

# Toward a Deeper Understanding of Prolific Lying: Building a Profile of Situation-Level and Individual-Level Characteristics

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## Abstract

Prior work suggests those who lie prolifically tend to be younger and self-identify as male compared to those who engage in everyday lying, but little research has developed an understanding of prolific lying beyond demographics. Study 1 ( $N=775$ ) replicated the prior demographic effects and assessed prolific lying through situation-level (e.g., opportunistic cheating) and individual-level characteristics (e.g., dispositional traits, general communication patterns) for white and big lies. For these two lie types, prolific lying associated with more opportunistic cheating, the use of fewer adjectives, and being high on psychopathy compared to everyday lying. Study 2 ( $N=1,022$ ) replicated these results and observed a deception consensus effect reported in other studies: the more that people deceived, the more they believed that others deceived as well. This piece develops a deeper theoretical understanding of prolific lying for white and big lies, combining evidence of situational, dispositional, and communication characteristics.

## Keywords

lying, deception, prolific lying, automated text analysis, Dark Triad, deception consensus effect

Lying is a basic element of everyday life. In social settings, people deceive to avoid embarrassment (Turner et al., 1975), to manage the impressions of another person (Toma & Hancock, 2012), and to appear attractive (Markowitz & Hancock, 2018;

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Toma & Hancock, 2010). Such deceptions are generally subtle and covert because people do not want to raise suspicion about their communication act (Markowitz, 2020; McCornack et al., 2014). In other settings, people deceive when the situation offers an opportunity and incentive for personal gain. That is, people who can earn money by cheating tend to capitalize on the opportunity (Markowitz & Levine, 2021) and offering an incentive for deception (e.g., lying will end an experiment early) often motivates people to deceive as well (Bond et al., 2013).

How often do people lie or cheat when opportunities and incentives for deception are available? The prior question has received substantial attention in the deception literature, though recent work suggests the prevalence of lying is a more complex and nuanced idea than once considered. Most deception research suggests people tell between one and two lies per day (DePaulo et al., 1996; George & Robb, 2008; Hancock et al., 2004; Hart et al., 2019; Markowitz, 2021; Markowitz & Hancock, 2018; Serota & Levine, 2015; Serota et al., 2010; Verigin et al., 2019). This figure is misleading, however, because averaging across participants gives an imperfect description of deception prevalence. In fact, most people are fairly honest (e.g., they self-report telling zero or few lies per day) and a few people (prolific liars) tell a large number of lies over an extended period of time (for a review, see Levine, 2020; Serota et al., 2021). Prolific liars skew the deception prevalence rate of most populations and failing to account for them makes researchers miss important information about who tells the bulk of lies in a sample.

The extant deception literature knows little about the people who lie prolifically beyond that they have specific demographic traits (e.g., people who lie prolifically are younger and tend to be male compared to those engaged in everyday lying). To systematically understand those who raise deception prevalence rates and account for a large share of lying in a population, a greater conceptualization of prolific lying and the characteristics of those who lie prolifically is needed. The current paper addresses this need by gathering new empirical evidence to understand how situation-level (e.g., the opportunity to cheat for personal gain) and individual-level characteristics (e.g., dispositional traits, communication patterns) indicate prolific lying. When woven together, these characteristics create a deeper theoretical understanding of the tendencies linked to prolific lying versus everyday lying. Concurrently, this paper attempts to replicate two findings from prior work as well: (1) the demographic traits associated with prolific lying (Serota & Levine, 2015), and (2) the interpersonal perception that people who often lie a lot also tend to believe others lie a lot, a phenomenon called the deception consensus effect (Markowitz & Hancock, 2018). Replications are crucial to substantiate the reliability of findings, yet they are rare in communication research (Keating & Totzkay, 2019; Markowitz, Song et al., 2021), making this investigation timely and important for deception scholarship.

Before proceeding, however, several terms require clarification because they are distinct in this paper and undifferentiated in the deception literature at large: prolific liars (vs. everyday liars) and prolific lying (vs. everyday lying). Recent work by Serota et al. (2021) evaluated the lying rates of university students longitudinally and observed several key findings. First, like other studies, lying rates were not normally

distributed and had a long right-hand tail. Second, most lies (90%) were white lies. Third, there was large day-to-day variation in the amount of lies told. In other words, some people had “bad lie days” where they lied more frequently than their baseline and therefore, individual differences accounted for substantial variation in lie frequency. Based on this new work, prolific liars are defined as people who demonstrate a longitudinal pattern of higher-than-average lying rates compared to everyday liars, who are individuals reportedly “telling few or no lies” longitudinally (Serota & Levine, 2015, p. 21). Alternatively, people who lie prolifically or engage in prolific lying tend to have “a high lie count” for a particular day (Serota et al., 2021, p. 19), but do not demonstrate a long-term trend of such deceptive behavior. Those who engage in everyday lying tell few or no lies for a particular day, but do not demonstrate this trend longitudinally, either. The current paper examined characteristics of people who lie prolifically compared to those who engage in everyday lying given its cross-sectional focus.

In the following sections, deception prevalence research is reviewed to establish the idea that lying averages are often skewed because of the deception rates of a few individuals. After this foundation is set, theoretically-derived situation-level and individual-level characteristics are examined to then associate with one’s tendency to lie prolifically.

