Linguistic Cues to Faking in Computer Mediated Employment Interviews

by

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Abstract

In order to create an effective and profitable organization, one must select the right employees into the right positions. While there are many methods used to select employees (e.g. assessment centers, personality questionnaires, cognitive ability measures), the number one staple used by the majority of organizations for selection purposes is the interview (Lievens, Highhouse, & de Corte, 2005; Salgado, Viswesvaran, & Ones, 2001). Recently, selection interviews have been moving from face-to-face environments to ones utilizing recent technological advances, such as telephone and computer-mediated formats. Despite these advances, threats to the validity and utility of selection interviews remains. One potential threat is applicant faking. Applicant faking has been defined as the tendency to deliberately distort responses in a positive light (McFarland & Ryan, 2000; Fan et al., 2012). Applicant faking behaviors in face-to-face interviews may differ from those in computer-mediated interviews, as the added aspect of written text allows for different types of deception cues, such as comma usage, to be identified.

The current study examined whether there are linguistic-based cues to faking in a computer-mediated employment interview. Results show that participants in the faking condition use significantly more words, words per sentence, complex words, commas, adjectives, affective words, and non-specific number words than participants in the honest condition. Additionally, those in the faking condition also used significantly fewer sentences, negations, exclusive words,

friendship words, text lingo, and first-person pronouns than those in the honest condition. The practical implications of these findings as well as the future research directions are discussed.

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CMC	Computer Mediated Communication
FtF	Face to Face
LIWC	Linguistic Inquiry and Word Count
MTurk	Mechanical Turk

Introduction

One foundational building block of an effective and profitable organization is having the right employees in the right positions. Because of this, a lot of emphasis goes into the process of employee selection. The employment interview is a crucial step in the selection process that nearly every employing organization utilizes at some point in their hiring process (Diekmann, & Konig, 2015; Levashina, Hartwell, Morgeson, & Campion, 2014). The extensive use of employment interviews is well founded, as the employment interview is not only well accepted by applicants (Macan, 2009), but also a valid predictor of future work performance (McDaniel, Whetzel, Schmidt, & Maurer, 1994).

As technology advances, so does the workplace. These advances include changes to the employee selection process, including the interview. Employment interviews are no longer tethered to face-to-face (FtF) interactions, as advances have made it possible for other forms of interview settings such as over the telephone (Oliphant, Hansen, & Oliphant, 2008), computer-mediated video conferencing (Chapman & Rowe, 2002), digital interviews (Brenner, Ortner, & Fay, 2016), and more to be used more efficiently and frequently. These changes typically come as organizations move to reduce costs and improve the efficiency of their job interview process (Langer, Konig, Krause, 2017).

The use of technology mediated interviews allows organizations freedom from the geographical, time, and budget restraints associated with traditional FtF interviews. For example, Mya Systems, a San Francisco based company, has developed an artificial intelligence recruiter that evaluates resumes and prescreens applicants through a chat-based interview before forwarding those applicants with a good fit on to the hiring manager. Further, the juice company Ocean Spray prescreens applicants by emailing them a link to participate in a webcam interview

with preset questions; hiring managers' review and rate the recorded interviews before deciding who moves to the next round of the selection process (Zielinski, 2012). While organizational use of technology in the selection process comes with many added benefits, one must be aware of potential issues that may arise, including applicant deception.

Although the physical setting and communication method used in computer-mediated interviews are different from what is used in traditional FtF interviews, it is unlikely that these differences will reduce the amount of applicant deceptive behaviors that occur. These deceptive behaviors, also referred as applicant faking behaviors, are employed by individuals in order to present oneself in a positive light as an attempt to receive a positive evaluation and subsequent job offer. The desire for a positive evaluation and job offer is context specific to the job application process, but not specific to the method or setting being used to conduct the interview. It can be assumed that applicant faking will still occur in computer-mediated interviews, as the motivation to fake is still present.

Extant research has found evidence of behavioral cues to deception in employment interviews, such as restrained facial behavior and lack of fidgeting (Schneider, Powell, & Roulin, 2015), that aid in detecting deception as it occurs. However, these nonverbal cues to deception in FtF situations are not present in many computer mediated interview contexts, such as the chat-based interview. While this restricts the transferability of research findings conducted in the FtF interview context to that of the computer mediated context, researchers have begun to evaluate other methods of deception detection, such as linguistic cues in written communication, in order to bypass the limitation of the lack of nonverbal cues.

While methods of identifying linguistic cues to deception in text have been researched in a variety of fields (e.g. communication, criminology, forensic science, etc.), the generalizability

of these cues to an employment interview context has not been evaluated. Assessment of their applicability in a selection setting is crucial, as certain cues may be context specific. For example, while research has shown that deception in text is often correlated to a reduced use of first-person pronouns, this may not hold in an interview context where questions are asked that require the applicant to discuss themselves and their personal work history. These types of questions require the applicant to refer to themselves as they discuss their previous experiences.

The proposed research evaluates the generalizability of established linguistic cues of deception to the employee selection context through use of an online intelligent virtual interviewer. In addition to exploring the generalizability of existing linguistic cues, this research will also examine whether linguistic cues can differentiate between various interview faking strategies.

Brief Overview of Employment Interviews

Selecting the right applicant for the position is one of the first tasks organizations must accomplish when building an effective workforce. To do this, employers rely on a variety of different methods to assess the qualification and fit of applicants. The employment interview is one of the most common personnel selection methods used in the workplace (McDaniel, Whetzel, Schmidt, & Maurer, 1994; Posthuma, Morgeson, & Campion, 2002; Salgado, Viswesvaran, & Ones, 2001). Further, the employment interview is often the only selection method used in some organizations (Levashina, Hartwell, Morgeson, & Campion, 2014), as work samples and assessment centers are often not appropriate or cost effective to employ (Fernandez-Araoz, 2007). As a result, interviews have received a significant amount of research attention in order to assess their viability and accuracy.

Interview Format and Components

There are three main types of interview formats commonly used: structured, semi-structured, and unstructured. Unstructured interviews do not have a fixed format or type of questions, which allows the interview to ask different questions for different candidates (Motowidlo et al., 1992). This is a free-flowing interview with no set objectives about what questions and information will be discussed. Structured interviews, on the other hand, have a specified format and question sequence that the interviewer uses. Semi-structured interviews are a mix between unstructured and structured. For example, a semi-structured interview may have predetermined questions they intend to ask, but the interviewer is allowed to deviate from them in terms of sequence and follow-up questions.

The more structured the interview has, the more systematic the information collection, the questions being asked, and the response scoring. For example, structure can come in the form of asking the same questions to all interviewees, limiting probing (i.e. follow-up) questions, the use of behaviorally anchored rating scales for scoring, and specified note taking (Levashina, Hartwell, Morgeson, & Campion, 2014). Weisner and Cronshaw (1988) found in their meta-analysis found that structured interviews had a higher correlation to job performance than unstructured interviews. Of interviewing formats in general, the structured interview stands out as the most reliable and valid (Levashina, et al., 2014).

Further, structured interviews have been found to result in substantially lower group differences than other typically used selection measures, such as cognitive ability tests (Outtz, 2002). A structured interview differs from an unstructured interview in its ability to accurately focus on different constructs or criteria of interest to the employer, while also limiting interviewer bias that may come about when using an unstructured or semi-structured

interviewing format. Additionally, the use of a structured interview can reduce race, gender, or disability bias in interview ratings by limiting the influence of inconsistent data gathered by the interviewer's subjectivity (Levashina et al., 2014). These factors make the structured interview an ideal choice for many organizations.

While the use of a structured interview should, ideally, remain the same across interviews within an organization, structured interviews used between organizations varies widely. The main way structured interviews may vary is in relation to the type of question being asked. There are two type of interview questions commonly used: situational questions and patterned behavior questions. Levashina et al. (2014) describes situational interview questions, based on goal setting theory, as those that ask applicants to respond to a hypothetical work-related situation under the premise that their answers show their intentions, which in turn predict future performance. On the other hand, patterned behavior questions ask applicants to describe what they did in a previous work-related situation under the premise that past behavior will predict future performance. The underlying theory behind this approach is behavior consistency theory (Janz, 1989), where it is assumed that past performance is the best predictor of future performance in similar circumstances. Meta-analytic studies have found that both situational and patterned behavior interview questions have criterion-related validity, but past behavior questions show slightly higher validity (Day & Carroll, 2003; Gibb & Taylor, 2003; Klehe & Latham, 2006).

In addition to a standardized set of interview questions, organizations can also utilize standard probes to clarify the candidates' responses. Schmidt and Conaway (1999) suggest that probing questions are an important way to improve the accuracy of behavioral information through additional clarifications or explanations. However, few studies have investigated the influence probing questions may have in interview outcomes (Levashina et al., 2014). Though

research is scant, what has been conducted suggests that choosing the same probing approach in each interview increases the consistency and interview reliability (Campion, Palmer, & Campion, 1997). As such, this study will use a limited probing approach with standardized probing questions. Further, as interviews will be used in a mock selection context, no job analysis can be conducted. As such, interview questions with be patterned behavior questions that target criteria that can be generalized to a wide variety of positions.

Technology in Interviews

Though interviews have been traditionally conducted FtF, technological advances have made it possible for other forms of interview settings, such as over the telephone (Oliphant, Hansen, & Oliphant, 2008) and computer-mediated video conferencing (Chapman & Rowe, 2002), to become more frequently used. These new selection mediums are appealing for organizations, as they allow them to reach a broader applicant pool while reducing expenses (Behrend, Toaddy, Thompson, & Sharek, 2012). The introduction of technology to the interview process comes with the added benefit of reduced human resources necessary to staff a structured interview administration, which may expedite the process. This will potentially reduce the overhead cost of conducting interviews and allow organizations to interview larger groups of candidates.

Additionally, these alternative interview methods can increase the fairness and standardization of the interview administration by ensuring that all applicants receive the exact same questions and presentation format (Van Iddekinge, Raymark, Edison, & Attenweiler, 2004). As such, this eliminates the bias that may occur when different interviewers are used. Further, Chapman and Webster (2003) argue in favor of reducing the human element in the selection process, as utilizing a standardized, impartial, technology may significantly reduce

adverse impact. One additional advantage of the introduction of technology in the selection process is the potential increase in legal defensibility of interview ratings, as exact recorded responses (in the form of videos, audio, or text) would be able to be used in court.

Although the psychometric properties of traditional structured interviews have been well established (see Conway, Jako, & Goodman, 1995; Harris, 1989; Huffcutt & Arthur, 1994; Wiesner & Cronshaw, 1988), it cannot be assumed that these psychometric properties are transferable when introducing new technology. Motowidlo et al. (1992) investigated the psychometric properties of a structured behavioral interview for management and marketing positions. One hundred and forty-six newly recruited marketing incumbents were evaluated via FtF interviews, audio recordings of their responses, and a written summary of their responses. They found that all three methods of evaluation were significantly correlated with job performance, and that both audio recordings and written responses explained additional variance beyond that explained by the FtF interviews. In other words, the use of alternative interviewing methods, such as audio recordings and written responses, can be justified in a selection context.

Computer mediated interviews have become a popular option for jobs the entail virtual and traditional forms of work (Athavaley, 2007). These interviews may take on a variety of forms with varying degrees of realism and richness (Behrend, Toaddy, Thompson, & Sharek, 2012). They can be voice or text-based conversations conducted through various mediums such as text-based messaging systems or virtual reality. While some may argue that the removal of the interviewer from the interview process may a negative impact, as the interviewer is an active participant in the data collection process (Cronshaw, Chung-Yan, 2005), research shows that removal of non-verbal cues does not have an impact on the validity of the structured interview (Motowidlo et al., 1992). Therefore, computer mediated interviews are a viable option for

organizations to use during their employee selection process. While the introduction of computer-mediated interviews offers many positive benefits to organizations, they are not free of potential issues. This includes the possibility of being used by applicants as a means of to deceive the organization.

Deception

In 1981, deception was defined as an intentional act to foster in another individual a belief or understanding which the deceiver knows to be false (Krauss, 1981). Ekman (1992) defined deception as "a deliberate choice to mislead a target without giving any notification of the intent to do so". Ekman's definition, like Krauss', emphasizes the deliberate choice one makes to deceive another. However, Ekman's definition takes it a step further by also suggesting that one is not being deceptive if they have informed the target of the deception. For example, a magician is not deceptive as the audience is aware that they are going to be deceived.

Building on these previous definitions, Vrij (2000) defines deception as a "successful or unsuccessful deliberate attempt, without forewarning, to create in another a belief which the communicator considers to be untrue". This operationalization expands on previous definition by asserting that an unsuccessful deception is still a deceptive act. In sum, deception can be described as having three main features: 1) the deceiver must believe that they are communicating false information; 2) the deceiver must not warn the target of the deception that they will be deceiving; 3) the deception may or may not be successful.

