



## Deception and Language: The Contextual Organization of Language and Deception (COLD) Framework

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The relationship between deception and language is complex and often inconsistent across studies. For example, prior work has observed that liars tend to use fewer self-references (e.g., *I, me, my*) than truth-tellers when discussing their views on abortion (Newman, Pennebaker, Berry, & Richards, 2003), but when writing fake hotel reviews, liars use more self-references than truth-tellers (Ott, Choi, Cardie, & Hancock, 2011). Inconsistent patterns of deceptive language have been observed for other cues as well, including negative emotion terms (Burns & Moffitt, 2014; Dzindolet & Pierce, 2004), the number of details in a false statement (Elntib, Wagstaff, & Wheatcroft, 2015), and the frequency of words that suggest complex thinking (e.g., exclusive terms, such as *but* and *rather*; Bond & Lee, 2005; Schober & Glick, 2011). Why is the impact of deception on language mixed?

One possibility is that deception does not affect language patterns and extant results reflect random noise. Given that the number of lies told per day is small (e.g., approximately two; DePaulo, Kirkendol, Kashy, Wyer, & Epstein, 1996; Serota & Levine, 2015), language may not be affected by dishonesty because its signal is not robust compared to truthful discourse.

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On the other hand, deception may affect language, but not uniformly. A recent meta-analysis provides evidence for this claim. Hauch, Blandón-Gitlin, Masip, and Sporer (2015) collected 44 studies that used automated methods to analyze deceptive language patterns, and the data revealed small to moderate effect sizes for cues that betray deceit. Importantly, however, these effects were influenced by moderators, such as the interaction type (e.g., if no interaction occurred, if there was an interview) and the production mode (e.g., written, spoken, or typed communication). The moderators, which often changed the direction and magnitude of the effect sizes for many cues in the meta-analysis, suggest that aspects of a situation matter when investigating the relationship between deception and language.

In this chapter, we draw on empirical moderator analyses from Hauch et al. (2015) and theories from deception research (Buller & Burgoon, 1996; Levine, 2014) to argue that *context* is an important aspect of each deception and requires consideration when making predictions about how lying affects language (and to understand anomalous results). Context is a vague term, however, and has received limited treatment from the deception literature. We dissect what context means for deception, the role of context in language production independent of deception, and how context plays a role in the relationship between deception and language. This approach integrates research from psychology, communication, and linguistics, concluding with a framework to understand how context affects deceptive word patterns, called the Contextual Organization of Language and Deception (COLD) framework.

### DOES DECEPTION AFFECT LANGUAGE?

The idea that deception affects language is supported by evidence suggesting that word patterns are modified by social and psychological processes. For example, a long tradition of clinical research has observed that depressive individuals are often more emotional than non-depressive individuals (Beck, 1967). The writing styles of people who rate highly on depression scales (Rude, Gortner, & Pennebaker, 2004) and who die of suicidal causes (Markowitz & Hancock, 2017) reveal a consistent pattern, as markers of emotion (e.g., positive and negative affect; *amazing* and *horrible*, respectively) are often amplified in the language patterns of people who are experiencing a distressing psychological event.

A second example highlights how academic success in college can be forecasted by students' admissions essays before they were accepted to the university. Pennebaker, Chung, Frazee, Lavergne, and Beaver (2014) analyzed the text of over 50,000 admissions essays and observed that better academic performance in college was associated with a more analytic writing style. Students with higher GPAs at the end of four years wrote with more articles (e.g., *a*, *the*) and prepositions (e.g., *above*, *below*), which reflect critical thinking, than students with lower GPAs. The lower-achieving students used

more pronouns (e.g., *I, me*) and verbs (e.g., *can, has*) than higher-achieving students, which reflects a narrative thinking style that is less analytic and complex. Together, the prior examples suggest that language reflects important information about who we are, what we are thinking and feeling, and what we are experiencing psychologically (Pennebaker, 2011). It is reasonable to assume, then, that language can be affected by deception and reveal distinct verbal patterns compared to truthful statements.

How does deception affect word patterns? Recall, prior meta-analytic work by Hauch et al. (2015) revealed small to moderate effect sizes for the effect of deception on language variables when looking across studies. For example, lies contained fewer words and more negative emotions compared to truths, but most patterns were influenced by moderators. The Hauch et al. (2015) meta-analysis accounted for five primary moderators that change the relationship between deception and language: (1) *event type* (e.g., a first-person experience, reporting of attitudes), (2) *valence of the deception* (e.g., if the false topic is positive, negative, or neutral), (3) *interaction type* (e.g., if no interaction occurred, the interaction took place online, there was an interview, or a face-to-face interaction occurred), (4) *motivation to lie* (e.g., no motivation, low to medium motivation, high motivation), and (5) *production mode* (e.g., handwritten, typed, spoken text).

The moderator analyses help to understand why language effects may be inconsistent for different deceptions. For example, across studies, lies often contain fewer words than truths, but considering the interaction type as a moderator for the effect reveals a different relationship between deception and language. In a one-way interview setting, a dyadic interpersonal setting, or if no interaction occurs, liars typically communicate with fewer words than truth-tellers. If the interaction occurs online (e.g., instant message chat, email), however, liars use *more* words than truth-tellers. These data suggest that simple changes to the communication format can modify deceptive language patterns and accounting for contextual elements is fundamental to achieve a more complete understanding of how deception changes behavior.

A second example considers how deception affects the rate of first-person singular pronouns (Newman et al., 2003; Pennebaker, 2011). Across studies, Hauch et al. (2015) reported a null effect of deception on first-person singular pronouns, which is unsurprising given that study-by-study comparisons find inconsistent results of lies containing both amplified (e.g., Ott et al., 2011) and attenuated rates of self-references (e.g., Larcker & Zakolyukina, 2012; Newman et al., 2003) relative to truths. Considering the valence of the deception as a moderator for the effect, however, clarifies the relationship. When the situation is negative (e.g., discussing a crime), lies often contain fewer first-person singular pronouns relative to truths, possibly as a psychological distancing mechanism (Newman et al., 2003). On the other hand, when people talk about a neutral event (e.g., writing about a hotel stay that never occurred; Ott et al., 2011), lies contain more first-person singular pronouns than truths, possibly to increase the speaker's credibility.

