LINGUISTIC HIDE-N-SEEK: DETECTING DISGUISE THROUGH DECEPTION DETECTION, AUTHOR PROFILING, AND AUTHORSHIP ATTRIBUTION

A Thesis
submitted to the Faculty of the
Graduate School of Arts and Sciences
of Georgetown University
in partial fulfillment of the requirements for the
degree of
Master of Science
in
Sociolinguistics

By

Sarah Mireille Carlson, M.S.

Washington, DC

March 31, 2023

TABLE OF CONTENTS

LIST OF TABLES

1. Introduction

On the evening of January 15th, 1999, Miriam Illes was murdered in her home in Williamsport, Pennsylvania. The murder occurred while Miriam and her husband, Dr. Richard Illes, had been going through a divorce. Richard became a suspect of the murder immediately due to his questioning police about what evidence was found at the crime scene, but having a strong alibi, he was not arrested. Not long after the murder, Dr. Illes' attorney (likely his divorce attorney) received an anonymous letter signed "Soldier of Equality, Soldier of God, Soldier of Death." The letter stated that Dr. Illes was not the murderer and contained linguistic features such as misspellings (including the misspelling of Dr. Illes' name) and missing punctuation, suggesting an author of low literacy or little formal education. However, a few months later, Dr. Illes' attorney received a second letter from the same author. In this letter, the author admitted to having disguised his or her writing in the first letter and claimed that he had gotten away with making police think that he was not intelligent. This new letter contained one misspelling, and one instance of missing punctuation. However, hints of disguise were still recognizable in this second letter. Eventually, through further investigations, police determined that Dr. Illes himself had written both letters in an attempt to deflect blame. With this and other evidence, they were able to convict him of the murder of his wife (Leung, 2005).

The element of disguise in this case represents an important element of linguistic analysis that is often overlooked in criminal investigations. In this paper, I will examine disguise in written criminal communications using findings from several areas of forensic linguistic inquiry to guide my analysis, namely, deception detection, author profiling, and authorship attribution. This forensic linguistic inquiry will be applied to features found in written communications from various criminal cases. The communications will be analyzed in terms of features from the

related areas of forensic linguistic analysis, as well as prior study of disguise in writing, The features which appear to be important in both previous literature and the communications included in this study will be organized into a proposed method of disguise detection at the conclusion of the study. For the purposes of this paper, disguise will be defined as the action intended to conceal an author's identity, which can be accomplished in several ways. First, an author may use anonymization, which consists of an attempt to make themselves unrecognizable as any person in particular. Second, impersonation involves an author imitating features of which they are aware of as being a noticeable part of another person's (usually their victim's) writing style. Third, counter-impersonation may be applied in circumstances where an author disguises their writing style in hopes that investigators will believe that the author is anyone but themself.

A number of researchers and law enforcement practitioners have examined how language use can be indicative of deception in both written and spoken contexts, including witness and confession statements taken by police (e.g., Laing, 2015; Adams, 1996). Although there is still a great deal of work to do, advances in the study of linguistic indicators of deception have proven to be relatively effective in aiding the process of detecting deception (Laing, 2015). The study of deception detection may prove useful in detecting disguise since disguise is a form of deception in terms of representation of identity. The three disguise types just described are parallel to the ways in which deception presents itself, involving both providing information that is untrue and omitting information or evading questions.

Additionally, disguise in this paper will be assessed from an author profiling perspective. Author profiling involves noting which linguistic features appear to be characteristic of an author and determining likely demographic correlates of the features. For example, if an author uses a lexical item belonging to a particular region of the United States, part of the author's profile

might mention that the author may be from, or have spent significant time in, this region. It would be expected that linguistic features which are used for profiling purposes may likely be those also used in attempted disguise, since disguise represents the inverse of profiling – masking rather than uncovering identity.

As the final source of features to be examined in the communications in this study, authorship attribution consists of, among other processes, finding similarities between features used in an anonymous communication and a communication or communications known to be written by a suspect or suspects. , As with author profiling, since the features of authorship attribution are used to make author identifications, those same features may be candidates for obfuscation in author disguise. Of course, authors will not likely be aware of all identifying features they use, but they likely will be motivated to hide any features of which they are aware that could connect the anonymous communication back to themselves. For this paper, features of authorship attribution will be drawn from McMenamin's (2010) work on forensic stylistics which refers to the types of features that will be analyzed in this context.

In many cases in which the perpetrator of a crime is not known, a critical component of the investigation is the criminal's profile. This profile can be created from the context of the crime scene, evidence of the criminal's method of operation, and even a person's writing style. While much of the investigative process has been streamlined through the years, the issue of disguise in linguistic profiling for forensic purposes has seldom been addressed. Decades of sociolinguistic study have led to the compilation of lists of features that may point to identity features of authors (e.g., demographic features like region, ethnicity, and education); however, the question remains as to how one can one be sure when profiling that an author is not attempting to disguise their identity. When developing an author's profile, it is critical that the

profile represents the author themselves rather than an attempt at anonymization or impersonation. An author may either deliberately use linguistic features that do not naturally occur in their individual idiolect (that is, the "pattern of language associated with a particular individual in a particular context" [Grant, 2022]), p. 25), or they may attempt to hide features of which they are aware as being prominent in their own idiolect to mislead investigators.

The first focus of this paper is to determine which linguistic features found in previous research relevant to deception detection, author profiling, and authorship attribution are found to have been altered in cases of known disguise and therefore may prove effective in assessing the likelihood of disguise in anonymous criminal communications. Additionally, since it is well known by sociolinguists and acknowledged by linguists involved in authorship analysis that "genre differences significantly influence language variation" (e.g., Nini (2015, p. 32), this paper seeks to explore how genre in criminal writings as well as the type of disguise may affect the linguistic features of disguise. For the purposes of this paper, I adopt the general definition of genre offered by Biber and Conrad (2019), who states that genre is concerned with the purpose and context in which language is used and that it is linguistically analyzed through the structures and features used to create specific types of texts (p. 2). It is expected that language use will differ according to the situation in which it is observed, but it is not yet known how deceptive language differs across genre. Finally, I use my findings to propose a model that offers a first step toward linguistically informed detection of disguise in written criminal communications.

The data used in this study consists of 14 communications from 11 different cases that were part of the evidence in real criminal cases within the last few decades. Genres to be assessed include threatening letters, staged suicide notes, ransom notes, and so-called Post-Offense Manipulation of Information Communications (POMICs, Fitzgerald, 2007) – that is,

communications sent to law enforcement entities or the media after an offense has been committed which overtly claim that the accused is innocent. These communications are always anonymous and usually do not name the offender (Fitzgerald, 2007; p. 8).

In each case included in this study, the author was originally anonymous; in all but one, their identity was uncovered. In addition, in each instance the case facts provide evidence that disguise was intended. The documents analyzed make reference mainly to violent crime, so as to keep as much consistency in this study as possible. Ideally, in assessing linguistic disguise, the analyst would be able to compare disguised writings with those of the same author that were written non-anonymously for non-criminal purposes (often called known documents or K-docs in forensic linguistics) and likely not disguised. I examine a few such documents in this paper; however, K-docs are not available in all cases, and case facts pointing to disguise must be relied upon.

To develop a model for detection of disguise in written communications, it is first necessary to determine which linguistic features and types of features are used in written disguise. This determination rests upon knowing which linguistic features reveal the most about an author's self-representation, and so author profiling and authorship attribution come into play. In addition, features found to be implicated in deception may come into play, since disguise necessarily involves deception. Second, discovering how the genre of a communication affects the relevance of the features in focus will allow for fine-tuning of a model for deception detection. The model for detecting disguise that I then propose may help streamline the process by prioritizing linguistic features according to the genre as well as to the type of disguise expected in connection with the nature of the crime.

This study thus contributes to forensic linguistic analysis methods for author profiling by adding methods for detecting disguise in linguistic representation of identity. It further builds on sociolinguistic studies of correlations between linguistic features and speakers' and writers' social characteristics and adds insight into how awareness of features affects their variable patterning, including when features are affected by non-native users. (For example, frequency of use may differ across 'authentic' vs. 'inauthentic' users.) However, it should be noted that the findings of this study are preliminary and the model presented only a first step, and more research is needed in order to develop a solid linguistic framework for detecting disguise.

1.1. Literature Review

This section is composed of a review of research on deception detection, author profiling, authorship attribution, and disguise detection. From this research, a list of linguistic features of interest has been compiled for the purposes of this study. This is not a study on the merits of various methods of deception detection (such as the now-disparaged SCAN or Scientific Content Analysis technique), author profiling, and authorship attribution (e.g., forensic stylistics), but rather on what overlap there might be between features of interest in these contexts and in disguise detection.

1.1.1. Deception Detection

Deception is defined by Newman et al (2008) as "describing events that did not happen or attitudes that do not exist" (2008, p. 665); it can involve omitting information or deliberately evading giving information. There have been a number of studies of possible linguistic indicators of deception, from a number of angles and fields of study. Of special focus here are studies and discussions conducted by linguists from academia (Visonà, 2021; Newman et al, 2008; Shuy, 1998; Laing, 2015) as well as a former law enforcement officer (Adams, 1996). Each of these

authors focuses on a different context in which deception detection is relevant, as well as criticizes various aspects of deception detection methods. It is important to include studies from various fields to create a complete and diverse collection of features to consider in this paper. In addition, with the end goal of this study being the eventual development of a model of analysis which can be used in law enforcement, broadening the analytical perspective is crucial.

One of the most frequent applications of methods of deception detection in written contexts is in the analysis of written witness and confession statements. This process involves assessing communications in terms of linguistic features believed to be indicative of deception, including those shown in research to correlate with deception. Drawing more or less closely from research-informed perspectives, law enforcement practitioners apply assessment of language features to assess the level of veracity of witness and confession statements. Several methods of conducting analyses of such statements exist, including a method that has been influential in law enforcement that is formally known as Statement Analysis or SCAN – Scientific Content Analysis). The SCAN technique has proven to be largely ineffective in detecting deception through multiple experimental studies (Lesce, 1990; Bogaard et al., 2016) and so will not be considered in this paper. However, careful linguistic analysis of witness as suspect statements has nonetheless proved to be useful.

Bridging perspectives of law enforcement and academic research, Adams (1996), a former FBI investigator, describes a process of detecting deception in written communication grounded in her studies in human development psychology as well as her law enforcement experiences. Her process involves two main steps, which are composed of (1) understanding what features are normally present in a truthful narrative account of an event, then (2) assessing whether any deviations from these expectations occur. For example, she maintains that it would

be expected that a truthful witness would be relatively confident about what they saw or experienced, so words expressing certainty or commitment to the narrative (ex. “I know;” “definitely;” etc.) would be expected. A deviation from this norm would be noted if the witness were to use words such as *I think*, or *possibly*, which denote uncertainty and possible deception. Adams clarifies, however, that this type of statement analysis is “not an end in itself” (p. 13) but rather identifies areas of concern necessitating further probing of the witness. This concept also applies to the current study, since the features here found to be relevant in detecting disguise will point to the need for further investigation of author identity rather than serve as conclusive proof of disguise.

Adams lists a number of linguistic features that indicate areas of concern when analyzing a witness or confession statement for the possible presence of deception. Beginning with pronouns, she explains that paying attention to the use of *I* vs. *we* in a statement can help determine the level of commitment to the story narrated by the author. She gives the example of “He forced me into the woods” vs. “We went into the woods” to show that the pronoun “we” can serve as a way of generalizing the events of the narrative. This is due to the distancing that occurs when pronouns are broadened from singular pronouns denoting specific individuals, such as *I*, *you*, or *he*, to pronouns denoting groups such as *we* and *they*. The use of plural pronouns, Adams notes, has an effect of removing individual identities from a story and may be used by authors to avoid sole responsibility for any crimes committed (p. 14) as well as to change any implied relationship between the involved parties based on which pronouns are used and how they shift throughout the narrative. This distancing could signal some level of deception where it occurs in narrative and should be followed up with more questioning on the events in question from the investigator. For current purposes, if pronoun manipulation is found to be implicated in

disguise, follow-up might take the form of applying caution to the creation of an author's profile if plural pronouns are used when single authorship is expected given case facts, or if pronoun use is inconsistent.