## **A Few Liars Spoil the Average**

Deception studies often express lying prevalence as a rate. For example, prior work on mobile dating deception collected text messages from senders and observed 131 out of the 1,840 total messages were deceptive, which equates to a lying rate of 7.1% (Markowitz & Hancock, 2018). Serota et al. (2021) observed that lies represented 7.3% of all communications by students, or “on average 2.1 lies out of 28.8 total messages per day” (p. 12). Therefore, deception prevalence is often expressed as a percentage of the sender’s total messages or as a ratio of lies to truths (or total communication output).

According to truth-default theory (Levine, 2014, 2020), and specifically the work of Serota et al. (2010, 2021), lying prevalence is not normally distributed (see also Halevy et al., 2014; Levine et al., 2013; Markowitz & Hancock, 2018; Verigin et al., 2019). Most people are honest most of the time, and a small number of people comparatively report telling many lies. To understand those who skew deception prevalence, studies have separated participants at the right-hand tail of a distribution from the rest of the sample. Prevalence studies suggest those who lie prolifically (e.g., those at the right-hand tail) tend to be younger and male compared to those who engaged in everyday lying (Serota & Levine, 2015; Serota et al., 2010). While the exact mechanism underlying these effects is unclear, prevailing evidence suggests lying rates are not normally distributed and there are demographic traits separating those who lie prolifically from those engaged in everyday lying. Consistent with prior work (Serota & Levine, 2015; Serota et al., 2010), the following prediction is offered and assessed in the current paper.

$H_1$ : Those who lie prolifically will be younger and self-identify as male compared to those who engage in everyday lying.

It is important to note, however, that in their evaluation of deception prevalence, Serota and Levine (2015) combined self-reported rates of white lies and big lies to create a total number of lies per day per person (despite white lies being nearly four times more frequent than big lies, on average). The current paper deviates slightly from their approach and argues white lies are different from big lies not only because of their frequency, but also because of what they represent conceptually. White lies are socially acceptable lies that do not intend to produce significant harm in another and are often communicated to save face (e.g., stating “Your hair looks great” when the communicator does not believe this to be true) (Turner et al., 1975). Big lies, on the other hand, are serious lies that have “great cognitive and emotional significance” to the communicator and lie recipient (DePaulo et al., 1996, p. 993). Given the stark conceptual differences between white and big lies, it is reasonable to suggest the characteristics identifying them will be different as well. Lying to a partner about infidelity (a big lie) is likely associated with a range of emotional processes that would not be present if the same person lied to the partner about their appearance (a white lie). Combining white and big lies would miss nuances in the understanding of prolific lying and therefore, they are separated in the current paper.

The following sections describe characteristics that are often linked to deception (e.g., aversive personality traits) with the goal of identifying how they also connect to prolific lying. Prior work argues that most people are dishonest because of situation-level influences (e.g., an opportunity for deception presents itself and people take the opportunity) or individual-level influences (e.g., individual differences such as aversive personality traits determine one’s deceptive behavior) (Markowitz & Levine, 2021). Therefore, to build on this framework, situational-level and individual-level characteristics were selected to assess if people who lie prolifically show similar or intensified effects for such characteristics versus people who engage in everyday lying.

## **Situation-Level Characteristics of Lying Prolifically**

People deceive when the truth is a problem or when the situation presents an opportunity for personal gain (DeAndrea et al., 2009; Levine et al., 2010; McCornack et al., 2014). Several experiments demonstrate how most people are situational cheaters. For example, people who have the opportunity to lie about their performance on a problem-solving task by shredding their answer sheet tend to report solving more word and math problems than those without an opportunity to lie (see Ariely, 2012). Other work suggests people also respond to incentives with deception (Bond et al., 2013). When there is something to gain from deception (e.g., a financial reward), most people take the opportunity to cheat just a little bit. Therefore, situational characteristics of deception are defined as those that align with a person’s goals and offer an opportunity for some gain (Levine et al., 2010; Markowitz & Levine, 2021).

By their nature, at least in terms of deceptive behavior, people who lie prolifically are not like most people (Serota et al., 2021). In a one-time opportunity for personal gain, people who lie prolifically might behave more deceptively than those who engage in everyday lying if they tend to capitalize on most opportunities for a reward, regardless of its size or the threat of detection. Alternatively, mere opportunity may not matter for those who lie prolifically because the deception situation is singular (e.g., one opportunity vs. many deception opportunities). Those who lie prolifically might be judicious and focus on high-stakes or multiple opportunities that will yield the biggest returns for their dishonesty.

The connection between the situation and prolific lying is investigated in the current paper through a cheating task in two separate studies. In both studies and tasks, all participants were given an equal opportunity to cheat for potential financial gain and the degree of cheating among those who lied prolifically and those who engaged in everyday lying was measured. The situation was consistent across participants (e.g., solving word problems in Study 1; solving math problems in Study 2) to evaluate if those who lie prolifically capitalize on the opportunity for deception and personal gain more than those who engage in everyday lying for a one-time cheating task. Drawing on this foundation, the following question is posed.

RQ<sub>1</sub>: Are people who lie prolifically more situational cheaters than those who engage in everyday lying during a one-time opportunity for personal gain?

## Individual-Level Characteristics of Lying Prolifically

### *Dispositional Traits*

While some situations and opportunities can facilitate lying (e.g., Ariely, 2012; Markowitz & Levine, 2021), individual differences are also reliably linked to deception (Ashton et al., 2014; Daiku et al., 2021). The relationship between individual differences and dishonesty is often investigated through the lens of personality traits. For example, Markowitz and Levine (2021) gave participants an opportunity to cheat for personal gain and measured their dispositional honesty. Those who were more dispositionally dishonest (e.g., soliciting responses to questions such as “If I want something from someone, I will laugh at that person’s worst jokes”) were more likely to cheat on a problem-solving task, on average.