Deception is widespread in everyday life. In fact, Serota, Levine, & Boster (2010) suggest that the average American adult tells at least one lie every 24 hours. Given this, the magnitude of deception one might encounter seems disconcerting. However, not all deception has a malicious intent. For example, white lies are dishonest statements told without malicious

intent and they are generally considered to have positive rather than negative values attached to them (Bok, 1978). White lies are often told in order to avoid hurting the feelings of another and have been found to be used by children as young as three (Talwar & Lee, 2002). As such, researchers are largely concerned with deception that has a malicious intent where the deceiver is looking to gain something from the deception. This includes deception that occurs during an employee selection process (i.e. applicant faking).

Applicant Faking in Personality and Bio-data Measures

For organizations, deception exhibited by applicants is a large concern during the employee selection process. Deception in an employee selection context is typically referred to as applicant faking. Applicant faking is composed of two main components: self-deception and impression management (Paulhus, 1984, 1986). Self-deception is an individual's unconscious tendency to view themselves in a favorable way, whereas impression management is a deliberate attempt to present oneself in a positive manner. In a selection context, the term "faking" typically refers with the impression management component, as organizations are most concerned with deliberate deception. Thus, applicant faking is defined as the tendency to deliberately distort ones' responses in a positive light (McFarland & Ryan, 2002). This deceptive tendency has also been referred to as response distortion, response bias, social desirability responding, impression management, and intentional distortion (Fan et al., 2012).

Faking in a selection context may affect the quality of hiring decisions and reduce the utility of the selection measure (Mueller-Hanson, Heggestad, & Thorton, 2003). These consequences are exacerbated by individual difference in peoples' ability and willingness to fake (Griffith, Chmielowski, Snell, Frei, & McDaniel, 2000). Mueller-Hanson and colleagues (2003) explain that the issue with applicant faking is that individuals do not uniformly increase their

scores, nor do only a small percentage of the population partake in faking behaviors, thus when selection ratios are small fakers will have an unfair advantage over applicants who responded honestly.

On all types of selection measures, individuals fake simply because it works. Applicants who effectively fake have been found to elicit more favorable reactions, which in turn increase their likelihood of getting hired (Weiss & Feldman, 2006). This is of concern for organizations, as faking on pre-employment measures has been linked to negative employment outcomes such as counter-productive work behavior (Rosse, Levin, & Nowick, 1999). In other words, faking is an effective tool used by the deceiver which may lead to negative or detrimental outcomes for the employer.

Faking in Interviews

Applicant faking, an individual's attempt at positive self-presentation, is wide spread in the employee selection context, as applicants can fake on a variety of different selection measures such as personality measures and selection interviews. More specifically, interview faking can be defined as a "conscious distortion of answers to the interview questions in order to obtain a better score on the interview and/or otherwise create favorable perceptions" (Levashina & Campion, 2007). In other words, applicatants fake in selection interviews by purposefully misrepresenting themselves through their interview responses in order to garner favor with the interviewer.

Levashina and Campion (2007) found that over 90% of undergraduate job candidates engaged in faking during job interviews. This issue is critical, as research indicates that those who employ faking strategies tend to be assessed more favorably (Stevens & Kristof, 1995; Barrick, Shaffer, & Degrassi, 2009), which may introduce bias to the selection process,

potentially reducing the predictive validity of the interview (Posthuma, Morgeson, & Campion, 2002). Further, individuals who fake during selection procedures have been found to show more undesirable behaviors at work, such as lower job performance (Donovan, Dwight, & Schneider, 2014).

Recently, research has focused on the behavioral indicators of faking in interviews, and interviewers' ability to detect them, as a way to circumvent the traditional self-report methods. Individuals who engaged in deception during interviews exhibited restrained facial behavior, unrestrained verbal behavior, and gave off the impression of being less anxious (Schneider, Powell, & Roulin, 2015). Additionally, Sporer and Schwandt (2007) found in their meta-analysis that individuals engaging in deception were more still (i.e., fakers engaged in less nodding, hand movements, and leg movements).

While research has found evidence of behavioral cues of deception, studies have shown that interviewers are no better than chance at detecting deception (Bond & DePaulo, 2008; Culbertson, Weyhrauch, & Waples, 2016). Further, experienced employment interviewers have been shown to be no more accurate at detecting deception cues than less experienced interviewers and laypersons (Reinhard, Scharmach, Muller, 2013). However, research has begun to examine alternative methods for detecting faking. For example, Derrick, Meservy, Jenkins, Burgoon, and Nunmaker (2013) used a chat-based interview to detect instructed faking (i.e. participants were instructed what questions to lie or be honest on). Results showed that deception is positively correlated with response time and the number of edits made, and negatively correlated to overall word count.

Measuring and Managing Faking

Researchers have suggested a multitude of ways to measure, minimize, and prevent faking in a selection context. Some of the first approaches involved statistical correction, response sets analyses, and rating items for social desirability (Crowne & Marlowe, 1960). Currently, faking is typically measured through self-report questionnaires such as the Impression Management and Self-Deceptive Enhancement measures (Paulhus, 1989), Bogus Statement inventory (Dwight & Donovan, 2003), and the Over-Claiming Questionnaire (Paulhus, Harms, Bruce, & Lysy, 2003). After the completion of these self-report measures, faking can then be controlled for via statistical correction.

While embedded measures within the selection questionnaires attempt to measure faking, pre- and middle warning messages are used to mitigate the occurrence of faking. These warning messages can be proactive, in which a message warns test takers against dishonest responding is shown before the begin the testing process; or they can be reactive, in which a message is shown after dishonest responding has been detected. Used in this way, a warning message is given after an initial testing block is completed by the applicant that allows the test taker an opportunity for recourse. Fan and colleagues (2012), found that the middle warning method caused a significant decrease in the faker's personality scores upon retesting. The traditional format used for warnings is an identification and consequence format, in which the test taker is informed that there is an embedded social desirability measure that has the ability to detect dishonest responses, and that there will be consequences for those who are identified as responding dishonestly (Pace & Borman, 2006).

Faking in an interview context is typically measured by a self-report questionnaire after the interview or by videotaping the interview and having a trained coder rating faking behaviors.

For example, Weiss and Feldman (2006) conducted a study in which job candidates completed an application and job interview. Post interview, candidates were informed that they were actually participating in a study and were asked to watch their videotaped interview and indicated when they told a lie. They found that applicants lied in both the written job application and the FtF interview in order to conform to the job requirements. A more commonly used, and less time intensive, method is the self-report questionnaire.

One of the most widely used scales is Levashina and Campion (2007)'s Interview Faking Behavior Scale, which examines 4 factors (Slight Image Creation, Extensive Image Creation, Image Protection, and Ingratiation) and 11 sub-factors (Embellishing, Tailoring, Fit Enhancing, Constructing, Inventing, Borrowing, Masking, Distancing, Omitting, Conforming, and Interviewer Enhancing). Slight image creation refers to minor attempts at faking to create a good image, such as over stating job relevant experiences. On the other hand, extensive image creation refers to more extreme faking, such as fabricating experiences or certifications. Image protection refers to more defensive tactics, such as excluding negative job experiences. Finally, deceptive ingratiation refers to the attempt of increasing likability, such as dishonestly agreeing with the interviewer's opinion.

As discussed previously, detection of in-person interview faking is inaccurate at best. Therefore, alternative methods are needed to detect faking once the interview is underway. For example, researchers have begun to pull deterrence strategies from the parallel research area of faking on personality tests. Law, Bourdage, and O'Neill (2016) used a moral warning, involving the appeal to ethical values, to deter the use of faking techniques. They found that the warning reduced both the perceived capacity to fake, as well as the subsequent use of faking behaviors with no adverse applicant reactions to the use of the warning.

While it has not yet been applied in an employee selection interview context, researchers have been evaluating the linguistic cues to deception in written communication. These cues could be used in a computer mediated interview process in order to detect interview faking.

Computerized Text Analysis

Modern text analysis can be traced back to the early days of psychology with the work of Freud (1901), who wrote about "slips of the tongue" where a person's hidden intentions and thoughts are revealed through their linguistic mistake. From there, projective tests were created as a way to detect people's thought and intentions. For example, the Thematic Apperception Test (Murray, 1943) found that the stories told by individuals could provide clues to their need for things such as affiliation and achievement. The General Inquirer, developed by Philip Stone and his colleagues was the first general purpose computerized text analysis program in psychology (Tausczik & Pennebaker, 2010). This program used a mainframe computer that adapted McClelland's need-based coding schemes to any open-ended text.

More recently, a computer program named the Linguistic Inquiry and Word Count (LIWC) was developed by Pennebaker, Booth, and Francis (2007) and is commonly used in linguistics research. The LIWC is a text analysis computer program that is able to categorize and quantify language use via 80 different linguistic categories. This is accomplished by counting the frequency of words in a given category and then outputting the percentage of hits associated with the given dictionary (Donohue, Liang, & Druckman, 2014). The two main components of the LIWC program are the processing component and the dictionaries.

The processing component is the program itself, which opens and analyzes text files word by word and compared it with the dictionary file (Tausczik & Pennebaker, 2010). For Example, if LIWC were to analyze the sentence "It was cold and rainy yesterday" it would first look at the

work “it” and see if it exists in any dictionary. “It” would be coded as a function word, pronoun, and impersonal pronoun, and then the program would move on to the word “was”. This process would continue until the entire text has been coded. Then, LIWC produce an output that outlines the percentage that each category was used within the given text. Computerized word count programs are typically blind to the context of the words but have been shown reliable results in the fields of personality, social, and clinical psychology (Newman, Pennebaker, Berry, & Richards, 2003).

The second component of LIWC are the dictionaries. For LIWC, “a dictionary refers to the collection of words that define a particular category” (Tausczik & Pennebaker, 2010). These 80 linguistic categories include standard language categories (e.g. articles, prepositions, and pronouns), psychological processes (such as emotion, cognitive, and social), time orientations (i.e. past, present, or future focused), and many more. While some of these categories are straightforward, such as “I” being a pronoun, others are more subjective. For categories that are more subjective, such as emotion words, an initial selection of words was gleaned from dictionaries, thesauruses, questionnaires, and lists. A group of three judges then independently rated the appropriateness of each word to the overall category (Tausczik & Pennebaker, 2010). A word must have been agreed upon by two out of three judges in order to remain in the category, and then the entire process was then repeated by another set of judges. Many revisions and updates have been made (see Pennebaker, Chung, Ireland, Gonzales, and Booth, 2007), and a validation of the lexicon contained in its dictionary has been performed through the comparison of human ratings of written texts to ratings obtain through using the LIWC program (Almela, Valencia-Garcia, & Cantos, 2013).

Detection of Deception in Text

While the LIWC program has traditionally been used to predict various outcome measures such as personality (Pennebaker & King, 1999) and psychological adjustment (Rude, Gortner, & Pennebaker, 2001), research has begun to identify several features of linguistic style, such as pronoun use and frequency, that are associated with deception in computer mediated communication (CMC, e.g. chat, email, instant messaging). Studies on deception in CMC assume that deception leaves a linguistic footprint because language production is a subconscious process, and because of the cognitive demands associated with deceptions that may cause performance deficits in other areas (Keila & Skillicorn, 2005). Because of this, various features of text may be linked to conscious deception. This may pave the way for automation of lie detection by computers, which would be valuable as meta-analytic findings indicate that human judges are only slightly better than chance at detecting lies (Bond & DePaulo, 2006).

The analysis of cues that distinguish truthful and deceptive messages in CMC used in an employee selection context can help guide future efforts to build profiles and algorithms for automatic deception detection. Extant literature in communication, criminology, psychology, and forensic science has begun to identify text-based cues to deception that may apply to CMC (see; Porter & Yuille, 1996; Vrij, 2000). Text-based cues that can be operationalized with general linguistic knowledge, as oppose to interpretation on the basis of a specific event, are called linguistic-based cues (LBC; Zhou, Burgoon, & Nunamaker, 2004).

A common approach when selecting LBC is to group the chosen features (i.e. specified criteria) into seven themes: quantity, complexity, non-immediacy, expressiveness, diversity, informality, and specificity (Adkins, Burgoon, & Nunamaker, 2004). These can be used for speech act profiling, which is a method of analyzing conversation in regard to how individuals

go about conversing rather than what they talked about (Twitchell, & Nunamaker, 2004). The focus on the structure and word usage, as opposed to the meaning behind conversations helps to alleviate the need for intelligent analysis of context. While context is certainly important and could aid in the identification of themes of deception, the Natural Language Processing field of computer science is still in its infancy. However, great stride are currently being made to advance this field. Thus, it is pertinent to examine the impact of structure and word usage for research purposes until it is practical to implement an addition focus on context.