Additionally, Adams notes that a sudden lack of personal pronouns should be taken into consideration as a possible sign of deception. Possessive pronouns can show the same type of closeness to or distance from a narrative as subject and object pronouns. Switching from possessive plus noun phrases to phrases consisting of determiner plus noun (e.g., from "my wife" to "the wife") or changing from nouns to proper names may function similarly. For example, in describing communications associated with a murder case several decades ago, Adams describes how a man writing a statement referred to his deceased wife as "my wife" before describing the event of her murder; as he wrote about the crime, he suddenly began referring to her as "Louise." Switching "my wife" with "Louise" removes the close relational aspect inherent in the personal pronoun and allows the man to take himself out of the narrative. While "Louise" is also a direct reference to his wife, there is an element of exclusion that occurs when the possessive pronoun is removed, so as to discursively create a barrier between himself and his wife. In addition, the deictic pronoun, when used, points back to the man whenever his wife is mentioned; there is no presence of deixis when the referent is simply a proper noun.

Adams also notes that an analyst should notice the verb tenses throughout a statement, since the use of a past tense verb may reveal that a suspect knows that something has already happened. She gives an example involving a woman who had killed her two children and subsequently stated to reporters covering the investigation: "My children wanted me. They needed me. And now I can' t help them." The woman's narrative contrasted with her husband's statements consisting of efforts to comfort her in response to her distressed comments to the

reporters, which included this present tense statement: “They're okay. They' re going to be home soon.”

Finally, Adams indicates that, throughout the entire statement, a proper balance of information is likely to indicate truthfulness, but an oversaturation of extraneous information and too little focus on the main event that is described should raise suspicion. Adams defines extraneous information as any information which does not answer the question of “what happened?” (1996, p. 18). Focus outside of the event of a crime can be a sign that a person feels the need to justify their actions, which might manifest itself as additional information that is not pertinent to the story or located chronologically in the chain of events (Adams, 1996). Sociolinguistics have long recognized that there is much more to a narrative than the series of chronological events, including, crucially, much rich evaluative material (e.g., Labov 1972, Schiffrin et al, 2010). Future research should seek to bring together the examination of deception in narrative statements with sociolinguistic perspectives on narrative analysis (see, e.g., Lowrey and Ray 2015 for an example of such a study).

Shuy’s 1998 book *The Language of Confession, Interrogation, and Deception* includes discussion of the problems in research and practice on identifying linguistic indicators of deception in interrogation settings. In many cases, little to no attention is placed on the interrogator’s participation in the interaction, thus completely disregarding the fact that the interrogator’s questions likely influence the suspect’s responses. This applies mainly to spoken contexts, although written statements are also prompted by questions from investigators and can even consist of co-constructions of events by the witness and investigators (Rock, 2001). My own research in this present paper does not involve this issue, since it only includes communications which, by nature, are not authored with collaboration of investigators.

In a different context, Visonà (2021) analyzed a large set of elicited true and false hotel reviews in order to understand how constructed speech and constructed thought correlate with truthful vs. deceptive reviews, as well as which linguistic features were present or absent in cases of fraudulent reviews. His study revealed that reviews containing constructed speech in the context of providing sensory details (e.g., "I called the front desk and they replied they would be right up" [p. 89]) was more likely to be truthful, while reviews containing constructed thought in terms of cognitive operations (e.g., "I thought, "what a disaster" [p. 87]) were more likely to be deceptive. These findings, while mostly applying in the context of narrative hotel reviews, may come into play in my data, especially in the case of staged suicide communications, where the genre is often narrative or narrative-like. Other linguistic features Visonà explored that may come into play in the analysis of criminal communications is the use of proper names and unusual orthography, including "excessive punctuation" to represent voice quality (p. 22), which were found to be more likely in fraudulent reviews. Visonà suggests that using proper names in discourse about a specific topic can be a way of feigning knowledge of and familiarity with that topic to appear legitimate. This explanation may also help explain Adams' finding that proper names may indicate deception, though she discusses their use in terms of the distance they create relative to possessive noun phrases. In addition, it may be that authors use proper names when disguising their identities to divert investigators' attention away from themselves and towards other individuals, who may or may not exist.

Similarly to Visonà, Newman et al (2008) used elicited statements in a study of deceptive writing. Participants were asked to write two separate paragraphs, one true and one false, about the prompt they were given. The findings showed that more negative emotion words were used in the false statements (e.g., *hate, worthless, sad*), which may be a reflection of the author's

underlying emotions that accompany the experience of writing deceptively (p. 666). The study also showed that deceptive statements contained fewer first and third-person pronouns and words of exclusion like *but, except,* and *without*. The findings regarding first-person pronouns accord with Adams' (1996) findings described above concerning pronoun use (at least in terms of first-person singular) and again may indicate that avoiding first-person pronouns creates a dissociation between a liar and the story they tell. The lower rate of third-person pronouns in deceptive communications is generally inconsistent with other previous research; however, Newman et al. note that the topic of the communication could influence pronoun use and indicate that in their study certain topics may have unduly impacted pronoun use. For example, the topic of abortion was used in their simulation, which by nature requires more third-person pronouns like *she* and *her*. Newman et al. also found that deceptive statements contain more verbs of motion such as *I went home* (as opposed to specific action verbs like *I took the bus home*), noting that using verbs of motion lowers the cognitive complexity of story fabrication (pp.667; 672).

Laing (2015) is a study conducted to determine which features were most indicative of deception in cross-cultural contexts. Discourse of speakers of American English and Ghanaian English was compared and resulted in slightly differing lists of relevant features. Ghanaians were found to have more pronoun inconsistencies (meaning that their use of pronouns changed throughout their discourse) and fewer negations than Americans in their deceptive speech. In addition, Americans used more superfluous speech (similar to extraneous information as discussed in Adams, 1996) than Ghanaians when speaking deceptively. Overall, the relevant features in both Americans' and Ghanaians' speech included a higher use of adjectives, adverbs, and modals.

In addition to his original study, Laing presented a thorough review of prior studies on linguistic indicators of deception. He noted that studies converge on findings indicating that deceptive language typically includes more emotional language (except for in narratives about traumatic events), more modal verbs, and more adjectives and adverbs (which contributes to superfluousness) than in truthful language (p. 35). He also notes that verb tense has not been confirmed empirically to have relation to deception. Further, while Laing's review shows that while there are likely to be some features which are commonly found in deceptive communications, his original study shows that culture plays an important role in the linguistic correlates of deception. It cannot be assumed that there are universal linguistic indicators of deception.

Among the studies I have reviewed above, the types of linguistic features which appeared to be relevant in most of them were pronoun usage (Adams, 1996; Newman et al, 2008; Laing, 2015) and verb types and tenses (Adams, 1996; Newman et al, 2008). There was some overlap between Adams (1996) and Laing (2015) concerning extraneous information, but overall, the findings were somewhat diverse. This is likely due to the wide variety of contexts in which deception was assessed in each study. However, this will be advantageous for this study since there are more features from which to attempt to better understand disguise.

1.1.2. Disguise Detection

Now that features indicating deception have been discussed, I will expand the literature review to research done on disguise, as well as author profiling and authorship attribution. Disguise differs from deception in that disguise is a means used to hide or take on another identity, rather than falsifying facts. However, a similarity between deception and disguise is that deception can also involve concealing information in addition to stating untrue facts, much like

an author might conceal sociolinguistic information about themselves through disguise. In addition, it can be argued that impersonation involves falsification, since impersonators take on aspects of identity they do not really possess.

In Marko's (2017) study of the linguistics of disguise in simulated communications, participants were asked to write two types of communications. The first consisted of an email to a friend about weekend or holiday plans, and the second was a threatening ransom demand. Participants were not told in advance to mask their identity but were asked after they finished writing whether they had used disguise in the threat. They were also given a limit of 150 words for the email messages to simulate the typical length of communications occurring in forensic contexts. For the threatening messages, participants were required to demand $100,000 from their victims. No word limit was applied to the threatening messages.

The study found that the most commonly found features used for the purpose of disguise were distortion of spelling as well as changes in register use. Marko also found that authors often chose a higher or lower register as a method of disguise, for example from more to less polite, sometimes switching registers a number of times in a single communication. Since Marko's results are mainly sourced from a controlled study, I am considering them to be a guidepost for starting my own project involving author disguise in data from real criminal cases.

1.1.3. Author Profiling and Authorship Attribution

There is very little research on author profiling in written communications; however, the two studies which I have included in this review will be highly relevant in the analyses which follow. Nini (2015) provides a comprehensive review of studies from various fields showing correlations between linguistic features and demographic characteristics. In addition, she conducted her own original study of such features in simulated malicious communications. Here

I focus on her findings on the relationship between noun and verb phrases and gender profiling, while also touching on age. Rangel and Rosso (2013) also focus on gender profiling but focus on individual words such as pronouns and determiners rather than syntactic structures. I will also include McMenamin's (2010) forensic stylistic approach to authorship attribution, to reference the types of features which are likely also relevant in disguise detection, as they have been shown to be useful indicators of author identity. Additionally, I have included Grant's (2022) perspectives on non-linguistic factors which influence writing style to further support the need for a diverse set of features.

In her study of author profiling in a forensic context, Nini (2015) collected data from nearly 300 fabricated texts in which participants were instructed to respond maliciously to fictional situations. To examine whether prior findings on the linguistic correlates of demographic factors, the participant pool was balanced according to age (as self-reported by participants), gender (male vs. female), level of education (below undergraduate, undergraduate, above undergraduate), and social class (composed of six different levels derived from the classification system used in the British National Corpus). The situations included in her study were an unsatisfactory experience with a travel agency, a letter to a politician from a disappointed voter, and an angry letter from an employee to their employer. The results of Nini's study indicate that gender is generally distinguishable based on the types of syntactic structures found in the discourse. Male authors tend to use more nominal structures, that is, a larger number of noun phrases, while female authors include more verb phrases and pronouns in their writing. In addition to her own findings, Nini's review showed that nominal structures typically increase with age, while syntactic complexity decreases with age. Additionally, her review included that

for socioeconomic status, lexical and syntactic complexity were both found to decrease as socioeconomic status decreased.

In addition to these features, Rangel and Rosso (2013) conducted a computational study of online posts derived from sites such as Twitter, Facebook, Wikipedia, and blog pages. The findings indicated that that male authors use more prepositions than women; they suggest the reason is that men often categorize things around themselves hierarchically. Women use more pronouns, determiners, and interjections since they focus more on relationships and society. Rangel and Rosso's reasoning for their findings can be considered to represent essentializing and outdated generalizations; however, the correlations themselves indicate potential for some features to be indicative of author gender and may possibly be used in disguising gender.

As the final step of an investigative linguistic analysis where identification of an author is in question, authorship attribution is used to identify a likely match between the anonymous communication and the known writings of a suspect. As noted earlier, authorship attribution is the practice of comparing the linguistic features used by an unknown author of a text against the known writings of possibly matching authors. For example, if a document of unknown authorship contains similar rates and types of spelling errors as a document which is known to have been written by a suspect, there is a possibility that the unknown document was authored by the suspect. McMenamin (2010) provides a detailed description of features to be examined in authorship attribution using the largely qualitative approach he calls Forensic Stylistics. Forensic Stylistics allows linguists to assess whether there is common authorship across several documents by assessing an array of types of features on various levels of language, such as punctuation, morphology (verb conjugations, plural vs. singular nouns, etc.), lexicon (vocabulary), syntax (subject-verb agreement, syntactic structure, etc.), discourse features

(narrative style, cohesion, etc.), sentence functions (e.g., types of questions), and sentence length (McMenamin, 2010, pp. 498-502). These types of features comprise a person's unique language style, or idiolect, and often contain information about an author's identity, including background. Some of these features will likely be applicable to disguise detection due to the necessity of ensuring that features which appear to be idiolectal may, in fact, be deliberate disguise.

