"My child is missing": 911 calls in mysterious disappearances of children☆

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ABSTRACT

Calls to 911 serve as important pieces of information in cases where a child has gone missing. Because investigation of mysterious child disappearances can pose unique challenges for law enforcement, the current study examined the characteristics of reports in such cases. Specifically, the current study compared proposed indicators of deception in a sample of child disappearances in which caregivers had made true or false allegations in their initial reports. Results suggest that characteristics traditionally thought to be indicators of deception were not present in cases of caregivers who had falsely alleged abduction. Further, many indicators conceptualized in previous research on 911 calls were not present in the current sample which suggests that established criteria for analyzing deceptive calls may be dependent on crime type or may be unreliable indicators altogether. Implications for policy and practice are discussed.

1. Introduction

Hundreds of thousands of children in the United States go missing from their caregivers for at least one hour each year (Sedlak et al., 2017). While approximately 91 % of children who are unaccounted for by their caregiver are not victims of a crime (e.g., result of miscommunication, child ran away, became lost or stranded; Sedlak et al., 2002) and children are located alive in a relatively short period of time, true child abductions result in significant challenges for law enforcement (Warren et al., 2020). Law enforcement often has very little information to rely on at the outset of an investigation aside from the initial reports made to first responders. Emergency calls to 911 therefore can be vital in locating missing children. However, little research has examined the value of information provided to emergency dispatchers by caregivers and how this can be useful in the investigation of child disappearances. The purpose of the current study is to examine indicators of truthfulness and deception across cases of missing children (benign and criminal). We provide a brief overview of the potential circumstances surrounding criminal cases of missing children prior to discussing indicators of truth and deception in 911 calls.

1.1. Child abduction

When true child abductions occur, they are most often perpetrated by family members (Sedlak et al., 2002) during custodial disputes between caregivers (Finkelhor et al., 1991; Grasso et al., 2001). As noted by Johnston and Girdner (2001), custodial abductions frequently involve younger children, the most common of which are children two to three years old. Perpetrators of custodial abductions are far more likely to be male and a current or former intimate partner of the child's mother, while the child is equally likely to be male or female (Finkelhor et al., 1991, National Center for Missing and Exploited Children (NCMEC), 2018). Custodial abductions are also unique in that they are generally reported as such (Hilts et al., 2015), meaning both the caregiver and responding law enforcement agency typically know the identity of the responsible party from the outset. This differs significantly from other types of missing children reports, including cases in which neither the caregiver nor law enforcement may possess knowledge of the circumstances (i.e., non-familial abductions), and cases in which the caregiver possesses such knowledge, but withholds this information from law enforcement to conceal his or her involvement in the

child's disappearance (e.g., false allegations of child abduction, child homicide).

1.1.1. Non-familial child abductions

Non-familial abductions include those perpetrated by any individual who is not the immediate caregiver of the child (e.g., family acquaintances, strangers, relatives). In contrast to the emotionally charged custodial disputes that often incite caregiver abductions, alternative motivations are more common in non-familial abductions. These additional drives include maternal desire, in which a female offender abducts a child to claim as her own; financial gain, where a child may be abducted for ransom; and sexual gratification, in which the child serves as the object of an offender's deviant sexual desire (Beyer & Beasley, 2003; Boudreaux et al., 2000; Shelton et al., 2016; National Center for Missing and Exploited Children (NCMEC), 2021). These cases also differ from the majority of reported missing children in that they are criminal events. Although family abductions arising from custodial disputes may also result in criminal charges, the circumstances of non-family abductions are less likely to be known by the reporting caregiver when the report is initially made. This lack of knowledge poses significant investigative challenges for law enforcement when responding to these reports, as information typically available in other crime types, such as an obvious crime scene or available eyewitnesses, may not be readily apparent.

Previous research has demonstrated that offender and victim demographics in non-familial abductions vary considerably depending on the offender's primary motivation. Often, motivations for abductions are strongly correlated with the age of the child (Beyer & Beasley, 2003; Boudreaux et al., 1999; Shelton et al., 2016). For instance, maternal desire cases typically involve newborns less than one month old, while a significant portion of sexually-motivated abductions involve elementary school-aged children, and financial gain is more likely to be associated with teenage children than of other age groups (Beyer & Beasley, 2003; Boudreaux et al., 1999; Shelton et al., 2016).

Gender has also been found to be a determining factor for both victims and offenders. The most striking example can be found in sexually motivated abductions, where approximately 80 % of abducted children are female (Boudreaux et al., 1999; Shelton et al., 2016; Warren et al., 2016). In contrast, male and female children are abducted at somewhat similar rates in maternal desire cases and male children are abducted at slightly higher rates in financial gain cases (Boudreaux et al., 1999). Offender demographics also vary depending on primary motivation. Males are overwhelmingly responsible for sexually motivated abductions, while abductions of newborns are committed almost entirely by females (e.g., maternal desire cases) (Beyer & Beasley, 2003; Boudreaux et al., 1999; Shelton et al., 2016). Another common finding in sexually motivated abductions is that many offenders commit these abductions in public or outdoor settings (Warren et al., 2020) where a child is likely to be alone or separated from other adults (Canadian Centre for Child Protection, 2016).

1.1.2. False allegation of child abduction

Some children who have been reported missing are not actually missing, but instead are victims of fatal abuse by their parents or other caregivers (Presser et al., 2021). Caregivers responsible for the death of a child in their care may falsely claim the child is missing, or has been abducted, to provide an explanation for the child's disappearance and divert suspicion away from their role in what truly happened to the child (Freeman & Turvey, 2018). Research has demonstrated that victims in false allegation cases are primarily children under the age of five, with a median age of 3.5 years old (Canning et al., 2011). Consistent with the Department of Health and Human Services (DHHS) findings that children under the age of four years are at greatest risk of severe injury or death by their caregivers, over half of children who are the subject of a false allegation are five years old or younger (United States Department of Health and Human Services, 2020). On the other hand, the average

age for children killed as a result of non-familial child abductions is much higher at 11 years (Brown et al., 2006).

The disparity observed in victims' ages is partially explained by the primary motivation of offenders. Compared to sexually motivated non-family abductions, most false allegation cases arise from fatal physical abuse inflicted by the caregiver and, in many cases, the child was unwanted (Canning et al., 2011). Additional risk factors identified in false allegation cases, such as unstable environments, significant interpersonal struggles between family members, and recent changes to household structures, also contribute to circumstances leading to false allegation. Most false allegation cases involve a single offender and the gender of offenders is nearly evenly split between males and females, with the biological mother of the child being the most frequent (Canning et al., 2011). The common denominator across all types of reported disappearances is that law enforcement must initially rely on information provided by caregivers. Notably, many offenders directly reported the child as missing or abducted to law enforcement, which allows for further examination of the characteristics of these reports.

Reports to 911 constitute key pieces of evidence as the initial impetus for law enforcement involvement. As such, understanding potential indicators of deceptive behavior by caregiver-reporters may prove particularly useful to law enforcement in determining the most efficient investigative direction to locate the child. Accurately reported information may help law enforcement's prioritization of resources, whereas false information may impede this process. Further, because 911 calls are recorded, the information is preserved for law enforcement to subsequently evaluate as additional details are learned through investigation. Information provided by a 911 caller that contradicts known evidence may provide law enforcement with new investigative leads.

1.2. Research on 911 calls

Research using 911 calls to investigate patterns in criminal events and violent crime, overall, is relatively rare. Likewise, research involving verbal behaviors and indicators of truth and deception in 911 calls is sparse but growing. Studies to date have focused primarily on homicide investigations and can largely be attributed to a landmark study by Harpster et al. (2009) who examined 100 calls from individuals who had reported a homicide in which they were, or were not, involved.

Harpster et al. (2009) found that several indicators were significantly correlated with the guilt or innocence of the caller, with the strongest association among guilty callers being the provision of extraneous information (defined as any unexpected communication made by the caller outside the context of the incident). The study also found that guilty callers used language indicating acceptance of the victim's death (even without proof of such), repeated phrases (i.e., three or more times in succession), and insulted or made derogatory remarks about the victim more frequently than innocent callers. Further, guilty callers resisted or delayed answering dispatchers' questions, provided conflicting facts, used ingratiating language rather than demanding help, and "possessed the problem" by using personal pronouns to take ownership of the situation (e.g., "I have an injured person") rather than focusing on the victim. In contrast, Harpster et al. (2009) found that innocent callers provided fewer conflicting facts than guilty callers, were more likely to correct their previous statements upon learning additional details and were more likely to exhibit a sense of urgency and demand in their plea for help, as well as provide the location where such help was needed in the initial moments of the call. Finally, callers categorized as innocent were more likely to display modulation of the pitch and tone of their voices and exhibited speech or emotional behaviors after the 911 call is answered, but before the dispatcher spoke. Notably, however, many of the factors used by Harpster et al. (2009) for analysis were not concretely operationalized and therefore may make direct replication of this research difficult. For example, it is unclear whether the concept "acceptance of death" included direct references to the victim's death or more subtle indicators at the level of word choice, such as use of past

tense.

Subsequent work by Harpster and Adams (2017) resulted in the development of the Considering Offender Probability in Statements (COPS), or 911 COPS Scale©. The 911 COPS Scale© is a checklist created for law enforcement to assess emergency calls by providing a framework to analyze 15 behaviors thought to indicate innocence ("Innocent Indicators") and 38 behaviors related to guilt ("Guilty Indicators"). The scale classifies indicators on six dimensions: *Who the call is about; What the call is about; How the call is made; Aggressive Demands/Passive Defenses; Cooperation/Resistance with the dispatcher; and Additional Guilty Indicators*. These indicators expand on Harpster et al. (2009) and include such additional "Innocent Indicators" as the provision of sensory details, immediate assessment of the victim's condition (e.g., is the victim breathing, speaking, etc.?), comments about bleeding, fear for caller's safety, and proximity to the victim, among others. Examples of "Guilty Indicators" include the following: defendant mentality, dispatcher confusion, diversion, equivocation, relaying events in an inappropriate order, answering only what is asked, pauses, self-interruption, short answers, unintelligible comments, attempts to convince, awkward phrases, and unexplained knowledge, in addition to several others. The 911 COPS Scale© has subsequently been recommended to law enforcement agencies for use in evaluating 911 calls across a spectrum of investigations.

Following the work of Harpster et al. (2009), several other studies examined indicators of truth and deception in 911 calls. Burns and Moffitt (2014) examined the transcripts of fifty 911 calls reporting homicides utilizing automated linguistic analysis based upon various theories of deception. They theorized that analysis of variations in words used by truthful callers would differ from those used by deceptive callers. They found that deceptive callers used the pronoun "they" more often when compared to truthful callers (who tended to refer to others in the third person singular). Deceptive callers additionally used more negation words (e.g., "none," "not"), and more inhibition terms (defined as a reluctance to initiate CPR or other first aid). By contrast, truthful callers used more numeric words and location-related words, along with negative emotion and anxiety words (i.e., indicators of felt emotion). One of the implications of this study is that truthful callers are more likely to display negative emotion and anxiety than deceptive callers. However, the study was limited by utilizing only written transcripts and not examining audio recordings.

