“Um, I can tell you’re lying”: Linguistic markers of deception versus truth-telling in speech

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ABSTRACT
Lying is a deliberate attempt to transmit messages that mislead others. Analysis of language behaviors holds great promise as an objective method of detecting deception. The current study reports on the frequency of use and acoustic nature of “um” and “like” during laboratory-elicited lying versus truth-telling. Results obtained using a within-participants false opinion paradigm showed that instances of “um” occur less frequently and are of shorter duration during lying compared to truth-telling. There were no significant differences in relation to “like.” These findings contribute to our understanding of the linguistic markers of deception behavior. They also assist in our understanding of the role of “um” in communication more generally. Our results suggest that “um” may not be accurately conceptualized as a filled pause/ hesitation or speech disfluency/error whose increased usage coincides with increased cognitive load or increased arousal during lying. It may instead carry a lexical status similar to interjections and form an important part of authentic, effortless communication, which is somewhat lacking during lying.
although some individuals engage in lying more frequently than the average person (e.g., psychopaths; Rogers & Cruise, 2000), lying appears to be a part of everyday social interactions with some studies suggesting that people generally lie once or twice a day (DePaulo, Kashy, Kirkendol, Wyer, & Epstein, 1996).

A comprehensive understanding of deception has significant applications in disciplines such as psychology and law. An important step toward this understanding rests on the ability to detect when somebody is lying or telling the truth. In view of the poor performance of human lie detectors, and other currently available methods (such as the polygraph, which is perhaps a guilt detector rather than a lie detector; Yocom, 2007), there is a need for improved methods of detection using more objective procedures. To this end, the analysis of language behaviors holds great promise because language draws on the kinds of cognitive and interpersonal processes thought to be associated with deception. The current study provides analysis of a particular aspect of language usage—the prevalence and acoustic nature of “um” and “like,” so-called filler words—in laboratory elicited lying versus truth-telling.

Despite the frequency with which we are exposed to lies, people’s ability to discriminate lies from truth is equal to that of chance (Bond & DePaulo, 2006). The inaccuracy of human lie detectors appears to stem from a number of factors, including undue reliance on nonverbal cues such as body movements (Mann, Vrij, & Bull 2004; Sporer & Schwan, 2007). A recent study showed that even trained schoolteachers, social workers, and police are poor deception detectors, and that they perform poorly regardless of whether the liars are 5–6 years of age, adolescents, or adults (Vrij, Akehurst, Brown, & Mann, 2006). To date, specifically tailored training programs in deception detection have failed to improve overall accuracy and, in some instances, have actually worsened detection rates (Kassin & Fong, 1999; Meissner & Kassin, 2002). Some studies have reported on rare “truth wizards,” who appear to demonstrate above-average deception detection abilities (Ekman, O’Sullivan, & Frank, 1999; O’Sullivan & Ekman, 2004); however, the notion of truth wizards is currently being debated in the deception literature (Bond & Uysal, 2007; O’Sullivan, 2008). In general, detection of deception is fraught with difficulty as the relevant cues may be “subtle, dynamic and transitory [and therefore] often elude humans’ conscious awareness” (Meservy, Jensen, Kruse, Burgoon, & Nunamaker, 2005, p. 198).

Although it is unlikely that scientists will ever identify the one cue that always occurs during any kind of deception (and not at any other time), it is fruitful to examine the probability of certain behaviors during lying versus truth-telling (Zuckerman, DePaulo, & Rosenthal, 1981). Language behaviors, in particular, draw on processes such as working memory, attention, arousal, motivation, and self-presentation that have been associated with deception (e.g., Buller & Burgoon, 1996; Burgoon & Floyd, 2000; DePaulo, 1992; Walczyk, Roper, Seeman & Humphrey, 2003; Zuckerman et al., 1981). Researchers interested in the link between language and deception have examined a number of linguistic variables. For example, measures of quantity have included assessment of the number of words/clauses/sentences produced, speech rate, length of individual words produced, and number of words from particular grammatical categories such as noun or verb (e.g., Burgoon & Qin, 2006; Sporer & Schwan, 2006). Other language
behaviors that have been investigated include expressivity (e.g., Rassin & Van Der Heijden, 2005); affect (e.g., Bond & Lee, 2005; Newman, Pennebaker, Berry, & Richards, 2003); and causation (e.g., Hancock, Curry, Goorha, & Woodworth, 2008); as well as diversity, redundancy, informality, and specificity (e.g., Zhou, Burgoon, Nunamaker, & Twitchell, 2004).