Grant (2022) discusses at length how the study and practice of authorship attribution have changed over time. He notes that individual language style is impacted by an array of factors that impact idiolect, such as genre, communities of practice, and medium of composition of the text (p. 24). His emphasis on taking genre into account strengthens the need for answering the question of genre in this present study. Grant further notes that authors are generally not aware of "higher-level" linguistic features (i.e., discourse-level features) in their idiolect as opposed to features on other levels of language, such as orthography or syntactic complexity (Grant, 2022; p. 27, citing Grant and MacLeod 2020). Extrapolating from this, it is likely that authors may fail to conceal higher-level features when attempting disguise, a useful fact in assessing anonymous communications for possible disguise.

Relatedly, it is important to note several baseline facts regarding authors' awareness of their linguistic usages and writing styles. First, Marko (2017) indicates that people are generally aware of their own personal writing style. Of course, this does not mean that people are fully aware of the minute linguistic intricacies of their language or dialect, but it does imply that they know at least to some degree that they possess identifiable stylistic idiosyncrasies. However, most people cannot be expected to know how to effectively apply this knowledge to the context of disguise. In accord with what Grant (2022) notes about varying degrees of awareness of features at different linguistic levels, Seals and Schilling (2020) state that most people are not

aware of the many “layers of language” which constitute their linguistic output (p. 163). This suggests that when people are attempting to disguise themselves in their writing, they will likely overlook aspects of their style that will show through the attempted disguise (2020; p. 163).

In sum, this present study is needed to aid in furthering the forensic linguistic analysis of how and what people disguise in language as well as the eventual creation of methods in detecting the disguise which will inevitably present itself in future criminal communications. This will be done by applying the linguistic features which have been found to be helpful in analyzing communications for purposes of deception detection, author profiling, and authorship attribution to communications where author disguise is in question. Since disguise has properties of deception and can be considered to be the inverse of uncovering author characteristics through profiling and author identity through attribution, this study brings together various areas of previous research to work toward building a model for the study and detection of disguise.

In addition, while there are some studies of disguise in spoken language (see Seals and Schilling 2020 for a review) there is a significant gap in the research pertaining to written disguise, especially of studies that include real writings from criminal cases. In part due to different sources of data but also due to different foci of analysis (deception, profiling, attribution), each of the previous studies discussed above finds slightly different features and types of features to be relevant. Some features cut across the three fields of types of analysis, while others are more specific to a field or even a given study; those presented below are used in the current analysis due to their important effects in the relevant studies above. I provide a summary list of features from these previous studies, to be used in the current analysis, in Table 2 below.

2. Methods

2.1. Data Selection

An initial step of this project consisted of selecting data which would allow for the most effective trial of previous research, much of which, again, was based on simulated data. It is often helpful or even necessary to use simulated data. For example, language data from real criminal cases is notoriously difficult to obtain, and in addition, real data is of course 'messier' than simulated, with various external stimuli impacting data other than factors of interest in a given study. However, it is difficult to know for sure whether the results of studies based on simulated data would apply to real-world data, since the contexts in which the simulations are created vary greatly and may be quite different from those surrounding criminal communications. For example, simulations generally do not replicate the stressful environments in which many criminal communications are composed, which may alter the output of an author. Without studies involving real-life data, analysts cannot be certain which linguistic features are most likely to be distorted in genuine cases of disguise. Hence, I chose to include only data from real criminal cases in my study. Because of this, the data set is limited (only 14 total communications). However, rich qualitative analysis is still possible, and, as will be shown, even with a small set of data, patterns do emerge regarding linguistic features that are likely to be used by real-life criminals in effecting disguise and so prove useful to analysts attempting to detect disguise.

Only data which was derived from cases whose facts point to disguise were included in this study. For example, a criminal who attempts to frame another individual for a crime they themselves committed is likely to attempt to produce a writing in the style of the framed person to cast blame on that person and deflect blame from the author. Similarly, a criminal wishing to

remain undiscovered may attempt to mask what they perceive to be recognizable features of their own writing style to avoid being discovered and eventually convicted.

Most of the cases included in this study have been fully resolved and author identities determined. Several of the communications were previously analyzed by other linguists, a number of them by James R. Fitzgerald, FBI Supervisory Special Agent (ret.) and forensic linguist, including the "Dear Sarah" threatening letter, the "Preskiller" threatening emails, the Illes letters, the Castor staged suicide letter, and the Jocelyn Earnest staged suicide letter. In addition, I was able to access non-criminal (and so likely non-disguised) writings from several of the authors, including those in the Stacey Castor attempted murder case and the Jocelyn Earnest murder case. In these cases, I analyzed known writings against the originally anonymous communications of Castor to further strengthen my assessment of what features and types of features are indicative of author disguise.

Table 1 below lists the communications used for this study, as well as the cases from which they are drawn and the expected type of disguise used based on the nature of the crime involved. Some authors may resort to anonymization, which, as noted above, is disguise with the goal of blending into the crowd so as to not be recognized through writing. Impersonation disguise would be involved in a crime where the author needs to appear to be a specific person, so they attempt to use features which resemble those used by another specific individual. Lastly, counter-impersonation disguise (where the author attempts to appear as anyone but themselves) would be used to convince readers that the author is specifically *not* a certain person. These disguise types are not necessarily associated strictly with certain crimes but can be generally expected based on the "needs" of an author after during and after the commission of a crime.

Table 1. Communications Included in Analysis

Case	Genre	Disguise Type
'Dear Sarah'	Threatening Letter	Anonymization
'Preskiller'	Threatening Letter	Anonymization
'Devil Strip'	Ransom Note	Anonymization
Annie Laurie Hearin Abduction	Ransom Note	Anonymization
Robert Wiles Abduction	Ransom Note	Anonymization
Goya Painting Heist	Ransom Note	Anonymization
JonBenet Ramsey Murder	Ransom Note	Anonymization
Illes Murder	Post-Offense Manipulation of Information Communication (POMIC)	Counter-impersonation
Stacey Castor Attempted Murder	Staged Suicide Letter	Impersonation
Jocelyn Earnest Murder	Staged Suicide Letter	Impersonation
Diaz Double Homicide	Staged Suicide Letter	Impersonation

2.2. Feature Selection

A large variety of features relevant to the analysis of witness and confession statements for indicators of deception, as well as to author profiling and to McMenamin's (2010) forensic stylistics was considered in this study. However, since the methodologies of deception detection,

author profiling, and authorship attribution are not necessarily built for the purposes of directly assessing levels of disguise, not all features pertaining to these methods are relevant to my study. Thus, it was important to filter through each set of linguistic features and determine which would likely be the most pertinent in the context of disguise. It is possible that some features, for example, those indicative of level of conviction (i.e., how committed the author is to their story based on their use of terms such as *I think*, *I know*, *probably*, etc. (Adams, 1996), are more suitable for deception detection than disguise detection because they relate more to the event of the crime than to the criminal themselves. This paper does not explore the assessment of true vs. false information pertaining to criminal events, but rather true vs. false representation of identity.

In table 2 below, a distilled list of features from the previously reviewed literature is presented. Not all of these features will appear in the analysis, but each was systematically considered for each communication in this study to determine which features were used in disguise and hence likely to be useful for disguise detection. For features derived from deception detection studies, only features which indicate possible deception are included in table 2. For McMenamin's forensic stylistics, I list types of features rather than specific features, since features examined may differ from case to case, depending on the communications at hand. In addition, for profiling, I include only two types of features since examining a full list of potential demographic correlates is beyond the scope of this project. These features are VP vs. NP, which has been shown to correlate with gender, and syntactic complexity, which has been shown to correlate with age and socioeconomic class. Age, gender, and socioeconomic class are the most commonly observed demographics throughout the studies included in the review for my study, limiting the number of features I could include in this table.

Table 2. Features of Deception Detection, Disguise Detection, Author Profiling, and Authorship Attribution Derived from Literature Review

Adams, 1996 Deception Detection	Visonà, 2021 Deception Detection	Newman et al, 2008 Deception Detection	Laing, 2015 Deception Detection
Change from 1 SG + 3 SG to only 1 PL pronouns Det + N Noun phrases instead of Possessive + N NP structures Verb tense (when inconsistent with chronology of narrative) Extraneous information (any information which does not pertain to the event of the crime) Use of words indicating lack of certainty such as *believe*, *kind of*, etc.) Balance of narrative focusing on events of the crime vs. other matters	Constructed Thought (in context of cognitive processes) vs. Constructed Speech Proper nouns Unusual orthography (mainly excessive punctuation)	Motion verbs (e.g., *to go, to walk, to drive*, etc.) vs. other types of verbs (e.g., action verbs denoting more specific types of actions, verbs of thinking and feeling; e.g., *to notice, to discuss*, etc.) Negative emotion words (e.g., hate, angry, confused, etc.) Few exclusive words (e.g., all, only, everything, etc.) 1SG and 3SG pronouns (expected that there are generally few of these)	Superfluous/redundant (i.e., extraneous information, meaning "excessive and unnecessary detail" [p. 32]) Inconsistent pronouns High use of adjectives, adverbs, modals High use of emotional language (except for traumatic narratives)
Rangel & Rosso, 2013 Author Profiling	**Marko, 2017 Author Disguise**	**Nini, 2015 Author Profiling**	**McMenamin, 2010Authorship Attribution**
Prepositions Pronouns Determiners Interjections	Distortion of orthography (and other deliberate "errors") Change of register (e.g., varying use of	Use of Noun Phrases Use of Verb Phrases Syntactic Complexity	Punctuation Morphology Lexicon Syntax

	politeness, syntactic complexity)	(average sentence length, number of clauses per sentence, number of embedded clauses per sentence)	Discourse features (narrative style, cohesion, etc.) Sentence functions (e.g., types of questions) Sentence length

2.3. Method of Analysis

Once the data set was completed and all relevant features were chosen, I conducted analyses of each communication focusing on one feature at a time. For example, I started with orthographic deviations from standardized forms and noted instances of such deviations for each communication. Then I repeated the process with each subsequent feature until all features had been considered for each case. Any additional features not in my initial list which appeared to become relevant throughout the analyses were also noted and then included in the process of feature assessment for each communication. The frequencies of each linguistic feature were also noted according to how often each feature occurs throughout each given communication. The purpose of noting the frequency is to assess whether a feature may be actual disguise or whether it is idiolect manifesting itself in the writing. Frequent use of a feature throughout a communication may indicate a feature that is part of an idiolect rather than disguise, while sparse or inconsistent usage may indicate disguise. It may also be that categorical use of a feature that is variable in genuine dialectal use may indicate disguise as well. For this paper, the term *distortion* will be used when it is quite clear that a feature was purposely used; *deviation* (from

standardized forms) will be used when purposeful disguise of a feature cannot be confidently assessed.

3. Analysis

The process of analysis included an in-depth assessment of each feature listed previously in the Methods section. Not all of the features were found in the communications, so only those actually present were included in the presentation of results. The analyses together yield a series of features which I synthesize to form a model for the analysis and assessment of deception at the conclusion of this paper. The features I touch on in this analysis suggest possible features and patterns which could be used in the future for investigative purposes, but there is still much work to be done.

In what follows, each communication is prefaced by a brief contextualization of its respective case, followed by a summary of the analytical findings. A detailed discussion of these findings will be reserved for the following section.

For the purposes of this analysis, relevant features have been identified and emphasized using boldface. Each communication was transcribed to reflect capitalization and textual organization used by the authors as closely as possible.

3.1. “Dear Sarah” Threatening Letter

This anonymous threatening letter was found on the floor of a U.S. high school in 2004. It was quickly analyzed by James Fitzgerald and investigated by the FBI who deemed it to be of a low level of threat. Eventually, a teenage girl who attended the school admitted to writing the letter as a prank. No damages occurred to the school or any other students (Schilling, 2022, Personal Communication).