Two later studies attempted to replicate the findings of Harpster et al. (2009). Cromer et al. (2018) examined fifty 911 calls from adjudicated law enforcement investigations of homicides and suicides. Of their sample, 36 callers were determined to be innocent and 14 were responsible for the homicide they reported. Cromer et al. (2018) examined several factors, nine of which were based upon Harpster et al. (2009). Of these, only two variables were statistically significant (extraneous information and conflicting facts) and two were marginally significant (thinking pauses and possession of the problem). Consistent with Harpster et al. (2009), the strongest predictor of deception was extraneous information. However, caution should be exercised when interpreting these results as several factors of interest were only present in a limited number of calls. For example, only five of the 50 calls included extraneous information and only four included conflicting facts. Miller et al. (2020) examined 175 emergency calls reporting homicides and suicides. Their sample was comprised of 100 calls reporting true suicides, 18 calls determined to be homicides staged as suicides by guilty callers, 26 calls regarding homicides committed by the caller (i.e., no suicide staging), and 31 homicide calls by innocent callers. Upon examination of audio and written transcripts of the calls, Miller et al. (2020) found that only a handful of factors had any discernable effect in discriminating between truthful callers and deceptive callers. Further, these effects were not necessarily in the expected direction. For example, voice modulation was more common with deceptive callers, as was using a term of endearment toward the deceased individual when the caller was a family member. Likewise, providing merely a notification of

a dead body was more likely among truthful callers. Finally, although the word "just" (a measure of minimization as defined by Harpster) was used in over 80 % of all calls, deceptive callers repeated it more often throughout the call than truthful callers (Miller et al., 2020). As for calls involving homicides staged as suicides, deceptive callers were more likely to hesitate or pause when answering questions and to avoid providing the location of the body. Furthermore, these deceptive callers were less likely than truthful callers to report the death as a suicide. Consistent with above, deceptive callers also repeated the word "just" more often than truthful callers.

As demonstrated above, there is a lack of consistency in findings as to truthful and deceptive indicators in 911 calls. Further, efforts to replicate the findings of Harpster et al. (2009) have met with limited success. These inconsistencies could be due to a variety of factors. Research into 911 calls is relatively scarce and any corresponding data may be insufficient to properly interpret and compare results due to variation in methodology, sample size, and conceptualization. In addition, previous research did not account for the influence of dispatchers' reactions or lines of questioning on caller statements. Dispatchers are responsible for collecting information relating to a wide assortment of potential emergencies from an equally vast array of callers under varying degrees of stress. Their training, experience, demeanor, or personality characteristics may affect how callers respond to questions and it is not known whether there is consistency across training programs or standardization within departments. Similarly, questions asked by dispatchers may be influenced by the statements and behaviors of callers, as well as by the nature of the call itself. Dispatchers may need to elicit different information when callers report an injured person in their presence than when callers report a missing person whose physical location and condition is unknown.

Discrepancies in the existing literature's results also could be due to the lack of current deception research being incorporated into 911 call studies. Recent deception research has shown promise into the proportion of complications, a truthful indicator, to common knowledge and self-handicapping strategies, two deceptive indicators (Vrij et al., 2017; Vrij, Leal, Jupe, & Harvey, 2018; Vrij, Leal, Mann, et al., 2018). Complications are defined as occurrences that make a situation more difficult to report (e.g., "I couldn't go swimming because I forgot my bathing suit."), whereas common knowledge details are strongly invoked stereotypical information about an event (e.g., "I saw the pyramids while in Egypt."), and self-handicapping statements provide justifications as to why someone is unable to provide information ("I don't know because I wasn't paying attention."). However, this type of approach has not yet been incorporated into 911 analysis. Further, empirically validated methods for evaluating statements may be useful for analyzing 911 calls, yet many variables associated with these methods have not been included in 911 research. Two such approaches, Criteria-Based Content Analysis (CBCA) (Steller & Kohnken, 1989) and Reality Monitoring (RM; Johnson & Raye, 1981), each contain a variety of criteria that have been used to assess indicators of truthfulness in statements (Sporer, 1997; Vrij et al., 2000). Both methods theorize that statements and memories based upon actual events differ in quality from those generated by internal processes, such as thoughts or imagination. These potential differences allow statements to be examined for the presence or absence of each method's respective criteria. Although both approaches are limited by a lack of deceptive indicators, empirical support for both is strong (Vrij et al., 2007).

1.2.1. The present study

Research into 911 calls has primarily focused on homicides and other death investigations. This has limitations for two reasons. First, the few studies conducted since 2009 have not replicated many of Harpster et al. (2009)'s original findings. Second, there is a lack of research on other types of 911 calls to determine whether indicators of truthfulness and deception are consistent across various emergency situations. These are important factors to consider as 911 calls may contain valuable

information that could benefit law enforcement in other types of cases, but only if they can be properly interpreted and replicated.

The current study, therefore, had three primary objectives:

1. The first objective was to examine a previously unexplored type of 911 call – reports of missing children by caregivers – to determine whether there are differences between True Report Callers (TRC) who legitimately report their child missing and False Allegation Callers (FAC) who killed the child (or had knowledge of the child's death) but reported the child missing or abducted to conceal this information.
2. The second objective was to conceptually replicate the findings of Harpster et al. (2009) by empirically testing the researchers' criteria with a different type of 911 call to determine whether it is appropriate for use in real-world investigations across varying crime types. It is unclear whether the 911 COPS Scale© is applicable to other types of 911 calls, especially those in which the caller may lack information about an individual's condition and whereabouts (e.g., missing children) as opposed to those in which this information is known to the caller (e.g., homicides).
3. The third objective was to test additional variables related to items on the 911 COPS Scale©, but not included on the instrument itself. Because previous research has found differences in the use of emotion-related words in 911 calls, the authors examined emotional responses in greater detail, as well as caregiver word choice.

2. Method

The current study aimed to examine caller, victim, and call characteristics in a sample of calls made to emergency response services regarding missing children. For the purposes of the study, a missing child was defined as one who could not be located by the caregiver responsible for supervising the child at the time of their disappearance. Cases were identified through various sources, including missing child investigations by federal, state, and local law enforcement in the United States.

Calls were also obtained from the Internet via news agencies and other online media wherein the call was found to be in its entirety and unsanitized. Searches were conducted utilizing publicly available online search engines. Examples of search terms included "*911 missing children*," "*911 child disappearance*," "*child abduction 911 call*," "*missing child 911*," and "*911 call child homicide.*" Cases were only included in the sample when the case resolution was verifiable. Case types included in the current study fit one of three potential outcomes: non-criminal events (e.g., lost, runaways); non-caregiver or stranger child abductions; and false allegations. Custodial abductions were not included in the sample. Non-criminal events were those in which the child's disappearance was due to a miscommunication between the child and caregiver, the child running away, becoming lost or injured, or otherwise missing due to a non-criminal event. False allegation calls consisted of calls from caregivers who caused the death of the child and disposed of the child's remains, believed the child was dead, or had knowledge of the child's death prior to placing the 911 call to report the child as missing or abducted. In all false allegation cases, the child was deceased prior to the 911 call being made, whereas non-criminal events and abduction cases could include children who were either living or deceased at the time of the 911 call. Cases resulting in criminal charges were adjudicated to the point of sentencing, conviction, or arrest of the offender.

2.1. Call characteristics

Seventy-one 911 calls reporting 73 children missing were collected. In two separate cases, a caller reported two siblings missing in the same incident. All other calls involved a single missing child. One call was excluded from the sample due to the biological mother calling on behalf of the child's biological father, who was responsible for the child's death.

This resulted in a final sample of 70 calls reporting 72 children missing. Calls were made over a 20-year time span, between 2000 and 2020. The final study sample included twenty-seven FACs (39 %) and forty-three TRCs (61 %). Of the 43 calls classified as TRC, 20 (47 %) were determined to be true abductions and 23 (53 %) were classified as non-criminal events. Audio recordings were available for most of the sample ($N = 67$) and call length ranged from 39 s to 15 min and 59 s in duration (M = 328.92 s, SD = 197.31). Caller word count ranged from 52 words to 1685 words and the average number of words spoken by callers was 349.43 (SD = 287.97). Dispatcher word count ranged from 25 words to 1184 words with an average word count of 309.59 (SD = 195.33).

2.2. Caller and victim characteristics

Callers ranged in age from 16 to 75 (M = 31.11, SD = 11.59) and were mostly female (64.3 %; male = 35.7 %). More than half of callers were a biological parent of the child (64.3 %). Biological mothers made up the largest share of callers (44.3 %). However, reports were also made by a variety of callers with parental and non-parental caregiver relationships (Table 1). Children who were the subject of the calls to 911 ranged in age from 4 days old to 16 years of age (M = 6.35, SD = 4.37) and more than half of children were female (55.60 %; male = 44.40 %).

2.2.1. Materials and procedure

All calls were transcribed upon receipt. Silent pauses, pause length, unintelligible comments and background noises observed during the calls were noted on the transcript as well. Three of the calls included only the written transcript as the audio recording was not available.

Coders utilized both the audio recordings (when available) and written transcripts for coding. Audio recordings were used to code for paraverbal behavior (e.g., pause length). To measure the behaviors, words spoken, or other verbalizations of the caller, the authors developed an instrument intended to supplement the findings of Harpster et al. (2009), in addition to using the original 911 COPS Scale©. This instrument was further expanded by incorporating additional variables relevant to the 911 COPS Scale©, but not included on the 911 COPS Scale© itself (e.g., emotional responses, crying, type of sensory description). With one exception, definitions of variables directly related to the 911 COPS Scale© were consistent with definitions used by Harpster et al. (2009) and Harpster & Adams, (2017). Further

Table 1
Case and caller characteristics.

	n	Total
US Census Region		70
Northeast	3	
Midwest	20	
South	29	
West	18	
Time of Call		40
AM	14	
PM	26	

	TRC (n)	FAC(n)	Total
Caller relationship			
Biological Mother	22	9	31 (44 %)
Biological Father	7	7	14 (20 %)
Relative	10	2	12 (17 %)
Mother's Intimate Partner	0	5	5 (7 %)
Stepmother	1	2	3 (4 %)
Stepfather	2	1	3 (4 %)
Adoptive Mother	1	0	1 (2 %)
Other	0	1	1 (2 %)

Note. Total *N*'s differ due to variation in information availability on some call features.

descriptions of these definitions can be found in Appendix A.

