not the case. It was found that some writers exhibit individual preferences for certain features while ignoring others. This means that a writer may show a preference for demonstrative noun phrases in his/her word-processed writing but may not at all -- or only infrequently -- choose this feature in his/her e-mail writing. Other writers were found to have other preferences. These individual differences become conflated when average frequencies for a small number of writers are considered (see Figures 2 and 3). Thus, our assumption that both media, e-mail and word processing, might produce their own "new register" (Halliday, 1990, p. 44) can at this point not be strongly supported, at least not when considering grammatical and lexical cohesion.

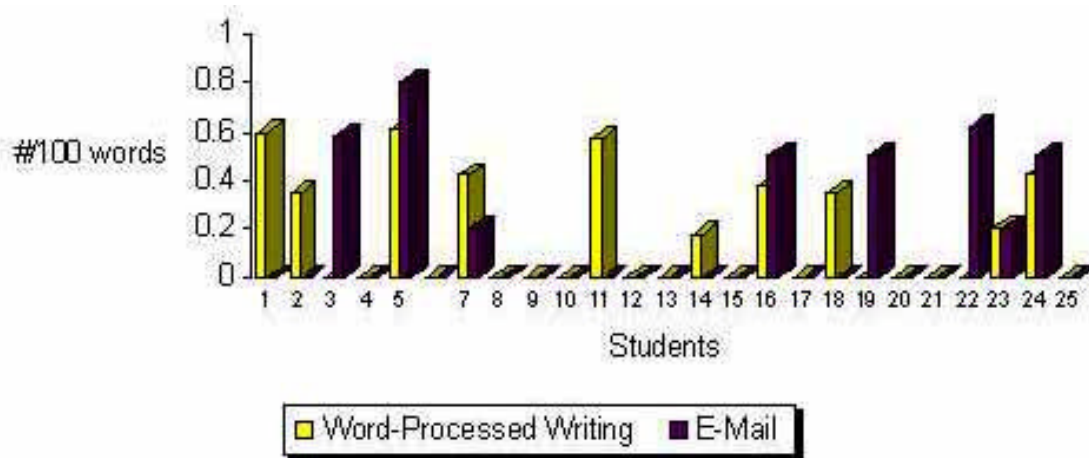


Figure 2. Normalized counts for demonstrative pronouns

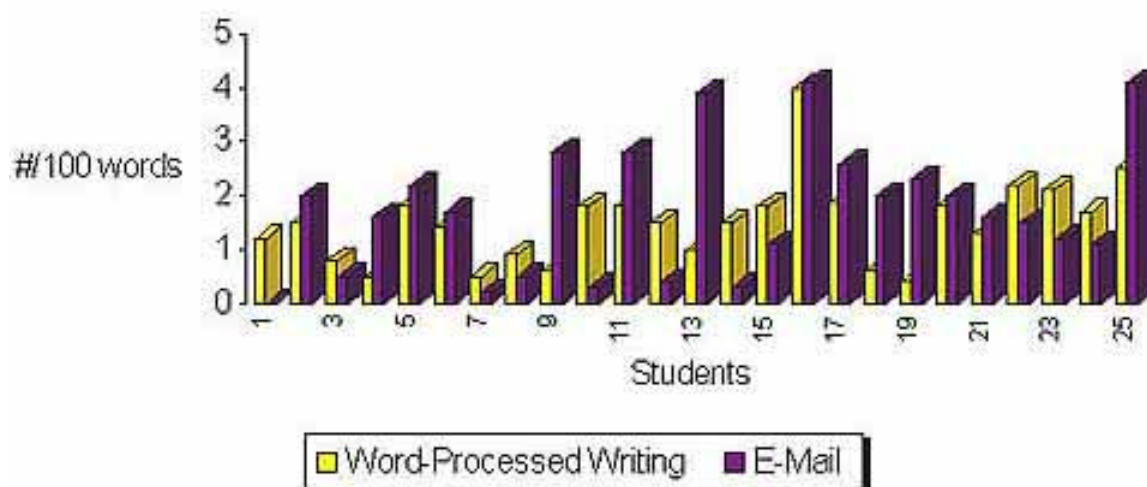


Figure 3. Normalized counts for sentence connectors

A third assumption concerned the context of the situation and audience as well as students' cultural background, which might influence how writers encode information in the two media (cf. Connor, 1996; Murray, 1988). Since both e-mail and word-processed writing took place in the context of an academic learning environment, and since the majority of participating students are Asian, one might in fact expect similarities in the use of cohesive devices across the two media. As a matter of fact, four of the cohesive devices under investigation are used by all writers in both media: sentence connectors, clause coordinators, clause subordinators, and pronouns.