The evidence by Hauch et al. (2015) suggests that deception affects language, but the relationship is complex given the important moderator effects. These findings proffer that a universal approach to understanding how deception affects language is clearly problematic. Yet, to date, context has not been systematically modeled for the relationship between deception and language, at least in the literature on computerized text analysis. Nonetheless, an examination of the papers from Hauch et al. (2015) revealed that nearly half of the studies cite contextual factors or “the context” when anomalous results are observed compared to prior research or expectations. What does context mean for the relationship between deception and language? In the following sections, we identify how deception and language are both context-contingent phenomena. Finally, we propose three features of context—psychological dynamics, pragmatic goals, and genre conventions—that influence how deception affects language.

### CONTEXT FOR DECEPTION

Deception theories sometimes consider contextual factors that affect deception detection. Two frameworks, Truth-Default Theory (Levine, 2014) and Interpersonal Deception Theory (Buller & Burgoon, 1996), both articulate how context can play a role in deception detection studies.

#### *Truth-Default Theory*

Levine’s (2014) Truth-Default Theory (TDT) proposes that people are poor lie detectors because they assume that others are predominantly honest, independent of message veracity. TDT argues that deception detection efforts can improve, however, when people listen to what is said (e.g., the communication content) and absorb information in context. Levine (2014) suggests that context refers to the specific communication act and other situations relevant to the communication act. For example, if two American college friends meet in the dining hall for lunch at their university to discuss spring break plans, the current situation refers to the collocated discussion about the spring break trip. Relevant situations for the communication content are prior conversations that may have occurred (e.g., sorting through options of where to go) and new information that one person holds (but has yet to tell the other person) about the trip. Considering *content in context*, as Blair, Levine, and Shaw (2010) suggest, can help to improve lie detection accuracy and expose parts of a deception that may lead to improved veracity judgments.

What does content in context provide to the lie detector? First, content in context helps to highlight contradictions that the liar may communicate. For example, friends often try to manage the impressions of others by lying about their availability over text messaging (Hancock, Birnholtz, Bazarova, Guillory, Amos, & Perlin, 2009). If a message sender was unresponsive

because of poor cell service but he or she was also active on social media, taking content in context (e.g., inconsistencies between offline and online behavior) can help to uncover their dishonesty. Indeed, research suggests that contextual features are often used in the actual detection of everyday lies (Levine, Park, & McCornack, 1999), including information from third parties that is inconsistent with the deceptive statements (e.g., knowing from a Facebook post that a friend did not stay home, but went to a party instead).

Second, content in context provides cues to suggest what is normal or possible in a situation. That is, content in context helps to differentiate false exaggerations (e.g., “I just ate a million donuts”) from harmful lies and allows people to focus on messages that are suspicious. Finally, content in context can provide idiosyncratic information that suggests if deception is plausible for a given situation. This element of content in context is especially applicable to niche areas of deception, including politics or finance, because people who have expertise or inside knowledge about a subject area can detect deception better than outsiders (Blair et al., 2010; Levine, 2014).

The value of using content in context for deception detection was demonstrated in several studies by Blair et al. (2010), who had participants watch videotaped interrogations with contextual information (e.g., a case file on the suspect) or without contextual information. The data revealed that both professionals and students were better lie detectors when presented with contextual information than without contextual information. Their veracity judgments exceeded chance, and there were fewer “false alarms” when contextual information was given relative to when it was not provided. The work by Blair et al. (2010) and Levine (2014) suggests that content in context can aid in deception detection because the situation provides clues about contradictory, possible, or specialized data related to a possible act of deception. To best understand a deception, contextual factors should be evaluated.

### *Interpersonal Deception Theory*

Interpersonal Deception Theory (IDT; Buller & Burgoon, 1996) proposes that relationship dynamics in a deception are context dependent and contextual features of a situation modify deception detection abilities. These include but are not limited to: (1) the degree of interactivity between two communicators, (2) attributes of each communicator that affect how the interpersonal interaction will unfold (e.g., personality, goals), (3) information and behavioral familiarity, (4) the affective relationship of the communicators before the interaction occurs, and (5) honesty expectations at the onset of the interaction. At its core, the theory treats deception as a negotiation between the sender and receiver; therefore, understanding interpersonal relationship dynamics (e.g., roles of each communicator, emotional valence of the situation) can help to diagnose why lies are undetected.

Experimental evidence from Burgoon and colleagues supports the idea that deception detection is affected by contextual features of a situation,

especially parts of the interpersonal relationship. Burgoon, Buller, and Floyd (2001) manipulated the level of interactivity between two communicators in an interpersonal setting. Participants experienced either high interactivity (e.g., engaging in a dialogue) or low interactivity (e.g., a monologue, where one person communicates to another without message exchange), and lied or told the truth to their partner when discussing four topics: (1) “Tell about the most significant person in your life,” (2) “Tell about a mistake you made recently,” (3) “Describe the most unpleasant job you have ever had to do,” and (4) “Talk about responsibility.” The data revealed that message receivers were less accurate detecting deception under high interactivity settings relative to low interactivity settings. Burgoon et al. (2001) suggest that receivers may be less willing to suspect or detect deception interpersonally because people are incorrectly biased by cues (e.g., mutuality), but message senders are also more likely to control how information is communicated. Therefore, context constrains how people communicate a deception and their ability to detect false statements.

Other studies in the IDT tradition suggest that interpersonal deceptions are context dependent because communicators influence conversations to make lies appear similar to truths. If a liar suspects that the message receiver is catching on to the deception, he or she may adjust future communication patterns to avoid detection (see Vrij, 2008). It is crucial to understand how contextual elements affect deception because most lies are interactive and involve two people. Each deception, therefore, demands a unique communication style and is associated with relationship dynamics that constrain how the lie will be communicated.

Together, Truth-Default Theory (Levine, 2014) and Interpersonal Deception Theory (Buller & Burgoon, 1996) suggest that deception detection is difficult because we believe that most people are honest, people often do not use content and context-related cues to detect lies, and dynamics of interpersonal relationships can influence how a lie is told and perceived. These theories suggest that context matters for lie detection, but they also guide how context matters for deceptive message production as well. To investigate how context affects the relationship between deception and language, the next section identifies how language patterns are also context contingent, independent of deception.