Deception in text is defined as the active communication of information and messages with the intent to create a false conclusion (Buller & Burgoon, 1996). The majority of studies on deception in computer-mediated communication have focused on media rich communication channels. Media richness theory (Daft & Lengel, 1986) asserts that communication media vary in their amount of inherent richness, with FtF being the richest medium of communication because of the verbal (the words used), nonverbal (facial expressions, physical movements, etc.), and para-verbal (vocal tone, etc.) cues available. A text-based computer mediated interview, on the other hand would be reduced in richness because there are no longer nonverbal or para-verbal cues available. The richness of media is measured by the amount of information, meaning, and emotion it is able to transmit (Daft & Lengel, 1986). Due to the nature of computer mediated communication, is it less rich because is an inability to transfer identifiable nonverbal cues into textual situations (Zhou, Twitchell, Qin, Burgoon, & Nunamaker, 2003).

However, Zhou and colleagues (2002) posit that, based on Channel Expansion Theory, individuals with more experience with the computer mediated communication will find it more rich, and will therefore be more likely to transmit more deception cues. In other words, if users perceive the media as being able to convey richer information that it actually does, they may use

the media in such a way that mimics the use of more rich media systems. Channel expansion theory extends media richness theory to incorporate the experience the senders or receivers have with the media (Carlson & Zmud, 1999). In other words, the more experience with computer-mediated communication, the richer they will find the media, and thus the more deception cues they will transmit. Patterns of linguistic deception may be unknowingly transmitted by the deceiver with more familiarity with the media in much the same was as deceptive cues occur in FtF situations (Zhou et al., 2003).

Hypothesis 1: Among fakers, individuals with more experience using text-based computer mediated communication will display more deception cues.

Previous Work on Deception in Text

A number of different studies have evaluated what linguistic cues can delineate deception in text accrued through computer mediated communication. While they all share the common thread of text analysis, each study is unique in the tasks used and how deception is assigned and implemented. Examining how these studies defined, assigned, and measured deception can help increase our understanding of how their findings may (or may not) transfer to an employee selection interview context.

Burgoon, Blair, Qin, & Nunamaker, 2003

In this study, 41 participants were randomly assigned to be "thieves" (i.e. deceivers), "innocents" (i.e. truth tellers), or an interviewer. The thieves were informed they had stolen a wallet that was left in the classroom and innocents were just informed that a wallet had been stolen on a specific day. Interviewers were tasked with interviewing the other participants and attempting to detect whether they were telling the truth or lying. Interviewers were trained to used investigative interviewing techniques. Motivation to participate was increased by offering a

$10 incentive to interviewers who could successfully detect whether they were telling the truth or lying, and $10 to interviewees if they could successfully convince the interview that they were innocent. Interviewees were interviewed under one of three modalities: face-to-face, text chat, or audioconferencing. Interviews were then transcribed for linguistic analysis.

Burgoon and colleagues found that deceivers said and wrote less, had significantly fewer long sentences, less complex sentences, and a lower Flesch-Kincaid grade level than truth tellers. They also found that in general, participants spoke more than they wrote, but message complexity did not appear different between the text and audio modalities. Many of their tested cues were not significant due to the small sample size.

Newman, Pennebaker, Berry, & Richards, 2003

This paper outlines five studies. In study one 101 participants were videotaped explaining their true opinion regarding abortion and to explain their reasons for favoring that position. They were then asked to state that they agreed with the opposite point of view from their own and discuss their reasons for agreeing with that opinion. In study two, 44 participants were asked to type both a truthful and deceptive communication concerning their views on abortion. In study three, 55 participants were asked to handwrite a truthful and deceptive description of their position on the issue of abortion. In study 4, 27 participants were asked to provide true and false descriptions of people whom they truly like and dislike. In study 5, 60 participants were asked to sit alone in a small cluttered room for a few minutes. Half were asked to look around the room and half were told to specifically look inside a book for a dollar bill and "steal it". Participants in both conditions were told to deny taking any money when asked by the "interrogator".

Newman and colleagues found that LIWC was able to correctly classify liars and truth tellers at a rate of 67%. Additionally, they found that liars showed lower cognitive complexity,

used less self and other references, used fewer exclusive words, used more motion verbs, and used more negative emotion words as compared to truth tellers.

Zhou, Burgoon, & Nunamaker, Twitchell, 2004

In this study, 60 participants were assigned to one of two roles (sender, receiver) in one of the two conditions (deception, truth) and communicate through email to perform the task for three consecutive days under the same condition. They were tasked with a modified version of the Desert Survival Problem (Lafferty & Eady, 1974). They were presented with the scenario that their jeep had crashed in the desert and their primary goal was to achieve a consensus ranking of 12 items they should salvage in terms of their usefulness for their survival. Deceptive senders were given instructions on deceiving their partners, and truthful senders were instructed to offer their true opinion. On the second day, participants were given an additional scenario in which one item was removed from consideration (e.g. a tarp flew away in a storm). This was done to elicit more interactions between the dyads.

Zhou and colleagues found that deceivers used a higher quantity of words, verbs, noun phrases, and sentences. Their messages were also more expressive (e.g. more negative affect) and appeared more informal (e.g. typographical errors). Deceivers also showed more uncertainty in the form of modifiers and verbs. Moreover, their messages were less complex as expressed through less punctuation.

Lee, Welker, & Odem, 2009

In study one, 514 participants were given a scenario in which a vice president is attempting to verify the value of various property listings, and to do so asks the property manager to provide a description of the buildings that is useful in assessing their condition and value. They are told the property listings are a sham and the buildings do not actually exist, and

so the property manager needs to lie to the vice president. After reading the scenario participants took a survey in which they indicated what the property manager should avoid including in his email to the vice president in order to protect the lie from discovery. In other words, what features are deception conveying and therefore should be left out of the email.

They found that participants indicated that deception is associated with substandard informational (irrelevancies, insufficiency) and presentational (disorganization, no illustrative examples, certainty, qualifications, and writing errors) characteristics.

In study two, 319 participants were presented with a similar scenario as study one and then asked to assess which features, when included in the email, would increase the property managers perception of being a truth teller. They found that eight features (organized presentation, absence of writing error, expressions of certainty, many qualifications, positive tone, wordiness, excessive information, and numerous illustrative examples) convey the impression of telling the truth.

In study three, 60 dyads were assigned in order to test whether deceivers had the propensity to include the different features found in studies one and two. One participant asked auditing-related questions and one participant answered questions either truthfully or falsely. Responders had incentives to construct messages that would be accepted as truth and questioners had incentives to detect deception. All communication was done through email.

Lee and colleagues found that deceivers messages contained more causation words, first-person pronouns, present-tense verbs, and tenacity verbs. These indicate that deceivers' messages contain more indications of the certainty feature than truth tellers' messages.

Derrick, Meservy, Jenkins, Burgoon, & Nunamaker, 2013

In this study, 180 participants interacted with a custom chatbot that asked varying types of questions on categories such as feeling, personal introspection, moral dilemmas, attitudes, and future actions. Participants were informed that the purpose of the study was to understand deception in chat-based communication. The chat system asked a serious of questions and the participants were instructed to be deceitful or truthful when prompted by the system.

Derrick and colleagues found that deceptive responses take longer to create, required more editing, and used less words than honest responses. Contrary to past literature, they found that there was no difference in the lexical diversity of honest and deceptive responses.

Zhou, Twitchell, Qin, Burgoon, & Nunamaker, 2003

In this study, 30 dyads were assigned to either a honest or deception condition to complete the Desert Survival Problem. Participants were informed the study was concerned with understanding how people make decisions over email. In the deception condition, one participant in each dyad was instructed to deceive their partner by lying about how they believe the items should be ranked. On the morning of day three, the dyads were given a scenario which rendered one item useless in order to stimulate more conversation.

Zhou and colleagues found that deceptive senders used more words, verbs, noun phrases, and displayed less lexical and content diversity than truthful senders. No significant effects of condition were found on complexity, non-immediacy, specificity, or expressiveness.

Hancock, Curry, Goorha, & Woodworth, 2005

In this study, 66 participants were told they would be having a conversation with an unknown partner about five topics, which were provided to the participants on a sheet of paper. One of the two participants in each dyad was randomly assigned the role of sender and the other

was assigned the role of receiver. Senders were asked to deceive their partners on two of the topics (denoted by an asterisk on the sheet of paper with the topics). Participants communicated in a text-based computer-mediated setting on isolated computer terminals.

Hancock and colleagues found that both senders and receivers used more words in the deceptive condition. Additionally, they found that senders used less first-person pronouns and more second and third person pronouns when lying. Senders also used more sense based descriptions when lying.

Zhou & Sung, 2008

In this study, participants participated in the Mafia game (Braverman, Otesami, & Mossel, 2006). In this scenario, participants interact with each other through online chat rooms. Participants were randomly assigned one of three roles: mafia (who deceived by denying membership in the mafia and/or incriminated others), villagers (told the truth), or policeman (detected suspects to identify mafia players). Each game consisted of a daytime stage where all players discussed in an open chatroom and cast votes to decide which players were in the mafia. If a player received a majority of the votes they were eliminated from the game. During the night stage, the mafia cast vote in a private chatroom to eliminate one village member, and then the policeman chose one suspect they thought was in the mafia. The game continued until all villagers had been eliminated or until the mafia member was eliminated.

Zhou and Sung found that deceivers sent significantly less messages, used fewer words, used longer words, showed higher lexical diversity, showed higher content diversity, and used more third-person references than truth-tellers. However, there was no significant difference in the usage of self-references between the deceivers and truth tellers.

Mihalcea & Strapparava, 2009

In this study, 100 participants were asked to imagine they were taking part in a debate and had 10-15 minutes to express their opinion about three topics (abortion, the death penalty, and their best friend). Participants were asked to prepare a brief speech expressing their true opinion and a second speech expressing the opposite of their opinion for each of the topics.

Mihalcea and Strapparava found that deceptive text included more references to others and certainty while truthful text included more self-references and optimistic words.

Almela, Valencia-Garcia, & Cantos, 2012

In this study, 100 participants were asked to imagine they were in a debate and write a speech in favor of their opinion and in favor of the opposing opinion about three topics (homosexual adoption, bullfighting, their best friend). They were asked for at least 5 sentences and as many details as possible. Almela and colleagues found that deceptive text contains more certainty related words and more negative words while truthful text included more belief-oriented words such as “think”.

Many of the previously mentioned studies share many similarities in their approach to assigning deception and their research findings. For example, many of the studies used either the approach of assigning deception in a game format (e.g. desert survival game) or by having individual argue both sides of a highly debated topic. Although these approaches accomplish the end goal of instigating deception in text, they do not inherently transfer to an employment interview context as the motives and reasons for deception in these contexts are different. While the desire of the deceiving participant to persuade others to believe their stories may transfer to a selection context, the stories themselves are very different. In the previously used approaches, the deceivers were driven to sway others to accept their point of view or to believe their innocence. However, deceivers in an interview context will be driven to convince others that

they are the best applicant for the job. Therefore, convincing others of your innocence and convincing others of your qualifications may result in very different approaches to deception. Thus, examination of how the linguistic-based cues to deception may differ in an employment selection context is warranted. This study will further the current understanding of linguistic based cues (LBCs) to deception by evaluating how they may transfer and/or differ in an employee selection context. Further, this study will evaluate if LBCs to deception can be mapped onto Levashina and Campion's (2007) model of deception in interviews.

Features of Deception in Text

Ekman and colleagues (1991) described "leakage cues" as the non-verbal signals to deception in FtF situations that result from the cognitive load and emotions experienced during lying. These cues manifest in a number of different ways, including facial expressions, body movements, and vocal tones. These physical indicators are not available during computer mediated communication (CMC); however, extant research has begun to identify the typological equivalent. Research in this area in grounded in interpersonal deception theory (IDT). IDT posits that individuals who are deceiving others will not only display strategic adjustments of their behavior in response to suspicions but will also display inadvertent behavior leakages cues that indicate that deception is occurring (Buller & Blair, 1996). While IDT was based on FtF deception, it does not focus solely on physiological or nonverbal cues, and thus it is applicable to CMC.

Using IDT as a guiding framework, research has begun to identify common leakage cues that occur in deceptive text-based communication. While a uniform categorization scheme for identified LBCs does not exist in the current literature, many researchers have begun to advance various classification schemes (see Fuller, Biros, Twitchell, Burgoon, & Adkins, 2006; Zhou,

Burgoon, Twitchell, Qin, & Nunamaker, 2004; Zhou, Burgoon, & Nunamaker, 2004). For example, Zhou, Burgoon, and Nunamaker (2004) outlines these cues as quality, quantity, clarity, relevance, depersonalism, and image-protecting behavior.

Quality refers to the deceiver opting to deviate partially or fully from the truth. Partial truths may be deceptive via the inclusion of qualifier adverbs and adjectives. Quantity refers to the deceiver being more reticent and less forthcoming, which may result in fewer words and reduced content and lexical diversity. Clarity refers to the deceiver's messages being less clear through the use of ambiguous language. Relevance refers to the deceiver giving semantically indirect or irrelevant responses. Depersonalism refers to the deceiver's use of language that distances themselves from their message. This non-immediate language includes a lack of pronouns and the use of a passive voice. Finally, image protecting behavior refers to behaviors used to make oneself appear sincere. This may include avoidance of discrediting information.