Other dispositional characteristics have strong connections to deception as well, including aversive personality traits. Three traits, known as the Dark Triad, are typically associated with high- and low-stakes deceptive behaviors (Halevy et al., 2014; Hart et al., 2019, 2020; Jones & Paulhus, 2017): narcissism, Machiavellianism, and psychopathy. Narcissism describes individuals who believe they are dominant, entitled, and superior to others; Machiavellianism describes individuals who are manipulative and lack conventional morals (Shafer & Wang, 2018); psychopathy describes individuals who are impulsive, thrill-seeking, and low on empathy (Daiku et al., 2021; Furnham et al., 2013).

While one-time deceptive behavior often associates with these “bad character” traits, few studies have evaluated how deception prevalence is associated with the Dark Triad (though, see Halevy et al., 2014; Hart et al., 2019; Jonason et al., 2014). Jonason et al. (2014) had 447 participants fill out responses to Dark Triad questionnaires and self-report lying rates over 7 days. Their data suggested men told more lies than women and lying prevalence positively associated with Machiavellianism and psychopathy, but the authors did not provide a distribution of the lying rates, nor did they evaluate prolific lying. Hart et al. (2019) observed self-reported lying tendencies associated with Machiavellianism. Still, the connection between Dark Triad traits and prolific lying was unestablished.

Dispositional characteristics, defined as relatively stable individual differences like one’s personality, clearly matter and are linked to deception prevalence, yet such individual-level traits have not been linked to prolific lying in detail (though, see Daiku et al., 2021). Such characteristics comprise a second way to develop a deeper understanding of prolific lying tendencies through individual differences. A second research question asks:

RQ<sub>2</sub>: What is the relationship between prolific lying and aversive personality traits?

### Communication Patterns

Traces of communication behavior such as language patterns provide an important lens into psychological phenomena, including individual differences and dispositional characteristics (Pennebaker, 2011). Pioneering work by Pennebaker and King (1999), for example, suggests words reliably indicate personality traits including extraversion, which is positively associated with social words (e.g., words such as *friend*, *family*, *flirt*) and positive emotion words (e.g., *amazing*, *awesome*); agreeableness is negatively associated with negative emotions (e.g., *hate*, *aggression*) and positively associated with positive affect (for a review, see Ireland & Mehl, 2014). In other work, language traces have successfully identified communicators who tend to exhibit covert and socially undesirable traits. Markowitz and Slovic (2020a) used language patterns (e.g., impersonal pronouns, power words) to identify people who dehumanized immigrants and observed that dehumanizers have a general language style that is different from non-dehumanizers. Language, therefore, offers an important lens into psychological dynamics that might be difficult to capture with self-reports, including deception (Paulhus, 1991), especially one’s tendency to lie prolifically.

The idea that language can offer a window into people and psychological processes is supported by decades of research in the social sciences (Boyd & Schwartz, 2021; Pennebaker, 2011). The current paper is one of the first to use words to identify those who lie prolifically and therefore, several exploratory analyses were performed. While it is common to use a top-down approach to connect language patterns with psychological constructs for theory-building and hypothesis-testing, this can be constraining for new research areas. As Boyd (2018) explains, a top-down approach for text analysis can be “particularly limited in scope and seldom takes into account the incredible

complexity and interplay of psychological processes at the individual level” (p. 12). Therefore, the current paper used exploratory approaches to test how validated language dimensions associate with the general language use of those who lie prolifically.

RQ<sub>3</sub>: What types of general language patterns link to prolific lying?

A second way to understand prolific lying from a communication lens is interpersonal in nature. Markowitz and Hancock (2018) observed that mobile daters who told many lies tended to believe they received many lies from their partners as well. The positive association between actual and perceived lying rates is a type of false consensus for deception, also known as the deception consensus effect (Markowitz & Hancock, 2018). The deception consensus effect originates from interpersonal deception research, but its logic can extend to non-interpersonal settings as well, to evaluate the connection between how much people lie (actual lying rates) and how much they believe others lie as well (perceived lying rates). The deception consensus effect has not been replicated, making it important to establish the reliability of this finding. This effect was only evaluated in Study 2 and the following prediction is made.

H<sub>2</sub>: Actual lying rates and perceived lying rates will be positively associated.

It is also crucial to investigate if the deception consensus effect might be stronger for those who lie prolifically or those who engage in everyday lying, which is an untested empirical question. Should those lying prolifically also display a stronger deception consensus effect than those engaged in everyday lying, this evidence may provide a nuanced understanding of how such individuals think differently about deception. Those who lie prolifically might feel justified in their deceptive behavior because they believe that others are also lying at high rates (compared to those engaged in everyday lying). We know little about interpersonal perceptions for those who lie prolifically, making the deception consensus effect a worthwhile relationship to examine.

RQ<sub>4</sub>: Is the deception consensus effect stronger for those who lie prolifically compared to those who engage in everyday lying?

Altogether, this paper has several aims. Chief among them is the theoretical advancement of prolific lying through situation-level characteristics (e.g., an opportunity for cheating when personal gain is available) and individual-level characteristics (e.g., dispositional traits, general communication patterns) for white and big lies. This advancement is necessary since our understanding of prolific lying is largely limited to deception prevalence and demographics for combined lie types. Relatedly, this paper attempts to replicate age and gender effects for prolific lying from prior work (Serota & Levine, 2015; Serota et al., 2010), and interpersonal dishonesty perceptions (e.g., the deception consensus effect) in Study 2.