## CONTEXT FOR LANGUAGE

According to Applegate and Delia (1980), communication messages are affected by five features of context: the physical setting (e.g., the location of the communication act), the social and relational setting (e.g., the relationship dynamics of the communicators), the institutional setting (e.g., an establishment with a specific purpose, such as an office, school, home), the functional setting (e.g., the reason for communication), and the cultural setting (e.g., nationality). The crossing of communication settings is called a

*situation* (Burlleson, 2009). The prior example of students planning a spring break trip can be categorized into Applegate and Delia's (1980) settings: Two American (e.g., cultural setting) college friends (e.g., social and relational setting) meet in the dining hall (e.g., physical setting) for lunch at their university (e.g., institutional setting) to discuss plans for spring break (e.g., functional setting).

Applegate and Delia (1980) provide a useful foundation for understanding context because their model suggests that interpersonal and environmental characteristics contribute to how a communication act occurs. Words are not produced in a vacuum, but they are dependent on and affected by social, institutional, and cultural influences to meet the expectations of other communicators (Levelt, 1989). People write emails to colleagues differently than they write emails to friends, send text messages to a boss differently than a significant other, and write newspaper articles differently than love letters. Communication works because people recognize setting cues and adjust their behavior when situations change (Clark, 1996; Levelt, 1989).

The Applegate and Delia (1980) framework can be supplemented, however, by considering the communication genre as a setting that affects language production. Knapp, Daly, Albada, and Miller (2002) suggest that message-related variables (e.g., the linguistic style, the source, and the audience) are important contextual elements for any communication act because communities have norms that shape how people produce word patterns (Biber, Connor, & Upton, 2007). For example, Tweets are constrained to a character limit and blogs often do not contain a word maximum. Each medium has different conventions that shape a discourse community. Consequently, we argue that an important contextual element of communication is the genre, which captures how people talk according to community norms (Biber et al., 2007). The genre typically changes when deceptions change, suggesting that this contextual element is important for understanding how deception may affect language patterns.

Together, the physical setting, social and relational setting, institutional setting, functional setting, cultural setting, and the genre form a situation and influence how language is communicated. This idea is most clearly demonstrated in interpersonal communication, as Burlleson (2009) suggests that certain features of context "shape and may even mandate" that people communicate according to dynamics of a community, a social relationship, or their own goals (p. 157). When people abide by elements of genre or their discourse community, they reinforce the social structures that allow communication to occur (e.g., speech acts, turn-taking, nonverbal gestures; Burlleson, 2009). Therefore, language has structure that is "beyond the sentence" (Biber et al., 2007, p. 8) and recognizing this structure or context is reflexive. People do not need to think about how to speak to their boss or someone of high social status because contextual cues about social relationships are built into the fabric of a situation (e.g., previous interactions, social expectations that suggest how rank affects communication style; Burlleson, 2009).

These findings from linguistics and psychology make clear how context plays a fundamental role in how language is used. In the next section, we integrate these observations with research on deception to develop a context-contingent framework for the relationship between deception and language.

### THE CONTEXTUAL ORGANIZATION OF LANGUAGE AND DECEPTION (COLD) FRAMEWORK

What contextual elements of a deception matter when evaluating how deception affects language? Prior research has often considered emotional and cognitive variables to understand the psychological dynamics of a situation inferred through language. For instance, researchers have considered how people express emotional content in Yelp reviews (Margolin & Markowitz, 2018), how emotion can be transferred across social networks (Kramer, Guillory & Hancock, 2014), and how people feel after experiencing a trauma (Cohn, Mehl, & Pennebaker, 2004). Empirical work also suggests that cognitive information or data related to cognitive load and complexity (see Sporer, 2016 and Vrij, 2008 for a review) also reveal how people may construe a situation. With substantial evidence suggesting that psychological dynamics matter when people communicate, it is reasonable to suggest that these elements will also matter for deception.

Communication goals, or the reasons why someone participates in a communication act, are also contextual and vary across deceptions. For example, evidence suggests that goals change how people choose to communicate in an online setting. Bazarova and Choi (2014) examined how people use different social media formats (e.g., Facebook status updates, wall posts, or private messages) depending on their social and relationship goals. For intimate conversations, people use private messages rather than status updates or wall posts. These data propose that people approach a situation with objectives, and communication behavior (e.g., language) is often a reflection of these goals. We suggest that deception goals, which vary by situation (Buller & Burgoon, 1996; Turner, Edgley, & Olmstead, 1975; Vrij, 2008), will modify language patterns because the reasons for communicating a deception vary widely.

Finally, it is important to consider how communication behavior reflects the environment that it is situated within. The genre is an important contextual variable for the relationship between deception and language because discourse patterns often reflect behavior that is typical for a given setting (Burlinson, 2009). A deception is situated within an environment, which has its own conventions (e.g., text messages are communicated differently than political speeches), and is constrained to language patterns that reflect the genre's norms. For deception, the genre is important because people who speak outside of the norms of the discourse community may be viewed as suspicious (Levine, 2014). People want to avoid detection and speaking in a genre-consistent manner is essential to blend in.

Based on these observations, we propose a model for assessing the contextual effects of deception on language: the Contextual Organization of Language and Deception (COLD) framework. The COLD framework suggests that there are three important aspects of context for any deception: (1) the psychological dynamics, or the emotional and cognitive elements of the lie, (2) the pragmatic goals of the speaker, or what he or she is trying to accomplish with the deception, and (3) the communication conventions in which the deception takes place, including the genre of the discourse community. We discuss these items as contextual constraints that should be considered when making assessments of how deception will affect language.