Table 1 is adapted from these proposed classification schemes (Fuller, Biros, Twitchell, Burgoon, & Adkins, 2006; Zhou, Burgoon, Twitchell, Qin, & Nunamaker, 2004; Zhou, Burgoon, & Nunamaker, 2004) and incorporates the findings of Derrick, Meservy, Jenkins, Burgoon, and Nunamaker (2013), which investigated nonverbal cues as well as verbal cues. The classification scheme used for this paper will include quantity, complexity, uncertainty, personalization, diversity, informality, and specificity. Discussion around deception hypotheses and results will be structured using these themes.

Table 1. Predicted Linguistic Cues to General Interview Faking

Category	Feature	Measurement	Honest	Faking
Quantity	Word Count	Total # of words	†	†
	Sentence Count	Total # of sentences	*	
Complexity	Avg. Sentence Length	Total # of words / Total # of sentences	*	
	Avg. Word Length	Total # of characters / Total number of words	*	
	Pausality	Total # of punctuation marks / Total # of sentences	*	
Uncertainty	Number of Edits	Total # of times backspaced		*
Personalization	Self-Reference	Total # first person singular pronoun	**	**
Diversity	Lexical Diversity	Total # of different words / Total # of words	*	
Informality	Typographical Errors	Total # of misspelled words /Total # of words		*
Specificity	negations	Total # negations	*	
	Exclusive words	Total # of exclusive words	*	

Note. *denotes more ** denotes no significant difference between groups †denotes question type specific

Quantity

In contrast to what is expected according to IDT during FtF deception, deceivers in CMC have been shown to use more words (Zhou, Burgoon, Nunamaker, & Twitchell, 2004). Yet, deceivers were shown to use less words in messages when answering benign questions or participating in a mock theft investigation (Burgoon et al., 2003; Derrick et al., 2013). This suggest that deception behavior might be context dependent, where not all identified cues will transfer to all contexts. Further, Hancock and colleagues (2005) suggest that deceivers may use fewer words in interrogative context in which it behooves them to do so, and more words in conversational context in order to provide additional evidence to support their lie. Therefore, it is imperative to consider the context of the CMC when evaluating LBCs of deception.

In the context of an employment interview, fakers (i.e. deceivers) may use fewer words than honest responders, depending of the types of questions being asked. Patterned behavior interview questions require interviews to answer with examples of past work experience. This will require more work on behalf of the faker, as inventing stories requires more cognitive effort than recalling past events (Tausczik and Pennebaker, 2010). Therefore, in contrast to previous research on text-based CMC which found that deceivers use more words than honest responders, fakers in an interview that used patterned behavior questions will use fewer words than honest responders will. This may be because of the cognitive effort required to create a fictional response about a previous (non-existent) experience, as well as the limited amount of time in which they have to do so because of the quick back-and-forth nature of CMC. It follows that individuals who use more words in general in conversations are also likely to use more sentences.

However, if a situational type interview questions are used deceivers may use more words and more sentences than honest responders may. This could be because situational questions allow interviewees to respond with hypothetical actions they would take. They are not trying to actively create a fictional narrative of a past behavior and are instead trying to persuade the interviewer that these are the actions they would take in that specific situation. Therefore, faker's linguistic patterns would be more similar to those found in previous studies where deceivers were attempting to persuade their partner used more words than honest responders did. Therefore, I hypothesize that:

Hypothesis 2: When patterned behavior questions are used, those in the faking condition will use fewer (a) words and (b) sentences than those in the honest condition.

Hypothesis 3: When situational questions are used, fakers will use more (a) words and (b) sentences than honest responders.

However, these patterns may not hold true for fakers who tell "half-truths" as opposed to complete fabrications in patterned behavior questions. Since they are only partially altering an existing recalled event, this may require less cognitive effort than a complete fabrication. Because of this, it is possible that fakers who tell partial lies may use more words than fakers who use complete fabrications. No research, to my knowledge, has examined this relationship. Thus, the current study will examine whether there is any difference in word count of fakers who tell complete vs. partial lies.

Research Question 1: Do those in the faking condition who tell partial lies use more, less, or an equal amount of words as compared to fakers who tell complete fabrications?

Complexity

Extant research has found that in CMC, deceiver's messages are less complex at both a content and lexical levels. Tausczik and Pennebaker (2010) argue the decrease in complexity is a result of the cognitive load that is required to maintain a story that is contrary to experience combined with the effort taken to try to convince someone else that something false is true. For example, Zhou, Burgoon, Nunamaker, and Twitchell (2004) found that deceivers were lower on pausality (i.e. punctuation marks), and Burgoon, Blair, Qin, and Nunamaker (2003) found that deceivers had significantly fewer long sentences and a lower flesh-Kincaid grade level (i.e. less complex vocabulary). Therefore, it follows that we can expect fakers in a CMC interview to use less punctuation, have shorter sentences, and use less complex vocabulary.

Hypothesis 4: Those in the faking condition will use (a) less punctuation, (b) less complex vocabulary, and (c) shorter sentences.

Uncertainty

Concerning the cue classification category of uncertainty, research has found that deception is positively correlated with the number of edits one makes when typing (Derrick, Meservy, Jenkins, Burgoon, & Nunamaker, 2013). This may be because the increase in cognitive load and stress that occurs during deception impairs the functioning of the prefrontal cortex of the brain. In turn, this would increase the difficulty of composing and communicating a chat-based response and thus result in more edits made. In other words, the act of deceiving someone is a stressful event that increases the difficulty in composing written communication, which will result in more errors made that will need to be corrected through the use of backspacing and retyping.

Hypothesis 5: Those in the faking condition will make more edits than honest responders.

In addition to making more edits, dishonest responders have also been found to use less self-referencing pronouns and more other referencing pronouns (DePaulo et al., 2003; Newman, Pennebaker, Berry, & Richards, 2003; Zhou et al., 2004). This suggests that deceivers attempt to distance themselves from their deception by using language that focuses more on others than on themselves. These actions reduce the deceiver's accountability for the content in their messages (Zhou & Sung, 2008). This has been referred to as verbal immediacy, which is defined as "any indication through lexical choices, syntax, and phraseology of separation, non-identity, attenuation of directness, or change in the intensity of interaction between the communicator and his referents" (Zhou, Burgoon, & Nunamaker, 2004, pg. 87).

Personalization

However, these findings may not transfer to the context of the employment interview, as patterned behavior and situational interview questions force the respondents to talk about themselves as they focus on the past behaviors or the predicted future behaviors of the interviewee. For example, a typical patterned behavior interview question my ask the interviewee to "tell me about a time when *you* made mistake at work". This type of question will force the responders to refer to themselves. Therefore, it is reasonable to expect both honest and dishonest interviewees to use similar amounts of first person pronouns.

Hypothesis 6: There will be no significant difference in the number of first-person pronouns used by participants in the two conditions.

Diversity

Lexical diversity is another category in which deceivers have been found to significantly differ from honest responders (see Burgoon, et al., 2003; Hancock, Curry, Goorha, & Woodworth, 2005; Zhou et al., 2004). Lexical diversity refers to the ratio of the total number of

unique/distinct words to the total number of words used in a CMC. Deceivers have been found to have less lexical diversity than honest responders (Burgoon et al., 2003). This may occur because of the cognitive complexity associated with the act of deceiving. Derrick and colleagues (2013) argue that the increase in cognitive load that occurs when lying, and the subsequent deactivation of the prefrontal cortex, decreased the lexical diversity found in messages. This impairment of the prefrontal cortex makes the cognitively intensive task of language generation more difficult. Similarly, Zhou and Zenebe (2008) suggest that the lower lexical diversity found in the messages of deceivers is a result of the high cognitive load, arousal, and stress associated with deception.

However, while Zhou and Zenebe found the expected relationship between lexical diversity and deception, Derrick et al. did not. These opposing findings may be due to the differences in the contexts of the tasks given to participants. In Zhou and Zenebe's study, participants engaged in prolonged discussion, while participants in Derrick and colleague's study engaged in a shorter question and answer format. While interviews are conducted in a question and answer format, the expected responses should be longer than those typical from the questions answered in Derrick's study (ex. "What do you plan to do on your next vacation?"). Additionally, probing questions will be asked to ensure fuller responses.

Hypothesis 7: Those in the faking condition will have a lower level of lexical diversity ratios than honest responders.

Informality

In addition to lower lexical diversity, Zhou and colleagues (2004) found that deceivers produced more typographical errors. This may also be attributed to the cognitive impairment created by the stress of deceiving. However, in an employee selection context, interviewees may be more vigilant to correct these errors in order to present themselves as an intelligent and

qualified applicant. Therefore, we will explore whether Zhou's findings generalize to an employment interview context. The LIWC system dictionary includes within their "Informal Language" category the dictionary for "netspeak" (i.e. informal language typically used on the internet such as "thx" to mean "thank you"). Zhou and colleagues did not specify if the typographical errors in their study were true misspellings or if they also counted netspeak. Therefore, it is possible that the informal language typically used on the internet may also be related to deception. While netspeak would not normally be expected in a selection context, the introduction of CMC may insight these language use changes.

Research Question 2: Do fakers produce more typographical errors than honest responders?

Research Question 3: Do fakers use more netspeak than honest responders?

Specificity

Newman et al. (2003) found that liars decrease their use of exclusive words and negation terms during deceptive conversations. Exclusive words such as "but" and "without", and negations such as "never" and "not" require deceivers to increase the specificity of their message (Hancock, Curry, Goorha, & Woodsworth, 2008). Linguistically speaking, they require the individual to define what is and what is not in a particular category. It is a cognitively complex task to invent these categorical specifics. Thus, it is assumed that this comes easier for truth-tellers, which leads them to use more of these terms in communication. These findings should transfer to the interview context, as it will be less cognitively taxing for an interviewee to recount categories associated with a previous event than to create and describe categories for an event that never happened.

Hypothesis 8: Those in the faking condition will use fewer exclusive words and negations as compared to those in the honest condition.

Mapping Linguistics Cues to Levashina and Campion's Model of Interview Faking

While the previously discussed hypotheses help to distinguish the linguistic differences between fakers and honest respondents in general, it is also possible that there are differences in cue used among fakers depending on the deception strategy they are implementing. The interview specific faking typology endorsed by Levashina and Campion (2007) distinguished four different strategies used by fakers in an interview context: slight image creation, extensive image creation, image protection, and ingratiation. As the current study does not allow for ingratiation (i.e. an attempt to gain favor with the interviewer through tactics such as complimenting and opinion conforming) because of the limited capabilities of the interviewing robot, we will focus on the remaining three strategies.

Interview Faking Strategies

Slight image creation is used when a candidate attempts to make themselves appear as the image of a good candidate through embellishing, tailoring, and fit enhancing. When a candidate embellishes, they are overstating their answers beyond a reasonable description of the truth. In other words, their answers contain some truth, but have been exaggerated in order to create an image of a good job candidate. Tailor refers to the modification of one's responses in order to fit the job. For example, if the candidate believes the job will require someone who has good communication skills, they may falsely adapt their response to highlight this trait. Fit enhancing is used to create the impression that they will fit in with the organization or job in terms of their values, beliefs, or attitudes. For example, a candidate will alter their response to emphasize honesty if they believe that is something the organization values.

Extensive image creation is used by a candidate to completely invent an image of themselves being a good candidate. According to Levashina and Campion, extensive image creation is accomplished through the use of constructing, inventing, and borrowing. Constructing is utilized through building stories through combining or arranging work experiences to provide better answers. When using this approach, the faker is coalescing a variety of stories to create one cohesive story that fully answers the question. When a faker uses the inventing approach, they are creating responses that are complete fabrications. Borrowing, on the other hand, is to create responses that used the experiences or accomplishments of others as your own.

The last strategy is image protection, in which a faker will defend an image of himself or herself being a good candidate for the position. This occurs through the use of omitting, masking, and distancing. Omitting refers to deliberately not mentioning something in order to provide a better answer. For example, a candidate may describe a past work experience in which they solved a problem but not mention that they had help in order to make it look like they are an excellent problem solver without the help of others. Masking is when one conceals or hides an aspect of their background to create a better answer. For example, one might not mention why they were fired from a previous job in order to appear to be a better candidate. Distancing is when one attempts to improve their answer through separating themselves from a negative event. For example, they might try to convince the interviewer that a previous mistake was made because of factors that were outside of their control.

Slight Image Creation

Extant research shows that honest responders use more personal pronouns than deceivers (Zhou et al., 2004). This is because deceivers will attempt to depersonalize their response as a distancing mechanism that will reduce the deceiver's accountability for the content of their

deceptive message (Zhou & Sung, 2008). In addition to this general difference between fakers and honest responder, there may also be differences in self-referencing pronoun use among fakers who employ different strategies.