## Study I: Method

Prior research suggests those who lie prolifically tend to be younger than those who engage in everyday lying (Cohen's  $d=0.39$ ; Serota & Levine, 2015) and the ratio of everyday lying to prolific lying is nearly 9:1. A power analysis was conducted, using the prior effect size estimate and ratio, to ensure enough participants were recruited to achieve 80% power ( $\alpha=.05$ , two-tailed). A total of 576 participants were required, though a larger sample was recruited since this is one of the first studies to evaluate links between prolific lying, situation-level characteristics, and individual-level characteristics. The University of Oregon's ethics board approved this work.

All data, code, and preregistrations are located on the Open Science Framework (<https://osf.io/5qg2c/>), and any deviations from the preregistration are noted in the online supplement.

### Participants

Participants ( $N=1,007$ ) were recruited from CloudResearch and paid \$0.50 for their time (median completion time = 10.7 minutes). Participants needed to have an approval rating of greater than 90% on CloudResearch and complete more than 500 tasks to be eligible for this study. The final sample was reduced to 775 participants because some participants failed an attention check (see below). Most participants self-identified as White ( $n=613$ , 79.1%), were 41.89 years old on average ( $SD=13.69$  years), and leaned liberal ( $M=3.54$ ,  $SD=1.82$ ) on a political ideology scale (1=Extremely liberal, 7=extremely conservative). Most participants had at least a 2-year college degree (592/775; 76.4%) and were employed full-time (483/775; 62.3%). On average, participants reported making between \$40,000 and \$60,000 per year.

### Procedure and Measures

The procedure for this study closely followed prior research (Markowitz, Kouchaki et al., 2021) and included key measures from prior work as well (Serota & Levine, 2015; Serota et al., 2010). After participants provided informed consent for a "problem solving" study, they were told their task involved unscrambling letters to form words in English. To incentivize their performance, participants were also told they were randomly assigned to a group of 100 other participants in the study and those who scored in the top 20% of their group would be randomly selected to receive a bonus for how well they performed on the task. Participants were told if their number of solved word jumbles was in the top 20% of their assigned group of people, they could earn a bonus of \$0.25 for each jumble (up to \$2.00 total). Their task was to unscramble as many anagrams as possible to form English words in 2 minutes. There were eight anagrams in total, four solvable and four unsolvable, which provided an opportunity for deception (cheating).

Crucially, participants were told they would self-score their performance and indicate if they solved each word jumble. An attention check asked participants about the



scoring procedure (“How is the performance on the task scored?”) with two radio button responses: (1) Every respondent scores his/her own responses, and (2) The researcher will score the respondents’ responses. Participants ( $n=232$ ) who responded to this question incorrectly were excluded. Participants were also told blank responses were counted as “not solved.” The four solvable anagrams/word jumbles included: (1) “TTISRA”: “ARTIST”; (2) “SREETD”: “RESTED”; (3) “LONSEM”: “LEMONS”; and (4) “TTEDES”: “TESTED.” The four unsolvable anagrams included: OPOER, ALVNO, ANH DU, and PECIT. All anagrams were presented in random order and cheating was measured as the total number of unsolvable anagrams claimed to be solved (min = 0, max = 4).

Next, participants were presented with a writing task. This task, called the Bottle Test (Pennebaker, 2011), helped to identify participants’ general language use. Participants were told to look at a picture presented on the screen (see Supplemental Figure S1) and asked:

*How would you describe the picture to someone who couldn't see it? Try to describe the picture in a way that someone you didn't know could imagine exactly what it looks like, just by your description. Try to write continuously about what you see. Do not use abbreviations and try your best to spell correctly. Please be as detailed in your writing as possible and remember to give a description from your own perspective.*

This task was chosen because it is affectively neutral (e.g., it is unlikely that people would have a strong positive or negative response) and a validated writing exercise (Pennebaker, 2011). Participants were required to provide a response greater than 100 characters (~25 words).

Following the Bottle Test, participants received a brief introduction to white lies and big lies prior to reporting such lying rates (Serota et al., 2010):

*We are also interested in truth and lies in people's everyday communication. Most people think a lie occurs any time you intentionally try to mislead someone. Some lies are big while others are small; some are completely false statements and others are truths with a few essential details made up or left out. Some lies are obvious, and some are very subtle. Some lies are told for a good reason. Some lies are selfish; other lies protect others. We are interested in all these different types of lies.*

Then, participants provided responses to two questions, which were presented in random order: (1) On average, how many times a day do you tell a little white lie? and (2) On average, how many times a day do you tell a big lie?; both contained 10 possible responses (i.e., 0, 1, 2, 3, 4, 5, 10, 15, 20, and 25+) and participants chose one response. Responses of “25+” were coded as 25. These questions facilitated a replication attempt of Serota and Levine (2015).

Finally, participants responded to the Dark Triad scale (Jones & Paulhus, 2014; Paulhus & Williams, 2002), which contains a total of 27 questions across three subscales of narcissism (Cronbach’s  $\alpha = .789$ ), Machiavellianism (Cronbach’s  $\alpha = .821$ ), and psychopathy (Cronbach’s  $\alpha = .795$ ). All questions were presented in random order

and scored from (1) Strongly disagree to (5) Strongly agree. The survey ended with demographic questions including age, gender, race, political ideology, education level, employment status, and annual income.