The results of studies that have examined multiple linguistic cues are impressive with some studies demonstrating deception detection rates of 67%, which is significantly better than the average levels of around 52% obtained by human lie detectors (e.g., Newman et al., 2003). A meta analysis of 120 deception studies conducted by DePaulo et al. (2003) found that liars generally provide fewer details; make more negative statements; sound more uncertain, impersonal, evasive, and unclear; and produce more words that distance themselves from their statements and the person or people to whom they are lying when compared with truth-tellers.

As we see it, an important challenge now facing researchers who work in the area of linguistic markers of deception is to refine the conceptualization of particular linguistic cues. Take, for instance, the case of emotion words. Newman et al. (2003) argued that increased use of negative emotion words might reflect deceptive behaviors as a result of guilt-related feelings. In contrast, Zhou et al. (2004) claimed that deceivers may exhibit a decreased use of negative emotion words as a result of decreased connectedness between the deceiver and the deceived and/or to cover any accidental betrayal of true feelings of guilt. A variety of important questions are yet to be addressed; for example, precisely what constitutes a negative emotion word, can all examples of these words be accurately identified by automated software, and what are the theoretical underpinnings that link negative emotion words and deceptive behavior?

The current study focuses on a particular language behavior, the use of so-called “fillers.” Here, we examined two such utterances, “um” and “like,” in laboratory-elicited lying versus truth-telling. Traditional thought is that these kinds of utterances constitute filled pauses/ hesitations (e.g., Maclay & Osgood, 1959) or errors that render speech disfluent in a similar way to repetitions, repairs, and false starts (Chomsky, 1965; Goldman-Eisler, 1968). Recent research provides an alternative view. It has been suggested that these utterances might not reflect problems in the planning and/or execution of speech. Rather, they might serve specific purposes and have a lexical status similar to other English words.

Clark and Fox Tree (2002) argued that utterances such as “um” have lexical status (perhaps similar to the open class of words termed interjections, which includes items such as “alrighty” and “woops”), and that they have “conventional phonological shapes and meanings and are governed by the rules of syntax and prosody” (p. 3). Unrelated to research on deception, Clark and Fox Tree’s analysis of 170,000 words from 50 face-to-face conversations demonstrated that speakers exhibit use of “um” when marking important delays in speaking (e.g., such delays may be associated with an attempt to keep the floor or cede the floor) and that they plan for, formulate, and produce such utterances just as they would any other English word.

Fox Tree’s (2006) examination indicated that “um” and “like” tend to be used in different places in a narrative. “Um” tends to occur at the beginning of the narrative, for example, to preface the beginning of a list of elements or when
stating specific names and times; “like” tends to occur just before information that might be considered a loose memory of the facts. Fox Tree (2007) explored differences in people’s understandings of their own usage of words such as “um” and “like.” Results backed up the earlier (Fox Tree, 2006) findings of differences between “um” and “like” in showing that there was a much wider range of intuitions regarding the meaning of “like” compared to “um.” Certainly, the use of “like” as an interjection appears to be more recent than that of “um.” In addition, the use of the word “like” as an interjection has been suggested by some to be a feature increasingly exhibited by young females and possibly related to sociolinguistic characteristics of certain peer groups (e.g., Drager, 2006), whereas “um” may be used more frequently by males (Benus, Enos, Hirschberg, & Shriberg, 2006).

A study of speech recognition in Spanish confirmed the frequency and acoustic predictability of fillers, and demonstrated that incorporation of such utterances as lexical items (rather than noise) in models of automatic speech recognition improves the recognizer’s performance (Rodriguez & Torres, 2006).