Sarah

I'm sorry about everything. Don't be mad. **Im going to** make sure **John** doesn't get hurt. Make sure you don't tell anyone. Including **Beth**. **I'm gonna** use my dads handgun. You know the one under the bed. I hope I'm doing the right thing. They deserve all of it anyway. Make sure you don't come to school tomorrow. Tell your mom **your** sick or something. I'll call you after school to talk more. 24hrs from now there **wont** be any Kanoks or me left. Don't hate me hate them.

You know who

The "Dear Sarah" letter gives a few small hints of disguise, but they are noteworthy, nonetheless. In Visonà (2021), it was shown that the inclusion of proper names may indicate deception. The "Dear Sarah" letter contains several instances of proper names, which may indicate the writer's distancing of themselves from the communication, or perhaps an attempt to misdirect investigation, since the inclusion of multiple names would lead investigators to question people with those names, which indeed took place in this case. Of course, it should be noted that the use of proper nouns in criminal communications does not always indicate disguise and that Visona's study involves quite different data, fabricated fraudulent hotel reviews. However, simulated specific detail, including specific names, could emerge as a disguise technique if more data on authentic criminal communications involving disguise can be assessed in the future. The only other overt feature within this letter is the deviation of punctuation from mainstream standard norms, with inconsistent uses of apostrophes in first person-singular contractions. However, a caveat should be noted here in terms of the length of the communication. Since this letter is very short, and there are no known writings available for additional analysis, it cannot be concluded with certainty that these deviations from punctuation conventions are deliberate.

3.2. "Preskiller" Threatening Email

On April 1st, 2004, the FBI received a series of threatening emails from an anonymous author calling themselves "Preskiller." The fourth in this series is examined here. Its style is representative of those of the other emails sent by the author, with most communications being much shorter than the one analyzed in this paper. James Fitzgerald's analysis along with the FBI's investigation revealed that the author turned out to be a young teenage boy in Vinton, VA, who had no intentions of following through with the threat (Schilling, 2022, Personal Communication).

Well.… That's very kind of you to try to get me to not kill the **P**resident well I will do you one favor. I will **POSTPONE** this murder for a small favor. I want 2 **T**housand dollars at the Vinton Library in Vinton, Virginia. I want it there… let's say 4/01/04. **THIS IS NOT** an April Fool's day trick either…. **I would also like** a different number to call. Any other number but the main number. Let's say the direct number to **S**pecial **A**gent R– R--'s Office and **I would like** to **C**hat **L**ive online with a **S**ecret **A**gent. **I would also like** his email address and **I**f my demands are met then I will give you guys a chance **BUT** if they are not met I **WILL** start taking hostages and killing a few people with my MAC-11 Submachine gun. This may get a little… **NASTY**!!!

In the "Preskiller" email, there are relatively few indications of disguise. However, due to the nature of the crime, it can still be presumed that some level of disguise may have been used. The main hint of disguise is found in the use of modals when the author expresses their demands. The use of mitigating modals in threats could be indicative of a lack of seriousness as well as evidence that a younger author may be using disguise to attempt to appear older, through using a more polite or formal register than is usually associated with younger people (including teenagers). The only other frequently used feature in this email is the distribution of capitalization, which mostly seems to be applied randomly rather than in a systematic way that might be indicative of idiolect or the writing conventions of a particular group. However, some of the capitalization occurs in places where additional emphasis may be expected, the exception being in the case of "I would like to Chat Live online with a Secret Agent," a common practice

in online writing of various types; hence, capitalization here can be considered to be suggestive rather than definitive of disguise, or of this author's idiolect.

3.3 "Devil Strip" Ransom Note

In a high-profile kidnapping case, the following anonymous ransom note was found at the home of an abducted juvenile. Linguist Roger Shuy was consulted and asked to provide a linguistic profile of the author. Based on his knowledge of dialect variation in the U.S., and consultation of the *Dictionary of American Regional English* (Houston et al, 1985), Shuy noted that the author's use of "devil strip" strongly indicated ties to Akron, Ohio. since Akron is the only known place in the U.S. where "devil strip" is typically used. It was later discovered that the kidnapper was, in fact, an educated man from Akron, Ohio (Shuy, 2001). Other details of this case are not publicly available, but those that have been included in this background are sufficient for the purposes of this study.

Do you ever want to see your precious little girl again? Put $10,000 cash in a diaper bag. Put it in the green trash **kan** on the devil strip **at corner 18th** and Carlson. Don't bring anybody along. No **kops**!! Come alone! I'll be watching you all the time. **Anyone with you, deal is off and dautter is dead**!!!

In this ransom note, there is notable deviation from conventional spelling. In his analysis, Shuy (2001) noted that simple words such as "trash kan" and "kops" are misspelled, while complicated words like "diaper" and "precious" are spelled correctly. It is also important to note that "dautter" is not misspelled in a way that would be predictable from an author who genuinely did not know how to spell "daughter," as it might be expected to see spellings such as *dotter* or *datter*. Shuy states that this is evidence that disguise in the form of "dumbing down" is used in this note. This communication also includes instances of preposition and article omission in the final sentence, though throughout the note most prepositions and articles are included. The frequency of the omission is interesting to note because the rate of omission increases from no

omissions in the first seven sentences to four omitted words (e.g., if, is, the, your) at the end of the note. These omissions may be part of the author's attempt to disguise themselves as less education than they are, but they may also indicate increasing haste as the note writing progresses. In this case, then, we see some fairly definitive indications of disguise in the form of spelling distortions, while other features, as above, are suggestive but not conclusive.

3.4. Annie Laurie Hearin Ransom Note (Note 1)

In 1988, Annie Laurie Hearin, the wife of a wealthy businessman, was kidnapped from her home in Jackson, Mississippi. Shortly after her kidnapping, a ransom note was found on her family's doorstep demanding that a group of twelve individuals linked to her husband's company be paid in exchange for her return. Only part of the note was able to be sourced for this paper, but it still gives a few hints as to how the author may have disguised his identity. While not all facts of the case are known with certainty, it was later revealed that not all 12 of the people mentioned in the note were involved with the kidnapping, and that a middle-aged, white, male lawyer from Florida by the name of Newton Alfred Winn was the actual kidnapper (Unsolved Mysteries Wiki, 2023).

Mr. Robert **Herrin**,
Put **these people** back in the shape **they was** in before **they** got mixed up with School Pictures. Pay **them** whatever damages **they** want and tell them all this so **then** can **no** what you are doing but **dont** tell **them** why you are doing it. Do this before ten days pass. **Don't** call police.

This note contains several traces of disguise. It appears that the author used a group identity to disguise their individuality. Pronouns and phrases such as "these people," "they," and

"them" are overt indicators of this disguise effort. The other noteworthy method used in this note is that of distortion of spelling and deviations from the syntactic conventions of standard written English (more precisely subject-verb agreement). The spelling distortions include "then can no" instead of "they can know" as well as an instance of punctuation distortion with the use (and lack) of an apostrophe in the cases of "don't/dont."

The non-standard subject-verb agreement has an added layer of complexity due to the region of origin of the likely author (as far as the case facts allude). It could be postulated that the "disagreement" found in "they was" may actually be a reflection of the author's sociolinguistic background, since verb leveling is a feature that is found in many varieties of Southern American English, and the actual author was from Florida. However, not all Florida dialects fit neatly within the Southern US dialect area, and in addition, the nonstandard usage may not reflect the author's genuine writing style given his high level of education. This dialect usage will be explored more deeply in the Discussion section.

3.5. Annie Laurie Hearin Ransom Note (Note 2)

This second ransom note arrived at the Hearin home soon after the first. Annie Laurie's husband immediately recognized his wife's handwriting, but this does not guarantee that the note was not dictated by her kidnapper(s).

Bob, If you don't do what these people want you to do, they are going to seal me up in the cellar of this house with only a few jugs of water. Please save me, Annie Laurie

While there is very little text in this note, it is known from case facts that Annie Laurie did in fact write this note, in the sense that she physically penned it. If she composed the note on her own, her use of "these people" and "they" to refer to her kidnappers would indicate that there was, in reality, more than one person involved in this crime, which would negate any

implications of the author of the first note being the sole participant in the kidnapping. The fact of this matter is, however, that there is not enough information surrounding this second note to make a decided conclusion about its author.

3.6. Robert Wiles Abduction

Robert Wiles was a pilot working for his family's aircraft maintenance company when he was abducted in April 2008. He was last seen at work before he went missing and was eventually presumed to be deceased after officials were not able to recover his body after a significant period of time. The kidnapper left the following ransom note a few days after the abduction (FBI, 2012). Investigations led to the arrest of 42-year-old Toby Holt, who was a coworker of Wiles' and was determined to have committed the crime on his own.

We have Robert. If you hope to see him alive again you must follow **our** instructions without deviation!

1. Do not speak about this to anyone including **family tell** everyone Robert is ill
2. Do not contact **ANY** authorities or private parties
3. Obtain an item of luggage of the appropriate size and place in it $750,000 in small unmarked untraceable bills.
4. Place the luggage containing the money in a plain cardboard box and ship it to your lakeland facility with detailed instruction that it is highly confidential materials for a special project that your son is working on. You should instruct someone you trust to place the box unopened in your son's office.
5. This must be completed by the evening of the 8th. **NO EXCUSES! NO EXCEPTIONS!**

Remember that **we** are watching everything and if you think you can out smart **us** it will cost your son his life.

Group X

The most relevant feature in this communication is the use of first-person plural when the author refers to himself. Since it is known that the perpetrator was only one person, it is clear that this was a disguise tactic. Holt also ended the note by calling himself "Group X," further attempting to indicate that more than one person was involved in the abduction. Additionally,

however less compelling, is an instance of what could either be a deviation from standard punctuation or slightly unusual syntax. In the first bullet point, the author writes: “Do not speak about this to anyone including family [;] tell everyone Robert is ill” (semi-colon added for illustration), showing either lack of prescriptively expected punctuation between independent clauses or a missing connective such as ‘and’. However, this deviation from standard norms cannot be confirmed as having been deliberately done by Holt. There are also several instances of fully capitalized words; again, though, as is the Preskiller case, the capitalizations seem to coincide with emphasis, a relatively conventional usage in less formal written (especially online) communication.

3.7. Goya Painting Heist (Letter 1)

In 1965, a famous painting of the Duke of Wellington by Francisco de Goya disappeared from the National Gallery in London. It had been recently auctioned for £140,000 and donated to the Gallery. Several anonymous ransom letters were published in newspapers claiming that the theft was committed solely for the purpose of charity rather than personal gain. The author of these letters, Kempton Bunton, eventually turned himself in to the police (Bremner, 2021).

QUERY NOT, THAT **I** HAVE THE GOYA. IT HAS A STICK LABEL ON BACK SAYING F LE GALLAIS + SON. DEPOSITORIES JERSEY. NAME DUKE OF LEEDS. DATE 22.8.58 NO 2. IT HAS 6 CROSS RIBS EACH WAY (BACK) THE ACT IS AN ATTEMPT TO PICK THE POCKETS OF THOSE WHO LOVE ART MORE THAN CHARITY.

THE PICTURE IS NOT DAMAGED APART FROM A COUPLE OF SCRATCHES AT SIDE.

ACTUAL PORTRAIT PERFECT.

THE PICTURE IS NOT, AND WILL NOT BE FOR SALE – IT IS FOR RANSOM - £140,000 – TO BE GIVEN TO CHARITY.

IF A FUND IS STARTED – IT SHOULD BE QUICKLY MADE UP, AND ON THE PROMISE OF A FREE PARDON FOR THE CULPRITS – THE PICTURE WILL BE HANDED BACK.

NONE OF THE GROUP CONCERNED IN THIS ESCAPADE HAVE ANY CRIMINAL CONVICTIONS.

ALL GOOD PEOPLE ARE URGED TO GIVE, AND HELP THIS AFFAIR TO A SPEEDY CONCLUSION.