These particular ways of creating cohesion in text are apparently not so much a matter of personal preference as a matter of what all non-native writers felt most comfortable using. Sentence connectors, clause coordinators, and subordinators are very explicit means for establishing intra- and inter-sentential relations (Halliday & Hasan, 1976, 1990). Similarly, pronouns need to refer back to an obvious link in the text and are thus one of the most basic ways of creating cohesion (Halliday & Hasan, 1976, 1990). The students in our study did, however, also use pronouns where a direct referent would have been more appropriate, such as in cases when the intended referent could not be recovered, or not be recovered easily, as the example below illustrates.⁶ This seems to indicate that students perceive pronouns as a prime means toward establishing texture and cohesion. An examination of whether or not students' e-mail writing contains more unsupported pronouns than their word-processed writing was not done in this study, but might warrant investigation.

I admit as much. Chinese who came in U.S. to make money on the pretext of China's "one-child" policy and unemployed Cubans, all of them do more harm than good in U.S. In addition, the Clinton administration failed to work out this problem until now. She said "Our immigration policy hurts U.S. citizens." (EM)

It is interesting that lexical repetition, found to be so prevalent in academic writing (cf. Biesenbach-Lucas, 1994; Weisberg, 1984), was infrequent in both e-mail and word-processed texts, even though some students showed a preference for making textual connections in this way. Overall, however, the general avoidance of exact lexical repetition may indicate that non-native speakers interpret the repetition of the same noun, or noun phrase, as demonstrating a lack of verbal flexibility, which they may also perceive as less desirable. Pronouns may be the easiest way to circumvent what the students perceive as a weakness as they may not have enough linguistic flexibility to select appropriate synonyms.

Overall, the present study has yielded no consistent pattern that clearly distinguishes students' e-mail writing from their word-processed writing -- at least not for the cohesive features investigated here.

Text Length

While e-mail writing does not apparently differ significantly from word-processed writing in the students' use of the 12 cohesive features targeted in our study, they do differ with respect to text length. Contrary to suggestions made by other researchers (Hidi & Hildyard, 1983; Lepeintre, 1995), word counts of all available e-mail and word-processed essay pairs reveal that, as hypothesized, the e-mail responses tend to be shorter than the corresponding word-processed essays for all three topics on which the students wrote (Figure 4). This difference is also statistically significant (in three of the four cases presented in Table 1), a finding which is consistent with that of Tella (1992), who also found the word count for e-mail texts to be lower than that for word-processed texts.