The conceptualization of utterances such as “um” as speech errors/hesitations or as utterances with lexical status has important implications for the way deception research is conducted and for the interpretation of results. Many deception studies have assumed that utterances such as “um” reflect disfluent speech, and it has been theorized that disfluent speech is associated with deception. It has often been argued that the link between disfluency and deception operates via increased cognitive load (related to effortful monitoring of responses) and/or increased arousal (related to heightened feelings of guilt, fear, or excitement) that often occurs during lying (e.g., Hosman & Wright, 1987; Vrij & Winkel, 1991). Vrij, Edward, Roberts, and Bull (2000, p. 242) stated “we expected liars to show . . . more ‘ah’ and ‘non-ah’ speech disturbances . . . as these behaviors are associated with thinking hard.” In another illustration of this pervasive view, language analysis software (such as the Linguistic Inquiry and Word Count software developed by Pennebaker, Francis, & Booth, 2001), which is increasingly being used in the study of deception detection, automatically tags utterances such as “um” as nonfluencies.

However, a close look at previous studies in this area reveals mixed findings concerning the relationship between utterances such as “um” and deception. Some studies have found an increase in these utterances during lying (e.g., Vrij et al., 2000). Other studies have found an increase in the number of these utterances during particular kinds of lies, for example, lies that involve reporting on discussions between people rather than on the physical appearance of individuals (Vrij & Heaven, 1999) and lies told in reverse order (Vrij et al., 2008). Recent metadata has revealed that effect sizes linking increased use of these utterances with deception “are no longer as strong as once believed” (Sporer & Schwandt, 2006, p. 437). Other research indicates that the presence of utterances such as “um” might be a marker of truthful rather than deceptive speech (e.g., Benus et al., 2006). Although these studies used a variety of research designs and elicitation methods, all were laboratory-based studies of truth-telling versus lying in healthy volunteers. None of these studies provided a complete list of all of the utterances that were classified as disfluencies. None mentioned the role of “like” and only one included acoustic analysis.
Our study was designed to elucidate the discriminative ability of these kinds of utterances during truth-telling versus lying. We examined laboratory elicited lies in healthy volunteers using the false opinion paradigm. We chose to include in-depth analyses of the prevalence and acoustic nature of two particular utterances: “um” and “like.” Although there appears to be growing consensus that both utterances operate similarly to interjections in English, it has also been suggested that there may be differences in the prevalence, use, and meaning of these two items (Fox Tree, 2006). We conducted our investigation using a within-participants design because the tendency to use “um” and “like” may vary considerably among individuals. Thus, it is individuals’ relative use of these items during lying versus truth-telling that was of interest here. It was also necessary to elicit language in the context of an interactive interview setting (rather than a monologue) for two reasons. First, we wanted to ensure a listener was present because, as mentioned, items such as “um” may be used (consciously or otherwise) for the listener’s benefit (as opposed to being reflective of the speaker’s speech-planning processes). Second, the presence of a conversant may assist in encouraging speakers to lie convincingly, when they need to respond to repeated questioning. Note also that the presence of a suspicious interviewer and very little time to prepare to lie in advance ensures that lying is not necessarily easy.

In summary, we expected “um” and “like” exemplars to demonstrate some discriminative ability between deceptive and truthful speech; however, considering the contradictory findings reported in previous published studies, it was an open empirical question as to whether the number of “um” and “like” exemplars would increase or decrease during lying compared to during truth-telling in the present study. Similarly, we were unsure whether we would find significant differences related to other acoustic characteristics of these utterances such as loudness and duration (during lies vs. truth). Finally, we thought it possible that “um” might be a more reliable marker of lying versus truth-telling than “like” because of the relatively recent use of “like” as an interjection in English and the greater variability concerning the folk understanding of its precise meaning. Although gender-related effects were not a key focus of the study, we thought it possible that we might find differences in usage of “like” versus “um” (with females exhibiting increased use of “like” as in Drager, 2006, and males exhibiting increased use of “um” as in Benus et al., 2006); we were unsure whether gender effects would interact with our deception conditions.