Coders consisted of sworn law enforcement officers with a minimum of 16 years of investigative experience and non-law enforcement personnel, including crime analysts with experience in missing child investigations and one Child and Adolescent Forensic Interviewer (CAFI). To safeguard the integrity of the findings, the lead author collected calls and designated each a unique identifier before assigning so that coders would be blind to the call condition. Two coders were assigned to code each call. Coders were trained on the instrument and practiced using the instrument prior to coding calls included in the sample.

2.3. Data analysis

Descriptive and frequency statistics were generated for various offender, child, and offense characteristics. One-way Analysis of Variance (ANOVA) was used for mean comparison testing. Dichotomous and categorical data were analyzed using Chi-square tests or logistic regression where appropriate. For variables analyzed using logistic regression, interpreted odds ratios for regression analyses are described throughout the subsequent sections. Unless otherwise specified, analyses were run with Call Type (TRC vs. FAC) as the independent variable with 911 COPS Scale© items and related factors as outcome variables. Due to differences in data formats (e.g., audio vs. transcript) and information availability, demographic and non-verbal information (e.g., pauses, sighs) was not available in some instances. As a result, sample sizes differ from the total sample ($N = 70$) for some analyses.

3. Results

3.1. Preliminary analyses

Calls did not vary in overall length as a function of Call Type, $F(1, 64) = 0.009$, $p = .925$, $\eta_p^2 = 0.00$. There was no significant difference between either caller word count (M = 349.43, SD = 287.97) or dispatcher word count (M = 309.59, SD = 195.33) as a function of Call Type, $F(2, 67) = 2.70$, $p = .08$, $\eta_p^2 = 0.07$. There were also no significant differences in call length between caregivers who were biologically related to the missing child and those who were non-biological caregivers, $F(1, 63) = 0.65$, $p = .42$, $\eta_p^2 = 0.01$.

A variety of terms were utilized by callers when describing the circumstances of the child's disappearance ($n = 74$). The most common term used was "*missing*" ($n = 36$; 51 %) followed by "*can't find*" ($n = 11$; 16 %). Additional terms included: "*taken*" ($n = 8$; 11 %); "*not here*" ($n = 7$; 10 %); "*abducted*" or "*kidnapped*" (4; 6 %); "*other*" ($n = 3$; 4 %); "*runaway*" ($n = 2$; 3 %); "*lost*" ($n = 2$; 3 %); and "*didn't come home*" ($n = 1$; 1 %). The terms categorized into the other category were circumstances where the callers reported their vehicle was stolen with the child inside ($n = 2$) or a caller stating the child "got out of the house" ($n = 1$). Most commonly, the caller referred to the child as *she/he* ($n = 63$; 90 %); *my* [e.g., daughter, son, child, grandson] ($n = 60$; 86 %); *a child* ($n = 10$; 14 %); *other* ($n = 9$; 13 %); *child's name unprompted* ($n = 10$; 14 %); *the* [e.g., daughter, son, child, grandson] ($n = 6$; 8 %) or *our* [e.g., daughter, son, child, grandson] ($n = 1$; 1 %). The terms categorized into the other category were *her, his, him, they, they, and that little girl*. Although we accounted for the presence of editing adverbs (e.g., "after," "then," "next") as a function of call type we did not find an increased probability of their occurrence, $\chi^2(67) = 0.48$, $p = .49$. The mean number of editing adverbs used by TRCs (M = 2.98, SD = 3.81) was not significantly different from that of FACs (M = 2.81, SD = 3.11), $F(1,67) = 0.04$, $p = .85$, $\eta_p^2 = 0.00$.

3.2. Caller demographics

There was no significant impact of caller ethnicity on TRCs versus FACs, $\chi^2(5) = 3.72$, $p = .27$. However, there was an association between gender and allegation type, $\chi^2(67) = 8.29$, $p < .001$, 95 % CI: 0.45, 2.56. Specifically, males were 4.5 times more likely than females to be FACs whereas the likelihood of an allegation being false was reduced by 24 % when the caller was female. Additionally, caller age was significantly related to allegation type, $F(1, 57) = 5.09$, $p = .028$, $\eta_p^2 = 0.08$. FACs were significantly younger (M = 28.93, SD = 8.81), on average, than TRCs (M = 36.09, SD = 14.371). Interestingly, this relationship changed when separating criminal and non-criminal events, $F(2, 56) = 4.24$, $p = .02$, $\eta_p^2 = 0.13$. Specifically, Tukey's HSD revealed no significant differences in age between true abduction callers (M = 32.78, SD = 9.63) and both caregivers reporting a non-criminal event (M = 40.36, SD = 18.35, $p = .184$) and FACs (M = 28.93, SD = 8.81, $p = .54$). However, callers reporting a missing child were significantly older than FACs ($p = .01$).

3.3. Child demographics

There was no association between child ethnicity and Call Type, $\chi^2(5) = 1.58$, $p = .90$ but child gender was significantly related to Call Type, $\chi^2(67) = 5.56$, $p = .02$, 95 % CI: 0.183, 2.21. Female children were 33 % less likely to be the subject of FACs whereas male children had a 3.01 times greater likelihood of being the subject of a FAC. Children who were the victim of FACs were significantly younger than children who were the subject of TRCs, $F(1, 68) = 12.83$, $p < .001\eta_p^2 = 0.16$. This relationship was explored further by parsing true child abductions from TRCs regarding missing and lost children (e.g., Non-Criminal Events). The relationship between age and Call Type was, again, significant, $F(2, 67) = 6.38$, $p = .003\eta_p^2 = 0.16$. Post-hoc testing using Tukey's HSD suggests that children who were the subject of TRCs in the case of an abduction did not differ in age from children who were involved in a non-criminal event ($p = .94$). However, FAC subjects were still significantly younger (M = 4.15, SD = 2.85) than both TRC abductions (M = 7.95, SD = 4.43, $p = .008$) and non-criminal missing children (M = 7.54, SD = 4.92, $p = .012$).

3.4. 911 Cops Scale© Items

Some variables contained very few cases. To prevent misleading results, variables with too few cases were not statistically analyzed. Instead, we only provide raw percentages. The overall logistic regression results for the 911 COPS Scale© items can be found in Table 2.

3.4.1. Who the call was about

Very few callers could be categorized according to pleas for help, plea focus, or acceptance of death (e.g., referring to the child in the past tense). In total, only 9 % of callers made a plea for help at some point during the call and even fewer made an immediate plea for help (5.7 %). Additionally, out of the few callers who made a plea for help, none made a plea for help for the child alone. We included references to the child in the past tense as a proxy measure to reflect the "Acceptance of Death" included in the COPS Scale. Although the number of times the callers in the current sample referred to the child in the past tense was recorded, only 5.7 % ($n = 4$) of callers displayed this behavior. Of these callers, all used the past tense to reference the child just once and we were therefore unable to conduct any meaningful analysis to explore variation as a function of call type.

Table 2
Predictors of false allegation cases utilizing the 911 Cops Scale Items and other relevant factors.

COPS scale variable	Call type (n)		Nagelkerke R^2	B	SE	Wald χ^2	p	95 % CI
	TRC	FAC						
Who Items								
Immediate Plea for Help	2	2	–	–	–	–	–	–
Plea Made at any Point[†]	2	4	–	–	–	–	–	–
Focus on Child	–	–	–	–	–	–	–	–
Focus on Caller	2	3	–	–	–	–	–	–
Equal Focus (Child and Caller) [†]	2	1	–	–	–	–	–	–
Acceptance of Death	1	3	–	–	–	–	–	–
What Items								
Extraneous Information	37	26	0.07	1.44	1.11	1.68	0.20	(−0.74, 3.62)
Sensory Details	37	24	0.00	0.26	0.76	0.12	0.73	(−1.22, 1.74)
Inappropriately Prioritized Order	9	12	0.09	1.11	0.54	4.21*	0.04	(0.05, 2.16)
How Items								
Urgency	9	5	–	–	–	–	–	–
Talks prior to operator[†]	8	7	–	–	–	–	–	–
Initial delays in speaking	13	19	0.19	1.70	0.54	10.05*	<0.001	(0.65, 2.75)
Passive defenses								
Makes Demands	–	–	–	–	–	–	–	–
Defendant Mentality	2	3	–	–	–	–	–	–
Ingratiating Language	12	9	0.01	−0.26	0.53	0.23	0.63	(−1.30, 0.79)
Insults/Blames Child	3	4	–	–	–	–	–	–
Minimizes Actions	17	13	0.01	0.35	0.50	0.50	0.48	(−1.32, 0.62)
Minimizes Actions (Initial Portion of Call)[†]	2	6	–	–	–	–	–	–
Resistance to dispatcher								
Diversion	4	4	–	–	–	–	–	–
Equivocation	32	26	0.16	2.20	1.08	4.13*	0.04	(0.08, 4.30)
Evasion	12	19	0.22	1.81	0.54	11.22*	<0.001	(0.75, 2.88)
Hangs Up	–	–	–	–	–	–	–	–
Pauses	30	22	0.03	−0.70	0.65	1.17	0.28	(−1.97, 0.57)
Repetition	13	14	0.06	−0.91	0.51	3.21	0.07	(−1.91, 0.09)
Self-interruption	11	8	0.03	−0.20	0.51	0.14	0.71	(−1.28, 0.87)
Short answers	18	11	0.00	0.05	0.50	0.01*	0.93	(−0.93, 0.97)
Unintelligible comments	18	12	0.00	−0.11	0.50	0.05*	0.83	(−1.08, 0.87)
Only answers what's asked	12	12	0.04	0.73	0.52	1.98	0.16	(−1.74, 0.28)
Additional guilty indicators								
Attempts to convince	10	17	0.20	1.73	0.54	10.29*	<0.001	(0.67, 2.78)
Awkward phrases	18	23	0.24	2.08	0.62	11.10*	<0.001	(0.86, 3.30)
Conflicting facts	4	14	–	–	–	–	–	–
'Huh?' factor	10	7	–	–	–	–	–	–
"I Don't Know"	19	16	0.03	−0.25	0.51	1.50	0.22	(−0.37, 1.58)
Used contractions	43	26	0.20	9.17	2282.67	0.00*	1.00	(−4464.78, 0.4483.12)
Voice modulation	39	24	0.01	0.24	0.52	0.22	0.64	(−0.77, 1.26)
Unexplained knowledge	2	2	–	–	–	–	–	–
"I don't know" followed by more information[†]	6	9	–	–	–	–	–	–
Related factors								
Emotional responses [†]								
Emotional response (at least one instance)	26	21	0.06	−0.49	0.30	2.79	0.10	(−1.07, 0.09)
Unemotional (throughout)	20	10	0.01	−0.38	0.51	0.54	0.46	(−1.37, 0.62)
Anger / Frustration	10	5	–	–	–	–	–	–
Laughed	7	2	–	–	–	–	–	–
Apologized/Expressed Regret	6	6	–	–	–	–	–	–
Gives Time of Disappearance	38	17	0.14	−1.50	0.63	5.80*	0.02	(0.14, 1.36)
States What They Were Doing Prior to Call	22	19	0.03	0.66	0.53	1.58	0.21	(−0.85, 0.19)
Mentions Changes in Household	6	4	–	–	–	–	–	–
Use of Possessive Pronouns (Non-biological Caregivers)	3	7	–	–	–	–	–	–
Use of non-possessive pronouns with child	6	4	–	–	–	–	–	–

Frequencies and Logistic Regression Analysis.