3.8. Goya Painting Heist (Letter 2)

GOYA Com' 3

THE DUKE IS SAFE. HIS TEMPERATURE CARED FOR – HIS FUTURE UNCERTAIN.

THE PAINTING IS NEITHER TO BE CLOARFORMED OR KIOSKED AS SUCH WOULD DEFEAT **OUR** PURPOSE AND LEAVE **US** TO EVER OPEN ARREST.

WE WANT PARDON OR THE RIGHT TO LEAVE THE COUNTRY – BANISHMENT?

WE ASK THAT SOME NON CONFORMIST TYPE OF PERSON WITH THE SPORTITUDE OF A BUTLIN AND THE FEARLESS FORTITUDE OF A MONGOMERY START THE FUND FOR £140,000. NO LAW CAN TOUCH HIM PROPRIETY MAY FROWN – BUT GOD MUST SMILE **WE** TO HAVE FIRST SPY AS TO DISPOSAL. A COMMITTEE OF FIVE MAY **OVERULE**.

PS LETTER TO REUTERS FEB 11 WAS 2ND COMM.

Between both letters, there is only one perceivable instance of deviation from standard spelling ("overule"). However, it's likely that this deviation is an unconscious mistake involving only a missing letter; there are no obviously distorted words, and so the most logical conclusion is to rule out orthographic distortion as a disguise tactic used by Bunton. These letters also contain a discrepancy in pronoun usage between the first and second letters. The first letter refers to the author using first-person singular "I," while the second uses first-person plural "we." This suggests a shift in disguise strategy, in the sense that Bunton did not chose to use plural pronouns until the later letter. Since he was the only participant involved in the heist, his use of first-person plural indicates an attempt to disguise his identity by taking on a group identity.

Letter 2 also contains interesting language in the phrase “THE SPORTITUDE OF A BUTLIN AND THE FEARLESS FORTITUDE OF A MONGOMERY.” However, it does not necessarily show an effort to disguise. At the same time, though, this excerpt is rich with noun phrases, which are consistent with the gender of the author according to Nini’s (2015) finding that men use more nominal structures than women. Although this point is relevant for profiling purposes, it does not contribute to assessing features pointing to disguise and so does not figure in the results of this study. Further, since there is no access to Bunton’s known writings, one cannot assess his known non-anonymous writings for similar use of noun phrases as well as alliteration and highly unusual words.

3.9. JonBenet Ramsey Ransom Note

In December of 1996, six-year-old JonBenet Ramsey was reported missing. A ransom note was found in the family home demanding a large sum of money in exchange for the return of JonBenet. However, the ransom note was simply a ruse since there was no kidnapping. The child was found dead in the home shortly thereafter with no trace of her killer. Investigations were never able to draw decisive conclusions on who the perpetrator was, even with a relatively long ransom note (Burke, 2022). Although this case is still unsolved, and the author not yet conclusively identified, the fact that this case involved a murder rather than a kidnapping indicates that the entire note was in fact an attempt at disguise and strongly suggests that within it will be specific features of linguistic disguise.

Mr. Ramsey,

Listen carefully! **We** are a **group** of individuals that represent a small foreign faction. **We** respect your **bussiness** but not the country that it serves. At this time **we** have your daughter in **our posession**. She is safe and unharmed and if you want her to see 1997, you must follow **our** instructions to the letter.

You will withdraw $118,000.00 from your account. $100,000 will be in $100 bills and the remaining $18,000 in $20 bills. Make sure that you bring an adequate size attache to the bank. When you get home you will put the money in a brown paper bag. **I** will call you between 8 and 10 am tomorrow to instruct you on delivery. The delivery will be exhausting so **I** advise you to be rested. If **we** monitor you getting the money early, **we** might call you early to arrange an earlier delivery of the money and hence **a** earlier pick-up of your daughter.

Any deviation of **my** instructions will result in the immediate execution of your daughter. You will also be denied her remains for proper burial. The two gentlemen watching over your daughter do not particularly like you so **I** advise you not to provoke them. Speaking to anyone about your situation, such as Police, F.B.I., etc., will result in your daughter being beheaded. If we catch you talking to a stray dog, she dies. If the money is in any way marked or tampered with, she dies. You will be scanned for electronic devices and if any are found, she dies. You can try to deceive **us** but be warned that we are familiar with Law enforcement countermeasures and tactics. You stand a 99% chance of killing your daughter if you try to out smart **us**. Follow our instructions and you stand a 100% chance of getting her back.

You and your family are under constant scrutiny as well as the authorities. Don't try to grow a brain John. You are not the only fat cat around so don't think that killing will be difficult. Don't underestimate **us** John. Use that good southern common sense of yours. It is up to you now John!

Victory!

S.B.T.C.

This ransom note contains several notable features which indicate potential disguise. First and foremost, the inconsistency of first-person singular vs. plural pronoun usage shows that the author was likely working alone in this crime but attempting to hide behind a group identity. The second relevant feature in this note is the deviation from spelling norms of standard English, which only occurs within the first paragraph of the note, with the words "bussiness" and "posession." Interestingly, in both words, the author either added or removed 's' in words which contain double 's.' Other than these distortions, there are no other major deviations of spelling aside from the use of 'a' where 'an' would be prescriptively correct, in the phrase "**a** earlier pick-up." Since this is the only instance of such a usage, it cannot be proven to be deliberate disguise.

The use of pronouns in this note is very inconsistent. At times, the author uses first-person pronouns to refer to themselves, while at others, first-person plural is used:

"At this time **we** have your daughter in **our posession."**

"Any deviation of **my** instructions will result in the immediate execution of your daughter."

These inconsistencies indicate that disguise is likely being applied to this communication. It seems that the author was trying to use first-person plural to assume a group identity but was unsuccessful in using it consistently, perhaps because the author was also cognitively occupied in crafting the content of the note.

Lastly, there is a great deal of what may be deemed extraneous information in this letter. The underlined sections contain information that is not strictly necessary in terms of exchanging a child for ransom. However, much of the 'extraneous' information arguably is used for purposes of intimidation, which could be expected in a ransom note or threat even when no disguise is present. A separate study assessing extraneous information in ransom notes would help clarify the issue of whether this feature is indeed implicated in disguise or is part of the ransom note genre. However, it is likely that the combination of inconsistent pronoun usage and spelling distortion, along with extraneous information, may be evidence enough to determine that disguise was used. More on the value of considering the co-occurrence of an array of features rather than single features alone will be discussed in the next section.

3.10. Illes Letters (Letter 1)

The context of the following letters was outlined in the introduction to this paper. The letters are listed in chronological order of their reception by Illes' lawyer (Leung, 2005).

LEPLEY –

I SHOT MIRIAM. THE LORD ORDERED ME TO HARVEST THE WICKED RACIST ONES OF THIS **TOWN I** EVEN MADE IT LOOK LIKE DR. **ILLIS** DID IT. BUT THE NIGHT I DID THE LORD WAS ANGRY, **CAUSE** HE DID NOT TELL ME TO HARM **HIM, I** EVEN PUT THE GUN WHERE THEY **WOULD IT** AND THINK IT WAS HIS. I UNDID MUCH OF **IT, BUT** I **COUDNT** UNDO IT ALL. I GOT THE GUN BACK AND I WROTE A LETTER TO THE **EDITER** OF THE SUN **GAZZET** THAT WEEKEND **EXPLANING** THAT I WAS ORDERED TO DO **GODS** WORK AND THAT HE SHOULD PRINT THE LETTER AS A WARNING TO ALL. HE DID NOT. I KNOW THE LORD IS WITH YOU ALSO SO YOU MUST MAKE THEM PRINT THE LETTER.

SOLDIER OF EQUALITY

SOLDIER OF GOD

SOLDIER OF DEATH.

In addition to the overt deflection of blame in "I even made it look like Dr. Illis did it," this first letter, later determined to have been written by Illes, is riddled with indicators of disguise. James Fitzgerald's analysis noted that the words "Illis," "cause," "editer," "gazzet," and "explaning" all point to misspellings by an author with a lower education level who seems to be attempting to spell based on pronunciation. "Cause" is an exception to this group since this misspelling relates to colloquial or fast speech pronunciation; however, the spelling still preserves the complex *au* form which might otherwise be misspelled by a true novice as "cuz." As in the Devil Strip case presented above, the presence of relatively complex correct spellings like *au* occurring alongside misspellings like "editer" suggests disguise. Overall, since it eventually became known that the author was well educated, the misspellings could be considered one of his methods of disguise.

The next disguise tactic that is heavily relied upon by Illes is distortion of punctuation. There are several missing apostrophes as well as commas. The lack of punctuation in phrases such as "THE LORD ORDERED ME TO HARVEST THE WICKED RACIST ONES OF THIS

TOWN I EVEN MADE IT LOOK LIKE DR. **ILLIS** DID IT" makes it appear as though the letter was written by an author of lower education. However, since it is known that Dr. Illes himself wrote this letter, it is clear that he was actively disguising his identity through the lack of punctuation.

The last notable feature in this letter is the missing verb in the phrase "I EVEN PUT THE GUN WHERE THEY **WOULD IT** AND THINK IT WAS HIS." This is the only occurrence of a missing word; however, because it is a key verb in this sentence it seems unlikely that the omission was accidental.

3.11. Illes Letters (Letter 2)

LEPLEY –

I AM QUITE DISAPPOINTED THAT MY LETTER TO THE EDITOR WAS NOT PUBLISHED. IT WOULD HAVE CLEARLY DEMONSTRATED THAT **DR. ILLES COULD NOT HAVE BEEN THE KILLER** OF HIS EVIL WIFE. BUT I AM CERTAIN THE STUPID AUTHORITIES ARE NOT INTERESTED IN THE TRUTH AT THIS POINT. THEY HAVE BEEN TOTALLY FOOLED BY MY SUPERIOR INTELLECT. THEY COULD NOT EVEN FIGURE OUT THAT ALL OF THE ERRORS IN MY LAST LETTER WERE DELIBERATE TO HIDE MY IDENTITY. I HAVE ADVANCED DEGREES AND AM FLUENT IN SEVERAL LANGUAGES, AND MY I.Q. IS TWICE AS HIGH AS ANY POLICE OFFICER.

I AM TRULY SORRY THAT **I HAVE RUINED DR. ILLES' LIFE**. I THOUGHT THE LORD **INTENTED** THIS. BUT I WAS WRONG. I KNOW THE LORD FORGIVES ME AND PRAY THAT DR. ILLES WILL. THE PAPER SAID THEY FOUND WIRE IN **DR. ILLES TRASH** THAT MATCHED WHAT I USED IN THE SILENCER. I HAD FREE ACCESS TO HIS HOME WHILE HE WAS ON VACATIONS, AND USED MANY OF HIS SUPPLIES TO FABRICATE MY EQUIPMENT. DO THEY ACTUALLY THINK HE IS STUPID ENOUGH TO KEEP ANY SUCH MATERIALS IF HE DID THIS, OR IF HE HAD KNOWLEDGE OF IT? THAT IS A REAL INSULT TO HIS INTELLIGENCE!!

PLEASE MAKE THE NEWPAPER PRINT MY ORIGINAL LETTER POSTMARKED JANUARY 16, 1999. IT WILL CLEAR UP MANY MISCONCEPTIONS. THIS WILL BE THE LAST YOU WILL HEAR FROM ME. I AM MOVING OUT OF THE AREA.

SOLDIER OF EQUALITY

SOLDIER OF GOD

SOLDIER OF DEATH

In Letter 2, as in the first letter, the author, Dr. Illes, again attempts to shift blame from himself through writing from the perspective of a different individual who writes of Dr. Illes in the third person (and even spells his name wrong in Letter 1). In this letter, the overt shift is indicated in “Dr. Illes could not have been the killer” and “I have ruined Dr. Illes’ life.”

Given the features of the first letter, the author would have been profiled as having minimal education. However, upon analyzing the second letter (Table 8), the profiled level of education changes significantly. The misspellings disappear almost entirely, with only one spelling error and one minor punctuation error, which cannot for certain be deemed intentional:

“I THOUGHT THE LORD **INTENTED** THIS.”