### *Automated Text Analyses*

Text responses to the Bottle Test were run through the tool, Linguistic Inquiry and Word Count (LIWC) (Pennebaker et al., 2015). LIWC is a gold-standard automated text analysis program used to infer what people are thinking, feeling, and experiencing psychologically from language (Boyd, 2017; Boyd & Schwartz, 2021; Tausczik & Pennebaker, 2010). The tool quantifies word patterns as a percent of the total word count, identifying social (e.g., words related to friends), psychological (e.g., words related to emotion), and part of speech dimensions (e.g., articles, pronouns). For example, the phrase “The bottle has a red label” contains six words and LIWC counts categories including but not limited to: articles (e.g., *the*, *a*; 33.33% of the total word count) and perceptual terms (e.g., *red*, 16.67% of the total word count). All language dimensions were drawn from the standard LIWC2015 dictionary.

## **Study 1: Results and Discussion**

All proceeding *t*-tests are Welch’s *t*-tests due to the presumed unequal variance across those who engaged in prolific lying and everyday lying for most measures. However, Welch’s *t*-tests offer nearly identical results as Student’s *t*-tests when variances and group sizes are similar.

A correlation matrix between key variables is in Table 1. Cheating behavior was moderately correlated with self-reported white ( $\rho=0.131$ ,  $p<.001$ ) and big lies ( $\rho=0.230$ ,  $p<.001$ ). The magnitude of these correlations are consistent with prior work (Halevy et al., 2014).

### *The Rate of Prolific Lying*

The distribution of deceptive behavior follows a trend consistent with prior evidence and predictions from truth-default theory (Supplemental Figure S2). That is, most people are honest or tell few lies, and a few people deceive at high rates. Supplemental Table S1 also confirms these patterns, as the standard deviations of self-reported white and big lies are substantially higher than the means.

Based on these data, and consistent with prior work (Serota & Levine, 2015), several procedures statistically isolated those who lied prolifically from those who engaged in everyday lying. An index of dispersion metric was calculated for white lies and big lies separately, based on the self-report measures, using the formula  $D=\sigma^2/\mu$ . In this calculation, the variance of each measure was divided by the mean for each measure. Participants telling the most lies from each distribution were successively removed from the right tail of the distribution until  $D\approx 1$ , which would therefore suggest the excluded participants (e.g., those who lied prolifically) represented a separate

**Table 1. Spearman's Rho Correlation Matrix Between Key Variables.**

	Cheating	White lies	Big lies	Machiavellianism	Narcissism	Psychopathy
<i>Study 1</i>						
Cheating	—					
White lies	.131** [.051, .198]	—				
Big lies	.230** [.139, .296]	.550** [.484, .586]	—			
Machiavellianism	.173** [.094, .245]	.327** [.269, .403]	.286** [.229, .363]	—		
Narcissism	.185** [.098, .244]	.127** [.054, .200]	.203** [.138, .284]	.343** [.279, .421]	—	
Psychopathy	.227** [.141, .293]	.334** [.270, .407]	.361** [.306, .437]	.605** [.563, .661]	.395** [.344, .465]	—
Age	-.142** [-.209, -.070]	-.191** [-.248, -.111]	-.205** [-.262, -.128]	-.194** [-.255, -.116]	-.163** [-.234, -.098]	-.236** [-.301, -.166]
<i>Study 2</i>						
Cheating	—					
White lies	.096** [.042, .173]	—				
Big lies	.145** [.083, .208]	.558** [.509, .600]	—			
Machiavellianism	.116** [.044, .169]	.278** [.215, .334]	.303** [.235, .354]	—		
Narcissism	.125** [.058, .185]	.132** [.074, .205]	.256** [.193, .317]	.357** [.298, .418]	—	
Psychopathy	.114** [.047, .175]	.327** [.258, .380]	.397** [.329, .447]	.566** [.510, .605]	.417** [.365, .476]	—
Age	-.136** [-.213, -.090]	-.170** [-.237, -.114]	-.143** [-.209, -.088]	-.143** [-.215, -.089]	-.114** [-.176, -.056]	-.182** [-.238, -.118]

Note. Cheating was measured with the number of unsolvable anagrams (Study 1) or unsolvable number matrices (Study 2). Numbers in square brackets are bootstrapped 95% confidence intervals with 5,000 replicates.

\*\* $p < .01$ .

population from the others (e.g., those who engaged in everyday lying). Successive removal of participants from the high end of each distribution revealed participants who claimed to lie five or more times per day were those lying prolifically for white lies ( $D=1.02$ ) and three or more times per day for big lies ( $D=1.20$ ). Categorical variables were created using these cut-offs to compare situation-level and individual-level characteristics between those lying prolifically and those engaged in everyday lying. No participant was told about their status as someone who lied prolifically or engaged in everyday lying because the determination was made post-hoc.

Based on this analytic process, prolific white lying<sup>1</sup> comprised 9.3% of the sample (72/775) and prolific big lying comprised 6.1% of the sample (47/775), rates that are consistent with other work using self-report data (Serota & Levine, 2015). A total of 34 participants were deemed as prolific white lying and prolific big lying.<sup>2</sup> Therefore, most people who engage in prolific big lying also engage in prolific white lying, but the reverse is not true.