### *Psychological Dynamics*

Psychological dynamics consists of two key dimensions. The first dimension reflects how the liar's emotional experience is different from a truth-teller's emotional experience. Liars often try to approximate the genuine emotions that truth-tellers feel, and there is mixed evidence for the effect of deception on emotion cues (e.g., negative emotion terms). For example, Burns and Moffitt (2014) evaluated false and truthful calls to a 9-1-1 dispatcher and observed that lies contained fewer negative emotion terms than truths. The authors suggest that truth-tellers felt genuine fear compared to deceptive callers who could not approximate similar levels of distress. On the other hand, liars can also experience more negative emotions than truth-tellers for reasons including worry of being detected, guilt for deceiving another, or breaking a moral code (see Ekman, 2001; Vrij, 2008). As offered by Hauch et al. (2015), emotional language use affected by deception is moderated by the valence of the topic, the type of interaction, motivation, and the production mode. Therefore, considering the impact of deception on emotions requires contextual rather than universal treatment.

A second dimension of psychological dynamics considers the cognitive experience of the deceiver. Some research suggests that false narratives contain fewer cognitive complexity markers than truthful narratives (e.g., exclusive terms; Schelleman-Offermans & Merckelbach, 2010), while other studies find that cognitive complexity markers are unrelated to deception (e.g., in the text of an online dating profile; Toma & Hancock, 2012). Considering context and the Hauch et al. (2015) moderators highlights that the interaction type of a deception may impact the frequency of exclusive terms. For example, exclusives are produced significantly less often in lies relative to truths for interviews, face-to-face interactions, and situations without an interaction. The effect disappears, however, in online environments. Considering features of the situation, particularly the interaction type from the prior example, can therefore help to understand why deception and language results may be inconsistent with empirical findings.

Together, emotion and cognition variables are important contextual elements of a deception because they reflect how the deceiver responds

psychologically to an act of lying. Prior work has observed that psychological variables change when people respond to events that deviate from everyday experiences (e.g., distress, death; Pennebaker, 2011). We argue that deception is not unique in this respect and each deception should be treated as a situation that creates specific psychological dynamics (e.g., emotional and cognitive demands) for the communicator.

### *Pragmatic Goals*

Communication goals can broadly be separated into two types: primary and secondary goals (Dillard, Segrin, & Harden, 1989). Primary goals often represent the reasons for influencing another person or their behavior (e.g., to produce a false belief in another), and secondary goals are motivations that support the primary goal (e.g., to prevent embarrassment). Turner et al. (1975) provide a specific set of motivations related to deception, including: to save face, guide the social interaction, avoid tension or conflict, influence or control the situation, and increase interpersonal power over another. Given that there are different strategies and reasons for lying, another important feature of context considers what the liar is trying to accomplish and how this goal is reflected in language.

A relevant example considers how communication goals modify deceptive language patterns. In 2012, former social psychologist Diederik Stapel was convicted of data fraud in over fifty research publications. Markowitz and Hancock (2014) analyzed Stapel's first-authored fraudulent and genuine papers, finding that he overused science-related terms in his fake relative to genuine papers. Presumably, Stapel attempted to make the deceptive reports appear credible or as credible as the genuine reports, but he inappropriately estimated the frequency of words related to means, methods, and investigation. Considering the reasons for a deception can help to understand why language patterns are different between false and truthful corpora.

The context argument here suggests that people have different reasons for lying and use communication patterns to match their deception. The effect of deception on language should not be uniform because liars have different goals. Crucially, categorizing lies by deception goal may help to understand why language patterns are consistent or inconsistent across studies.

### *Genre Conventions*

A genre, or the discourse community of a speaker (Biber et al., 2007), influences the relationship between deception and language by first constraining a person's language to a refined set of features for conversation. Then, these genre-normative language features are modified by deception. This approach, where a person's discourse is first constrained by communication settings (Applegate & Delia, 1980; Knapp et al., 2002) and then false intentions alter language patterns, is fundamental to the context argument.

Take again the example of scientific fraud, where the genre (science communication) has written, edited, and impersonal writing style conventions. Language dimensions such as first-person singular pronouns (e.g., *I*, *me*), which are scarce in science writing, are unlikely to be affected by deception because they are generally unconventional in the genre. The characteristics of science writing, as suggested by a COLD framework perspective, are different from other genres that often include personal pronouns such as politics (Pfiffner, 1999). Therefore, first-person singular may be an important language feature in one genre (e.g., political speeches) but not in another (e.g., science writing) because the community conventions, independent of deception, are unique. The COLD framework argues that the effect of deception on language will be influenced by the genre of the deception, and the robustness of the effect will likely be limited to that genre.

Taken together, the COLD framework suggests that there are three contextual factors that need to be considered when evaluating the relationship between deception and language. A universal conceptualization of how deception affects language will likely miss how each deception's language effect is determined by the psychological dynamics of the deception, the goals of the communicator, and the genre in which it is communicated. By considering the psychological dynamics (e.g., emotional and cognitive processes affecting language production), pragmatic goals (e.g., what the liar is attempting to accomplish and how this is reflected linguistically), and genre conventions (e.g., features of the genre or discourse community that constrain language use), a more systematic model of how deception affects language should arise and allow for predictions to be made across studies. Below, we apply the COLD framework to a database with systematic differences in context by examining US presidential deceptions.

## POLITICAL DECEPTION

Does deception affect political speech? We approach this question by applying the COLD framework to six deceptions from US Presidents: George W. Bush and the War in Iraq, Lyndon B. Johnson and the Gulf of Tonkin Incident, Bill Clinton and the Monica Lewinsky Affair, Richard Nixon and Watergate, John F. Kennedy and the Cuban Missile Crisis, and Ronald Reagan and the Iran Contra Affair (see Alterman, 2004).

To apply the COLD framework to these data, we first hold genre constant by comparing all speeches within political discourse. Second, we organize presidential lies by the pragmatic goals each president was trying to accomplish with their deception. Research in political science (Alterman, 2004; Pfiffner, 1999) has observed that political deceptions can be broadly arranged into policy lies (e.g., reasons for bringing a country to war; George W. Bush, Lyndon B. Johnson), lies to prevent embarrassment (e.g., marriage infidelity or illegal campaign tampering; Bill Clinton, Richard Nixon), and state secrets (e.g., lying by omission or concealment to prevent domestic or international

chaos; John F. Kennedy, Ronald Reagan). We expect that these pragmatic goals will modify language between goal types (e.g., policy lies should reveal a different language style than lies to prevent embarrassment).