Note. Some scale items were omitted due to the low likelihood of appearing in child abduction cases.

[†] Denotes questions that were added to the coding protocol by the authors due to relevance to the COPS scale items and frequent presence in child abduction cases.

* Indicates statistical significance at or below the level of α = 0.05.

3.4.2. What the call was about

While a large number of callers were categorized as having given extraneous information and providing sensory details information, non-significant logistic regressions did not suggest an increased likelihood of the presence of these factors as a function of truthful calls or false allegations. Prioritizing specific information, such as providing alibi information prior to describing the events surrounding the disappearance, however, was 3.02 times more likely to occur in calls containing a false allegation while the probability of inappropriate prioritization occurring in truthful allegations was reduced by 33 %. Most callers made extraneous statements ($n = 63$) and the majority of callers reported at least one type of sensory information, with the majority reporting visual descriptions. However, there was no difference between true and false allegation callers in terms of the number of sensory categories (visual, auditory, tactile, none) callers reported on, $\chi^2(3) = 4.04$, $p = .26$.

3.4.3. How the call was made

A number of callers displayed behavior including a sense of urgency, beginning to speak prior to the dispatcher's greeting, and initial delays in speaking. However, only initial delays in speaking contained enough data for analysis. Callers who displayed hesitancy to speak after the dispatcher took the call were 5.48 times more likely to be false allegations while callers who did not delay speaking had a 18 % reduced likelihood of making a false allegation. Because initial delays in speaking were categorized as characteristics of "How the call was made" within the COPS Scale, we also measured the number of sighs and filler words (e.g., "um,", "uh") used by callers in order to further capture characteristics related to hesitation. The number of filler words used was not significant, F(1, 65) = 2.14, $p = .15$. The number of sighs made was also non-significant, F(1, 66) = 1.26, $p = .27$. In addition, the number of overall hesitations present (sighs and filler words) was not significantly different between TRC and FACs, F(1,66) = 2.34, $p = .13$, $\eta_p^2 = 0.03$.

3.4.4. Passive defenses and aggressive demands

Overall, very few callers displayed a "defendant mentality," insulted or blamed the child, or minimized their actions in the initial portion of the call. In addition, none of the callers were aggressively demanding. Logistic regression analysis of calls categorized as having used overly ingratiating language or minimizing the actions of the caller throughout the call do not suggest that the presence of these behaviors led to an increased likelihood of the allegation being either false or true.

3.4.5. Resistance toward the dispatcher

Resistance to the dispatcher's questions proved to be present more often than many of the other scale items. None of the callers hung up on the dispatcher and very few attempted to engage in diversion. The presence of self-interruptions, providing short answers or unintelligible comments were not significantly associated with the likelihood of a call being either a true or false allegation. The number of questions callers chose not to answer was not significantly different for TRCs as compared to FACs, F(1, 67) = 0.46, $p = .50$, $\eta_p^2 = 0.01$. However, the presence of equivocations and evasion were significant predictors of FAC while repetition was marginally significant. Specifically, callers who engaged in equivocation were 8.94 times more likely to be making a false allegation whereas not engaging in equivocation was associated with an 11 % decrease in the odds of the allegation being false. Similarly, callers who were evasive had 6.14 greater odds of making a false allegation while callers who did not engage in evasion were 16 % less likely to be making a false allegation. Although repetition was only marginally significant, callers who made repetitive statements had 2.49 greater odds of having made a false allegation whereas callers who did not were 40 % less likely to have made a false allegation.

3.4.6. Additional indicators of guilt

Very few callers were categorized as qualifying for the "Huh?" factor. Additionally, few callers provided unexplained knowledge or conflicting

facts, although three times as many false allegation callers provided conflicting facts. Conversely, all but one caller in the sample used contractions in their statements while most displayed characteristics of voice modulation. In addition to the use of contractions and voice modulation, responses of "I don't know" were also relatively frequent but non-significant. However, attempts to convince the dispatcher and awkward or unexpected phrasing were associated with a significantly greater likelihood of false allegation. Callers who attempted to convince dispatchers of their lack of involvement in the child's disappearance were 5.6 times more likely to have made a false allegation while making no such attempt was associated with an 18 % reduction in the likelihood of the allegation being false. The presence of awkward or unexpected phrasing was also associated with a 7.99 times greater odds of false allegation whereas the lack of awkward phrasing was associated with a reduction of 13 % in probability of the allegation being false.

4. Discussion

This study was designed to answer three research questions. First, the researchers tested whether any distinguishable differences could be found between TRC and FAC when reporting a child missing. Secondly, the authors examined whether the findings of Harpster et al. (2009) and those characteristics outlined in the subsequently developed 911 COPS Scale© could be replicated. Finally, the authors tested whether additional variables derived from missing child investigations could assist law enforcement in differentiating between TRC and FAC. The results of the study were mixed. Regarding the first objective, several differences were found between TRC and FAC, some of which conflict with previous research.

Previous research has found that offenders tend to be male in both sexually motivated and custodial abductions (Boudreaux et al., 1999), but roughly half of false allegation offenders are female (Canning et al., 2011). However, in the current study, FAC were over four times as likely as TRC to be male. Consistent with previous research on general abduction characteristics (e.g., Beyer & Beasley, 2003), children reported missing in FAC were significantly younger than children reported missing in TRC. Likewise, male children were three times as likely as female children to be reported missing by FAC in the current sample. These findings are, again, consistent with previous research into false allegation investigations (Canning et al., 2011). Similarly, caller age also seemed to be a factor in false allegation cases. FAC were significantly younger than TRC. When taken together, the findings of previous research and the current study suggest that the age and gender of both children and callers are reliable factors for law enforcement to consider when making decisions in the initial stages of the investigative response. When calls involve the disappearance of a young child, this may indicate to law enforcement that the call is related to a false allegation or custodial abduction rather than abduction for the purposes of financial gain (Beyer & Beasley, 2003; Shelton et al., 2016.) These findings may also have important implications for law enforcement to prevent possible bias when reviewing 911 calls in missing child investigations. However, it is important to note that much of the previous research regarding trends in abduction relies on descriptive rather than inferential statistics. Future research focusing on comparative statistical analysis is needed in order to fully explore these patterns.

Regarding the second objective, while some results were consistent with Harpster et al. (2009) and the 911 COPS Scale©, the majority were not. Of the forty-three 911 COPS Scale© variables tested, only six in the present study appeared to be statistically significant when comparing TRC and FAC and two of these variables, equivocation and awkward phrases, require further clarification to properly interpret the results. Although equivocating statements and awkward phrases were more often associated with FAC than TRC, the authors did not attempt to examine the total occurrences within each call, but only the presence or absence of these statements. Thus, a single instance of an equivocating word or awkward phrase was coded the same as a call with multiple

instances. It is unknown whether counting the total number of occurrences would have resulted in a different statistical outcome as some people may naturally utilize this type of language more often than others. Further, the coding of awkward phrases was difficult as the definition utilized by Harpster and Adams (2017) was highly subjective. Future research should further investigate inappropriate phrasing by more objective means such as linguistic analysis.

Several results were particularly noteworthy. In contrast to the finding in Harpster et al. (2009) that truthful callers issued a direct plea for help more often than deceptive callers, the current study found this characteristic lacking in most calls, regardless of call type. A possible explanation is that the 911 call itself is inferred by callers to be the plea for help and thus, TRC do not find it necessary to explicitly request help. Further, 911 calls for missing children differ from calls examined by Harpster et al. (2009), in that information about the child's immediate condition is not available. This lack of knowledge could also influence callers' responses.

Perhaps even more remarkable was the lack of urgency displayed by most TRC and FAC callers. In Harpster et al. (2009)'s analysis involving death/homicide calls, urgency was found to be a truthful indicator. Similarly, the emotional responses of callers did not help discriminate between TRC and FAC. These findings seem to belie popular notions of how caregivers should behave in these situations. We included several measures of emotion and emotional valence (e.g., laughing). Although this was exploratory, FAC engaged in these reactions somewhat less frequently than TRC and similar patterns have been found in previous research (Burns & Moffitt, 2014). It may be that emotions related to urgency and deception are difficult to capture without considering word choice. In addition, several other 911 COPS Scale© variables were also only found in a limited number of calls in the current study. No calls contained instances of callers making demands or hanging up on the dispatcher and only a few callers exhibited a defendant mentality or provided unexplained knowledge.

We did not find extraneous information to be indicative of FAC. Rather, the authors found that extraneous information was present in nearly every call, regardless of type. However, the type of extraneous information varied greatly among callers and it is possible a closer examination could clarify this difference, given that the underlying motivations for this may differ greatly. For example, callers who responded with extraneous statements may have done so to avoid answering a question, while others may have added additional information to an answer already provided to clarify or because they had initially forgotten to relay the information. Future research should attempt to examine these differences in greater detail.

Consistent with Harpster et al. (2009) and the 911 COPS Scale©, the authors found that attempting to convince the dispatcher, demonstrating initial delays, providing information in an inappropriate order, and providing evasive responses were significantly more likely to occur in FAC than TRC. It is possible FAC may hesitate at the outset of calls while attempting to rehearse what they are going to say. Likewise, FAC may evade answering dispatcher questions in a variety of ways that were not examined in this study, to include repeating the question back to the dispatcher, changing the subject, answering a question other than what was asked, or appearing as though they did not hear the question. Further exploration into these variables may provide valuable insight.

The finding that attempts to convince (i.e., repeating a word or phrase throughout the call) were more common with FAC than TRC should be interpreted with caution. While the term "attempts to convince" has intuitive appeal, a better explanation may simply be that it is cognitively easier for deceptive callers to repeat information as opposed to the greater mental effort required to invent additional information. Indeed, Strömwall et al. (2006) found that a verbal strategy used by liars was to keep their stories simple and not add details. As such, repeating phrases may serve to lower cognitive load while allowing deceptive callers to appear cooperative. Similarly, while not statistically significant, a weak association was also found between FAC and the use of successive repetition. Finally, a much higher percentage of FAC than TRC provided conflicting facts, but the low number of calls in which this occurred could have accounted for the difference.