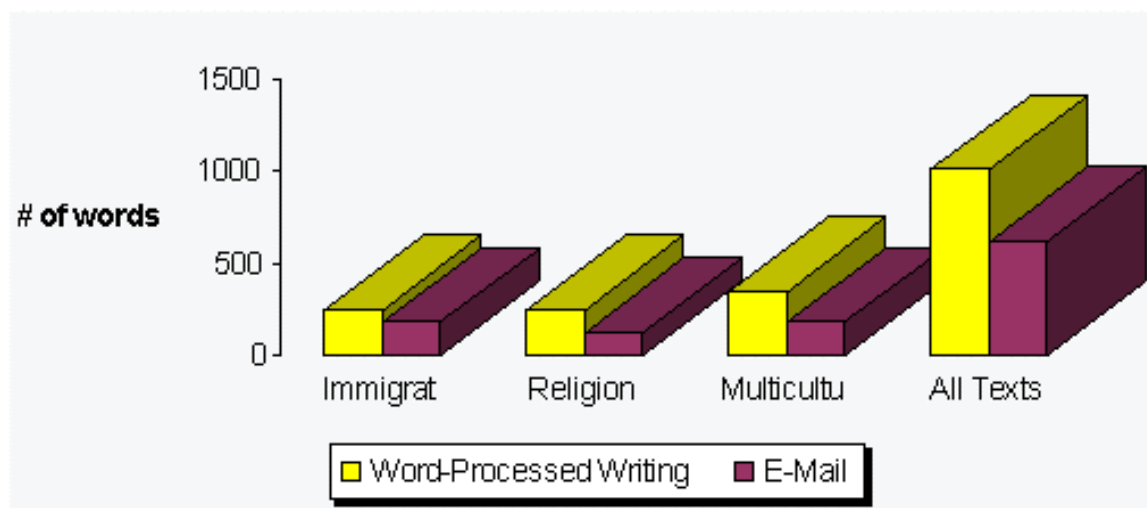


Figure 4. Average text lengths for each topic (for paired texts)

Table 1. Wilcoxon Matched-Pairs Signed-Ranks Test of Text Length

Texts (N=25)	R	Number	S Rank	Mean Rank
Immigration (N=10)	+R -R $z = -2.429, p < .05$	8 1	43 2	5.375 2
Religion (N=7)	+R -R $z = -2.366, p < .05$	7 0	28 0	4 --
Multiculturalism (N=8)	+R -R $z = -1.54, p > .05$	5 3	29 7	5.8 2.33
All texts (N=25)	+R -R $z = -3.829, p < .01$	20 4	284 16	14.2 4

In addition, it was found that all essays, both e-mail and word-processed, tended to get longer over the course of the study. In other words, the e-mail responses and the word-processed essays are shorter for the first two topics, immigration and religion, and longest for the last topic, multiculturalism. In the e-mail condition, the responses to the text on religion were actually the shortest of all three topics, possibly reflecting a generally lower interest in the particular source text. While this may simply be a reflection of the students' greater interest in the last topic, it can also be assumed that the writers had become more used to writing in e-mail and word-processed conditions throughout the semester.

While it might be argued that a practice effect could account for the greater length of word-processed texts, the text prompts -- even though on a related topic -- were not based on the same texts. Thus, each writing constituted a new task, only differentiated in the medium of production.

It is also interesting to note that particularly truncated writing, that is, texts of 120 words or less, is more typical of students' e-mail than of their word-processed texts. This is confirmed in a subsequent analysis (Biesenbach-Lucas et al., 2000), where a number of e-mail texts remain below 100 words. A closer investigation of argument structure in the students' writing (cf. Connor, 1996) might shed light on potential core information that is retained in e-mail writing.

Contextualization

The difference in text length between the students' e-mail and word-processed texts precipitated a closer investigation into what might account for the greater text length in word-processed writing. Guided by the assumption that writers need to consider what information is shared with their readers and what is not, one might expect that those assumptions are reflected in the resulting texts by including less context for an audience which is familiar with the topic. It had been hypothesized that writers would demonstrate a greater concern for providing background for the reader initially in the essay when addressing a potentially wider audience, as in the word-processed writing condition. Our findings show that there is in fact a distinct trend in the students' word-processed writing for initial contextualization of information, unlike in their e-mail writing (Figure 5). More precisely, in their word-processed essays, writers make an effort to provide some kind of background information on the topic, which takes various forms, such as referring to the title of the source article, its author, the author's point of view or message, or a general introduction to the topic. It is only after this background has been provided that the writers proceed to respond directly to the essay prompt, namely, whether or not they agree with the author's point of view. Apparently, even though the writers know that their audience, the two teachers, are familiar with the texts, they frame their word-processed essays in a way consistent with self-contained writing, in which background needs to be established.