Third, we consider how deceptive language patterns are affected by the psychological aspects of a deception. According to the Newman Pennebaker (NP) Model of Deception (Newman et al., 2003), which was not developed for political speech, but its features have been substantiated across a number of empirical deception studies (Bond & Lee, 2005; Hauch et al., 2015; Toma & Hancock, 2012), liars betray several deception cues with language. For example, liars tend to use fewer self-references (e.g., *I, me*) than truth-tellers to focus the attention away from the self and onto other objects in the situation. Liars also use reduced rates of exclusive terms (e.g., *but, unless*) than truth-tellers, as a reflection of the reduced cognitive complexity often associated with telling a false story. Lies subsequently have less detailed information than truths because it is difficult for people to tell a detailed story that is fabricated (Markowitz & Hancock, 2014). Further, lies typically contain more negative emotion terms (e.g., *hate, dislike*) than truths to reflect the distress and anxiety associated with telling a false statement (Ekman, 2001). Finally, motion terms (e.g., *change, follow*) are often more prominent in lies relative to truths as they can help to move a false story forward and distract the listener from detecting deception.

Here, we perform an exploratory analysis to investigate how lies from the genre of politics, arranged by deception goals, modify rates of first-person singular pronouns, exclusive terms, negative emotion terms, and motion terms (Newman et al., 2003).

## METHOD

The Center for Public Integrity (CPI, 2008), a nonprofit group of investigative journalists, created a database of public statements by eight Bush administration officials about the rationale for the Iraq War (President George W. Bush, Vice President Dick Cheney, Secretary of State Colin Powell, National Security Adviser Condoleezza Rice, Defense Secretary Donald Rumsfeld, Deputy Secretary Paul Wolfowitz, White House Press Secretaries Ari Fleischer and Scott McClellan). CPI researchers gathered transcripts from September 11, 2001, to September 11, 2003, and identified objectively false claims. Together, 531 texts were collected and divided into false (49,797 words) and truthful control statements (139,200 words). Some false statements ( $n=24$ ) did not contain a truthful control, resulting in a database of 1,036 statements.

We acquired transcripts for the other five presidents from the American Presidency Project (Woolley & Peters, 2009), an archive containing over one hundred thousand presidential documents. Consistent with the CPI's methodology to investigate the Bush administration's utterances, we analyzed a president's transcripts from the timeframe during which event-specific

lies were told. A total of 111 statements were gathered across the five presidencies, and statements were divided into their deceptive (Johnson  $n=22$ ; Clinton  $n=8$ ; Nixon  $n=12$ ; Kennedy  $n=3$ ; Reagan  $n=10$ ; 5750 total words) and truthful statement types (Johnson  $n=23$ ; Clinton  $n=8$ ; Nixon  $n=12$ ; Kennedy  $n=3$ ; Reagan  $n=10$ ; 142,680 total words).

## TEXT PROCESSING

We used Linguistic Inquiry and Word Count (LIWC; Pennebaker, Booth, & Francis, 2007) to assess false and truthful control statements by speaker. LIWC is a well-validated tool that calculates the frequency of a single word across its internal dictionary of social dynamics, psychological processes, and parts of speech (see Hauch et al., 2015). For example, the statement from Lyndon B. Johnson, “I was later informed that the ships or the unidentified vessels continued to approach our two destroyers and they opened fire,” contains 21 words and LIWC increments each category as a percentage of the total word count. Since there was one instance from each of the NP model categories, first-person singular pronouns (e.g., *I*), exclusives (e.g., *or*), negative emotion terms (e.g., *destroyers*), and motion terms (e.g., *approach*) represent 4.76% (1/21) of the input text. NP model dimensions were drawn from the standard LIWC 2007 dictionary and compared across false and truthful statements for all presidents and officials.

## RESULTS

The data were analyzed using hierarchical linear mixed models with statement type (false versus control) as a between-subjects factor. We controlled for data non-independence by nesting statements within speaker and entering this variable as a random effect into each linear mixed model.

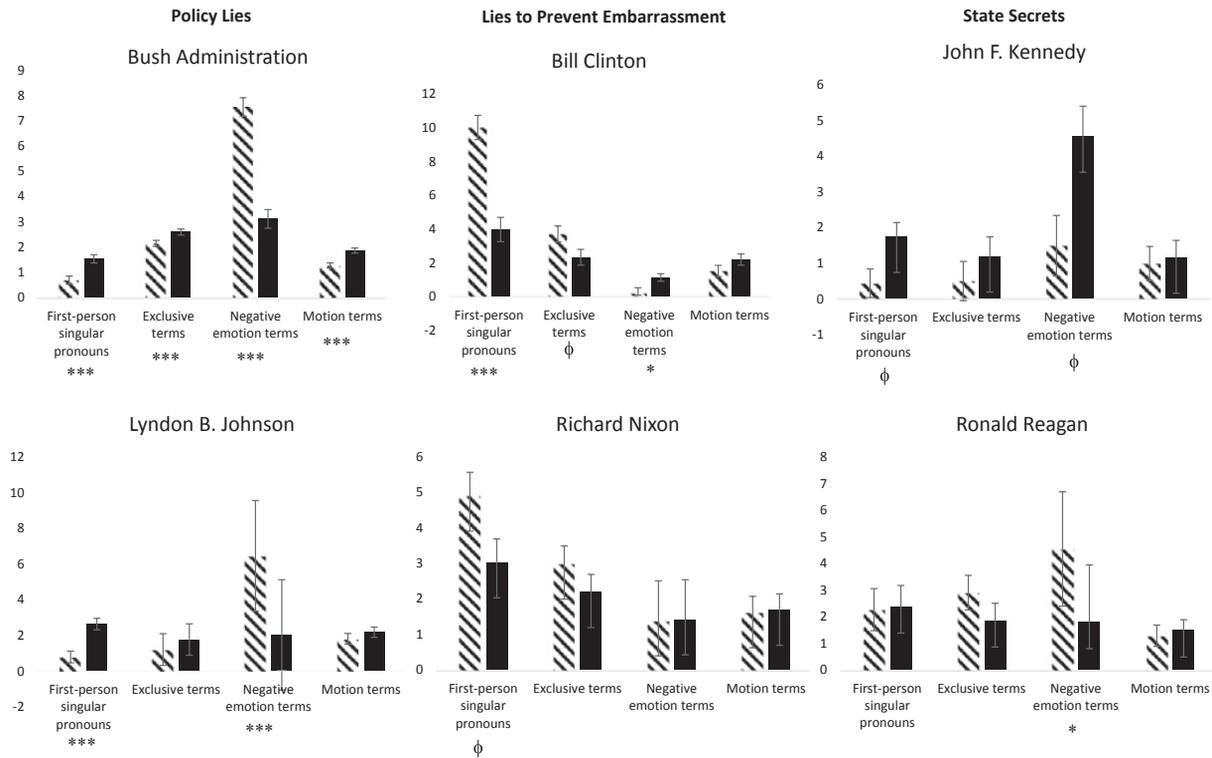
If deception affects language in a context-contingent manner, as predicted by the COLD framework, we would expect significant interaction effects for statement type (deceptive vs. truthful control statements) and pragmatic goals (policy lies, lies to prevent embarrassment, state secrets). Consistent with the COLD framework and the idea that deceptive language patterns are context dependent, there were significant interaction effects between the pragmatic goal and statement type for several NP dimensions: first-person singular pronouns [ $F(2, 1128.36)=28.38, p<.001$ ], exclusives [ $F(2, 1128.99)=3.27, p=.038$ ], and negative emotion terms [ $F(2, 1133.09)=11.00, p<.001$ ], but not for motion terms [ $F(2, 1131.03)<1$ ].