### *Demographic Characteristics and Prolific Lying*

Supporting  $H_1$  and prior evidence, those lying prolifically were younger than those who engaged in everyday lying for white lies ( $p < .001$ ; Cohen's  $d=0.40$ ) and big lies ( $p < .001$ , Cohen's  $d=0.62$ ).<sup>3</sup> The relationship between self-identified gender and prolific lying was statistically significant for big lies ( $p=.029$ ,  $\phi=0.096$ ); there were nearly 1.5 times as many prolific lying males than prolific lying females. The relationship between gender and prolific lying was not significant for white lies, however ( $p=.177$ ,  $\phi=0.067$ ). Other links between demographics and prolific lying are offered in the online supplement out of space considerations.

### *Situation-Level Characteristics and Prolific Lying*

Addressing  $RQ_1$ , those who engaged in prolific white lying ( $M=1.61$ ,  $SD=1.66$ ) tended to cheat more on the anagram task by claiming to solve more unsolvable anagrams than those who engaged in everyday white lying ( $M=0.90$ ,  $SD=1.39$ ), [Welch's  $t(81.59)=3.51$ ,  $p < .001$ , Cohen's  $d=0.46$ ]. Those who engaged in prolific big lying ( $M=2.30$ ,  $SD=1.67$ ) tended to also cheat more on the anagram task by claiming to solve more unsolvable anagrams than those who engaged in everyday big lying ( $M=0.88$ ,  $SD=1.37$ ), [Welch's  $t(50.12)=5.71$ ,  $p < .001$ , Cohen's  $d=0.93$ ]. Therefore, those who lied prolifically capitalized on the situation and their opportunity for personal gain more than those who engaged in everyday lying.

### *Individual-Level Characteristics and Prolific Lying*

*Dispositional traits.* Separate logistic regression models predicted prolific lying from Dark Triad measures. Addressing  $RQ_2$ , the results in Table 2 suggest all Dark Triad traits significantly predicted prolific lying ( $ps < .002$ ). The strongest link existed between prolific big lying and psychopathy. Those engaged in prolific big lying were

**Table 2.** Dark Triad Traits Predicting Prolific Lying Across Measurements.

	Study 1											Study 2											
	B	SE	z	p	Odds ratio	95% CI	R <sup>2</sup>	B	SE	z	p	Odds ratio	95% CI	R <sup>2</sup>	B	SE	z	p	Odds ratio	95% CI	R <sup>2</sup>		
Narcissism	0.55	0.18	3.04	.002	1.74	[1.24, 2.50]	0.03	0.91	0.16	5.59	<.001	2.49	[1.77, 3.64]	0.06									
Prolific white lying																							
Prolific big lying	1.19	0.23	5.29	<.001	3.29	[2.33, 5.08]	0.10	1.52	0.22	6.76	<.001	4.57	[3.09, 7.21]	0.13									
Machiavellianism																							
Prolific white lying	1.06	0.20	5.36	<.001	2.89	[2.03, 4.39]	0.09	1.31	0.16	7.95	<.001	3.69	[2.65, 5.30]	0.13									
Prolific big lying	1.36	0.25	5.51	<.001	3.89	[2.62, 6.23]	0.12	1.47	0.21	7.02	<.001	4.36	[2.85, 6.84]	0.14									
Psychopathy																							
Prolific white lying	1.50	0.20	7.66	<.001	4.48	[3.07, 6.93]	0.18	1.45	0.16	9.24	<.001	4.25	[3.11, 5.98]	0.17									
Prolific big lying	2.23	0.27	8.32	<.001	9.34	[5.53, 19.20]	0.31	2.47	0.24	10.23	<.001	11.86	[7.45, 20.84]	0.35									

Note. 95% CI are for the odds ratios and were bootstrapped with 5,000 replicates. Odds ratios are exponentiated coefficients. R<sup>2</sup> = Nagelkerke's R<sup>2</sup>.

more than nine times more likely to be high on psychopathy than those engaged in everyday big lying. Together, there is a strong and systematic connection between prolific lying and aversive personality traits across different lie types.

**Communication patterns.** Exploratory Welch's *t*-tests assessed communication traces via language patterns to identify the general language use of those lying prolifically. Several significant patterns emerged, and the full exploratory output is provided in the online supplement (Supplemental Table S2). Therefore, select results addressing RQ<sub>3</sub> are highlighted in Table 3 and discussed below due to their existing connections to deception theory and meta-analytic research (Hauch et al., 2015).

On average, those lying prolifically tended to be less verbose than those engaged in everyday lying. This pattern was statistically significant for big lies ( $p < .001$ , Cohen's  $d = 0.66$ ) but not for white lies ( $p = .157$ , Cohen's  $d = 0.16$ ). Prolific lying tended to also associate with the use of more personal pronouns for white lies ( $p = .002$ , Cohen's  $d = 0.47$ ) and for big lies ( $p < .001$ , Cohen's  $d = 0.68$ ) compared to everyday lying. Personal pronouns (e.g., words such as *I*, *he*, *her*, *we*, *us*) are often connected to verbal immediacy (Markowitz & Slovic, 2020b; Pennebaker & King, 1999), or the idea that people are thinking in the "here and now" (Weiner & Mehrabian, 1968). People who use high rates of personal pronouns also tend to be more self- and collective-focused compared to people who use low rates of personal pronouns.

Prolific white and big lying is associated with a reduced rate of adjectives compared to everyday white and big lying. Similarly, prolific lying is generally associated with a reduced rate of perceptual terms (e.g., words such as *red*, *appear*, *feel*) relative to everyday lying. Perceptual terms provide sensory descriptions, such as what people can see, feel, or touch. Such terms are important for the Bottle Test because they can represent a depth of processing (e.g., how deeply people described the bottle in the image) or effort (e.g., the richness of the descriptions). Taken together, these data provide some of the first indications that communication traces can identify the general language use of those who lie prolifically versus those who engage in everyday lying.