More specifically, fakers who use a slight image creation strategy make use more 1st person pronouns than those who use extensive image creation or image protection strategies because their responses will have a basis of truth with slight embellishments, and thus will be more similar to an honest response than a complete fabrication. Additionally, fakers who employ a slight image creation strategy may have a larger average word length and more lexical diversity than those who employ don't because the majority of their response will be an honest description of a previous experience. This aligns with previous finding of increased lexical diversity and word length of honest responders (Tausczik & Pennebaker, 2010). In sum, fakers who utilize a slight image creation strategy will have linguistic cue pattern that align more closely with honest responders than fakers who use an extensive image creation or image protection strategy.

> *Hypothesis 9:* Among those in the faking condition, those who use more of a slight image creation strategy will use (a) more first-person pronouns, (b) more lexically diverse words, and (c) longer words.

Extensive Image Creation

While many studies have found that deceivers use less words than honest responders do (Burgoon, Blair, Qin & Nunamaker; Derrick, Meservy, Jenkins, Burgoon, & Nunamaker, 2013; Zhou & Sung, 2008), Zhou and colleagues (2004) found that deceivers in their study used more words than honest responders when the task involved persuasion. Since the use of extensive image creation involves the complete fabrication of responses, fakers using this strategy will likely be attempting to persuade the interviewer that their answer is true. This will result in more

words than the other faking strategies. Additionally, these persuasion attempts may include more justification and evidence in order to provide more reasons to believe they are the truth (Zhou et al., 2004). Because of this, more causation words such as "because" can be expected. Because responses using this method are fabricated, it is conceivable that they will also be coupled with a longer response time and more edits as the fakers created their response. This is because the event they are describing never occurred, so they do not have a memory to draw from. Thus, the creation of story is a cognitively demanding task that will require more time than recounting a previous experience. Additionally, since there is no existing memory the fakers are drawing from, they may change their mind about the inclusion of certain details as they flesh out their response, which will result in more edits made.

> *Hypothesis 10:* Among those in the faking condition, those who use more of an extensive image creation strategy will (a) use more words, (b) make more edits, (c) have a longer response time interval, and (d) use more causation words.

Image Protection

Fakers who use an image protection strategy will be attempting to distance themselves from a negative event or image. As such, it is reasonable to presume they will use less first-person pronouns and more third person pronouns than fakers utilizing one of the other strategies will. This suggests that fakers using an image protection strategy will attempt to distance themselves from their deception by using language that focuses more on others than on themselves. These actions reduce the faker's accountability for the content in their messages (Zhou & Sung, 2008). The use of more third person pronouns will take the focus off themselves in order to further distance themselves from the negative event or situation. Additionally, it can be expected that fakers using an image protection strategy will use the least amount of words

among fakers, as they will be trying to conceal facts or avoid revealing information. By using less words, they will be divulging less information, which lessons the chance of them unintentionally revealing what they are trying to hide or avoid talking about. In this respect, they are similar to liars who attempt to avoid contradiction, which have been found to use less words (Zhou et al., 2004). Because they are using fewer words, it follows that fewer sentences should be expected. Fakers using an image protection strategy are trying to conceal or omit a negative event; as such, they may be less likely to use causation words that require them to increase specificity. Increased specificity will be avoided by those using an image protection strategy because they are purposefully avoiding talking about certain details or events.

Table 2. Predicted Linguistics Cues of Faking Styles

Faking Strategy	**Feature**	**Direction**
Slight Image Creation	1st person pronoun	↑
	Lexical diversity	↑
	Word length	↑
Extensive Image Creation	# of words	↑
	# of edits	↑
	Response time	↑
	# of causation words	↑
	3rd person pronouns	↑

Image Protection	# of words	↓
	# of sentences	↓
	# of causation words	↓

Hypothesis 11: Among those in the faking condition, those who use more of an image protection strategy will (a) more third person pronouns, (b) fewer words, (c) fewer sentences, and (d) fewer causation words.

Method

Participants

Participants (n=525) were recruited through Amazon's Mechanical Turk (MTurk), an online, crowdsourced survey platform where individuals can complete research tasks for compensation. Participants were required to live in the United States, be 18 years of age or older, and currently employed. After removing participants who incorrectly answer the attention check questions inserted in the survey, the total number of remaining participants was 501. Participants participated in either an honest (n=201) or a faking condition (n=300). Participants' ages ranged from 20 to 73 with a mean age of 38, with 53.2% being female.

Procedure

MTurk users are able to scroll through research opportunities on the mechanical turk website and participate in studies they are eligible for. The current study consists of an online chat-based interview with Juji's online intelligent virtual interviewer and a subsequent survey created and hosted Qualtrics. On MTurk, the first page of the survey informed participants of the purpose, expected response time, and compensation to be paid to their Amazon account after completing the survey. Eligible participants were required to pass two prescreen questions.

Respondents will be required to be over 18 years of age and reside in the United States. There were two separate studies hosted on MTurk, an honest responding and an instructed faking version. After passing the prescreening questions, they were shown a page with the following instructions for the honest responding study.

> This study consists of **two separate parts**: a chat-based mock employment interview and a follow-up questionnaire. We ask that you imagine you are applying for a retail store manager position at a large fortune 500 company. **Please respond as honestly as possible** during both the chat and the survey portion of this study.
>
> NOTE: the chat and survey portion will be hosted on separate websites, please keep each portion of the study open on separate windows or tabs until you have completed all portions. **At the end of the survey you will be given a unique code that you will be required to enter on the MTurk website in order to receive payment for your participation.**
>
> 1. Please use this link [insert hyperlink here] to be directed to the online chat-based interviewing system
> 2. At the end of the interview, you will be given a link to a short Qualtrics survey.
>   a. Please copy and paste this link into a new tab your internet browser to take the survey.
> 3. At the end of the survey you will be provided a unique code that you must copy and paste into MTurk to receive payment for your participation.

Once on Juji's website, participants interacted with their online intelligent virtual interviewer for approximately 35 minutes. During this time they were asked a specified set of interview questions, with additional predefined probing questions if their original responses did not meet the minimum text requirement. At the end of the interview, they were given a link to the Qualtrics survey. The Qualtrics survey consisted of demographic questions and the modified interview faking questionnaire. At the end of the survey they were provided a unique study code to paste into MTurk in the blank provided. This enabled the researcher to compensate the participants for their participation.

In the instructed faking condition, participants were shown this message on MTurk:

> This study consists of **two separate parts**: a chat-based mock employment interview and a follow-up questionnaire. We ask that you imagine you are applying for store manager position at a large fortune 500 company. In the **interview portion please respond in a way that makes you appear to be a perfect candidate for this position.** In the **survey portion, please respond honestly**.
>
> NOTE: the chat and survey portion will be hosted on separate websites, please keep each portion of the study open on separate windows or tabs until you have completed all portions. **At the end of the survey you will be given a unique code that you will be required to enter on the MTurk website in order to receive payment for your participation.**

1. Please use this link [insert hyperlink here] to be directed to the online chat-based interviewing system
2. At the end of the interview, you will be given a link to a short Qualtrics survey.
    a. Please copy and paste this link into a new tab in your internet browser to take the survey.
3. At the end of the survey you will be provided a unique code that you must copy and paste into MTurk to receive payment for your participation.

In addition to the previously described measures on the survey portion for the honest condition, participants in the faking condition were also asked to specify what faking approach they took when responding to each individual question.

Measures

***Slight image creation*.** Slight image creation was measured after the structured chat-based interview using 13 items from Levashina and Campion (2007). Interviewees were asked to report the extent to which they agree with each statement using a 5-point likert type scale) response options range from 1= strongly disagree to 5= strongly agree). An example item is "I used examples of my best performance to answer questions about my everyday performance".

***Extensive image creation*.** Extensive image creation was measured after the structured chat-based interview using 18 items from Levashina and Campion (2007). Interviewees were asked to report the extent to which they agree with each statement using a 5-point likert type scale) response options range from 1= strongly disagree to 5= strongly agree). An example item is "I used other people's experiences to create answers when I did not have good experiences of my own".

***Image Protection*.** Image protection was measured after the structured chat-based interview using 12 items from Levashina and Campion (2007). Interviewees were asked to report the extent to which they agree with each statement using a 5-point likert type scale) response options range from 1= strongly disagree to 5= strongly agree). An example item is "I talked mainly about my strengths to mask my weaknesses".

***Individual question faking behavior*.** How fakers chose to fake to each individual question (slight image creation, extensive image creation, image protection) was measured through a self-report questionnaire. Fakers were shown each question and then asked to select what faking approach they took when answering this question.

***Degree of faking*.** The degree to which the interviewee faked on each interview question was measured by a self-report questionnaire. Interviewees were asked to report whether they "answered completely honestly", "answered mostly honestly/told a partial lie", "answered dishonestly/told a complete lie" for each interview question.

Feature: Word count. Word count was operationalized as the total number of words used. This was measured using the LIWC software.

Feature: Sentence count. Sentence count was operationalized as total number of sentences used. This was measured using the LIWC software.

***Feature: Average sentence length*.** Average sentence length was operationalized as the ratio of the total number of words to the total number of sentences. This was measured using the LIWC software.

***Feature: Average word length*.** Average word length was operationalized as the ratio of total number of characters used to the total number of words used. This was measured using the LIWC software.

Feature: Pausality. Pausality was operationalized as ratio of the total number of punctuation marks used to the total number of sentences. This was measured using the LIWC software.

Feature: Number of edits. The number of edits made was operationalized as the total number of times the backspace function is utilized. This was measured through the chat-based interview system.

Feature: Self-reference. Self-reference was operationalized as the total number of first person pronouns used (singular and plural). This was measured using the LIWC software.

Feature: Other reference. Other reference was operationalized as the total number of second person pronouns used. This was measured using the LIWC software.

Feature: Lexical diversity. Lexical diversity was operationalized as the ratio of the total number of unique words used to the total number of words used. This was measured using the LIWC software.

Feature: Typographical error. Typographical error was operationalized as the ratio of the total number of misspelled words to the total number of words. This was measured using Microsoft Word.

Feature: Netspeak. Netspeak was operationalized as the total number of instances of informal language used. An example of netspeak is “btw” used to mean “between”. This was measured using the LIWC software.

Feature: Negations. Negations was operationalized as the total number of negation terms used. An example of a negation term is “never”. This was measured using the LIWC software.

Feature: Drive for Achievement. The drive for achievement was operationalized as the total number of words associated with achievement. An example of an associated word it "win" or "success". This was measured using the LIWC software.

Feature: Exclusive words. Exclusive words was operationalized as the total number of exclusive words used. An example of an exclusive word is "without". This was measured using the LIWC software.

Feature: Positive/negative affect. Positive/negative affect was operationalized as the total number of positive or negative words used. An example of a positive affective word is "happy", and an example of a negative affective word is "sad". This was measured using the LIWC software.

Results

Linguistic analyses were conducted using the Linguistic Inquiry and Word Count Program (Pennebaker, J. W., Booth, R. J. & Francis, M. E., 2007). This is a text analysis program that calculates, using internal validated dictionaries, the degree to which text samples use various categories of words. Each word in a document is individually assessed by LIWC, and the appropriate scale or scales is used depending on the category being assessed. All interview chat transcripts were converted into individual word documents, and check for grammar, text lingo, and missing sentence punctuation before being run through the program. Additionally, each participants' chat transcripts were further broken down into individual word documents for their responses to situation and past behavior type interview questions and run through the program separately. All statistical analyses were conducted using SPSS 25.

Condition Check

Participants self-selected into either an honest condition or a faking condition by accepting the particular HIT on Mturk. Participants were not allowed to participate in both conditions and were only able to participate once. This was ensured by cross-referencing their Mturk ID. Conditions differed in the instructions given during the chat-based interview portion of the study. Those in the honest condition were asked to respond honestly to the interview questions, while those in the faking condition were asked to respond in a manner they believe an ideal job candidate would respond. The amount and style of faking was measured via a self-report survey after the completion of the chat-based interview. Given a violation of Levene's test for homogeneity of variances, $F(1,500) = 97.37$, $p < .00$, an independent-samples t-test not assuming homogeneous variances was conducted to compare the amount of faking in honest and faking conditions. Participants in the faking condition ($M = 2.71$, $SD = 1.00$) reported a significantly higher level of faking than participants in the honest condition ($M = 1.48$, $SD = .65$), $t(493.94) = 15.50$, $p < .00$; $d = 1.46$. This suggests that the differing instructions were effective in inducing honest or faking responses in the differing conditions.

Hypothesis Testing

Hypothesis 1 predicted that participants in the faking condition, who had more experience using text-based computer mediated communication, would display more deception cues. Results of a correlation analysis showed no significant correlation among fakers in the amount of deception cues displayed as a result of their experience with text-based computer mediated communication. Variables tested were word count, words per sentence, complex vocabulary, personal pronouns, negations, commas, lexical diversity, exclusive words, and pausality. Therefore, hypothesis 1 was not supported.