As expected by the contextual approach of the COLD framework, the language effects were consistent within pragmatic goals and different across pragmatic goals (see Fig. 10.1). The combined results for policy deceptions (the Bush administration and President Lyndon B. Johnson; the left panel of Fig. 10.1) revealed patterns consistent with typical NP model predictions

for first-person singular pronouns [ $F(1, 1128.41) = 63.63, p < .001$ ], exclusive terms [ $F(1, 1129.18) = 11.54, p = .001$ ], and negative emotion terms [ $F(1, 1133.16) = 423.51, p < .001$ ]. Motion terms were significantly different across statement type, but in the opposite direction as predicted by the NP model [ $F(1, 1131.27) = 37.98, p < .001$ ]. Together, the data suggest that statements from the Bush administration and President Lyndon B. Johnson had speaking patterns largely consistent with the NP model (e.g., fewer self-references and exclusive terms, more negative emotion terms) in false compared to truthful control statements, when holding the speaker constant (see Fig. 10.1 for univariate effects by speaker).

The combined results for lies to prevent embarrassment (Presidents Clinton and Nixon; the middle panel of Fig. 10.1) were less clear but markedly different from the policy deception language effects. That is, lies contained *more* first-person singular pronouns [ $F(1, 1128.36) = 37.49, p < .001$ ] and a trend toward more exclusive terms [ $F(1, 1128.98) = 2.59, p = .108$ ] compared to truths. Negative emotion and motion terms were in the opposite direction of the NP model and also failed to reach significance as well [ $F_s < 1$ ]. Finally, combined results for Presidents Kennedy and Reagan (the right panel of Fig. 10.1) revealed no significant differences across NP model features [ $F_s < 1.1$ ]. Together, the mixed language patterns between pragmatic goals but consistent language patterns within pragmatic goals suggest that this element of context plays a crucial and systematic role in the way that a deception is communicated linguistically.

This study has several strong effects that differ from typical NP model predictions. For example, while the rate of first-person singular pronouns was lower in lies relative to truths for policy deceptions (Presidents Bush and Johnson), more self-references were used in the lies relative to truths for lies to prevent embarrassment (Presidents Clinton and Nixon). How can we reconcile such mixed effects? The COLD framework offers a foundation to evaluate how deception affects language across two crucial dimensions, with genre held constant: (1) psychological dynamics, and (2) pragmatic goals. Recall, the psychological dynamics of a lie involve how a person responds emotionally and cognitively to the deception. Considering the psychological dynamics of embarrassment lies that are personal in nature (e.g., dishonesty about marriage infidelity), they often affect a person's face, or his/her positive sense of self (Goffman, 1959). An increase in first-person singular pronouns may be a psychological process used to augment speakers' authenticity or credibility because their reputation has suffered (Ott et al., 2011). This can be accomplished by using more self-references and more concrete language (see Larrimore, Jiang, Larrimore, Markowitz, & Gorski, 2011; Pennebaker, 2011). On the other hand, lies that are less instrumental for the self and mainly concern others (e.g., policy deceptions; Pfiffner, 1999) may focus more on the collective and less on the speaker to diffuse responsibility and divert attention from the self. Our data are consistent with this possibility,



**Fig. 10.1** Vertical axes represent raw LIWC percentages of the total word count. Striped bars indicate deceptive statements and solid bars indicate truthful control statements. \*  $p < .05$ , \*\*\*  $p < .001$ ,  $\phi = p < .08$ . Error bars are Standard Errors

with President Lyndon B. Johnson using a lower rate of first-person singular in lies relative to truths, suggesting that this distancing was likely a psychological response to manage the lie.

The pragmatic goals associated with policy lies and lies to prevent embarrassment are also not uniform, and therefore, we should not expect the language patterns reflecting these deception goals to be consistent across different lies. That is, the goal to convince a country of a war effort is qualitatively different than saving face from a marriage scandal. These unique goals should shape the manner in which deception affects language and we found evidence of this contention, similar to how a fraudulent scientist (Markowitz & Hancock, 2014, 2016) should deceive differently than someone writing a fake online dating profile (Toma & Hancock, 2012) because the purpose for the deception is distinct. A fraudulent scientist may fake data and write his or her report differently than a genuine scientist to achieve recognition in academia, while an online dater may lie to portray a more idealized self (see Markowitz & Hancock, 2018). With unique deception goals across settings, the effect of deception on language should not be universal and should be considered a context-contingent phenomenon.

Together, these data and the COLD framework provide empirical and theoretical evidence that political deceptions are not told with uniform language patterns. Psychological dynamics and pragmatic goals of each deception (e.g., policy lies, lies to prevent embarrassment, state secrets) systematically influenced how deception affected language.