The current study creates potential uncertainty about the application and efficacy of Harpster et al. (2009)'s findings and the use of the 911 COPS Scale© in missing child cases. This may also apply to homicides in which little information is known to the caller. As noted above, researchers were unable to replicate most of Harpster et al. (2009)'s findings. This has several practical implications for law enforcement. Importantly, the 911 COPS Scale© contains two-and-a-half times as many deceptive variables as truthful. This large difference could result in deception bias, even if these variables had been replicated (Kassin et al., 2003; Kassin & Fong, 1999). This is particularly relevant because the two most empirically supported approaches to evaluate statements, CBCA and RM, contain mostly *truthful* indicators (Vrij et al., 2007).

Finally, caution should be exercised when interpreting indicators of truth or deception as they do not necessarily indicate "guilt" or "innocence" as suggested on the 911 COPS Scale©. Truthful callers may exhibit certain verbal patterns for reasons unrelated to the specific incident in question. For example, a limited number of TRC in the present study who exhibited indicators of deception were later arrested on charges of child neglect or drug possession but were not responsible for the child's disappearance. However, we did not have enough data on criminal history to include these factors in our analyses. Future research should investigate how a caller's criminal history might impact the information provided during a 911 call.

In regard to the third objective, only one significant difference was found between call types and additional variables related to the 911 COPS Scale©. TRC were found to be more likely to provide the approximate time of the child's disappearance than FAC.

The current study examined several relationship and word choice characteristics on an exploratory basis. Three of these are noteworthy. First, a similar percentage of TRC and FAC reported "the" child or "a" child missing. As this phrasing could suggest an attempt to depersonalize the child or to distance the caller's relationship with the child, the authors expected FAC would refer to the child in this manner more often than TRC. A possible explanation is that FAC may want to appear credible as concerned caregivers, which may influence how they refer to the child by implying a close association. Similarly, the authors explored how caregivers who were not biologically related to the missing child referred to the child during the call. For FAC, this included six non-married intimate partners of the child's biological parent, two stepparents, and one neighbor. Seven of these nine callers referred to the child as "my" or "our," including five of the six intimate partners. In contrast, although three of the four non-biologically related TRC (all three were stepparents) also referred to the child as "my," all three clarified this relationship later in the call. None of the FAC did this. This, again, could be impacted by a FAC's desire to create the perception of a close caregiver relationship. Finally, regardless of caregiver relationship to the child, most caregivers did not refer to the child by name without

first being prompted by the dispatcher. Although not statistically significant, these are important factors for law enforcement to recognize as the lack of unprompted reference to the child's name occurs in both TRC and FAC. Future research should further examine the role of word choice as a function of caregiver relationship in 911 calls.

The counterintuitive findings in this study could have several possible explanations. First, TRC's lack of knowledge as to the true whereabouts of the child could create uncertainty as to whether the situation is a bona fide emergency. Further, TRC may not want to immediately consider the possibility that their child has been harmed, choosing instead to believe there must be a misunderstanding until evidence suggests otherwise. Alternatively, FAC may attempt to mimic what they believe are expected responses during 911 calls, thereby creating the illusion of a TRC.

4.1. Limitations

The current study has several limitations. Although larger than some previous studies, the sample size is smaller than ideal, which could limit the generalizability of the findings. However, the population baseline rate of false allegation cases is far lower than that of true missing reports and this sample size therefore may adequately represent of the scope of the problem. The method of case collection was representative of operational cases but was not random. Most cases were identified through law enforcement or open media sources, and thus represented only those cases that rise to the level of intense police response and/or media attention. Furthermore, as this was the first study to conduct a comprehensive examination of 911 calls in missing child cases, it is unknown whether these findings could be replicated in future studies using different samples.

The current study limited the analysis of deception detection factors derived from recent research as the primary purpose of this study was to attempt to replicate the findings of Harpster et al. (2009) and the 911 COPS Scale© developed by Harpster and Adams (2017). One limitation of this replication was the inability of the authors of the current study to directly utilize the same coding used in the development of the 911 COPS Scale©. Coding parameters for the current study may have been more strictly interpreted and operationalized in comparison to Harpster et al. (2009) and Harpster and Adams (2017) due to the lack of clarity regarding the original definitions of scale items. Future research in this area is needed to determine if the application of current deception research can better distinguish between types of callers. Specifically, the greater incorporation of CBCA and RM criteria, as well as recent research into total details, complications, common knowledge, and self-handicapping strategies, are particularly intriguing. It may also be beneficial to examine training protocols utilized by 911 dispatchers to determine if different approaches to questioning result in different responses by callers.

5. Conclusion

The results of this study could have significant practical use to law enforcement, especially in the early stages of a missing child investigation when details are scarce, but decisions must be made as to the extent and type of resources needed. Research to date, though limited, has shown that information contained within 911 calls can provide valuable insight for investigators to consider in conjunction with other known case facts. In addition, 911 calls may be a vital early source of information into potential indicators of truthfulness or deception and may better inform interview strategies and questions. At the same time, the results of this study call into question the efficacy of the 911 COPS Scale© and its ability to discriminate between truth and deception across different call types. Other researchers (Cromer et al., 2018; Miller et al., 2020) have largely been unable to replicate the findings of Harpster et al. (2009) and the current study also did not find support for most variables on the 911 COPS Scale©. Investigators should therefore utilize caution when interpreting results derived from the 911 COPS Scale© in favor of empirically supported approaches.

Declaration of competing interest

The authors have no known conflict of interest or declarations of interest to disclose.

Appendix A

Coding variables and definitions as conceptualized for use in the 911 COPS Scale©.

Variable	Definition
Immediate Plea for Help	Explicit requests for help made by a caller at the earliest practical point during the call
Any Plea for Help	Explicit requests for help made by a caller at any point during the call
Sense of Urgency	Requests made by a caller to expedite the response or other references by a caller to the urgent nature of the situation
Makes Demands	Forceful directives made by a caller to the dispatcher to expedite the response
Voice Modulation	A normal and/or loud voice with clear evidence of inflection with varying tones
Emotional Response (at least one instance)	Some evidence of distress exhibited by a caller at any point during the call
Emotional Response (majority of call)	Evidence of distress exhibited by a caller throughout the majority of the call
Anger / Frustration	Expression of anger or frustration by a caller at any pint during the call
Laughter	Laughter by a caller at any point during the call or in response to a dispatcher's question
Apologized / Expressed Regret	Expressions of regret or apologetic statements made by a caller at any point during the call
Equivocation	Vague or ambiguous terms utilized by a caller such as "I believe," "I think," "maybe," "possibly," "something," "someone," "kind of," etc.
Pauses	Silence of three or more seconds by a caller while waiting for the dispatcher's next question
Short Answers	Responses by a caller of three words or less for at least 25 % of the call
Evasion	Responses by a caller that do not answer the question asked, that provide an incomplete answer, or behaviors of a caller that prevent an answer to the question (e.g. emotional response)
Only Answers What is Asked	Answers by a caller that are strictly confined to the question asked, without additional information being volunteered
Repetition	Repetition of individual words or phrases three or more times in succession by a caller in response to a question
Unintelligible Comments	Incoherent or inaudible words or phrases spoken by a caller
Self-Interruption	Words or sentences that are stopped midway through by a caller to change the direction of the statement
Diversion	Redirection of dispatcher questions by a caller to avoid answering by asking unanswerable questions in response, such as "Who would do this to her?"
Sensory Details	Details provided by a caller related to sight, smell, taste, touch, or sound

(*continued*)

Variable	Definition
Awkward / Unexpected Phrases	Confusing or clumsy statements made by a caller in response to dispatcher questions
Information in Inappropriate Order	Information most important to a caller, such as alibi or exculpatory information, that is shared by a caller prior to sharing information most important to the missing child
Conflicting Facts	Information provided by a caller that contradicts previous information
Extraneous Information*	Information provided by a caller that is unrelated to the question asked or is not essential to answer the question
Possesses the Problem	Statement by a caller that takes ownership of a problem (e.g. "I have a missing child.")
Attempts to Convince	Statements repeated by a caller three or more times in an effort to persuade dispatchers of certain themes
Initial Delays	Slow and unnecessary words used by a caller at the beginning of the call that delay getting help to the missing child
Initial Sounds or Comments	Sounds, displays of emotions, or words spoken by a caller at the outset of the call prior to the dispatcher speaking or while the dispatcher is asking his/her initial question
Minimizes Actions/Inactions in Initial Communication	Attempts by a caller to reduce perceived culpability by utilizing minimizing words such as "just" and/or "only" when describing their actions
Ingratiating remarks	Overly polite language, such as "please" or "thank you" utilized by a caller during the call
"Huh?" Factor	Responses such as "huh?" or "what?" made by a caller to dispatcher questions
Hangs up	Caller disconnects prematurely from the call or in response to a dispatcher's question
Insults or Blames Child	Derogatory language used by a caller to describe the missing child
Provides Approximate Time of Child's Disappearance	Estimated time a caller claims to be the last time the missing child was seen or verified to be ok
Describes Activities at time of Child's Disappearance	Activities a caller claims to have been engaged in at the time of the child's disappearance
Discusses Changes in Child's Household	Recent changes described by a caller to the composition of the child's household prior to his/her disappearance
Non-Biological Parents' Use of Possessive Pronouns	Possessive pronouns, such as "my" used to describe the missing child by a caller who is not biologically related to the child
Use of Non-Possessive Pronouns	Non-possessive pronouns, such as "the" or "a" used to describe the missing children by a caller
Use of Editing Adverbs	Adverbs utilized by a caller as "text bridges" from one topic to another or from one sequence to another, such as "then," "when," "once," "later," "after," "next," or "as."

Note. Harpster et al.'s (2009) study defined extraneous information as "any unexpected communication made by the 911 caller to the dispatcher which is outside the context of the incident," while Harpster and Adams (2017) defined it as "irrelevant information that does not assist the victims." The researchers in the current study found this definition challenging to apply to the 911 calls in the present study as the researchers found that callers may have provided information extraneous to the incident, but relevant to the question asked, or may have provided information relevant to the incident, but extraneous to the question asked. Due to this, the researchers defined extraneous information in the current study to be "Information provided by a caller that is unrelated to the question asked or is not essential to answer the question."

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"911 What's Your Emergency?": Deception in 911 Homicide and Suicide Staged as Homicide Calls

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Abstract

Emergency 911 calls are often the first indication a homicide occurred and serve as initial witness statements in an investigation. The current study explores deception among homicide and homicide staged as suicide 911 calls. One hundred suicides, 18 homicide staged as suicide calls, 31 homicides with uninvolved callers, and 26 homicide offender calls were compared. Little overlap was found in deception indicators between the current findings and previous studies. Caution is warranted when extrapolating from studies using only 911 homicide calls to equivocal death cases, where investigators consider if the manner of death is a suicide or a staged homicide.