METHOD

Participants

A total of 32 participants (22 females, 10 males) with an average age of 20.2 years (SD = 4.8) volunteered to take part in the study. They received course credit in exchange for their participation.
**Procedure**

We employed a false opinion paradigm based on the procedure described by Frank and Ekman (2004). The recruitment notices that were posted on the research participation noticeboard described the study as an investigation of communication skills relating to social issues; “deception” was not mentioned during recruitment. Participants took part in individual testing sessions lasting 30 min. At the beginning of the session each participant was given a social issues questionnaire (see below for the topics addressed in this questionnaire). They then handed this questionnaire to an experimenter for processing and filled out some other test instruments (unrelated to the current study) for 5–10 min. The experimenter then told the participant that they would be asked to lie or tell the truth about their opinion on some of the social issues that had been presented to them in the social issues questionnaire during a videotaped interview (with an interviewer whom they would meet shortly).

Participants were given explicit instructions about how to respond during the interview. For the issue about which participants would give a truthful account, the experimenter instructed them to simply give an honest account of their genuinely held opinion. For the issue about which participants would give an untruthful account, the experimenter instructed participants that they should attempt to make the interviewer believe that they held the opposite opinion to their genuine beliefs. In other words, participants who agreed with the question about an issue were instructed to lie so that the interviewer would believe that they actually disagreed, and vice versa.

Participants were given additional instructions that were intended to motivate them to attempt to be convincing during their lying (i.e., to raise the stakes associated with lying), and to appear genuine when giving a truthful account. The experimenter told participants that the interviewer was aware that some participants would attempt to lie about some issues, but would not know who those participants were. Participants were told that if the interviewer suspected that the participant was lying, the interview would be terminated immediately, and that it was important to be extremely convincing during the interview.

The experimenter then introduced participants to the interviewer, who commenced videotaping and began the interview. The order of the two interview topics was counterbalanced so that truthful accounts preceded untruthful accounts for half of the participants, and vice versa. The interviewer raised one of the two issues with participants and asked a series of questions about the issue: (a) *What is your opinion about this issue?* (b) *Can you tell me why you hold that opinion?* (c) *Is this really your true opinion?* (d) *Are you lying to me now?* (e) *You have told me your opinion, but others might hold the opposite view. Can you tell me what you think might lead them to hold an opposite opinion to yours?* After asking participants about both issues, the interviewer returned participants to the original experimenter, who carried out a debriefing and thanked participants for their participation.

The social issues questionnaire contained a list of 10 debated topics in Australian current affairs at the time that the research was conducted. The topics are listed in Table 1.
Table 1. Topics addressed on the social issues questionnaire

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<tr>
<td>1</td>
<td>Smoking ban: Should smoking be banned in all enclosed public places?</td>
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<td>2</td>
<td>Capital punishment: Should the death penalty be reintroduced in Australia for serious crimes (e.g., murder)?</td>
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<td>3</td>
<td>Legalize marijuana: Should marijuana be legalized for public use?</td>
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<td>4</td>
<td>Abortion: Should abortion be made illegal in Australia?</td>
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<tr>
<td>5</td>
<td>Same-sex marriage: Should homosexual couples be allowed to marry?</td>
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<td>6</td>
<td>Sex offender registry: Should the government require public identification of pedophiles by placing their name, photograph, and information on the Internet?</td>
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<td>7</td>
<td>Mandatory detention: Should Australia have a policy of mandatory detention for asylum seekers?</td>
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<td>8</td>
<td>Shoot to kill: Should New South Wales police officers adopt a shoot to kill policy for suspected terrorists?</td>
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<tr>
<td>9</td>
<td>Telstra sale: Should the Commonwealth government sell its remaining share of Telstra (a telecommunications company)?</td>
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<tr>
<td>10</td>
<td>Industrial relations: Should industrial relations laws be changed to encourage individual agreements between employers and employees?</td>
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We asked each participant to first provide their opinion on each topic (1 = strongly disagree, 7 = strongly agree) and to then rate how strongly they personally felt about each issue (1 = no feelings, 7 = very strong feelings). Based on these responses we selected two topics for each participant for which participants held both a strong opinion (of either agreement or disagreement) and had strong feelings. Wherever possible, we chose issues for which the participant had reported an opinion rating of either 1 or 7 and had also provided a value of 7 for personal feelings about the issue. For one topic participants were asked to give a truthful account of their views, and for the other topic participants were asked to provide an untruthful account of their views (i.e., to lie). For each participant, the two selected topics were randomly assigned to be either the target of the truthful or the untruthful account. Across the 32 participants, the mean absolute difference of opinion ratings from the midpoint of 4 (i.e., mean absolute strength of agreement or disagreement) was 2.44 (SD = 0.72) for issues assigned to be the truthful account and 2.63 (SD = 0.49) for untruthful accounts. The mean ratings of feelings were 5.94 (SD = 0.95) for truthful accounts and 6.16 (SD = 0.92) for the untruthful accounts. We conducted paired samples t tests and found no significant differences between issues selected for truthful and untruthful accounts in terms of participants’ opinions, \( t (31) = -1.359, p = .861 \), or feelings, \( t (31) = 1.487, p = .184 \).