### Capturing Prolific Lying

How well do the prior demographic, situation-level, and individual-level characteristics explain prolific lying? Two logistic regressions, one predicting prolific white lying and the other predicting prolific big lying, were modeled with age, gender, cheating rates, all Dark Triad traits, and the four language dimensions from Table 3 as predictors. Note, to maintain the simplicity of the statistical models, participants not identifying as male or female ( $n = 5$ ) were excluded.

Nearly 20% of the variance in prolific white lying was explained by the prior variables, with personal pronouns ( $B = 0.18$ ,  $SE = 0.05$ ,  $z = 3.41$ ,  $p < .001$ , Odds ratio [OR] = 1.19) and psychopathy ( $B = 1.17$ ,  $SE = 0.30$ ,  $z = 3.89$ ,  $p < .001$ ,  $OR = 3.22$ ) as significant predictors. Other predictors were not significantly related to prolific white lying ( $ps > .253$ ). A stepwise logistic regression model (forward selection using the Likelihood Ratio selection method) revealed that psychopathy and personal pronouns significantly explained nearly 19% of the variance.

**Table 3.** The Language Patterns of Prolific Lying.

		Study 2															
		Prolific lying				Everyday lying				Prolific lying				Everyday lying			
		M	SD	M	SD	t (df)	p	Cohen's d	95% CI <sub>d</sub>	M	SD	M	SD	t (df)	p	Cohen's d	95% CI <sub>d</sub>
Word count		40.89	21.50	44.77	26.29	-1.43 (94.19)	.157	0.16	[-0.07, 0.40]	41.87	21.61	43.72	23.87	-0.88 (167.28)	.379	0.08	[-0.10, 0.27]
White lies		31.85	11.27	45.22	26.36	-6.99 (83.58)	<.001	0.66	[0.46, 0.85]	34.71	19.48	44.14	23.76	-3.84 (84.84)	<.001	0.43	[0.18, 0.73]
Big lies																	
Personal pronouns		M	SD	M	SD	t (df)	p	Cohen's d	95% CI <sub>d</sub>	M	SD	M	SD	t (df)	p	Cohen's d	95% CI <sub>d</sub>
White lies		2.54	3.45	1.18	2.13	3.28 (76.66)	.002	0.47	[0.23, 0.71]	2.25	3.03	1.23	1.95	3.64 (137.34)	<.001	0.40	[0.21, 0.59]
Big lies		3.35	4.00	1.17	2.10	3.70 (47.65)	<.001	0.68	[0.37, 1.00]	2.69	3.51	1.25	1.96	3.39 (72.22)	.001	0.51	[0.25, 0.75]
Adjectives		M	SD	M	SD	t (df)	p	Cohen's d	95% CI <sub>d</sub>	M	SD	M	SD	t (df)	p	Cohen's d	95% CI <sub>d</sub>
White lies		7.97	4.99	10.10	4.98	-3.45 (86.12)	<.001	0.43	[0.18, 0.68]	8.94	4.58	10.61	4.83	-3.79 (163.18)	<.001	0.36	[0.17, 0.54]
Big lies		7.10	5.80	10.08	4.91	-3.45 (50.34)	.001	0.56	[0.23, 0.93]	8.61	5.32	10.54	4.77	-2.95 (77.36)	.004	0.38	[0.13, 0.66]
Perceptual terms		M	SD	M	SD	t (df)	p	Cohen's d	95% CI <sub>d</sub>	M	SD	M	SD	t (df)	p	Cohen's d	95% CI <sub>d</sub>
White lies		7.01	4.69	8.85	4.53	-3.18 (85.12)	.002	0.40	[0.15, 0.65]	8.20	5.32	9.71	4.77	-3.01 (151.62)	.003	0.30	[0.11, 0.50]
Big lies		6.54	5.63	8.82	4.47	-2.72 (49.81)	.009	0.45	[0.12, 0.80]	7.79	6.63	9.65	4.69	-2.31 (74.16)	.024	0.33	[0.05, 0.63]

Note. 95% CI<sub>d</sub>=bootstrapped 95% Confidence Intervals for Cohen's d using 5,000 percentile-based replicates. All t-tests are Welch's t-tests. Mann-Whitney U tests provided substantively equivalent results. Except for word count, all variables in this table reflect percentages of the total word count per text.

Nearly 43% of the variance in prolific big lying was explained by the prior variables, with personal pronouns ( $B=0.24$ ,  $SE=0.06$ ,  $z=3.66$ ,  $p<.001$ ,  $OR=1.27$ ) and psychopathy ( $B=1.88$ ,  $SE=0.43$ ,  $z=4.42$ ,  $p<.001$ ,  $OR=6.54$ ) as significant predictors as well. The other predictors were not significantly related to prolific big lying ( $ps>.111$ ). A stepwise logistic regression model (forward selection using the Likelihood Ratio selection method) revealed psychopathy, personal pronouns, and cheating behavior explained nearly 40% of the variance.

Taken together, this first study suggests various situation-level and individual-level characteristics that can identify prolific from everyday lying. Those who lie prolifically are more likely to take up the opportunity for deception, be high on aversive personality traits, and use fewer details in their general language patterns than those who engage in everyday lying. There are limitations of this study, however, that should be resolved with additional research. First, the relationship between prolific lying and language patterns required exploratory tests, therefore raising the possibility of Type I errors. Since this study provided some of the first evidence of new characteristics that identify those who lie prolifically for white and big lies, a replication is in order. Study 2 followed the first study's procedure closely, focusing on the primary language variables from Table 3 alone. Second, it is also possible that the patterns of cheating were an artifact of the anagram task and therefore, a different cheating task was used in Study 2.