“THE PAPER SAID THEY FOUND WIRE IN **DR. ILLES TRASH […].”**

There is again a shift of blame from Dr. Illes to the author of the letter, to avoid the appearance that Dr. Illes was the murderer:

There is also a large amount of extraneous information (underlined) in the second letter, similar to that found in the Ramsey Ransom Note. This type of extraneous information references the superiority of the author in comparison to the recipient of the communications. The inclusion of extraneous information thus indicates a similarity across the genres of ransom notes and POMICs (i.e., communications written after an offense has been committed in an effort to influence the investigation of the offense), one which may possibly extend to other disguised communications as well, as it has been found to be a feature of deceptive communication more generally. Extraneous information will be discussed in more depth in the Discussion section.

3.12. Castor Staged Suicide

In 2007, it was discovered that Stacey Castor had murdered her two late husbands by poisoning them with antifreeze. Prior to her conviction, since the evidence pointed strongly towards Castor as the murderer, she attempted to pin the blame on her daughter Ashley. Castor composed a suicide letter under Ashley's name and attempted to murder her by using the same method of poisoning by antifreeze. Ashley was found unconscious, but still alive, by her sister, who also found Castor's letter next to her. Ashley eventually recovered, and Castor was convicted of murdering her late husbands and of attempting to murder Ashley. Linguistic analysis conducted by James R. Fitzgerald indicated common authorship between the letter and Castor's known writings (Meyersohn et al, 2019).

1. Mommy

2. When you read the letter just remember I love you and everything I did is because I love
3. you I'm sorry all of this is happening to you but now everyone is going to know what
4. really happened and they know it wasn't you it was me none was every supposed to know
5. about daddy I told you **when daddy died it was all m y fault** and it was daddy was doing
6. things you never knew about he was drinking when he was at pick n pull house and at
7. lisas house he was smoking pot again to I saw him he was mean to you and me and he
8. only every loved bree I couldn't let him do those things to you anymore you think I don't
9. remember how things were but I do and I didn't want to every live like that anymore it I
10. wasn't fair to you or me daddy wasn't going to be good to you or be ever only bree I
11. couldn't stand it any more the cops said there was antifree in daddys body but did they
12. tell anyone about the **rat poson** too when I got home from school that day I knew what
13. was going on daddy was barely breathing I knew he was gonna die that's why I didn't
14. call you for help or anyone else I wanted to make sure he couldn't be mean to you or me
15. anymore he died before I went to pick bree up from school I watched him and I knew he
16. couldn't hurt you anymore then we were happ y for while just the three of us and then
17. you married david and he was mean to you to he was mean to all of us mener that dadd
18. y and I knew you loved him like you loved daddy and you were going to let h im **treet**
19. you like he did and you wouldn't leave it wasn't fair mommy he didn't love you or me or
20. bree I never thought anyone would miss daved none but you loved him it was harder than
21. with daddy because you were always home or with him but **it did it I made sure he would**
22. **never hurt you anymore** to that Friday when david came home so you could go to the post
23. office is when I first did it it was easy I asked him if he wanted something to drink and I
24. put the antifree in his glass with some soda he drank **2 hole glasses** that was it only it took
25. longer for david then with daddy once I put the antifree in daddys gatorade it only took a

day or so and that's when he died when you were sleepin on the couch after david locke himself in the room I got the extra key because I knew where he hid it and I put stuff in the room i tried to get him to drink some of that booze with the dropper thing but he was gout of it and wouldn't I poured the antifree in the glass and on the floor and left the bottle in the rom and then I put the gloves back in the kitchen and got ready for wok you never knew and know all of these cops are saying all of this stuff about you to everyone you know and love mommy its just not fair when you told me they dug daddy up I knew what was going to happen none was ever supposed to know mommy and not thay do and they think you did it but you didn't it was me when the cops came to my school today I thought they had figured it out and I was going to go to jail but they didn't take me mommy I can't live like this and watch what they are doing to you not anymore but I cant go to jail for the rst of my life i can't put you through that I did the only thing I could to help you mommy I know you hate me for doing what I did buy mommy remember I love you more than anything and I did it for you and for us please forgive me mommy someday when all of this is over please forgive me make sure you take care of bree she is all you have left now remember how happy we all were together adn you will be ahppy again I promis you mommy tell matt I love him and I'm sorry tell bree to be a good girl for you and I love her now too please don't hate me remember I love you

Ashley

Through the context of the case, it is discernable that Castor was seeking to impersonate her daughter. However, considering that Ashley was a university student (Meyersohn et al, 2019), it is clear that if an author profile were conducted, the writing style chosen by the author would not match that of an author with a university-level education. As Fitzgerald noted in his analysis, the omitted punctuation throughout the document would not been characteristic of a university student, and the deviations from prescriptive spelling rules appear to be deliberate distortion since simple words like "rat poson" and "treet" are misspelled, while more complicated words like "fault" and "would" are spelled correctly. Why Castor chose to omit most punctuation when she was attempting to impersonate her daughter, who, as mentioned earlier, was well-educated, is still in question. However, it may be that omitting nearly all punctuation was Castor's way of disguising any patterns of punctuation which may have been recognizable as distinctive in her own writing. A need to remain hidden behind the face of the victim might drive an author to use or omit such linguistic features for the purpose of

impersonation disguise. Thus, for the purposes of this paper, I acknowledge that it is not easy to categorize the disguise type of this communication, but I will still consider it to be impersonation disguise (rather than anonymization) due to the nature of the crime (as well as the content of the letter, in which Stacey writes from Ashley's point of view and signs the letter with Ashley's name).

In addition to examining the 'suicide' note, I also examined a non-criminal communication of Castor's; the comparison makes it clear that her non-disguised writing contains punctuation in the prescriptively correct places, and her orthography is generally correct as well. Her own writing does not show features suggestive of a lack of education or of a younger age. Syntactic complexity across Castor's known writing and the staged suicide note cannot be accurately assessed, given the lack of punctuation indicating sentence breaks in the staged letter. There are nonetheless some clear breaks between ideas and clauses in the impersonated letter (e.g., lines 5-8 below), which reflect her writing style in her known writing. In the example included below, I have added brackets to show where the text could be split into groups of ideas or thoughts which appear to reflect the same level of complexity as the sentences in Castor's known letter:

> [it was daddy was doing things you never knew about] [he was drinking when he was at pick n pull house and at lisas house he was smoking pot again to] [I saw him] [he was mean to you and me and he only every loved bree]

3.13. Jocelyn Earnest Staged Suicide/Murder

In December of 2007, Jocelyn Earnest was found dead by a gunshot wound in her home in Virginia. A seeming suicide note was found next to her body. She and her husband, Wesley Earnest, were going through a divorce, in which finances were a serious problem as they were deep in debt. A comparison conducted by Fitzgerald of the suicide note with known journal

entries of Jocelyn revealed inconsistency of writing style between the note and the known writings. Regarding content, Fitzgerald noted that Jocelyn's personal journal writings rarely mentioned finances, and even when they were mentioned, they were not present in conjunction with suicidal feelings. Additionally, Fitzgerald noted that most of Jocelyn's known journal entries consisted of multiple pages in length, whereas this letter only contains 83 words. Based in part on Fitzgerald's expert linguistic testimony, Wesley was convicted of first-degree murder in 2010 (Spencer, 2012).

Mom,

I just can't take it anymore. I have tried so hard to be so strong but **its** too hard to continue. The ups and **down** are too much to deal with. I keep trying to appear as though I am doing fine but the bad days are so overwhelming and lonely. My new love will never leave the family, Wes has buried us in debt and starting over is too much.

I am so sorry Mom. I am so sorry everyone.

Jocelyn

After my own examination of both this note and Jocelyn's known journal entry, it appears that in her known writings Jocelyn displays several of the features discussed by Rangel and Rosso (2013) as indicative of female authorship, such as high pronoun and determiner usage, as well as a low number of prepositions (*but* and *in*). However, contrary to their findings regarding female authorship, Jocelyn's known writings do not include many interjections, such as *too* and *so.* The ransom note in question contains multiple instances of *so* as well as *too* and *just,* all used as interjections. It appears that Wesley Earnest actually applied Jocelyn's writing style relatively well in forging the suicide note, but he may have overcompensated for his male writing style and included too many features of typical female writing style (unless his own personal style includes a larger amount of interjections than the average male author). This is a

strong indication of disguise. At the same time, drawing on Nini's (2015) findings on features of female vs. male authorship, this note contains a high number of verbal structures (which tend to indicate female authorship), such as the following:

"I keep trying to appear as though I am doing fine"

"Wes has buried us in debt and starting over is too much."

It is unclear whether these structures also represent Wes's application of features of female style to his forged note; however, it is likely they do not, since the use of more verb phrases vs. noun phrases is likely to escape people's consciousness, whereas interjections will be far more salient.

3.14. Diaz Staged Suicide/Double Homicide

In January of 2007, Duceliz Diaz and her daughter Kayla were found dead in their Pennsylvania home. Around the same time, a "suicide" note was sent to the Diaz family via email. Duceliz's former boyfriend, Albert Perez, was quickly identified as a plausible suspect, and this was confirmed through linguistic analysis of the email against known writings of Perez. Once again, Fitzgerald conducted the authorship attribution analysis, as he did for several others in this study, and concluded that there was a high likelihood of common authorship between the suicide note and Perez's known writings, which influenced the court to convict Perez of two counts of first-degree murder (Ludgate, 2008).

i'm doing something today **thast** will **affe4ct** us all**,** I **weant** you to do me a favor**,** get **j**ajaira and **e**ddie and all 4 of **their** kids**,** he raped me when **i** went to their **hous e** and she watched**,** so **i** want you to kill **thenm,ill** be **watchin** to make sure you do this**,** leave **a**lbert alone though just **'**tell **a**lbert **i** love him and this ist his fault**,** and **its** not the **familys faut** either**, i** just **deont weant** to live anymore**, m**ommy and **p**oppi **i liove** you**, m**io **i** love you **c**arlos **i** love you and **b**renda **i** love you**,** please tell albert that **i** will always love him**…….i sorry** that it has to be this way everyone**,** but this is what **iv wantred** to do for a very **log tmie, peace3** out and **i'll** be keeping an eye on all

of you**,** and even though we argued and fight over stupid things**,** you guys are always **gonna bwe** in my heart**,**

Of all the features that stand out in this communication, one of the most interesting is the author's use of apostrophes in first-person singular verbal contractions such as *I'm* or *I'll.* Apostrophe usage in this email is inconsistent; there are four total opportunities for the apostrophe to be applied, and only two of the four are present in this communication: "i'm/i'll" vs "iv/ill." This inconsistency may be a sign of distortion, suggesting that the author was not able to consistently fake the disguised usage. In addition to apostrophes, the overall use of punctuation is of interest in this communication since there are no periods in the entire email. Each sentence is demarcated by a comma, which is reminiscent of the consistent lack of punctuation in the Castor staged suicide letter.

The frequency of deviation from prescriptive standards of spelling is fairly consistent throughout the communication, so from that standpoint, it is not compelling as far as disguise is concerned. Marko (2017) noted that it is very difficult to authors to consistently alter features for disguise, which supports the fact that the deviations in this communication are not strongly indicative of disguise. It could even be postulated that the deviations of spelling in this communication may be typing errors rather than a lack of knowledge of prescriptive spelling rules. However, if a comparison between this email and the author's known writings were attainable for this paper, it may reveal a lower rate of nonstandard spellings in the known writings, which would be considered cause to suspect disguise.

Lastly, the only occurrence of capitalization is found in one of the *I's.* None of the proper nouns or beginnings of new sentences are capitalized, which, like the punctuation patterns, could indicate disguise in the form of random distortion.

While none of the features mentioned in this analysis is strong enough on its own to prove that disguise was deliberately used by the author, together they create a need to inspect the communication further. More will be discussed on this in the following section.