Quantity

Two independent samples t-tests were conducted to examine hypotheses 2a and 2b, which predicted that those in the faking condition will use few words and fewer sentences than participants in the honest condition when patterned behavior interview questions were used. A one-way MANOVA revealed a significant multivariant main effect for condition, Wilks' λ = .965, F (2,497) = 8.88, p <. 001, partial eta squared = .035. To further examine these results independent samples t-tests were run. Results indicated that there was a significant difference in the number of words used between the two groups, $t(500) = 4.23$, $p < .00$; $d = 0.39$. These results suggest that individuals in the honest group (M = 304.89; SD = 162.06) used less words than individuals in the faking group (M = 373.52; SD = 187.71) when responding to past behavior type questions. Therefore, hypothesis 2a was not supported, as the significant results were in the opposite direction as hypothesized. For hypothesis 2b, given a violation of Levene's test for homogeneity of variances, F(1,500) = 5.12, $p = 0.02$, an independent-samples t-test not assuming homogeneous variances was conducted. Results showed there was no significant difference in the number of sentences used by either group $t(383.74) = 1.08$, p =.28. Hypothesis 2b was also not supported. However, the significant difference in word count paired with no significant difference in the number of sentences suggest that there may be a syntactical difference in sentence structure between the two groups. To test this, further analysis were conduction and showed that participants in the faking condition (M = 2.44, SD = 1.83) used significantly more commas than participants in the honest condition (M = 1.77, SD = 1.59), $t(500) = 4.19$, $p < .00$; d = 0.39. This suggests that while both groups used a similar number of sentences when past behavior questions were used, those in the faking condition used sentences with a more complex structure.

The differences in the number of words and sentences used between instructed fakers and instructed honest responders when situational interview questions, were used were examined in hypothesis 3a and 3b. A one-way MANOVA revealed a significant multivariant main effect for condition, Wilks' λ = .960, *F* (2,495) = 10.36, p <. 001, partial eta squared = .040. To examine these results further, an independent-samples t-test not assuming homogeneous variances was conducted, as a violation of Levene's test for homogeneity of variances occurred, F(1,500) = 12.58, *p* <.00. When situational questions were used, participants in the faking condition used significantly more words (*M* = 239.96, *SD* = 121.65) than those in the honest condition (*M* = 193.72, SD = 105.63), *t*(500) = 4.38, *p* <.00; *d* = 0.88. However, participants in the honest condition used more total sentences (*M* = 6.83, *SD* = 2.23) than those in the faking condition (*M* = 6.25, *SD* = 1.69), *t*(347.56) = 3.17, *p* <.00; *d* = 0.29. Hypothesis 3a was supported but hypothesis 3b was not, as the significant result was opposite of those hypothesized. Further analysis of the differences between the two groups when situational type questions were used showed that those in the faking condition used significantly more words per sentence (*M* = 17.14, *SD* = 4.43, *t*(496) = 2.16; *d* = 0.20) and commas (*M* = 2.35, *SD* = 1.87, *t*(500) = 3.53, *p* <.00; *d* = 0.33) than those in the honest condition (*M* = 16.20, *SD* = 5.19 and M = 1.77, *SD* = 1.87, respectively).

Complexity

Hypotheses 4-8 examined general differences between participants in both the honest and faking conditions without regard to question type (refer to table 3). Hypothesis 4 examined the difference in punctuation, vocabulary, and sentence length between the two groups. A one-way MANOVA revealed a significant multivariant main effect for condition, Wilks' λ = .943, *F* (3,497) = 9.94, p <. 001, partial eta squared = .057. Further analyses were run to examine these

significant results. Hypothesis 4a stated that participants in the faking condition would use less punctuation (i.e. pausality) than participants in the honest condition. Results of an independent samples t-test showed that there was a significant difference in the rate of pausality, with instructed fakers ((M = 1.67, SD = 0.42) having a significantly higher rate than instructed honest responders (M = 1.55, SD = 0.41), $t(499) = 3.16$, $p < .00$; d = 0.29. Thus, hypothesis 4a was not supported as the significant results were in the opposite direction as hypothesized. Similarly, hypotheses 4b and 4c were not supported as the significant results were in the opposite direction as hypothesized. The independent samples t-tests showed fakers used significantly more complex vocabulary (M=17.30, SD = 3.15; $t(499) = 2.00$, $p = .04$; d = 0.19) and longer sentences (M = *16*.99, SD = 4.02, $t(499) = -2.26$, $p = .02$; d = 0.20) than honest responders (M = 16.68, SD = 3.60 and M = 16.15, SD = 4.10, respectively).

Uncertainty

Hypothesis 5 was concerned with the differences between groups of the number of edits made. However, due to technical difficulty of the chat-based interview program, this data was unable to be collected.

Personalization

Hypothesis 6 stated that there would be no significant difference in the number of first-person pronouns used by those in the faking and honest conditions. Surprisingly, there was a small but significant difference in the number of first-person pronouns. Instructed honest responders (M = 8.61, SD = 1.99) used significantly more first-person pronouns than instructed fakers (M = 8.15, SD = 1.75), $t(499) = 2.71$, $p = .01$, d = 0.25.

Diversity

Participants in the faking condition were expected to have a lower level of lexical diversity ratios than participants in the honest condition (hypothesis 7), with lexical diversity ration being operationalized as the total number of unique words to the total number of words. Hypothesis 7 was tested using independent-samples t-test not assuming homogeneous variances, as Levene's test for homogeneity of variances was violated. Hypothesis 7 was supported, as results showed that participants in the honest condition had higher levels of lexical diversity (M = .19, SD = .08) than participants in the faking condition (M = .15, SD = .07), t(375.66) = 5.08, p < .00; d = 0.50.

Specificity

Hypothesis 8 stated that fakers will use fewer exclusive words and negations than honest responders. A one-way MANOVA revealed a significant multivariant main effect for condition, Wilks' λ = .961, F (2,498) = 10.17, p <. 001, partial eta squared = .039. Further analyses were run to examine these results. Hypothesis 8 was supported, as fakers used significantly fewer exclusive words (M = 2.58, SD = 0.90; t(499) = 4.54, p < .00; d = 0.41) and negations (M = 1.55, SD = .55; t(499) = 2.00, p = 0.05; d = 0.19) than honest responders (M = 2.98, SD = 1.06 and M = 1.65, SD = .62, respectively).

Mapping Faking Styles

Hypotheses 9-11 were concerned with parsing out the deception cues related to the three different styles of faking measured in this study, namely, slight image creation, extensive image creation, and image protection. However hypotheses were not supported, as results showed no significant correlations with the hypothesized deception cues (see table 4). While no a priori hypothesis of deceptive cues specific to faking styles were significant, additional post-hoc

analyses were conducted of other available LIWC categories and will be discussed in the next section.

Table 3
Results for Differences in Linguistic Cues between Conditions

	Condition						95% CI for Mean Difference		
	Honest			Faking					
	M	SD	n	M	SD	n		t	df
Pausality	1.55	0.41	201	1.67	0.12	300	-0.19,-0.46	3.16**	499
Word Per Sentence	16.15	4.10	201	16.99	4.02	300	-1.56,-0.11	2.26*	499
Complex Words	16.69	3.60	201	17.30	3.15	300	-1.22,-0.01	2.00*	499
1st Person	8.61	1.99	201	8.15	1.75	300	0.13,0.79	2.71**	499
Lexical Diversity	0.18	0.09	201	0.15	0.07	300	0.02,0.05	5.08**	374.7
Exclusive Words	2.98	1.06	201	2.58	0.90	300	0.23,0.57	4.54**	499
Negations	1.66	0.62	201	1.55	0.56	300	0.01,0.21	2.00*	499
Word Count	608.7	300.8	201	753.4	349.5	300	-204.01, -85.51	4.80**	499
# of Sentences	6.60	1.66	201	6.21	1.39	300	0.12,0.67	2.78**	377.4
Typographical Errors	1.11	2.15	201	1.17	2.89	300	-0.53,0.41	-0.25	499
Text Lingo	0.20	0.61	201	0.09	0.38	300	0.01,0.20	2.18*	307.1
Commas	1.97	1.55	201	2.48	1.69	300	-0.80,-0.21	3.39**	499
Adjectives	3.74	1.05	201	3.97	0.94	300	-0.40.-0.05	2.54*	499
Affect	3.98	1.11	201	4.35	1.06	300	-0.56,-0.17	3.73*	499
Non-spec.#	1.79	0.76	201	4.34	1.06	300	-0.27,-0.10	2.19*	499
Friendship Words	0.28	0.47	201	0.17	0.19	300	0.04,0.18	3.19**	245.4

Table 4
Correlations between faking styles and linguistic categories

	M (*SD*)	1	2	3	4	5	6	7	8	9	10	11
1.Slight Image Creation	2.59 (1.05)	1										
2. Extensive Image Creation	2.78 (1.21)	.83**	1									
3.Image Protection	2.50 (1.11)	.71**	.67**	1								
4.1st Person Pronouns	8.15 (1.75)	.02	-.02	.00	1							
5.Lexical Diversity	.15 (0.07)	-.00	-.03	.04	.51**	1						
6.Word Length	17.29 (3.15)	.03	.00	-.08	-.20	-.12	1					
7.# of Words	753.43 (349.50)	.03	.05	-.05	-.39	-.81**	.07	1				
8.Response Time	31.28 (15.56)	.04	.02	-.04	-.27	-.42**	.13*	.56	1			
9.Causation Words	2.41 (0.81)	.04	.08	.01	-.01	.09	.30	-.83	-.08	1		
10.3rd Person Pronouns	3.36 (1.26)	-.05	.03	-.02	-.02	-.05	-.32	.02	-.03	-.20**	1	
11.# of Sentences	6.21 (1.39)	-.01	-.03	.03	.39**	.62**	-.06	-.46**	-.19**	-.06	-.05	1

Research Question Testing

Research question 1 discusses whether those in the faking condition who told partial lies would use, more, less, or an equal amount of words as compared to those in the faking condition that told complete fabrications. An independent samples t-test showed that fakers who used complete fabrications (M = 810.82, SD = 369.37) used significantly more words than fakers who only told partial lies (M = 714.51, SD = 325.09), $t(291) = 2.37$, p = .02. Research hypothesis 2 was interested in the amount of typographical errors those in both the honest and faking conditions would make, and whether there would be a significant difference. An independent samples t-test showed that there is no significant difference between groups in the number of smelling mistakes made ($t(500)= 0.25$, $p > .05$) or the number of missing apostrophes ($t(500)=-0.34$, $p > .05$). In other words, participants in both conditions made a similar amount of spelling mistakes. Research question 3 revolved around netspeak and whether those in the faking condition would use more or less netspeak than those in the honest condition. An independent samples t-test showed that there is a significant difference in the amount of text lingo used, with participants in the honest condition using more (M= .61 , SD = .04) than those in the faking condition (M = .38, SD = .02), $t(500) = 2.37$, p = 0.3).

Additional Post-Hoc Testing

Additional post-hoc analyses were conducted to examine other linguistic categories measured by LIWC that did not have any a priori hypotheses associated with them but may show group differences between those in the instructed honest and faking conditions. Participants in the faking condition were found to used more adjectives ($M = 4.05$, $SD = 0.99$; $t(499) = -2.54$, $p = .01$) and more commas ($M = 2.48$, $SD = 1.69$; $t(499) = 3.39$, $p < .001$; $d = 0.31$) than those in the honest condition ($M = 3.81$, SD = 0.98 and $M = 1.97$, SD = 1.55, respectively). Those in the

faking condition were also found to use more words relating to affective processes (e.g. “happy”, “cried”), positive emotions (e.g. “love”,” sweet”), perception (e.g. “look”, “heard”), and non-specific quantitative descriptions (e.g. “many”, “few”) (see table 3). Additionally, participants in the faking condition were found to use significantly less words relating to friendship (e.g. “buddy”) than those in the honest condition.

Additional post-hoc analyses were also conducted to examine what other LIWC categories were correlated with the three faking styles (see table 5). Results of a Pearson product-moment correlation showed that slight image creation ($r = .20$, $p \leq .01$), extensive image creation ($r = .25$, $p \leq .01$), and image protection ($r = .15$, $p \leq .05$) were all significantly and positively correlated with words of positive emotions such as “nice” or “sweet”. Further, all faking styles were also correlated with negatively correlated with tentative words such as “perhaps” (see table XX). While words related to power and the future were associated with both slight image creation ($r = .14$, -.14, respectively) and extensive image creation ($r =.14$, -.15, respectively), they were not correlated with image protection. Examples of words relating to power are “superior” and “bully, while examples of words relating to the future include “will” and “soon”.

While there were no categories that only correlated with extensive image creation, there were some that only correlated with either slight image creation or image protection. In particular, adjectives ($r = .12$, $p \leq .05$) and words associated with achievement ($r = .14$, $p \leq .05$) were significantly correlated with only slight image creation. On the other hand, words associated with sadness such as “crying” and “grief” were only significantly correlated with image protection ($r = -.13$, $p \leq .05$).