Data preparation and analysis

An excerpt from an interview where the participant was being interviewed about the topic of same-sex marriage is provided in Appendix A as an example of the language we elicited. In the tagging of “um” instances, examples of “uh” (or “ah”) were not tagged as “um” unless they were characterized by vowel nasalization (anticipatory nasalization occurs when speakers intend to close with a
nasal consonant such as /m/). The tagging of “like” instances only included usage as interjections, and did not include instances of other grammatical categories (e.g., verb use as in “I like smoking”). All duration and amplitude measures were made by an experienced sound engineer using Sony Sound Forge 9. The sound engineer was blind to the deception conditions (lying vs. truth-telling) of the speech samples. Frequency of use is reported as a percentage of the total number of words the participant produced in each condition. For duration (ms) the beginning and ending of each utterance was determined by their slight presence above the ambient noise floor. Amplitude (dB) was measured at the peak (loudest). It should be noted that where a participant did not produce “um” or “like,” there are obviously no data for duration or amplitude.

Prior to conducting each analysis we examined the truth and deception conditions for outliers and removed participant data (i.e., individuals not trials) that were ±2.5 $SD$ from the overall mean (the number of outliers removed is indicated in brackets for each analysis). In separate analyses of the utterances “um” and “like” we conducted a series of analyses of variance (ANOVA)s to examine each of three dependent variables: frequency of use, average duration, and average amplitude. For each ANOVA there were two independent variables: deception was a within-participants factor (lying vs. truth-telling) and gender was a between-participants factor (female vs. male).

RESULTS

Participants produced an average of 162 words in the truth condition and an average of 182 words in the lying condition. A 2 (Condition: lying vs. truth-telling) × 2 (Gender: female vs. male) ANOVA revealed no significant main effects in terms of total number of words produced during lying versus truth-telling or for females versus males ($F$s < 1) and no significant interaction between these variables, $F(1, 30) = 1.15, p = .292$.

Analysis of “um”

We excluded data from four participants whose responses constituted outliers. Descriptive statistics with these outliers excluded are provided in Table 2.
We conducted ANOVAs to examine the average frequency, average duration, and average amplitude (loudness) of “um.” The analysis of frequency of use (one outlier removed) revealed a significant main effect of deception, $F(1, 29) = 7.04, p = .013$, with significantly more instances in the truth-telling condition. In contrast, there was no main effect of gender and no interaction between gender and deception (both $F$s < 1). The analysis of duration of utterances (two outliers removed) revealed a significant main effect of deception, $F(1, 20) = 5.15, p = .034$, with significantly longer utterances in the truth-telling condition. There was also a significant main effect of gender, $F(1, 20) = 9.28, p = .006$, with females exhibiting longer utterances than males; however, there was no interaction between gender and deception (both $F$ < 1). In the analysis of amplitude (one outlier removed) there were no significant effects.

**Analysis of “like”**

We excluded data from three participants whose responses constituted outliers. Descriptive statistics for the three dependent measures (with outliers excluded) are provided in Table 3.

As in our analysis of “like,” we conducted ANOVAs to examine the frequency, average duration, and average amplitude (loudness) of “like.” The analysis of frequency (one outlier removed) revealed no main effect of deception ($F < 1$), no main effect of gender, $F(1, 29) = 1.44, p = .240$, and no interaction between these variables ($F < 1$). The analysis of duration (one outlier removed) revealed a main effect of gender, $F(1, 12) = 4.89, p = .047$, with males producing longer instances of “like” than females, but there was no main effect of deception ($F < 1$), and no interaction between these variables ($F < 1$). In the analysis of amplitude, too, there were no significant main effects and no significant interaction (all $F$s < 1).