## CONCLUSION

This chapter argues that the effect of deception on language is context dependent, and after considering what context means for deception and language, three features of a contextual framework were developed. First, psychological dynamics considers how deception affects the emotional and cognitive experience of the communicator, as reflected in language (Hauch et al., 2015). Second, pragmatic goals suggest what the liar is trying to accomplish with the deception. Because goals shift based on setting features (Applegate & Delia, 1980; Burluson, 2009; Knapp et al., 2002), deception should not affect language uniformly across lying situations. Finally, genre conventions suggest how the influence of deception on language is first constrained by the genre and the discourse community of each situation (Biber et al., 2007). Considering these three elements together can provide a model of how deception affects language and how communicators change their verbal patterns based on deception-specific characteristics.

We also applied the COLD framework to an untested dataset of political lies and used NP model features to investigate how deceptions modify language patterns (Newman et al., 2003). Separating the deceptions by pragmatic goals provided a clearer depiction of how false political statements

compare to truthful political statements. By positioning deceptive language patterns in the COLD framework, inconsistent outcomes of presidential deceptive speech relative to established theory or prior empirical work can be better understood. Our overarching conclusion suggests that with unique psychological dynamics affecting how a lie is told and distinct motivations for lying within a single genre, the effect of deception on language should not be uniform across studies. We can strategize and learn about the relationship between deception and language by considering the contextual elements that affect how a lie is communicated.

We recognize, however, that our framework does not provide an exhaustive list of dimensions that may matter for the relationship between deception and language. We provide only a starting point for researchers to build off of our theorizing and understand how deception plays an important role in false language production when situations change. Our goal with this chapter was to argue that context deserves additional treatment, positioning, and defining in the deception literature. We offer why deception and language are context-contingent phenomena and explain three characteristics of context that influence how deception affects language. Future research should expand on this model and approach deception as a phenomenon that is modified by psychological dynamics, pragmatic goals, and genre conventions that are unique to each deception.

## REFERENCES

- Alterman, E. (2004). *When presidents lie*. New York: Viking Penguin.
- Applegate, J. L., & Delia, J. G. (1980). Person-centered speech, psychological development, and the contexts of language usage. In R. S. Clair & H. Giles (Eds.), *The social and psychological contexts of language usage* (pp. 245–282). Hillsdale, NJ: Lawrence Erlbaum.
- Bazarova, N. N., & Choi, Y. H. (2014). Self-disclosure in social media: Extending the functional approach to disclosure motivations and characteristics on social network sites. *Journal of Communication*, *64*, 635–657. <https://doi.org/10.1111/jcom.12106>.
- Beck, A. T. (1967). *Depression: Clinical, experimental, and theoretical aspects*. New York, NY: Harper & Row.
- Biber, D., Connor, U., & Upton, T. A. (2007). *Discourse on the move: Using corpus analysis to describe discourse structure*. Philadelphia: John Benjamins Publishing Company.
- Blair, J. P., Levine, T. R., & Shaw, A. S. (2010). Content in context improves deception detection accuracy. *Human Communication Research*, *36*, 423–442. <https://doi.org/10.1111/j.1468-2958.2010.01382.x>.
- Bond, G. D., & Lee, A. Y. (2005). Language of lies in prison: Linguistic classification of prisoners' truthful and deceptive natural language. *Applied Cognitive Psychology*, *19*, 313–329. <https://doi.org/10.1002/acp.1087>.
- Buller, D. B., & Burgoon, J. K. (1996). Interpersonal deception theory. *Communication Theory*, *6*, 203–242. <https://doi.org/10.1111/j.1468-2885.1996.tb00127.x>.

- Burgoon, J. K., Buller, D. B., & Floyd, K. (2001). Does participation affect deception success? *Human Communication Research*, 27, 503–534. <https://doi.org/10.1111/j.1468-2958.2001.tb00791.x>.
- Burleson, B. R. (2009). The nature of interpersonal communication: A message-centered approach. In C. R. Berger, M. E. Roloff, & D. R. Roskos-Ewoldsen (Eds.), *The handbook of communication science* (pp. 145–165). Thousand Oaks, CA: Sage.
- Burns, M., & Moffitt, K. (2014). Automated deception detection of 911 call transcripts. *Security Informatics*, 3, 1–9. <https://doi.org/10.1186/s13388-014-0008-2>.
- Center for Public Integrity. (2008). *'The Iraq War Card' project*.
- Clark, H. H. (1996). *Using language*. Cambridge, UK: Cambridge University Press.
- Cohn, M. A., Mehl, M. R., & Pennebaker, J. W. (2004). Linguistic markers of psychological change surrounding September 11, 2001. *Psychological Science*, 15, 687–693. <https://doi.org/10.2307/40064028>.
- DePaulo, B. M., Kirkendol, S., Kashy, D., Wyer, M., & Epstein, J. (1996). Lying in everyday life. *Journal of Personality and Social Psychology*, 70, 979–995. <https://doi.org/10.1037/0022-3514.70.5.979>.
- Dillard, J. P., Segrin, C., & Harden, J. M. (1989). Primary and secondary goals in the production of interpersonal influence messages. *Communication Monographs*, 56, 19–38. <https://doi.org/10.1080/03637758909390247>.
- Dzindolet, M. T., & Pierce, L. G. (2004). *A computerized text analysis can detect deception*. Paper presented at the Human Factors and Ergonomics Society Annual Meeting, New Orleans, LA.
- Ekman, P. (2001). *Telling lies: Clues to deceit in the marketplace, politics, and marriage*. New York: W.W. Norton.
- Elntib, S., Wagstaff, G. F., & Wheatcroft, J. M. (2015). The role of account length in detecting deception in written and orally produced autobiographical accounts using reality monitoring. *Journal of Investigative Psychology and Offender Profiling*, 12, 185–198. <https://doi.org/10.1002/jip.1420>.
- Goffman, E. (1959). *The presentation of self in everyday life*. New York: Anchor Books.
- Hancock, J. T., Birnholtz, J. P., Bazarova, N. N., Guillory, J., Amos, B., & Perlin, J. (2009). *Butler lies: Awareness, deception and design*. Paper presented at the Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI).
- Hauch, V., Blandón-Gitlin, I., Masip, J., & Sporer, S. L. (2015). Are computers effective lie detectors? A meta-analysis of linguistic cues to deception. *Personality and Social Psychology Review*, 19, 307–342. <https://doi.org/10.1177/1088868314556539>.
- Knapp, M., Daly, J., Albada, K., & Miller, G. (2002). Backgrounds and current trends in the study of interpersonal communication. In M. Knapp & J. Daly (Eds.), *Handbook of interpersonal communication* (pp. 3–20). Thousand Oaks, CA: Sage.
- Kramer, A. D. I., Guillory, J. E., & Hancock, J. T. (2014). Experimental evidence of massive-scale emotional contagion through social networks. *Proceedings of the National Academy of Sciences*, 111, 8788–8790. <https://doi.org/10.1073/pnas.1320040111>.
- Larcker, D. F., & Zakolyukina, A. A. (2012). Detecting deceptive discussions in conference calls. *Journal of Accounting Research*, 50, 495–540. <https://doi.org/10.1111/j.1475-679x.2012.00450.x>.