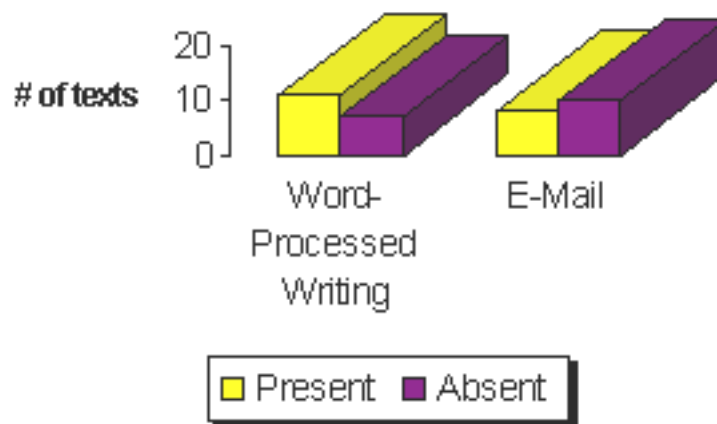


Figure 5. Topic contextualization provided initially in text

In contrast, in the e-mail responses, writers tend to begin right away by providing their personal opinion; and in all cases the writers use explicit markers to signal their intent, for example by writing *in my opinion*, *I think*, *I agree with the author*, or *I disagree with the author*. In most cases, students react directly to the essay prompts by even repeating the

wording of the prompts as provided by the teacher, for example, *In my opinion, her research project is important*. However, background is not established, nor is the author of the text prompt identified, as the use of the possessive pronoun *her* in the previous example illustrates. Such background is most likely assumed as being shared with the audience, the two teachers involved in each class. It is quite obvious that the absence of contextualizing information also accounts for generally shorter texts, in this case the students' e-mail responses.

In the following examples, students did not include text-initial contextualization. The sentences represent the first sentence in the students' e-mail texts:

I agree with Ms. Yeh's position. (EM)

Here, the reader is clearly assumed to be familiar not only with Ms. Yeh's position and the topic that this position refers to, but also with who Ms. Yeh is in the first place, as well as that the prompt asked students to agree or disagree with her point of view. In the following example, the student also begins immediately with a personal opinion. What is more, the student explicitly assumes that the reader is familiar with the research project he is referring to as well as whose research this is

In my opinion, her research project is important. Because we can learn about the other religions in the whole world. (EM)

Similarly, the writer of the following e-mail text indicates that he is providing several reasons, as indicated by the word *first*, clearly assuming that the reader knows what these reasons refer to and what topic they concern. By the same token, the reader is expected to know who Joan Beck is since the writer provides no other background but name only:

First, I do not agree with Joan Beck, because in the US there are more than 250 million living and many foreigners living in the US. (EM)

In contrast, text-initial contextualization does not assume the same kind of familiarity with concepts referred to as is illustrated in the following example from a student's word-processed texts:

It goes without saying that every country must have its common language to announce its policy or execution. (WP)

Here, the initial information provided serves as a general introduction to the topic, multiculturalism and multilingualism, but it does not refer to any specific elements from the text prompt. In the following example, the writer provides a summary of the main point of the text prompt, thus deliberately establishing shared information with the reader but not assuming it:

The U.S. Postal Service is taking the unusual step of releasing a stamp commemorating a religious holiday other than Christmas, and plan to issue other stamps in the future "to honor the country's increasing cultural and ethnic diversity." (WP)

Similarly, the next example provides the title of the text prompt, its author, and the general point made in the article. There would be no need to provide this information if the writer assumes his audience to share it:

In the article, "Saying No To the Flow" written by Jim Hoagland, tell us about the problem of immigration in the U.S. (WP)

To conclude, the students' e-mail and word-processed texts showed evidence of their different assumptions about intended readership (cf. Chafe, 1976), which manifest themselves in tendencies for different information presentation depending on the medium in which texts are produced.

DISCUSSION

The results of this study indicate that the students' on-line and off-line texts could not be distinguished in terms of the relative frequency of occurrence of the cohesive lexical items. However, the two groups of texts were distinguished fairly clearly based on text length and the amount of contextualization given text-initially. Factors which could have influenced the results are the academic context, student characteristics, and choice of cohesive features.

The writing completed for this study was reading-based and written for instructors. Furthermore, it was incorporated into a teaching unit for which students wrote other reading-based essay responses. During the first part of the semester, students were made aware of instructors' general expectations regarding textual organization. These included expectations regarding textual organization including the use of cohesive features (cf. Halliday & Hasan, 1990). Students were taught, following typical academic conventions, to include three types of information in their writing, including introductory information, a discussion, and concluding information. Likewise, the course curriculum incorporated instruction of the use of cohesive elements, particularly inter- and intra-sentential cohesive ties as well as lexical cohesion (Halliday & Hasan, 1976). It would seem likely that students would address these expectations in both responses produced for this study, especially since the stated audience of their writing included their instructors.