Keywords

911 calls, homicide investigations, homicides staged as suicides, homicide offenders, suicides

While the number of research articles on 911 calls in homicide investigations is relatively small, it has increased over time. The genesis of the knowledge base, the growth and its relation to investigative importance, can be attributed to the original research

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conducted by Harpster et al. (2009). Harpster and colleagues (2009) hypothesized there were several key features of 911 calls that make them potentially valuable as evidence in death investigations. First, they noted that 911 calls are generally not rehearsed and take place after the caller has discovered or committed a violent act. In either case, the caller is influenced by their emotions and therefore if they have committed the crime may make unintended mistakes or respond inappropriately. Second, 911 calls are recorded and can be repeatedly examined. They noted recorded calls can help identify voice modulation, ascertain any hesitation or pauses, and detect any background noise or activity. Burns and Moffitt (2014) also argued that it requires extra effort to lie when face to face or to a live 911 operator and is far different than an attempt to lie in a written statement. In preparing a written statement, the offender has a chance to consider his words carefully and may be able to edit the statement at any time. This is obviously not the case in a 911 call. These are real time and recorded exchanges, so there is no doubt about the caller's statements or whether he or she backtracked or inadvertently refuted previous statements.

Harpster et al. (2009) developed their original study for the purpose of analyzing 911 calls from individuals reporting homicides. They measured the differences between two groups—one group was innocent callers whereas the other group consisted of guilty callers (i.e., offenders). During their analysis, they considered the totality of the call, including not only what was said by the caller, such as whether the caller asked for assistance or was merely reporting a crime and the quality of the caller's language, but also included how the information was relayed by the caller (i.e., emotions, voice modulation, and any delays in speech or answering questions). Further, they assessed the reason for the call. For example, did the call focus the attention on the victim and their need for assistance or did the caller focus mainly on himself? Harpster et al. (2009) found distinct differences in the call characteristics for guilty versus innocent callers. Innocent callers were more likely to focus on getting help for the victim and did not provide extraneous information. They were able to provide accurate details on the victim's status, answer questions, and follow directions from the 911 operator. Innocent callers were consistent regarding the facts of the event and were more likely to correct erroneous information if new details were learned during the call as opposed to guilty callers who were more likely to provide conflicting information and seldom self-corrected.

Harpster and colleagues (2009) also found guilty callers tended to provide rambling and unclear explanations and did not fully cooperate with 911 operator instructions, such as performing CPR on the victim. They also tended to repeat demands or phrases, such as "Oh my God, oh my God," which was seen as an effort to avoid answering questions. Further, guilty callers were more likely to provide extraneous information and unneeded details of events, rather than a clear and concise report of relevant information. Providing extraneous information was one of the strongest indicators of guilt within their study. Guilty callers also tended to delay answering questions or had noticeable pauses in the conversation referred to as the *"huh factor."* This was understood as the caller being caught off guard with an unexpected question and was reflected through the callers use of "what?" or "huh?" in response to the 911 operator.

Other factors of guilty callers included: being overly patient and polite in conversation with the 911 operator. Examples included making requests and not demands for assistance and usage of "please, thank you, yes ma'am or yes sir." Acceptance of the victim's death without absolute proof and insulting or derogatory comments directed toward the victims were also prevalent among guilty callers.

Burns and Moffitt (2014) conducted a study of fifty 911 calls of reported homicides but used a different approach to their analysis. They examined the text of the calls for linguistic cues based on theories of deception detection to differentiate between deceptive and truthful 911 callers. Specifically, they measured the calls using "linguistic feature mining." This technique allowed them to quantify deceptive linguistic language. This is a change from previous studies that involved listening to the actual audio recordings of the calls with the focus on the totality of the words and syntax. They hypothesized they could differentiate between deceptive and truthful 911 callers based solely on the systematic differences in the words used to report the incident. They found that truthful callers used more negative words (i.e., swear words) and first person singular (i.e., he, she), while deceptive callers used person plural words more often (i.e., they, them) and statements such as "wait" or "hold on." However, by not using audio calls they were not able to hear any voice modulation or background noises, nor could they determine the length of any pauses. Moreover, with a lack of access to the full recordings, they could not tell if the transcription was completely accurate or if any hesitation on the caller's part was properly documented.

Cromer et al. (2018) completed a third study analyzing 911 calls for indicators of deception. Similar to Burns and Moffit (2014) they focused both on using the linguistic aspects of the call while integrating the findings of Harpster et al. (2009) as the basis for their study. Their analysis consisted of reviewing fifty 911 calls from completed police investigations, 36 were from known truthful callers and 14 from known deceptive callers. They measured 14 linguistic and four mitigating variables from the transcripts to determine if any of the variables, or combination thereof, could discern the truthfulness of a 911 call. Mitigating variables were classified as events that if present during the call may influence the linguistic behavior of the caller. Like the study by Burns and Moffitt (2014), only the written transcripts of the 911 calls were used to obtain the data from which to measure the variables.

Their resulting analyses confirmed some of Harpster et al.'s (2009) findings and refuted others. Cromer et al. (2018) found that a caller providing extraneous information is probably the strongest predictor of guilt of all of the measured variables. They also concurred on indicators including conflicting facts and possession of the problem, which was defined as the caller focusing on the victim, or the current problem, rather than focusing on themselves. Callers who tend to focus on themselves rather than the victim, noted by comments such as "I need help, I have a problem, I need assistance" are not taking possession of the problem. In this instance, the focus of attention or the problem is on the caller's need not the victim. When a caller focuses on themselves it was found to be an indicator of deception. Additionally, the researchers found that incorrect order and weapon touch were also found to be linked

to deceptive callers (Cromer et al., 2018). Incorrect order was defined as the order in which individuals speak about things is suggestive of their priorities. For instance, it was hypothesized that an innocent caller tends to report the most serious aspect of the event, that is, the immediate need for emergency service, before reporting other aspects of the event such as extent of injuries or status of the victim. Guilty callers may report other less serious aspects of the event prior to reporting the more serious. For example, initially reporting someone broke into a house and ransacked property, and then reporting the death of the victim - the time sequencing of important events is out of sync. Weapons touch referred to comments made by the caller without prompting from the operator, that they had touched the weapon at the scene. Overall, Cromer et al. (2018) found a positive predictive rate of 86%, meaning the callers who were identified during the research as deceptive were later determined to be guilty of the offense. Further, the negative predictive rate of 80% was found for those callers that were identified in the research as truthful and later determined to be truthful.

Cromer and colleagues could not replicate many of the initial findings from Harpster's original study; out of the nine variables related to guilt in the work by Harpster et al. (2009), only two variables were determined to be statistically significant (Cromer et al., 2018). For example, the two studies disagreed on the importance of a caller's acceptance of a victim's death, a caller's level of politeness, interacting with the dispatcher, and the use of the word "just" to minimize involvement in the death. It is possible that the smaller sample size in Cromer et al.'s study (2018) meant it lacked the statistical power to detect differences. Additionally, the study was also limited in similar ways to the Burns and Moffitt study (2014) because it relied on the written word rather than the actual recorded call.

Crime Scene Staging

Crime scene staging, by common understanding, is an attempt to misdirect a police investigation away from the true facts. Beauregard and Martineau (2014) found 0.9% of sexual homicides involved some form of crime scene staging. Crime scene staging is described by Chancellor and Graham (2017) as intentional efforts by an offender to add, remove, or rearrange physical and/or forensic evidence within the scene to resemble the event they would like the police to believe happened. One important element of the staging effort could be the 911 call to police reporting the death, which would be the first step in the offender's attempts to misdirect the police investigation. The 911 call is an example of verbal staging where the caller implants false information to the police hoping to influence their response. For instance, reporting a suicide to 911, the police may respond to the scene with the mindset they are responding to a suicide. One study of staged homicides found that 21.5% of them involved verbal staging, which involves providing a false verbal report with police in order to misdirect the investigation (Schlesinger et al., 2014). Chancellor and Graham (2017) note that a staged scene is not designed to withstand a long-term investigation; rather it is only to get through the initial police response to the scene. If the responding police officers are

convinced that the death is the result of suicide, it is likely there will be no further investigation and the offender will have achieved the goal of successfully getting away with murder[1]. The 911 call thus is an essential part of the offender's effort. It should be noted that while offenders in staged homicides frequently "discover" the victim and reported the death, this is not always the case (Ferguson & Petherick, 2016). Offenders may stage the homicide by manipulating both the scene and others (Eke, 2007), which includes having others call 911 for them.

Looking at aspects of crime scene staging, Ferguson and Petherick (2016) specifically discussed the concept of a homicide being staged to resemble a suicide. They conducted a multi-decade study of 115 homicide cases. A total of 16 (13%) were found to have been initially reported as suicides, but through police investigation were determined to be homicides. Other experts have all identified suicides as one of the more common themes used to misdirect police away from the true facts (Chancellor & Graham, 2017; Ferguson & Petherick 2016; Geberth, 2015) On the flip side, there is one additional aspect of staging involving suicide wherein a suicidal victim has staged the scene and their death to resemble a homicide, thereby, their death is seen as being a "homicide victim" rather than suicide. This may be an effort to protect their image or as one final effort to gain notoriety, exact revenge against family or friends (Adair & Doberson, 1999; Prahlow et al., 1998). In response to a story that made national headlines of a 71-year-old man who staged his suicide to look like a homicide, his daughter surmised that his intention was to protect his family from the shame of suicide and the self-doubt of missing warning signs (Abrahamson, 2018).

Douglas et al. (2006) also noted an important aspect of homicide staging, "When a crime is staged the responsible person is not someone who just happens upon the victim. It is usually someone who had some kind of association or relationship with the victim, who is most likely to be considered a suspect, thus necessitating the need to deflect attention away from them." (p. 34). Thus, making the 911 call is especially important for the offender to begin deflecting attention away from them and onto someone or something else. As noted by Chancellor and Graham (2017), there is no need for a stranger to stage a scene to resemble any other act. In fact, a qualitative examination of offender forensic awareness behaviors in 22 homicides found that the most elaborate forensic awareness behaviors occurred when the offender and victim were known to each other (Ferguson, 2019). Staging efforts by a stranger is an exception and not the general rule because there is little need to alter a scene and misdirect a police investigation away from them. For example, one study of staged homicides, put the estimate at 10% of offenders who staged some part of the scene were strangers in relation to the murdered victim, while another study put the estimate below 2% (Ferguson, 2015; Schlesinger et al., 2014). Ferguson and Petherick (2016), in their study was the relationship between the victim and offender in incidents of staged suicides, noted 43.8% of the homicide offenders were cohabitating spouses, 6.3% were cohabitating partners, and 50% were nondomestic family members or friends. There were no cases of strangers staging homicides to look like suicides (Ferguson & Petherick, 2016). This establishes the necessity of examining the 911 calls, as the

spouse or those with close personal relationships, are generally among the most likely to stage a scene and are normally the first suspects.