- Larrimore, L., Jiang, L., Larrimore, J., Markowitz, D., & Gorski, S. (2011). Peer to peer lending: The relationship between language features, trustworthiness, and persuasion success. *Journal of Applied Communication Research*, 39, 19–37. <https://doi.org/10.1080/00909882.2010.536844>.
- Levelt, W. J. M. (1989). *Speaking: From intention to articulation*. Cambridge: MIT Press.
- Levine, T. R. (2014). Truth-default theory (TDT): A theory of human deception and deception detection. *Journal of Language and Social Psychology*, 33, 378–392. <https://doi.org/10.1177/0261927x14535916>.
- Levine, T. R., Park, H. S., & McCornack, S. A. (1999). Accuracy in detecting truths and lies: Documenting the “veracity effect”. *Communication Monographs*, 66, 125–144. <https://doi.org/10.1080/03637759909376468>.
- Margolin, D., & Markowitz, D. M. (2018). A multitheoretical approach to big text data: Comparing expressive and rhetorical logics in Yelp reviews. *Communication Research*, 45, 688–718. <https://doi.org/10.1177/0093650217719177>.
- Markowitz, D. M., & Hancock, J. T. (2014). Linguistic traces of a scientific fraud: The case of Diederik Stapel. *PLoS ONE*, 9, e105937.
- Markowitz, D. M., & Hancock, J. T. (2016). Linguistic obfuscation in fraudulent science. *Journal of Language and Social Psychology*, 35, 435–445. <https://doi.org/10.1177/0261927x15614605>.
- Markowitz, D. M., & Hancock, J. T. (2017). The 27 Club: Music lyrics reflect psychological distress. *Communication Reports*, 30, 1–13. <https://doi.org/10.1080/08934215.2016.1210663>.
- Markowitz, D. M., & Hancock, J. T. (2018). Deception in mobile dating conversations. *Journal of Communication*, 68, 547–569.
- Newman, M. L., Pennebaker, J. W., Berry, D. S., & Richards, J. M. (2003). Lying words: Predicting deception from linguistic styles. *Personality and Social Psychology Bulletin*, 29, 665–675. <https://doi.org/10.1177/0146167203029005010>.
- Ott, M., Choi, Y., Cardie, C., & Hancock, J. T. (2011). *Finding deceptive online spam by any stretch of the imagination*. Paper presented at the 49th Annual Meeting of the Association for Computational Linguistics, Portland, OR.
- Pennebaker, J. W. (2011). *The secret life of pronouns: What our words say about us*. London: Bloomsbury Press.
- Pennebaker, J. W., Booth, R. J., & Francis, M. E. (2007). Linguistic Inquiry and Word Count. [www.liwc.net](http://www.liwc.net).
- Pennebaker, J. W., Chung, C. K., Frazee, J., Lavergne, G. M., & Beaver, D. I. (2014). When small words foretell academic success: The case of college admissions essays. *PLoS ONE*, 9, e115844.
- Pfiffner, J. P. (1999). The contemporary presidency: Presidential lies. *Presidential Studies Quarterly*, 29, 903–917. <https://doi.org/10.1111/1741-5705.00073>.
- Rude, S., Gortner, E.-M., & Pennebaker, J. (2004). Language use of depressed and depression-vulnerable college students. *Cognition and Emotion*, 18, 1121–1133. <https://doi.org/10.1080/02699930441000030>.
- Schelleman-Offermans, K., & Merckelbach, H. (2010). Fantasy proneness as a confounder of verbal lie detection tools. *Journal of Investigative Psychology and Offender Profiling*, 7, 247–260. <https://doi.org/10.1002/jip.121>.
- Schober, M. F., & Glick, P. J. (2011). Self-deceptive speech: A psycholinguistic view. In C. Piers (Ed.), *Personality and Psychopathology* (pp. 183–200). New York: Springer.

- Serota, K. B., & Levine, T. R. (2015). A few prolific liars: Variation in the prevalence of lying. *Journal of Language and Social Psychology*, *34*, 1927-1945. <https://doi.org/10.1177/0261927x14528804>.
- Sporer, S. L. (2016). Deception and cognitive load: Expanding our horizon with a working memory model. *Frontiers in Psychology*, *7*, 1-10. <https://doi.org/10.3389/fpsyg.2016.00420>.
- Toma, C., & Hancock, J. T. (2012). What lies beneath: The linguistic traces of deception in online dating profiles. *Journal of Communication*, *62*, 78-97. <https://doi.org/10.1111/j.1460-2466.2011.01619.x>.
- Turner, R. E., Edgley, C., & Olmstead, G. (1975). Information control in conversations: Honesty is not always the best policy. *Kansas Journal of Sociology*, *11*, 69-89. <https://doi.org/10.17161/str.1808.6098>.
- Vrij, A. (2008). *Detecting lies and deceit: Pitfalls and opportunities* (2nd ed.). West Sussex: Wiley.
- Woolley, J. T., & Peters, G. (2009). The American Presidency Project. Retrieved from <http://www.presidency.ucsb.edu/>.