The students' level of proficiency, their specialized preparation (i.e., English for Academic Purposes) and first-language background (i.e., most students were Asian) may have restricted their use of English to more formal registers and may have prevented their use of features associated with more conversational registers. Also, some students' lack of familiarity with the technology may have extended to not being aware of the sociolinguistic variations that

can occur between on-line and off-line texts. This unfamiliarity could have restricted the use of whatever conversational features they had acquired although only a couple students indicated -- in a questionnaire administered at the beginning of the study -- that they did not often use email. Most students reported using email often with a number of types of audiences.

It may be that a different selection of features associated with textual cohesion would distinguish on-line and off-line texts. For example, during the analyses, we noted that deictic features² and lexical topicalization (similar to left dislocation) were prominent and could possibly distinguish the texts.

In light of these various possible constraints on variation in textual features, it is interesting to note some fairly clear distinctions found in the study. Variations in text length and contextualization, as well as the occurrence of features such as salutations in students' on-line texts, indicate that students employ different rhetorical strategies for on-line and off-line writing. Danet (1999) argues that confusion about whether letter writing conventions should be applied to e-mail in conjunction with a lack of adherence to conventions for writing in e-mail accounts for the use of salutations, and other features associated with letter writing, in e-mail. This is an issue which deserves further study, but in this study we focused on text length and contextualization.

The longer texts, which tend in this study to be the word-processed texts, are longer in part because of the inclusion of contextualizing material. The provision of such information, especially text-initially, is consistent with academic writing conventions taught in EAP composition courses. It is thus not surprising to find this type of information in students' responses. What is interesting in these findings is the tendency for students not to include contextualizing information in e-mail -- even when it is addressed to their instructors. This observation suggests that some students viewed the media differently in terms of the types of information required. This may be due to the notion of the immediacy of e-mail with the related expectation that the instructors were familiar with the articles and the prompts and that if some information was not clear that the instructor could easily e-mail the student for clarification.

The observation of these distinctive characteristics raises the question as to whether e-mail is an appropriate tool for students to use in writing academic essays. Aside from difficulties due to the limited editing facilities in the Pine e-mail editor, if students tend not to contextualize and develop their writing in e-mail -- for whatever reason -- e-mail may be an inappropriate vehicle for promoting self-contained academic writing or, at least, aspects of it. Likewise, instead of taming the technology to meet pedagogical objectives (Marcus, 1995), it may be more reasonable to use the various technologies in ways for which they are better suited.

Hawisher (1992) discusses misuses and appropriate uses of e-mail, arguing, for instance, that e-mail can be effective in conferencing. Based on the results of our study, it appears that the effectiveness of using e-mail during the drafting and revising stages of writing should be questioned. It may be more effective to have students draft and revise their writing in a word processor and then upload/download it in the event that the writing were to be mailed.

In general, it is not clear how writing in e-mail may benefit students in terms of producing academic writing. A number of empirical studies have been done in business contexts (Ferrara, Brunner, & Whittemore, 1991; Kurth, 1987; Metz, 1994; Murray, 1985, 1991, 1995; Sproull & Kiesler, 1986; Yates & Orlikowski, 1995; Yates, Orlikowski, & Okamura, 1997) to document the effectiveness of communication via e-mail in corporate contexts, but relatively little has been done to document how students' writing could be improved as a result of using e-mail (Lepeintre, 1995; Stroble, 1987; Tella, 1992; Yoder, 1991). While there is a growing body of literature which provides suggestions for classroom applications (Dik, 1986; Kumpf, 1986; Rosenthal, 1991; Warschauer, 1995) and which investigates affective variables associated with classroom uses (Ingram, 1987; Tella, 1991), there is an acute need for empirical research of the potential effects of e-mail use on students' language acquisition.

In light of the informal observations made during this study, an investigation of other features (e.g., deictics and topicalization) which appear to play a role in distinguishing students' on-line and off-line texts might be useful. A refined analysis of contextualization likewise promises useful and interesting insight into possible differences of e-mail and word-processed texts. Variations in deployment of features under consideration should be examined qualitatively. Finally, a sociolinguistic analysis of the potential intersects of students' familiarity with e-mail and the linguistic and rhetorical textual variations should be completed.