The focus of this literature review was two-fold. First, to review other similar studies relating to Harpster and colleagues' groundbreaking 911 call analysis research, and second to introduce the concepts of crime scene staging within the 911 call used by an offender in an attempt to misdirect a police investigation. The knowledge base to date relies on only a few studies that have examined 911 call characteristics. Consequently, it is of vital importance that further work be done to replicate and expand this investigative avenue. Additionally, so far, the research has focused primarily on 911 calls of homicides, whereas the presented research sought to expand to 911 call analysis of suicides and homicides staged as suicides. A review of the literature on staging shows that 911 calls could provide valuable information for investigators. While 911 calls were always considered important to obtain during a death investigation, the usefulness of analyzing 911 calls is still evolving to determine if information contained within provide clues about the truthfulness of the caller.

The first objective of the presented paper was to use an updated sample to replicate the previous work done by Harpster et al. (2009), as it is used as the foundation for many law enforcement trainings and a book geared toward law enforcement was published (Harpster & Adams, 2017). Beyond the replication is an expansion into unexplored concepts within 911 calls based on questions that have arisen in the operational experiences of the authors. The goal was to empirically test these new constructs to determine if they helped differentiate between callers who were involved in the homicides and those that were not. We hypothesized that similar findings would be present in the replication study with more recent 911 calls.

Research Question 1: What 911 caller behaviors and verbalizations are more likely among callers who were involved in the homicide as compared to 911 callers who were not involved?

The second objective, and hence research question, focused on those times when a homicide is staged as a suicide and the homicide offender calls 911 to report that the deceased killed him or herself. It was unclear if findings from the previous 911 call studies would be applicable to these staged homicides. This research expanded on what was previously done by including an appropriate comparison group to homicides staged as suicides, namely true suicide 911 calls where a person found someone who committed suicide and then called 911 to report it. We hypothesized that homicide staged as suicide 911 calls would have more verbal staging as measured by specifically stating the death was a suicide and mentioning the previous mental health and physical health history, along with prior suicidality of the deceased.

Research Question 2: For 911 calls that were called in as a suicide, what caller behaviors and verbalizations are more likely among callers who staged a homicide to look like a suicide as compared to callers reporting a true suicide?

Method

Sample

Utilizing a convenience sample of calls, the authors obtained 911 calls from a combination of cases worked by military law enforcement, federal law enforcement, calls posted online via news articles or on YouTube and public records requests from state or local police departments. All cases must have been an adjudicated homicide or for suicides, an official determination of suicide was made by appropriate officials to be included in the sample.

One hundred seventy-five 911 calls that were made between 2005 and 2019 at both United States Army installations (64%) and civilian 911 call centers (36%) were utilized for this study. The calls were either 911 calls where the death was presented as a suicide or where the death was presented as a homicide. These calls were further subdivided into two groups—the caller was not involved in the death or the caller was the homicide offender. Consequently, we had 100 true suicide calls (57.1%), 18 homicide staged as suicide calls (10.3%), 31 calls where the caller was not involved in the homicide (17.7%), and 26 offender calls (14.9%). All the homicide staged as suicide 911 calls were made by the homicide offender. To be included in the true suicide call group, the caller must not have been the person who committed suicide, rather it must have been someone who found the deceased's body after the suicide.

Most of the 911 callers were male (67.4%), 32.5% were female, and one could not be determined. The victim-offender relationship was measured by how the caller described the relationship on the 911 call. Most of the callers were the spouse or partner to the deceased (34.9%). The second most common relationship type, most likely due to the high number of Army 911 calls, was work colleague (17.1%), which was then followed by other family members (16.6%). Friends, acquaintances and roommates made up 11.4% of the callers. We were unable to determine the victim-offender relationship in 10.3% of the calls. Callers were considered strangers to the victims in 4.6% of the calls, and callers of other varied relationships were 4.6% of calls. Interestingly, only one caller was an ex of the deceased (0.6%).

Measures

To obtain measures of 911 call behaviors and verbalizations, actual words used by the caller, we developed an instrument with multiple measures intended to replicate the concepts explored by Harpster et al. (2009). We augmented this by adding questions of our own based on inquiries that arose during case investigations for a total of 28 variables. These variables and their distributions can be seen in Table 1. Two of the operational definitions for the variables measured require explanation. For voice modulation coders were looking for a change in the intensity and pitch of the caller's voice. Providing extraneous information was coded when the caller shared information that was irrelevant to the crisis at hand.

Finally, we added three questions that were only to look at the possibility of verbal staging within homicide staged as suicide 911 calls as compared to true 911

Table 1. Caller Behaviors across Four Types of 911 Calls.

	Homicide calls		Presented as suicide	
	Not involved in homicide (n=31)	Caller is homicide offender (n=26)	True suicide (n=100)	Homicide staged as a suicide (n=18)
Requests help for victim	25.8%	38.5%	28.0%	22.2%
Only provides notification of body	48.4%*	23.1%*	43.0%	66.7%
Urgency through demands to respond	35.5%	57.7%	49.0%	33.3%
Has voice modulation	48.4%*	76.9%*	78.0%	61.1%
Gives immediate report of victim's condition	80.7%	88.5%	80.0%	77.8%
Names the victim	16.1%	26.9%	43.0%	55.6%
Focuses on victim welfare for whole call	48.4%	53.9%	82.0%	38.9%
Accepts victim's death	45.2%	26.9%	49.0%	55.6%
Blames victim	3.2%	11.5%	16.0%	22.2%
Reports victim is dead	45.2%	30.8%	48.0%	55.6%
Provides extraneous Information	16.1%	23.1%	17.0%	22.2%
Provides detail about the Location	77.4%	80.8%	96.0%**	66.7%**
Shares own location prior to incident	41.9%	57.7%	34.0%	44.4%
Provides sensory detail	77.4%	65.4%	56.0%	77.8%
Delays at outset of call	16.1%	23.1%	11.0%	16.7%
Comments about blood/ Brains	38.7%	26.9%	26.0%	44.4%
Stays close to victim[a]	59.1%	72.7%	41.9%	57.1%

(continued)

Table 1. (continued)

	Homicide calls		Presented as suicide	
	Not involved in homicide (n = 31)	Caller is homicide offender (n = 26)	True suicide (n = 100)	Homicide staged as a suicide (n = 18)
Talks over dispatcher	25.8%	19.2%	18.0%	61.1%
Asks dispatcher's permission	9.7%	11.5%	13.0%	22.2%
Uses curse words	9.7%	26.9%	19.0%	27.8%
Stalls when answering	22.6%	23.1%	7.0%*	27.8%*
	Homicide calls		Presented as suicide	
	Not involved (n = 31)	Caller is offender (n = 26)	True suicide (n = 100)	Staged as a suicide (n = 18)
Uses terms of endearment and is a family member[b]	6.3%*	38.9%*	16.7%	21.4%
Reports no knowledge about what happened	51.6%	54.9%	27.0%	33.3%
Calls out to a higher power ("Oh my God")	35.5%	42.3%	27.0%	44.4%
Mentions mental health of Deceased	3.2%	3.9%	8.0%	11.1%
Mentions physical health of deceased	9.7%	19.2%	8.0%	11.1%
Uses the word "just"	80.7%	88.5%	80.0%	83.3%
Average number of times "just" is used by caller	2.5*	4.0*	2.4**	6.4**

*p < .05 **p < .01;
[a]n = 132. Removed calls where it could not be determined and where the dispatcher told the caller to move away.
[b]Family was defined as both spouse/partner/exes and other immediate family members.

Table 2. Caller Behavior for 911 Calls Reported as Suicides.

	True suicide (n = 100)	Homicide staged as a suicide (n = 18)	Total calls presented as suicides (n = 118)
Specifically states the death was a suicide	60.0%*	22.2%*	54.3%
Questions missing signs of impending suicide	2.0%	0.0%	1.7%
States the deceased was previously suicidal	1.0%	11.1%	2.5%

*p < .01.

calls—specifically (a) stating that the death was caused by suicide, (b) the caller questioning themselves about missed signs of suicide, and (c) stating that the deceased was previously suicidal (see Table 2). Each 911 call variable was either coded as present or absent, except for a few which had the option of unable to determine, such as for the concept of the caller staying close to the victim.

Procedure

Ensuring the integrity of the findings, it was crucial that the coders be blind to the outcome of the case, especially as in the pioneering work by Harpster et al. (2009) there was no mention of the culpability of the caller being blind to the coders. On the other hand, blind coding was incorporated in the research by Cromer et al. (2018). For the current study, no author coded a call that came from their own agency. The last author was responsible for finding all open source calls and submitted all records requests. Moreover, the last author then assigned calls to the coders so that the coders would be blind to the call condition.

Coders utilized both a written transcript of the call as well as the full audio recording to code each variable. Coders were either sworn law enforcement officers with a minimum of 15 years of experience in investigations or other operational personnel who participate in casework. The lowest percent agreement between the coders was 72.0% agreement on "Caller demonstrates voice modulation" (present/absent) and 72.4% agreement for "Caller reports a lack of knowledge about circumstances of death" (present/absent). For those where the level of agreement was below 80%, all of the authors reconvened to discuss the differences in interpretations, and subsequently re-coded those specific items.

Data Analyses

Chi-square tests were run to compare true suicide calls to homicide staged as suicide calls, while separate chi-square tests were run comparing homicide calls where the

caller was not involved to calls where the homicide offender called 911 but did not admit culpability on the call. For those bivariate analyses where the cell size was less than five calls, Fisher's exact test was used to test significance. Unfortunately, we were not able to do multivariate analyses due to the likelihood of overfitting the model due to the small number of dependent variables in each group. Finally, Cramer's V was calculated to compare the bivariate analyses strength of association to what was reported by Harpster et al. (2009).

Results

Research Question #1: What 911 caller behaviors and verbalizations are more likely among callers who were involved in the homicide as compared to 911 callers who were not involved?

Of the numerous variables tested, only four had a discernable effect in differentiating 911 calls where the caller was not involved in the deceased's murder compared to those where the offender called 911. Only providing notification of the deceased's body was related to a caller being less likely to be involved (χ^2 (1, N=57)=3.90, $p < .05$). Almost half of uninvolved callers called 911 to only provide notification of a dead body as compared to approximately a quarter of offender 911 callers. Voice modulation was significantly more common among offender involved calls (χ^2 (1, N=57)=4.86, $p < .05$), and finally, when the caller was a family member of the deceased using a term of endearment was more likely among homicide offenders who called 911 (χ^2 (1, N=34)=5.02, $p < .05$). The word "just" was used by the 911 caller in approximately 80% of all calls, and there was not a significant difference when only measuring if the word was used (χ^2 (1, N=57)=0.65, $p = .33$). The true difference came in the number of times the word just was used (t(55)=-2.01, $p < .05$); on average, a homicide offender who called 911 used "just" 4.0 times, as compared to an average of 2.5 times when the caller was not involved in the victim's death.