4. Discussion of Results

In this section, only the most commonly found features in these communications will be discussed. Features which were only found once or which do not carry strong enough weight due to a lack of potential for explanation will not be included since they will not be useful in drawing conclusions and leading us toward a new system of analysis. The features discussed hereafter do not appear in any particular order.

4.1. Pronoun Inconsistency

Pronouns were noted in each communication during the initial stages of analysis and coded for first, second, and third-person singular/plural, but not all communications manifested relevant patterns of usage. In the Annie Laurie Hearin ransom note, the author uses only third-person plural pronouns to refer to any participants other than Mr. Hearin: “Pay them whatever damages they want […]”. This is an example of how the use of plural pronouns may indicate disguise. The usage is consistent. In contrast with this note, the Goya heist ransom notes and the Ramsey ransom note display inconsistent uses of singular vs. plural pronouns to refer to the author(s), which is also cause to suspect disguise. The inconsistency in the Goya notes occurs inter-communicationally, meaning that the pronoun uses change from one note to the next. The author makes use of a first-person singular pronoun to refer to himself in the first note (“QUERY NOT, THAT **I** HAVE THE GOYA.”), while in the second note he uses only first-person plural pronouns (“[…] AS SUCH WOULD DEFEAT **OUR** PURPOSE AND LEAVE **US** TO EVER OPEN ARREST.”). In the Ramsey ransom note, the pronoun usage is inconsistent intra-

communicationally. The note begins using first-person plural pronouns ("**We** are a **group** of individuals that represent a small foreign faction."), then switches back and forth rather sporadically throughout the note with first-person singular pronouns ("The two gentlemen watching over your daughter do not particularly like you so **I** advise you not to provoke them.").

There are several ways in which pronoun usage can indicate possible disguise. The key is to recognize which type of usage is found in the communication, especially singular vs. plural, and whether different pronouns are used to refer to authors themselves.

4.2. Word Omission

This is a feature that arose during the analytical process rather than from the research discussed in the literature review. Occurrences of this feature were found in the "Devil Strip" Ransom Note and in the first Illes Letter:

Anyone with you, deal is off and dautter is dead!!! ~ *"Devil Strip" Ransom Note*

"I EVEN PUT THE GUN WHERE THEY **WOULD IT** AND THINK IT WAS HIS." ~ *Illes Letters (Letter 1)*

Each excerpt shows omissions of varying parts of speech such as prepositions, determiners, and verbs, so more data would be needed to determine which parts of speech are most frequently omitted as a disguise tactic. The more convincing use of word omission in terms of disguise appears to be the omissions noted in the "Devil Strip" note, since there are more occurrences of omission as opposed to the single omission in the Illes letter and since it involves some omissions that might be found in less literate writing and so used by the author as a form of "dumbing down" for disguise purposes. Of course, analysts should take caution to consider that the author may actually have a lower literacy level or be a non-native speaker/writer. However, if such features occur with misspellings of simple words like 'kops', as well as correct usage of

idiomatic phrase like “[the] deal is off,” then disguise can be considered. At present, the best conclusion to be drawn from word omission is that it is easily identifiable and should be noted early on during an analysis but not necessarily prioritized for indicating a high likelihood of disguise on its own.

4.3. Subject-Verb Agreement

Verb tense did not appear to come into play in author disguise. However, subject-verb agreement yielded some helpful results in the analyses for this paper. For example, the analysis of the Annie Laurie Hearin notes showed possible use of nonstandard subject-verb agreement (“Put these people back in the shape **they was** in”) for purposes of disguise, to indicate a low level of literacy or a particular dialect background the author does not really share; however, the nonstandard agreement pattern may also have been indicative of the unconscious usages of an author with US Southern dialect influence.

Features such as subject-verb agreement have been subjected to much sociolinguistic analysis; comparing their patterning in criminal communications with their authentic patterning according to linguistic and social factors may yield evidence of inauthentic use for purposes of disguise. Dialect features may deviate from the rules of standard English, but they are subject to (typically unconscious) rules of their own, some of which can be quite complex. Hence, while mimicking a noticeable feature like lack of subject-verb agreement may be relatively easy, affecting its authentic patterning is likely to be more difficult. The leveling of subject-verb agreement paradigms to a single person and number is common across vernacular varieties of English, such as dialects of Southern American English, including some parts of Appalachia (José, 2007; Wolfram & Schilling, 2016). According to José’s (2007) study of data drawn from 18 interviews with European-American participants from Southern Indiana, there is a correlation

between the proximity of the subject and verb and the likelihood of plural -s inflection, with the likelihood of singular -s occurring with plural subjects being higher when the verb is separated from the subject by intervening material rather than adjacent to it. Additionally, José's study further found that leveling to the -s form is most likely to occur in conjunction with second-person pronouns, whether singular or plural. Wolfram & Schilling (2016) also note that speakers are more likely to use third-person plural -s in the context of collectives, or subjects such as *family*, *team*, or *some of them*. Age and level of education are also correlated with the likelihood of the use of leveling. José showed that older speakers had a higher probability of using plural verbal -s, while younger speakers had a slightly lower probability of using this feature. The fact that the instance of leveling in the Hearin note occurs with a third-person subject rather than second and with an adjacent subject and verb, as well as the fact that the known age and education levels of the author do not align with the social conditioning of subject-verb leveling, adds support to the contention that "they was" in this communication represents disguise. Whether the feature was used for the purpose of appearing less educated or of appearing to have a different sociolinguistic background cannot be definitively determined in this case; however, leveling could be used to mask sociolinguistic background if the author were well educated and had not spent a significant amount of time in regions or populations in which leveling is a common dialect feature.

4.4. Extraneous Information

As defined in table 2, extraneous information consists of any information which does not pertain to the event of the crime (Adams, 1996). Extraneous information is highly relevant for deception detection in statements and in this study has appeared to be potentially helpful in assessing disguise in other types of communications. This feature comes with several

complications, the first being that the amount of information given in a document would differ depending on the genre, the intent of the writing, and even the culture the author identifies with (Laing, 2015). For example, a study conducted by Jones and Bennell (2007), based on a data set of 33 genuine and 33 simulated suicide notes collected decades earlier and used in a number of subsequent studies, revealed that genuine suicide notes generally contain a relatively high amount of information, but that it is unusual for someone in such an emotional state to provide a reason for their action. Generally, explanations for suicides come as subtle "warning signs" before a genuine letter is written to anyone (pg. 222).

In the Castor suicide letter, there are three possible interpretations of the long, detailed text that comprises the letter (if it were the case that we did not now know the true author of the document). First, the determination that the letter is genuine letter could be made based on the fact that, like other suicide notes, it is long and detailed and contains affective language (e.g., expressions of love, terms of endearment) (Jones and Bennell, 2007). This interpretation assumes no disguise is at play. The second interpretation would be that the letter was written with the intention of impersonating Ashley's extensive inclusion of detail in her authentic communications, an interpretation that would be strengthened if Ashley's known communications were indeed of this style. The third and final interpretation would be that the large amount of extraneous information is characteristic of the actual author attempting to frame her crime as a suicide, meaning that Stacey did not change the length and level of detail in her attempt at disguise. According to my analysis of Stacey Castor's known writing, it does not appear that Castor typically uses fused (run-on) sentences in her own communications, though she does include detailed explanations in her letter to her friend about her current state. At this point, it is difficult to conclude whether the second or third interpretation is correct (or if both

factors come into play); however, the third interpretation seems to be the most likely of the three, especially given the features other than extraneous information that are used in the staged suicide letter.

Again, suicide notes appear to be a genre where seemingly extraneous information may not actually be irrelevant since the nature of suicide notes involves the inclusion of larger amounts of additional information. Also again, Jones and Bennell (2007) note that much of the information in these notes is not explanation, as we see in the Castor letter, but instructions for those surviving the suicide victim. Therefore, what counts as extraneous in an alleged suicide note may be different from what counts in another genre. In general, it seems that the content of the extraneous information may be more relevant than the presence of the information itself. The genre of the document must be taken into account before deciding to what extent extraneous information will play a role in assessing the presence or lack of disguise.

Another aspect of extraneous information that should be questioned is the inclusion of statements in ransom notes and threatening letters such as: “we are smarter than you” or “we know how police tactics work,” and so on. Such statements are likely used for their intimidating effect. And while it Since these types of statements occur so frequently in the documents of the aforementioned genres studied here, it is difficult to discern whether such information is actually extraneous, or whether it is inseparable from the genres. It would be possible to write a ransom note or threatening letter without including intimidating statements; however, omitting them may lessen the threatening effect the communications are intended to have on their recipients, which would likely defeat the purpose of writing them for some authors. These reasons contribute to my inclination to assume that statements in which authors assert mental or physical superiority

over readers or otherwise attempt to cause fear are, for the most part, not qualifiable as extraneous information.

4.5. Distortion of Spelling

Similar to Marko's (2017) findings, deliberate distortion of spelling is the most widely used method of disguise across the communications included in this paper. The frequency of distortion varies depending on the author, but this feature is often included, to a greater or lesser extent. Analysis of spelling should consider the types of words that are misspelled, specifically how similar the spellings are to how the words are pronounced (which would influence how difficult they are for the average author to spell) and whether the spellings are standard spellings in specific regions, such as words like *color* vs *colour* in standard American English as opposed to standard British English (Brooks, 2015).

There are several documents included in this analysis which contain misspellings and informal spellings such as "gonna" and "cause" which should be addressed in particular. Sometimes, nonstandard spellings should be regarded as unintentional misspellings or habitual informal spellings. In some cases, such as the examples shown below, I would argue that a spelling error is merely a deviation from standard forms rather than a deliberate distortion due to the low frequency of spelling deviations throughout the communications:

"I THOUGHT THE LORD **INTENTED** THIS." ~ Illes letter 2

"A COMMITTEE OF FIVE MAY **OVERULE**." ~ Goya letter 2

"I'm **gonna** use my dads handgun." ~ "Dear Sarah" letter

Additionally, since "gonna" and "cause" are relatively established spellings in L1 American English, it is nearly impossible to determine whether this is intentional distortion without access to known writings of the author. (Interestingly, in the Diaz case, Fitzgerald

actually showed a difference in the spelling of “gonna” in the known writings of the victim, Diaz, vs. those of the murderer, Perez.) An exception to considering established informal spellings as not indicative of disguise may occur if there is a misalignment between the genre of the document and the informal spellings used.

4.6. Distortion of Punctuation

The Castor letter and the Diaz email are exemplary communications for distortion of punctuation. Interestingly, both communications serve the same purpose (to make a murder appear to be suicide) and both adopt a relatively consistent punctuation style. The Castor letter contains almost no punctuation whatsoever, and the Diaz email uses only commas between sentences. Based on these communications, it may be hypothesized that authors who make use of punctuation as disguise apply this technique most often by choosing one type of punctuation, or a single lack of punctuation, throughout the entire document. The data set available for this study is too small to make a definite conclusion on this, but to see such a pattern in the two communications which seem to rely more heavily on punctuation for disguise is promising.

4.7. General Observations

4.7.1. Frequency of Feature Use Within a Communication

Once the relevant linguistic features have been considered in the analysis of a communication, a final step in determining the likelihood of the use of disguise should be taken. It would be expected that a document with no deliberate attempt at disguise would contain deviations from prescriptive norms and other characterizing linguistic features at a stable amount and rate throughout the document and that their patterning would align with authentic patterns of variability. In other words, after taking linguistic conditioning into account, there would likely be similar amounts of a particular feature evenly dispersed throughout a communication.

Conversely, a document in which disguise is involved might involve uneven dispersal of features, especially higher-level features or features subject to more complex variable patterns (e.g., syntactic features vs. spelling features, syntactic features with complicated internal constraints). Thus, such questions should be asked as: Where is X feature most frequent? How does the frequency throughout the communication change? Does the feature's usage accord with authentic linguistic patterns? Asking questions such as these may reveal a discrepancy in the rate or patterning of feature usage that may be suggestive of disguise.