Table 5

Post-Hoc analysis of relationships between faking styles and additional categories

	M (*SD*)	1	2	3	4	5	6	7	8	9	10
1.Slight Image Creation	2.59 (1.05)	1									
2. Extensive Image Creation	2.78 (1.21)	.83**	1								
3.Image Protection	2.50 (1.11)	.71**	.67**	1							
4.Adjectives	8.15 (1.75)	.12*	.07	.00	1						
5.Positive Emotion	.15 (0.07)	.20**	.25**	.15*	.23**	1					
6.Tentative Words	17.29 (3.15)	-.15*	-.14*	-	-.05	-.01	1				
7.Achievement Words	753.43	.14*	.11	.11	.03	.30**	-.02	1			
8.Power Words	31.28 (15.56)	.14*	.19**	.10	.08	.04	-	.07	1		
9.Future Words	2.41 (0.81)	-.14*	-	-.04	-.11	.02	.20**	.04	-	1	
10.Sadness Words	3.36 (1.26)	.03	-.04	-.13*	.03	.02	.03	.01	.09	-.09	1

Discussion

Hypothesis 1 was not supported as there was no difference in the amount of deception cues displayed regardless of experience with text-based computer-mediated communication. However, this may be due to the fact that 85.5% of participants indicated that they were either "confident" or "very confident" at communicating with chat-based systems, and only 14.4% of participants indicating they were only "somewhat confident". The limited variability in responses may have limited the power of the statistical analysis to detect differences. This limited variability may be due to the collection method. MTurk is an internet-based data collection resource, thus individuals who use MTurk may be more likely to have knowledge of technology and online communication in general.

When examining how interview question type may impact the amount of words and sentences used by participants in the faking and honest conditions, results showed that those in the faking condition used more words than honest responders regardless of question type. However, while there was no significant difference in number of sentences between the two conditions when answering past behavior questions, those in the faking condition did use significantly more sentences when responding to situational interview questions. A priori hypothesis indicated that participants in the faking condition would use fewer words and sentences when responding to past behavior questions because of the cognitive effort required to create a fictional response about a previous (non-existent) experience. However, the presence of a physical chat log of the interview may have reduced the cognitive effort required. Unlike face-to-face interviews where responses must come at a quicker pace, the chat format may have allowed those instructed to fake to take more time to initially respond and review the log of previous responses to tailor future responses. Therefore, those in the faking condition may have

been better able to focus on trying to persuade the interviewer that they are the best candidate, which may have led to the increased amount of words used as compared to honest responders.

Participants in the faking condition were shown to use a similar amount of sentences as honest responders when responding to past behavior question, but significantly fewer sentences than participants in the honest condition when responding to situational questions. Further analysis examined comma use between the two conditions, and regardless of question type, those in the faking condition used more complex sentences that included significantly more commas. The increased use of commas may indicate the use of more examples and clarifications in responses in order to better persuade the interviewer of their abilities. An alternative explanation for this occurrence is that those in the faking condition may have used a "stream of consciousness" writing style as they made something up for the first time. This may have unintentionally led to longer sentences as they added on more information as it came to mind.

Extant research has found that in CMC, deceivers' messages are less complex at both content and lexical levels. Tausczik and Pennebaker (2010) argue the decrease in complexity is a result of the cognitive load that is required to maintain a story that is contrary to experience combined with the effort taken to try to convince someone else that something false is true. However, our findings from hypotheses 4a-c conflict with these previous results. Thus, the context may play an important role in how fakers respond. The visual aspects of a chat-based interview may have reduced the overall cognitive load that is required to maintain a coherent storyline, as those in the faking condition were able to physically rephrase/retype their responses as well as scroll up in the chat log to refresh their memory of previous responses. In other words, participants in the faking condition no longer need to hold their previous responses in memory since it is easily accessible for them to reread. This possible reduction in cognitive load would

allow them to focus more cognitive effort on crafting responses they believe the interviewer is looking for instead of keeping their previous responses in their working memory.

While extant research has found that instructed fakers use fewer self-referencing pronouns than instructed honest responders (DePaulo et al., 2003; Newman, Pennebaker, Berry, & Richards, 2003; Zhou et al., 2004), we expected to find no significant difference due to the nature of employment interview that requires responders to answer questions about themselves. However, results showed that even in employment interviews those in the faking condition did use significantly fewer first-person pronouns. This may be because even though instructed fakers are answering questions about themselves and their past behavior, they are still attempting to reduce their accountability for the content in their messages. Thus, the impact of context does not extend to verbal immediacy.

Consistent with extant research, fakers were found to use fewer exclusive and negation words, as well as have lower levels of lexical diversity. Our results suggest that, even though the interviews were in an online format similar to Derrick and colleagues (2013), the length of the required responses was significantly longer, which may have increased the cognitive load enough that a decreased lexical diversity was observed for participants in the faking condition. While the cognitive load on instructed fakers was less than in a face-to-face interview, the type of detailed responses required by interview questions would have caused more cognitive load than simpler questions liked those used in Derrick et al.'s study (e.g. "what are your hobbies?"). In a similar vein, our findings for hypothesis 8 align with those of extant research, which showed that deceivers reduced use of exclusive words and negations in face-to-face conversations. The use of exclusive words such as "but" and negations such as "never" require individuals to be more specific in their communication and define what is and what is not in a particular category.

Naturally, those in the faking condition would desire to avoid using such specifics in order to further reduce their accountability for the deceitful content of their messages. Additionally, increased specificity is more difficult when the detail are made off the cuff as opposed to simply remembering a past event.

When examining hypothesized LIWC categories for potential significant group differences, we found that participants in the honest condition used significantly more words relating to friendship (e.g. “pal” or “buddy”). This may due to the context of the condition, such that participants were giving honest responses and were not necessarily concerned with trying to impress the interviewer. Thus, those in the honest condition may have felt like the situation was more casual and, as such, used more casual language such as referring to their friends instead of using more professional words such as “work colleague”. Additionally, participants in the faking condition were found to use more commas, adjectives, non-specific number words, and words relating to affect. The increased use of commas and adjectives implies more complex and “fuller” sentences where more information is being presented. This may occur as they are trying to appear as the perfect job candidate and “put their best foot forward” to impress the interviewer. In the process, they may be attempting to give fuller and more detailed responses in order to better appear and competent and hirable.

The increased use of non-specific number words by those in the faking condition, such as “many” or “few”, may indicate an attempt to retain psychological distance from the information in their responses by being non-specific. This would allow them to avoid being held completely accountable for the accuracy of the information. The final significant, but non-hypothesized, LIWC category concerned words relating to affect such as “happy” or “cried”. Participants in the faking condition were found to use significantly more of these types of words. This result

conflicts with previous research, which found that deceivers are less likely to have messages that contain affective information (Zhou et al., 2002). The reason for the conflicting finding may lie in the context, as this study is set in an interview context while Zhou and colleagues used undergraduate students working in teams on a desert survival game. The increased pressure to perform well in an interview may have caused participants in the faking condition to divert attention from the lies in their responses by appealing to the emotions of the interview. They may have been attempting to appear as more empathetic and compassionate leaders.

Unfortunately, hypotheses 9-11, which examined if the different faking styles were correlated with specific deception cues, were not supported. This may be because applicants were instructed to fake in general and not in a particular manner or style. Therefore, it is plausible that participants utilized any combination of the different styles while answering the different interview questions and did not consistently stick to just one style. This caused unanticipated noise or "static" in the data, which may be obscuring potentially significant correlations to specific styles of faking.

Additional analyses were conducted to test whether there were any un-hypothesized LIWC categories that correlated with the various faking styles. Results show that all of the faking styles were significantly and positively correlated with positive emotions and significantly negatively correlated with tentative words. This may be because those instructed to fake would be trying to impress the interviewer, thus using unsure language such as tentative words would not exude confidence in their ability (a trait that is likely desired by employers). Similarly, participants in the faking condition would want to appear positive, and thus expression of positive emotions would be expected.

Further analysis showed that the two faking styles relating to image creation were both positively related to use of words about power and negatively associated to words about the future. Instructed fakers may have created scenarios in their responses that illustrate their adherences to properly using the chain of command within an organization, and thus commonly used words such as “supervisor”. A potential alternative explanation is that when creating their responses, those in the faking condition may have wanted to display their leadership abilities by referring to themselves as supervisors or bosses. In regards to the negative relationship between these two faking styles and words relating to the future, it is possible that those in the instructed faking condition utilizing image creation strategies would want to maintain a focus on the past examples. This would allow them to create convincing stories by altering things they or others have experienced to fit the question instead of creating completely new “possible” scenarios. Cognitively speaking, retelling and altering a previous experience would be less demanding of a task than completely creating a new scenario and your prescribed actions.

Interestingly, adjectives and words relating to achievement were only correlated with slight image creation. Perhaps participants engaging in this style of faking were only slightly altering their past experiences by up-playing the outcomes and what they were able to achieve. It is also possible that the increase in adjective use helps to craft a more convincing story by giving additional details that may or may not be accurate. With regards to the image protection strategy, a negative correlation was found with words associated with sadness. This may be because they were trying to defend the image of being a good candidate. One way to defend this image is by omitting information about any negative event they may have experienced. This would significantly decrease their needs to use any words associated with bad or sad emotions.

Results regarding research question 1 showed that those in the faking condition who told complete fabrications used significantly more words than those who told only partial lies. This may be due to the nature of story-telling. When completely making up a story, there is more room for added details as you are not restricted to the predetermined story-line as you would be when telling the truth or mostly the truth. Additionally, this falls in line with results that showed participants in the faking condition used more words than participants in the honest condition. It follows that those who told partial lies are more similar to honest responders than those who told complete fabrications. Thus, more words would be expected from those who told complete fabrications. Research question 2 results showed that there was no significant difference between participants in the two conditions on the amount of typographical errors made. However, this may be confounded as we were not able to see how many edits were made, which may have helped to reduce typographical errors. Analysis of research question 3 showed that there was no significant difference in text lingo used between the two conditions. This may be because the interview context influences individuals to be more formal when responding than they would in casual conversation.

Limitations and Future Directions

One limitation of the current study is that the sample population was pulled from a population of users on the online resource Mturk. Because of this, results may not directly generalize to job applicants who would have a stronger motivation to fake in order to obtain the job they are applying for. On a similar note, another limitation rests in the assignment to faking and non-faking conditions. By not allowing faking to occur naturally, we are not able to generalize the results to fakers in employment selection context at large, as there may be some

individual differences in the linguistic styles used by individuals who naturally choose to fake compared to individuals who would not normally fake but were instructed to.

Another limitation of the current study is the limitation on interview questions. The interview questions were limited to predetermined questions and follow-up questions. In a more realistic interview environment, follow-up questions can be tailored depending on the initial responses of the applicant. While the chatting system used was semi-intelligent, in that it capable of responding to basic questions the participant may ask such as “tell me about yourself”, it does not have the natural language processing capabilities to understand complex questions or responses and respond to them. Therefore, some follow-up questions asked to the applicant may have already been answered in their previous response, which could cause irritation and agitation.

A final limitation of the current study rests in the distant nature of the data collection. As all data was collected anonymously over the internet, there was no way to control for a myriad of potential confounding factors. For example, we are unable to know the environment the participants completed the study in or the type of distractions they may have encountered. Additionally, while there was a time restraint in which they were required to complete both the chat and the follow-up survey, it was a generous amount of time in order to account for unforeseeable technological issues that may have arisen in a study utilizing many different websites for completion. Therefore, there may have been a time lag between completion of the interview chat and the completion of the survey, which may have reduced their ability to accurately recall the type of faking behaviors they engaged in. However, from an applied perspective many companies are moving toward methods of interview other than face-to-fact, such as video-chats and prerecorded interviews. Therefore, knowing how unexpected distractions

and interruptions may affect an individual's responses may be valuable information to know attempting to implement any linguistics analysis of faking in an applied setting.

Future research should control for the aforementioned limitations and test for generalizability of results by using an actual job applicant sample, conducting the research in a more controlled environment, and utilizing advances in technology to better tailor follow-up questions asked. While the current study asked general interview questions about common selection criterion (e.g. communication), future research should examine the effects of questions meant to target specific job-related criterion. Additionally, no technical questions were asked in this study. Thus, future studies could examine if the results found generalize to different question types that may be more job specific.

A final possible avenue of research is including middle warning messages during the interview process. Middle warning messages administered during personality tests have been found to cause a reduction in applicant faking (insert cite). It would be interesting to see if the inclusion of a middle warning message will cause fakers to adjust their response style, and whether these changes are a result of beginning to respond honestly or of attempting to not be detected lying. For example, it is possible that a faker, when given a warning message indicating faking has been detected, may continue faking, but adjust their responses to be more specific in order to give the appearance of telling the truth.