Research Question #2: For 911 calls that were called in as a suicide, what 911 caller behaviors and verbalizations are more likely among callers who staged a homicide to look like a suicide as compared to callers reporting a true suicide

For homicides staged as suicides 911 calls, there was more reluctance on the part of the caller to provide information to the dispatcher. In homicides staged as suicides, the offender who called 911 was more likely to stall when answering (χ^2 (1, N=118)=7.20 $p < .05$), and less likely to provide basic information about the deceased's location (χ^2 (1, N=118)=16.92 $p < .01$). Additionally, contrary to expectations, homicide staged as suicide callers were less likely to specifically state that the death was a suicide (χ^2 (1, N=118)=8.77 $p < .01$).

Table 3. Comparison of Cramer's V Strength of Association.

	Harpster et al. (2009) Cramer's V (χ^2)	Homicide calls Cramer's V (χ^2)	Staged as suicide Cramer's V (χ^2)
Plea to help victim	.288 (10.23)**	.136 (1.05)	.047 (0.26)
Urgency of plea[a]	.416 (16.52)**	.261 (3.89) *	.171 (3.43)
Demanding plea	.492 (28.63)**	.222 (2.81)	.113 (1.50)
Voice modulation[a]	.390 (16.76)**	.292 (4.86) *	.141 (2.35)
Self-correction[b]	.253 (8.70)*	—	—
Extraneous information	.806 (76.43)**	.088 (0.43)	.049 (0.28)
Inappropriate politeness	.531 (36.79)**	.083 (0.39)	.085 (0.85)
Acceptance of death	.375 (14.74)**	.189 (2.02)	.047 (0.26)
Acceptance of death with relationship	.531 (36.79)**	.230 (1.80)	.149 (1.24)
Insulting/Blaming the victim	.229 (7.20)**	.162 (1.50)	.060 (0.42)
Minimizing just	.191 (3.70)*	.106 (0.65)	.030 (0.11)
Huh factor	.308 (10.89)**	.006 (.00)	.247 (7.21)**
Repetition	.420 (23.46)**	.236 (1.17)	.075 (0.21)
Conflicting facts	.624 (50.00)**	.024 (0.03)	.056 (0.36)
Resistance to answer	.593 (45.38)**	.088 (0.43)	.063 (0.46)

Chi-square values in parentheses; *df* = 1 for all analyses.
*$p < .05$ **$p < .01$.
[a]Significant relationship found in the opposite direction as seen by Harpster et al. (2009).
[b]Sample size too small to make bivariate comparisons.

The same finding from the replication portion of the study about the use of the word "just" remained true with 911 calls reported as suicides as well. There was no difference in the likelihood of the word "just" being used between the two types of calls (χ^2 (1, N = 118) = 0.11 $p = .52$), but homicide staged as suicide callers said the word "just" on average 6.4 times during the call as compared to only 2.4 for callers reporting a true suicide (t(116) = -2.47, $p < .05$).

Table 3 illustrates the comparison between Harpster and colleagues' findings (2009) to the replication segment and the homicide stage as suicide segment of this study. The variables measuring (1) if there was an urgency to the plea for help and (2) voice modulation were the only relationships that had a significant Cramer's V; however, the relationship was in the opposite direction as compared to Harpster and colleagues' analyses.

For those variables in the current study where no relationship was found between the measured construct and the involvement of the caller, it could have been due to the current study's smaller sample size. Yet it is important to note that where there was not a significant relationship, Cramer's V, which measured the strength of the relationship, was not nearly as strong as what was seen by Harpster et al. (2009). Focusing on the expansion to suicide calls, there was agreement between the findings of Harpster et al. (2009) where the measure of delayed reaction (the "huh" factor) was seen more often in the homicide staged as suicide calls as compared to true suicide calls.

Discussion

The first objective of this study was to attempt to replicate the findings from previous work on deception in 911 homicide calls. Contrary to our hypothesis this study was unable to replicate the formative findings in the field by Harpster et al. (2009). In fact, when we did find a significant result between homicide offenders who called 911 without admitting to the crime and uninvolved 911 callers it was in the opposite direction of what was previously found. Voice modulation was more likely among homicide offenders, while calling only to notify of a dead body was more common among uninvolved callers. A more recent study found that providing extraneous information was the strongest predictor that a caller was involved in the homicide (Cromer et al., 2018), yet in the current study providing extraneous information was uncommon among the callers, and when it was given it was equally likely among the groups. We attempted to replicate a further finding from Cromer et al. (2018) about the importance of weapon touch in relationship to the likelihood the caller was involved, however, in the current study there were too few callers (3/175, 1.7%) that mentioned that had touched the weapon during the call to run comparative statistics.

The novelty in this study came with the introduction of homicide staged as suicide 911 calls as compared to true suicide calls. The findings demonstrated that the indicators seen in previous research about deception among 911 homicide callers, and even within the current study, cannot be applied to understanding the verbalizations of homicide staged as suicide 911 calls. There was not a single variable that overlapped within our analysis between homicides where the 911 caller reported it as a suicide and homicides that were reported as such to 911. Also, contrary to our expectations, mentioning that the victim was suicidal was rare in the calls of both true suicides and staged suicides, as was mentioning the mental health of the deceased. In fact, 911 callers who were reporting true suicides were more likely to specifically tell the dispatcher that it was a suicide. Offending callers who staged a homicide to appear as a suicide were significantly less likely to provide basic information on the location of the deceased. Offending callers of staged suicides used the word "just" more frequently in their interactions with the 911 dispatcher. They also were more likely to stall in responding to dispatchers' questions, which supports the findings of Burns and Moffit (2014), along with what Harpster et al. (2009) called the "huh" factor.

With the exploration of 911 calls reported as homicides and 911 calls reported as suicides, the inclusion of new operationally devised constructs did not add any meaningful assistance to the differentiation of calls. Namely, mentioning the mental health or physical health of the deceased or calling out to a higher power were unrelated to the involvement of the caller in the death of the deceased. Moreover, we did not find a difference in cursing between involved and uninvolved callers as did Burns and Moffit (2014).

Operational Considerations

To ensure accuracy when coding we listened to the audio recordings, while reviewing the written transcripts of the call. This is also necessary when conducting an analysis

of a 911 call for an active homicide case. Listening, while reading the transcripts, allows law enforcement to detect emotion, stress, voice modulation, irritation, and potential background noise and other conversations. One can also evaluate their speech patterns and listen for any changes in their pace or any pauses or hesitation. One of these pauses was earlier identified as the "huh factor" (Harpster et al., 2009). The "huh factor," or stalling in response to dispatcher's questions, was present within our study only among those callers who tried to stage a homicide to look like a suicide. These speech pattern changes are not always present or appreciated when only reviewing the written transcripts.

Second, it is extremely valuable to be able to listen to the voice of the caller as they are explaining the incident. Non-offending callers who were reporting a homicide were less likely to have voice modulation and more likely to be calling to only report a dead body. For those calls reporting a suicide, non-offending callers were much more straightforward in their explanation to 911 dispatchers by specifically stating the death was a suicide (60% of the calls), as compared to callers who were staging a homicide as a suicide who only specifically stated it was a suicide in 22% of the calls.

The written transcripts also allow for a simple way to examine one facet of minimization. Minimization is defined as the use of the words "just" or "only" to create distance between the caller and the event (Harpster & Adams, 2017). In this present study, both offender and non-offender callers used the word *"just"* in the description of events. The importance was found to be the number of times the caller used the word "just", which can be easily quantified using a transcript. In those cases of homicide staged as suicides, the caller used "just" 6.4 times compared to 2.4 times for non-offenders reporting a suicide, while in typical homicide 911 calls offenders used the word just an average of four times, as compared to 2.5 for non-involved callers.

While the application of research methods tries to ensure objectivity, there is still an inherent subjectivity in analyzing these calls, as noted by the level of agreement only reaching 72% for a few variables even as the coders are seasoned researchers and law enforcement professionals. This illustrates the importance of considering the call within the unique context of the facts of the case and the comparative analysis of additional statements made by the caller. In fact, deception detection research has led to the best practice of considering a baseline for how subjects provide truthful statements in similar settings to those where they are being deceptive (Vrij et al., 2010). Individual differences in the way people communicate and respond to trauma must be factored into an analysis of 911 calls in determining whether people are likely being deceptive.

Limitations and Future Directions

A large percentage (93%) of the sample's true suicide calls came from military installations. True suicide 911 calls from the general public are difficult to obtain, which necessitated the incorporation of military suicide calls. This can limit the generalizability of the sample, so we strongly encourage future work to replicate these findings with suicide 911 calls from a wider segment of the population. Second, while the overall sample size is large, the number of calls within each group of 911 callers are

smaller than ideal, which limits the power to detect statistical differences. In an attempt to show the direction of our findings we included strength of association measures (Cramer's V). However, as the presented findings conflict with what is seen previously in the research literature, we urge continued inquiry so that law enforcement practitioners can choose from empirically driven techniques when they investigate homicide cases. Additionally, there were a few items with rates of agreement under 80%, which was surprising given the investigative experience of the coders. While we included those items with lower agreement in this analysis, as they were subsequently discussed and recoded, future work needs to explore the level of agreement between seasoned investigators on these concepts.

While we obtained calls from across the country, due to the small sample size within each of the four call categories, we did not examine how the results varied by geographic region. As the coders were blind to the regions of the country from where the calls, nor were caller accents measured, it was difficult to properly account for any regional differences in word use, for example in the repetitive use of the word "just." Future research should examine the use of "just" as an indicator for possible deception varies by region.

Conclusion

While studies thus far have had mixed results labeling which specific variables have a potential value to indicate possible deception within 911 calls in homicide investigations, there is still utility of using 911 calls as an investigative tool. According to Adcock and Chancellor (2016), one of the first steps in any death investigation is to eliminate the person who found the body or reported the crime as a suspect. Beyond the ability of comparing the story provided to the 911 call dispatcher with the facts of the case, this study revealed some significant findings that can help investigators use 911 calls as a possible starting point for establishing the direction of their investigation. Recognizing a deceptive caller through their audio or linguistic cues, could quickly direct police attention and scrutiny toward that caller. The research thus far, however, makes it unlikely a 911 call analysis alone could be used as direct evidence in a criminal proceeding as evidence of deception. Rather it is more likely that conflicting statements or admissions made under emotional distress following the crime, could be introduced as evidence in a criminal proceeding.

Note

1. Interestingly, while there is a number of articles exploring the offender's use of staging, there was no empirical research found that explores the investigative clues that led to the staging being discovered.

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