The frequency and consistency of features is clearly relevant in communications such as the Ramsey note. Distortion of spelling occurs at the beginning of the note, then does not happen at all further on. The opposite is noticeable in the "Devil Strip" note, where omission of prepositions and articles occurs only at the end. Pronoun usage can also be assessed in terms of frequency and consistency, even if at first it does not seem to point to disguise. Taking the Ramsey note again for example, the author uses first-person singular and plural pronouns somewhat interchangeably, so the frequency of one type of pronoun versus the other is unstable.

4.7.2 Effects of Genre on Feature Use

From this present study, few patterns of feature use seemed to be influenced by the genre of the communications. With such a small data set, it is difficult to answer the question of how genre affects methods of disguise since most types of features seem to be fairly evenly distributed across each genre. However, the findings show potential for patterns which may appear after further research has been conducted. For example, in the Ramsey note as well as the Illes letters, there is a relatively large amount of extraneous information relating to the superiority of the author, even though the two sets of communications differ in purpose. This shows a similarity across genres since there are similar types and quantities of extraneous

information in both the ransom note and the informative letter meant to deflect blame. Additionally, deviations from normative usage of spelling and punctuation show some correlation with genre, as shown in table 3 in the conclusion.

4.7.3. Combinations of Features

A final relevant point I will address is how the combination of seemingly less important features may result in a stronger indication of possible disguise than consideration of any single feature in isolation. As was explored in the Diaz email, there were no features which ultimately would have indicated disguise on their own, but taken together, the noted features pointed to the need for further analysis. This finding parallels results in authorship attribution cases where, at times, a set of anonymous and known documents may not contain many instances of any single notable shared feature, but in combination with one another those features make a stronger case for shared authorship (McMenamin, 2010).

5. Conclusion

To conclude this paper, the results of the analysis have been condensed into a model for use during forensic linguistic analysis of anonymous written communications. Conceding that there is little data in this study and that only some features in the compiled list were found to occur with regularity across the communications in cases involving individuals attempting to hide their identities, more research is needed to confirm the correlations found here between certain linguistic features and authorship disguise. The difficulty in finding publicly available criminal communications in solved cases in which disguise was implicated impedes linguists' ability to study which features are used in disguise and whether any can subsequently reliably be used to identify disguise before author identity is uncovered. However, the process through

which I analyzed the communications for this study has made a first-attempt model possible, and this model has the potential to be further developed and made more precise. An added challenge for this study is that although each of these cases (except for the Ramsey case) has been solved, there is very little access to known writings from the authors of these communications. This means that the analysis focused on what is known about the authors from the facts of the case, not what the authors' actual writing style is.

The following tables show the number of communications (for this data set) which included relevant features that indicate possible disguise. Only features which occurred multiple times within a communication (with one exception) were included in these tables, and therefore in the model of analysis. The numbers in the table represent the number of communications which contained the respective features.

Table 3. Relevant Features According to Genre

	Spelling	*Pronouns*	*Punctuation*	*Extraneous information*	*Word omission*	*Subject-verb agreement*
Threatening Letter						
Ransom Note	3	4	1	1	1	1
POMIC	1		1	1		
Staged Suicide Letter	2		2			

Table 4. Relevant Features According to Disguise Type

	Spelling	*Pronouns*	*Punctuation*	*Extraneous information*	*Word omission*	*Subject-verb agreement*
Anonymization	3	3	1	1	1	1
Counter-impersonation	1		1	1		
Impersonation	2		2			

The lack of threatening letter samples led to inconclusive results as far as relevant features are concerned. Neither of the threatening letters ("Dear Sarah" letter; "Preskiller" email)

included in this study contained any overly convincing indicators of disguise, possibly due to the fact that both threatening letters were sent as pranks, rather than with real intent to cause harm. It is not my claim that there are no relevant features of disguise to be found in threatening letters, but that more research should be done when more samples become available for research. For the time being, considering the inferable disguise type (most likely anonymization) for the prioritization of features is sufficient. Overall, there is much work to be done concerning how genre affects disguise, but the findings in Table 3 may help inform future research.

Communications using anonymization disguise display a higher number of relevant features throughout this data set than impersonation and counter-impersonation disguise. This is likely be due to the higher number of examples available for this study, but it does increase confidence in the findings concerning anonymization.

Lastly, since there is only one set of examples from one author for counter-impersonation disguise, the conclusions made do not carry as much weight as for anonymization. While the results are likely not useless or irrelevant, they are incomplete. Further research on counter-impersonation disguise would contribute greatly to this study. The challenge, however, is again finding enough samples of this type of disguise.

I have synthesized the findings of this study to suggest a model of analysis for disguise detection. I note, however, that the conclusions of this study should be taken as preliminary and in need of further research to make any definite confirmations. The proposed model of analysis to be used for the purpose of detecting disguise in anonymous criminal communications is as follows:

1) Establish the genre of the communication. The genre will determine which features to prioritize during analysis.

2) Assess features in order of priority in accordance with the genre of the communication.
    a. Threatening letters – Since there are no conclusive results in this study, until further research has been conducted, prioritize features according to the disguise type that would most likely be used by the author (see 3 below), if possible, to determine based on case facts and the content and context of the letters at hand.
    b. Ransom notes – Distortion of spelling, pronoun inconsistency, distortion of punctuation, extraneous information, word omission, and distortion of subject-verb agreement.
    c. POMIC - Distortion of spelling, distortion of punctuation, extraneous information.
    d. Staged suicide letter - Distortion of spelling, distortion of punctuation.
3) Take note of the type of disguise most likely used by the author and prioritize the appropriate features:
    a. Anonymization – Spelling, pronouns, punctuation, extraneous information, word omission, and subject-verb agreement.
    b. Counter-impersonation – Spelling, punctuation, extraneous information.
    c. Impersonation – Spelling, punctuation.
4) Make note of any other notable features specific to the communication.
5) Assess the frequency and patterning of each noted feature across the communication.

This new model of analysis may save investigators time during high-stress situations and help produce accurate profiles of criminals in a short time. More studies should be conducted when more communications become available to refine the model and list of features presented. Despite the limited data on which the current model is based, I hope it will still offer a helpful

starting point for investigators needing to avoid overlooking important linguistic features while analyzing a new communication.

This study has contributed to the field of linguistics by examining linguistic features in the context of disguise in written communications, as well as the frequency and patterning of such features as indications of disguise. Additionally, this paper serves to open the door for more research on how to detect disguise in anonymous communications and presents a preliminary model for the linguistic detection of disguise. This starting point will eventually allow linguistic analysts and investigators to detect disguise and streamline further processes in identifying the authors of criminal communications more effectively.

6. References

Adams, S. (1996, October). Statement analysis: What do suspects' words really reveal. *FBI Law Enforcement Bulletin Vol. 65-10,* 12-20.

Bogaard, G., Meijer, E. H., Vrij, A., & Merckelbach, H. (2016). Scientific content analysis (SCAN) cannot distinguish between truthful and fabricated accounts of a negative event. *Frontiers in Psychology, 7,* Article 243. https://doi.org/10.3389/fpsyg.2016.00243.

Biber, D., & Conrad, S. (2019). *Register, genre, and style*. Cambridge University Press. Cambridge, United Kingdom.

Bremner, J. (2021, August 19). *Ransom notes released 60 years after theft of portrait in bid to secure free TV licenses for elderly*. ITV News. https://www.itv.com/news/2021-08-19/ransom-notes-released-60-years-after-portrait-theft-in-bid-for-free-tv-licences.

Burke, M. (2022, November 10). *Police investigating unsolved murder of JonBenet Ramsey to seek help from cold case team.* NBC News. https://www.nbcnews.com/news/us-news/police-investigating-unsolved-murder-jonbenet-ramsey-seek-help-cold-ca-rcna56567.

Houston, J., Cassidy, F. G., & Hall, J. H. (1985). *Dictionary of American Regional English: S1-Z*. Belknap Press of Harvard University Press. Cambridge, Massachusetts & London, United Kingdom.

FBI. (2012). Robert Arthur Wiles. https://www.fbi.gov/wanted/seeking-info/robert-arthur-wiles.

Fitzgerald, J. R. (2007, February). The FBI's Communicated Threat Assessment Database: History, design, and implementation. *FBI Law Enforcement Bulletin Vol. 76-2,* 6-9.

Grant, T. (2022). *The idea of progress in forensic linguistics*. Cambridge Elements in Forensic Linguistics series, T. Grant and T. Gales (Eds.). Cambridge University Press. Cambridge, United Kingdom.

Jones, N. & Bennell, C. (2007). The development and validation of statistical prediction rules for discriminating between genuine and simulated suicide notes. *Archives of Suicide Research*, *11*(2), 219-233. https://doi.org/10.1080/13811110701250176.

Labov, William. 1972. The transformation of experience in narrative syntax. *Language in the inner city*, 354-396.

Laing, B. L. (2015). The language and cross-cultural perceptions of deception. Master's Thesis. Brigham Young University. Provo, Utah.

Lesce, T. (1990). Scan: Deception detection by scientific content analysis. *Law and Order*, 38(8), 3-6.

Leung, R. (2005, January 6). *A shot in the dark*. CBS News. https://www.cbsnews.com/news/a-shot-in-the-dark/.

Ludgate, J. (2008). Commonwealth v. Perez. 6 Pa. D. & C.5th 272. https://cite.case.law/pa-d-c5th/6/272/.

Marko, K. (2017). Strategies for disguise in written threatening communications and ransom demands: an analysis of English and German texts. *International Journal of Speech, Language and the Law*, *24*(2), 243-247. https://doi.org/10.1558/ijsll.35084.

McMenamin, G. R. (2010). Forensic stylistics Theory and practice of forensic stylistics. In *The Routledge handbook of forensic linguistics*, 515-535. Routledge. Abingdon, United Kingdom.

Meyersohn, J., Gray, K., & Valiente, A. (2019, February 7). *How detectives caught a 'black widow' in her deadly web of lies.* ABC News. https://abcnews.go.com/US/detectives-caught-black-widow-deadly-web-lies/story?id=60854018.

Newman, M. L., Pennebaker, J. W., Berry, D. S., & Richards, J. M. (2008). Lying words: Predicting deception from linguistic styles. *Personality and Social Psychology Bulletin, 29*(5), 665-675. https://doi.org/10.1177/0146167203029005010.

Nini, A. (2015). Authorship profiling in a forensic context. Doctoral dissertation. Aston University. Birmingham, United Kingdom.

Rangel, F., & Rosso, P. (2013). Use of language and author profiling: Identification of gender and age. *Natural Language Processing and Cognitive Science*, 177.

Rock, F. (2001). The genesis of a witness statement. *Forensic Linguistics, 8,* 44-72.

Seals, C. A., & Schilling, N. (2020). Can people really disguise themselves when writing or speaking? In Bauer, L. & Calude, A (Eds.), *Questions about language*, 151-166. Taylor & Francis. Abingdon, United Kingdom.

Schiffrin, D., De Fina, A., & Nylund, A. (Eds.). (2010). *Telling stories: Language, narrative, and social life*. Georgetown University Press. Washington, D.C.

Schilling, N., & Marsters, A. (2015). Unmasking identity: Speaker profiling for forensic linguistic purposes. *Annual Review of Applied Linguistics, 35*, 195-214.

Shuy, R. (1998). *The language of confession, interrogation, and deception.* (pp. 74-93). Sage. Thousand Oaks, California.

Shuy, R. (2001). DARE's role in linguistic profiling. *DARE Newsletter, 4*(3), 1-5.

Spencer, M. (2012, June 2). *Murder or suicide: How did Jocelyn Earnest die?* CBS News. https://www.cbsnews.com/news/murder-or-suicide-how-did-jocelyn-earnest-die/.

Unsolved Mysteries Wiki. Annie Hearin. https://unsolvedmysteries.fandom.com/wiki/Annie_Hearin.

Visonà, M. W. (2021). Predicting veracity in online hotel reviews using types of reported speech, speaker identity, and quotation marks. *The International Journal of Speech, Language and the Law*. *28*(1), 99-123.