Conclusion

In sum, the linguistic cues of participants in the faking condition did differ significantly from those in the honest condition. Notably, participants who were instructed to fake used more words, complex sentence structures, and complex words than those who were instructed to answer honestly. However, those who were in the honest condition used a larger variety of words

and more sentences overall. This research was the first step in generalizing extant findings of linguistic-based cues to an employment interview context. While some findings were found to generalize between contexts, others were not. Future research should continue to explore these relationships in order to advance our understanding of language used in deception in an employee selection context.

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Appendix A

MTurk Listing Example

Online Chat and Survey Instructions and Link

We are conducting an academic research about mock employment interviews. We need to understand how the words people use may differ depending on if the the truth or a lie is told in response to an interview question. In this portion we are examining those who lie or embellish their answers during interviews.

There will be two parts to this study. In the first part you will follow the link below to complete an online chat-based interview. At the end of the interview, you will be provided with another link to a follow-up survey. At the end of the survey, you will receive a code to paste into the box below to receive credit for completing our study. Completion of both parts together should take around 1 hour.

When completing the chat-based interview and survey, we ask that you **respond as you believe a perfect job candidate would respond.** In other words, respond in a way that you think the employer would want you to respond.

Make sure to leave this window open as you complete the chat and survey. When you are finished, you will return to this page to paste the code into the box. You must sumbit your worker ID in both the chat and the survey.

Chat link:	https://juji.io/pre-chat/mjs0064-9f4ce87/16

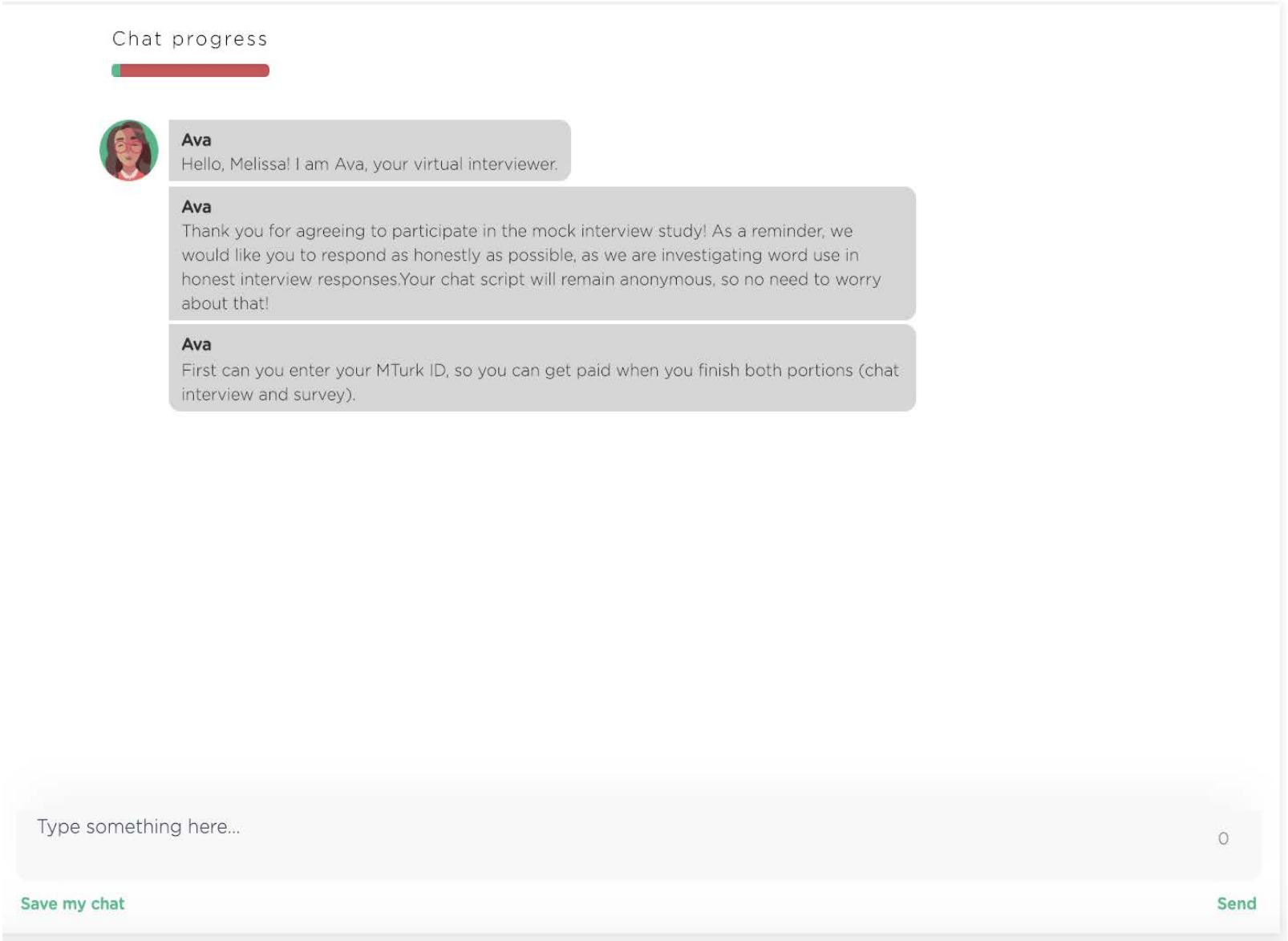
Provide the survey code here:

e.g. 123456

Submit

Appendix B

Preview of Chat-based Interview



Appendix C

Interview Faking Behavior Scale

I. SLIGHT IMAGE CREATION
(to make an image of a good candidate for the job)

Embellishing

(to overstate or embellish answers beyond a reasonable description of the truth)

- ICEMB1 I said that it would take less time to learn the job than I knew it would
- ICEMB2 I exaggerated my future goals.
- ICEMB3 I exaggerated my responsibilities on my previous jobs.
- ICEMB4 I exaggerated the impact of my performance in my past jobs.

Tailoring

(to modify or adapt answers to fit the job)

- ICTAI5 During the interview, I distorted my answers based on the comments or reactions of the interviewer.
- ICTAI6 During the interview, I distorted my answers to emphasize what the interviewer was looking for.
- ICTAI7 I distorted my answers based on the information about the job I obtained during the interview.
- ICTAI8 I distorted my work experience to fit the interviewer's view of the position.
- ICTAI9 I distorted my qualifications to match qualifications required for the job.
- ICTAI10 I tried to find out about the organization's culture and then use that information to fabricate my answers.

Fit Enhancing

(to create the impression of a fit with the job or organization in terms of beliefs, values, or attitudes)

- ICFIT11 I enhanced my fit with the job in terms of attitudes, values, or beliefs.
- ICFIT12 I inflated the fit between my values and goals and values and goals of the organization.
- ICFIT13 I inflated the fit between my credentials and needs of the organization.
- ICFIT14 I tried to use information about the company to make my answers sound like I was a better fit than I actually was.

II. EXTENSIVE IMAGE CREATION
(to invent an image of a good candidate for the job)

Constructing

(to build stories by combining or arranging work experiences to provide better answers)

- ICCON15 I told fictional stories prepared in advance of the interview to best present my credentials.

- ICCON16 I fabricated examples to show my fit with the organization.
- ICCON17 I made up stories about my work experiences that were well developed and logical.
- ICCON18 I constructed fictional stories to explain the gaps in my work experiences.
- ICCON19 I told stories that contained both real and fictional work experiences.
- ICCON20 I combined, modified and distorted my work experiences in my answers.
- ICCON21 I used made-up stories for most questions.

Inventing

(to cook up better answers)

- ICINV22 I claimed that I have skills that I do not have.
- ICINV23 I made up measurable outcomes of performed tasks.
- ICINV24 I promised that I could meet all job requirements (e.g., working late or on weekends), even though I probably could not.
- ICINV25 I misrepresented the description of an event.
- ICINV26 I stretched the truth to give a good answer.
- ICINV27 I invented some work situations or accomplishments that did not really occur.
  ICINV28 I told some "little white lies" in the interview.

Borrowing

(to answer based on the experiences or accomplishments of others)

- ICBOR29 My answers were based on examples of job performance of other employees.
- ICBOR30 When I did not have a good answer, I borrowed work experiences of other people and made them sound like my own.
- ICBOR31 I used other people's experiences to create answers when I did not have good experiences of my own.

III. IMAGE PROTECTION

(to defend an image of a good candidate for the job)

Omitting

(to not mention some things in order to improve answers)

- IPOMI32 When asked directly, I tried to say nothing about my real job-related weaknesses.
- IPOMI33 I tried to avoid discussion of job tasks that I may not be able to do.
- IPOMI34 I tried to avoid discussing my lack of skills or experiences.
- IPOMI35 When asked directly, I did not mention my true reason for quitting previous job.

Masking

(to disguise or conceal aspects of background to create better answers)

- IPMAS36 I did not reveal my true career intentions about working with the hiring organization.
- IPMAS37 When asked directly, I did not mention some problems that I had in past jobs.

- IPMAS38 I did not reveal requested information that might hurt my chances of getting a job.
- IPMAS39 I covered up some “skeletons in my closet.”

Distancing

(to improve answers by separating from negative events or experiences)

- IPDIS40 I tried to suppress my connection to negative events in my work history.
- IPDIS41 I clearly separated myself from my past work experiences that would reflect poorly on me.
- IPDIS42 I tried to convince the interviewer that factors outside of my control were responsible for some negative outcomes even though it was my responsibility.

Appendix D

Interview Questions

1. Could you introduce yourself?
2. Describe a situation in which you identified a problem and evaluated the alternatives to make a recommendation or decision. What was the problem and who was affected?
    - Looking back now, would you change your final decision or recommendation?
3. If I were your supervisor and asked you to do something that you disagreed with, what would you do?
4. Give me an example of a time when you were able to successfully persuade someone to see things your way at work.
    - Why do you believe the persuasion tactic you used was successful?
5. Assume you are a supervisor and one of your employees consistently arrives late to work. What action would you take and why would you take these actions?
6. Tell me about a time when you had to involve someone more experienced than you to resolve an issue you encountered.
7. You are under pressure for a deadline at work and a new high-priority item has just been handed to you. What would you do?
8. Give me an example of a time that you felt you went above and beyond the call of duty at work.
9. How would you finish a task if you did not have enough information to complete it efficiently?
10. Have you ever been on a team where someone was not pulling their own weight? Describe the situation and how you handled it.

11. A work colleague has told you in confidence that she suspects another colleague of stealing. What would your actions be?
    - How would you prevent this from occurring in the future?
12. Tell me about a time when you had to relay bad news to a coworker or superior.
13. How would you handle it if your employee was not meeting your expectations or was performing below average?
14. Tell me about a time when you made a mistake. What actions did you take to correct it?
15. How would you handle it if you were unsatisfied by an aspect of your job?

Appendix E

Complete or Partial Lie Questionnaire

For each of the following questions please selection what method you used to deceive when answering each interview question.

- Describe a situation in which you identified a problem and evaluated the alternatives to make a recommendation or decision. What was the problem and who was affected?
    - When responding to this question, what style of deception did you use?
        - Partial lie
        - Complete lie
        - Withheld information
        - Complete truth

- Give me an example of a time when you were able to successfully persuade someone to see things your way at work.
    - When responding to this question, what style of deception did you use?
        - Partial lie
        - Complete lie
        - Withheld information
        - Complete truth

- Tell me about a time when you had to involve someone more experienced than you to resolve an issue you encountered.
    - When responding to this question, what style of deception did you use?
        - Partial lie
        - Complete lie
        - Withheld information
        - Complete truth

- Give me an example of a time that you felt you went above and beyond the call of duty at work.
    - When responding to this question, what style of deception did you use?
        - Partial lie
        - Complete lie
        - Withheld information
        - Complete truth

- Have you ever been on a team where someone was not pulling their own weight? How did you handle it?
    - When responding to this question, what style of deception did you use?
        - Partial lie
        - Complete lie

        - Withheld information
        - Complete truth

- A work colleague has told you in confidence that she suspects another colleague of stealing. What would your actions be?
    - When responding to this question, what style of deception did you use?
        - Partial lie
        - Complete lie
        - Withheld information
        - Complete truth

- How would you finish a task if you did not have enough information to come to a good decision?
    - When responding to this question, what style of deception did you use?
        - Partial lie
        - Complete lie
        - Withheld information
        - Complete truth

- You are under pressure for a deadline at work and a new high-priority item has just been handed to you. What would you do?
    - When responding to this question, what style of deception did you use?
        - Partial lie
        - Complete lie
        - Withheld information
        - Complete truth

- Assume you are a supervisor and one of your employees consistently arrives late to work. What action would you take?
    - When responding to this question, what style of deception did you use?
        - Partial lie
        - Complete lie
        - Withheld information
        - Complete truth

- If I were your supervisor and asked you to do something that you disagreed with, what would you do?
    - When responding to this question, what style of deception did you use?
        - Partial lie
        - Complete lie
        - Withheld information
        - Complete truth