APPENDIX A: Sample Assignments

Sample Assignment for E-mail Reaction

EFL40 Oral Communication

Reaction Writing/Article #5

MULTICULTURALISM: "DON'T SAY A WORD -- UNLESS IT'S IN ENGLISH"

Directions:

- Σ Read the attached article, "Don't Say a Word -- Unless It's in English."
- Σ Go to a computer and enter the GWIS2 system.

- Σ Write your reaction to the article. Then e-mail it to your OC and your G/W instructors.

Respond to the following question:

Joan Beck wants English to be made the official language of the United States. Do you agree with her? Why or why not?

Sample Assignment for Word-Processed Reaction

EFL40 Grammar and Writing

Reaction Writing/Article #6

MULTICULTURALISM: "Lingua Blanka"

Assignment for the Computer Lab on Friday, November 15th:

- Σ Use Word Perfect for this assignment.
- Σ Write your reaction to the article, "Lingua Blanka."

Respond to the following question:

Dennis Baron does not believe that English should become the official language of the United States. He actually believes that English should be banned. Do you agree or disagree with him? Why?

When you have finished this assignment, give a hard copy and your diskette to your Grammar and Writing instructor. Your instructor will return your diskette next Monday after making it available to your Oral Communication instructor.

[\[RETURN TO TEXT\]](#)

APPENDIX B: Average Normalized Counts

Textual Features	Normalized Counts for E-mail Texts	Normalized Counts for Word-processed Texts
Demonstrative Pronouns	0.24	0.19
Demonstrative Noun Phrases	0.92	1.35
Sentence Connectors	1.85	1.66

Clause Coordinators	1.72	1.37
Clause Subordinators	1.56	1.30
Phrase Subordinators	0.50	0.47
Discourse Particles	0.03	0.06
Lexical Repetition	0.81	0.64
Synonyms	0.11	0.10
Pronouns	2.29	2.05
Ellipsis	0.56	0.42
Summative Expressions	0.00	0.01

[\[RETURN TO TEXT\]](#)

NOTES

[return1](#) Biber and Finegan (1989, 1992) note the diachronic shift from literate to oral characteristics in written texts.

[return2](#) These features were clausal vs. phrasal structures, left dislocation, repair, and "nextness."

[return3](#) None of the student examples provided here have been edited.

[return4](#) In the word counts of the e-mail responses, the entire message was considered, including salutations (beginning and end) and headings. For the word-processed essays, each essay was considered in its entirety, including rewritten headings, salutations, and rewritten essay prompts (except when the writer clearly indicated through bracketing or different font style/size that a particular question was not intended as part of the text proper but rather a reminder to the reader).

The following lexical items were counted as *one* word:

Σ possessives, e.g., *Dr. Eck's* [research]

Σ abbreviated verb forms, e.g., *I'm, don't, can't, that's, it's*

Σ proper names, including titles, e.g., *Dennis Baron, Dr. Eck, Prof. Meloni, Binbing Yu, Washington Post*

- Σ hyphenated words (often in adjectival position), e.g., *non-French*, *right-wing*, *non-legalized*, *long-term*, *safe-haven*, *high-skilled*, *low-skilled*, *CD-Rom*, *English speaking*, *anti-British*, *high-paid*, *under-developed*, *non-citizens*
- Σ abbreviations/acronyms, e.g., *INS*, *TOEFL*, *GWU*, *U.S.*, *U.S.A.* (but not *United States*)
- Σ each item in dates, e.g., *August 4, 1986*
- Σ each item in a percentage value, e.g., *600%*

[return5](#)The formula for calculating normalized counts is the following:
(number of occurrences of feature / length of text) x 100

[return6](#)Pronouns with unrecoverable referents, i.e., pronouns in sentences/clauses not immediately following the intended referent, were not counted in our study.

[return7](#)Deictics are features which anchor a text temporally and spatially. The use of *now*, for example serves as a temporal deictic, referencing the time of writing. See Lyons (1979) and Levinson (1983) for further discussion of deictics.

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