**DISCUSSION**

The current study was designed to investigate the use of “um” and “like” as linguistic markers of truth versus deception. To our knowledge, there have been limited previous investigations of this topic. Of the previous investigations that have examined items such as “um,” researchers have not always been explicit in their
methods of defining and identifying these utterances (e.g., possible differences between “um” vs. “uh”), in explaining the role of these items in communication (i.e., as disfluencies or as lexical items), or in discussing the reasons why their use might correlate with deception. It would appear that no previous investigation has examined the prevalence and acoustic nature of both “um” and “like” along with possible effects of gender in truth-telling versus lies.

The results confirmed our hypothesis that these kinds of utterances successfully discriminate between deceptive and truthful utterances. In particular, our results showed that instances of “um” were significantly more frequent and of longer acoustic duration during truth-telling than during lying. These effects are subtle, as is often the case with cues to deception (Meservy et al., 2005). On average, the difference in frequency of use between lies and truth (within participants) amounts to around one extra use of “um.” This suggests that the discriminatory power of these utterances might be more effectively harnessed via computer-assisted detection methods rather than trying to train humans to detect these kinds of subtle effects.

We propose two possible explanations regarding the discriminatory power of “um.” It may be that such utterances are more accurately conceptualized as conventional English words rather than filled pauses/hesitations or speech disfluencies/errors (see Clark & Fox Tree, 2002; Fox Tree, 2006). Research unrelated to deception behaviors provides converging evidence for the special status of utterances such as “um” that have been found to have different distribution patterns to other types of disfluencies such as repetitions and false starts. Bortfeld, Leon, Bloom, Schober, and Brennan (2001) found that these utterances “may be a resource for or a consequence of interpersonal coordination” (p. 123). As such, these utterances might be an important part of authentic, effortless speech (i.e., presumably, somewhat lacking during lying). Accordingly, although the use of utterances such as “um” may not be under strategic control, we would expect usage to be lessened during lying (compared to truth-telling). The second possibility is that the use of utterances such as “um” is under direct control, and that participants reduce their usage of these utterances during lying in an effort to mask deception. In line with this view, speakers remove what they see as markers of uncertainty (utterances such as “um”) when they lie (e.g., Akehurst, Kohnken, Vrij, & Bull, 1996; Vrij & Semin, 1996).

The outcome of each of these scenarios is the same: fewer utterances such as “um” during lying. Of importance, although frequency of use of “um” could conceivably be under strategic control, it seems unlikely that particular acoustic characteristics of these utterances, such as duration (which we found to differ significantly across our two deception conditions), could be as easily controlled by participants. However, perhaps while strategically reducing the frequency of “um” in deceptive speech, speakers also try to rush through any that do manage to break through into their speech. This remains an open empirical question to be investigated in future studies. Our results challenge traditional conceptualizations of “um” as a filled pause/ hesitation or speech disfluency/error that is more likely to occur in situations of increased cognitive load and/or increased arousal, such as during lying (e.g., Hosman & Wright, 1987; Vrij & Winkel, 1991).
The most compelling explanation for the discrepancy between the present findings and previous studies of deceptive speech relates to inconsistencies in the way utterances such as “um” have been defined and measured. For instance, Sporer and Schwandt (2006), in their meta-analysis of 41 studies of linguistic cues to deception grouped “um,” “uh,” “er,” and so on together under the heading of “filled pauses”; the individual contributions made by each measure are unclear. To our knowledge, of the previously published studies that did specifically measure “um” in its own right, the findings were consistent with ours; that is, the presence of “um” was observed more frequently during truthful than deceptive speech. As mentioned, it has been argued in the psycholinguistic literature that “um” is not a nonlexical sound, but instead deserves the status of a legitimate word (Clark & Fox Tree, 2002; Fox Tree, 2001, 2002). The inconsistencies reported in the research on fillers in deception, and the findings of the present study, support the measurement of “um” as a variable in its own right.

Another explanation for the discrepancy between the findings reported for the discriminative ability of “um” in deceptive speech relates to the differences in research design. Many different paradigms are utilized in deception research; as such, there are a number of moderator variables that may impact upon findings including the content and difficulty of the lie, preparation time, rehearsal time, motivation to lie, the amount of interaction with the experimenter, between-participants versus within-participants design, monologic versus dialogic format, and so on. For instance, Vrij and Heaven (1999) reported a positive relationship between what they labeled “speech disturbances” (the frequency of saying “uh,” “um,” “mm,” or pausing between words) and deception when the lie was difficult and a negative relationship between speech disturbances and deception when the lie was easy. It is possible that through the false opinion paradigm our participants may have been able to construct a lie somewhat more easily because of a familiarity with the arguments for both sides of the social issues that were presented.1 However, we think this may have been offset by other factors in our study that contributed to making the lies more effortful: participants were given no preparation time, they were face to face with a suspicious interviewer, and they were told the interview would be terminated as soon as the interviewer decided they were lying.

We found no significant differences in the prevalence or acoustic nature of “like” utterances in truth-telling versus deceptive speech. Perhaps we failed to find significant effects in our analysis of “like” because of the small number of data points and, thus, these particular results should be interpreted with caution. However, use of “like” may appear less often than “um” in any speech sample because the use of “like” as an interjection is a relatively recent phenomenon. It is interesting that it has been suggested that “like” might have a different meaning/purpose from “um” in popular usage (as in Fox Tree, 2006). As mentioned earlier, it is possible that participants see “um” as a marker of deception and try to control their use of it when trying to convince someone with a lie. By contrast, participants might view “like” quite differently (compared with “um”) and consequently might not attempt to control their use of “like” because they do not view it as a marker of deception. We suggest that (at least in this point in
contemporary language use) “um” is a clearer marker of truth versus deception compared with “like.”

Finally, our results suggest some interesting differences in the use of both “um” and “like” by females and males. On average, females produced longer instances of “um” and males produced longer instances of “like.” Previous research has suggested gender differences in usage of “um” (Benus et al., 2006) and “like” (Drager, 2006) but, to our knowledge, ours is the first study to examine both “um” and “like” and to show that differences are related to acoustic duration. These differences were unrelated to the deception conditions.

It would be valuable for future studies to examine a wider range of interjection-like utterances and to examine the prevalence and nature of utterances such as “um” during real-life, high-stakes lies (e.g., media interviews and court cases associated with homicide). The paradigm we have used here is a well-accepted method of eliciting lies in the laboratory, but it is important to verify that findings from the laboratory can be generalized to truth versus lies in the real world. Future studies might also look at teasing apart the influence of different kinds of research design, and more directly manipulating cognitive load, arousal, and opportunities for strategic control during truth-telling versus lies, to see if this changes the pattern of use for utterances such as “um.”

CONCLUSION

In summary, utterances such as “um” have traditionally been considered to be filled pauses/hesitations or speech disfluencies/errors that increase when an individual is experiencing the kind of increased cognitive load and increased arousal that often accompanies lying. As such, researchers in the area of deception have tended to theorize that we might see increased use of these utterances during lying. In contrast, our results showed decreased use of “um” and shorter instances of “um” during lying compared to truth-telling. These results have important implications for research in the area of deception but also in terms of a reconceptualization of the role of these utterances in general communication.

APPENDIX A

“. . . Um, well I think they’re just like any other person so um they should just have the same chance as any other Australian to get married um and it’s sort of up to them whether or not they should want to, like, it’s their choice . . .”

NOTE

1. As noted by a reviewer, fillers are used less often in rehearsed speech; is it the case that people’s familiarity with both sides of the arguments concerning current social issues resulted in the use of “rehearsed speech”? Over time, people might rehearse one side of an argument (most likely, the side they believe in, their “truth”) and become increasingly aware of the other side of the argument. Thus, we might expect to see fewer fillers in the truthful condition as this is more likely to reflect speech that participants have personally rehearsed a number of times; however, our results showed the opposite
pattern of results (fewer fillers during lying). Future research could look more closely at this issue.

REFERENCES