## Study 2: Method

### Participants

A total of 1,022 participants were recruited from CloudResearch and paid \$0.70 for their time in a problem-solving study. Participants received more compensation for this study because of its slightly longer length (median completion time = 11 minutes). Consistent with Study 1, participants needed to have an approval rating of greater than 90% on CloudResearch to participate, though in this study, they needed more than 100 tasks to be eligible. This threshold was slightly relaxed relative to Study 1 because participants could not complete both studies and this reduced the pool of possible participants.

Most participants self-identified as White ( $n=773$ ), were 39.22 years old on average ( $SD=12.52$  years), and leaned liberal ( $M=3.59$ ,  $SD=1.71$ ) on the 7-point political ideology scale from Study 1. Nearly three-fourths of participants had at least a 2-year college degree ( $n=732$ ) and most were employed full-time ( $n=595$ ). On average, participants reported making between \$40,000 and \$60,000 per year.

### Procedure and Measures

Study 2s procedure and instructions were nearly identical to Study 1 except for two key elements. First, the anagram task was replaced with a different assessment of cheating: the matrix task. The matrix task is conceptually similar to the anagram from Study 1, but it involves solving math problems instead of word problems. Both tasks



are valid cheating tasks (Ariely, 2012; Gino et al., 2011; Kouchaki & Smith, 2014), but matrices were used to ensure that the prior effects were not germane to one dependent variable.

In the matrix task (Ariely, 2012; Markowitz, Kouchaki et al., 2021), participants needed to find two numbers that summed to 10 in a 3 (column)  $\times$  4 (row) grid. An example matrix was provided before eight total matrices were offered (four were unsolvable). Participants selected a “Found it” button if they found two numbers that summed to 10, but did not click a button if they did not find a solution. Each matrix appeared on the screen for a maximum of 15 seconds before automatically progressing to the next matrix. Like Study 1, to incentivize performance, participants were told they had a chance to earn a bonus of \$0.25 for each matrix they solved and one person at the end of the study would be randomly selected to earn this money.

Second, after the Serota and Levine (2015) self-report prevalence questions with the introductions provided in Study 1, participants were asked how much they believed other people in the study might have cheated and told white and big lies. Participants were told, “Before, you saw a total of eight matrices (math problems) and might have solved some of them. On average, how many matrices do you think other people in this study were able to solve?” and they provided a number from 0 to 8. The self-report questions asked: “On average, how many times a day do you think other people in this study tell a [little white/big] lie?” These three questions were presented in random order and facilitated a replication attempt of the deception consensus effect.

## Study 2: Results and Discussion

Prolific lying was identified by the index of dispersion procedure from Study 1 using the self-reported white and big lying prevalence questions (Serota & Levine, 2015). Participants who claimed to lie five or more times per day were categorized as prolific white lying ( $D=0.89$ ) and three or more times per day were categorized as prolific big lying ( $D=1.08$ ). Categorical variables were created from these values to compare those who lied prolifically to those who engaged in everyday lying.

Prolific white lying comprised nearly 12% of the sample (124/1,022), and prolific big lying comprised 6.8% of the sample as well (70/1,022). A total of 48 participants were people who engaged in both prolific white lying and prolific big lying.<sup>4</sup> Again, most people who engage in prolific big lying also engage in prolific white lying, but the reverse is not true.

Consistent with Study 1, cheating on the matrix task was significantly correlated with self-reported white lying ( $\rho=0.096$ ,  $p=.002$ ) and big lying ( $\rho=0.145$ ,  $p<.001$ ). The correlations are small, yet in the expected direction and in range of other studies (Halevy et al., 2014).

### *Demographic Characteristics and Prolific Lying*

Those lying prolifically were younger than those who engaged in everyday lying for white lies ( $p=.003$ , Cohen’s  $d=0.28$ ), and big lies ( $p<.001$ , Cohen’s  $d=0.42$ ). These data support  $H_1$  and replicate Study 1. The relationship between gender and prolific

lying was not significant for white lies ( $p = .106$ ,  $\phi = 0.067$ ), but was statistically significant for big lies ( $p < .001$ ,  $\phi = 0.120$ ). That is, there were nearly 1.6 times as many prolific lying males than prolific lying females. Other demographic data are in the online supplement out of space considerations.

### *Situation-Level Characteristics and Prolific Lying*

Those who engaged in prolific white lying ( $M = 1.99$ ,  $SD = 1.55$ ) tended to cheat more on the matrix task by claiming to solve more unsolvable matrices than those who engaged in everyday white lying ( $M = 1.51$ ,  $SD = 1.50$ ), [Welch's  $t(156.55) = 3.27$ ,  $p = .001$ , Cohen's  $d = 0.32$ ]. Those who engaged in prolific big lying ( $M = 2.26$ ,  $SD = 1.50$ ) tended to cheat more on the matrix task by claiming to solve more unsolvable matrices than those who engaged in everyday big lying as well ( $M = 1.51$ ,  $SD = 1.51$ ), [Welch's  $t(79.59) = 3.99$ ,  $p < .001$ , Cohen's  $d = 0.49$ ]. Consistent with the Study 1 evidence and addressing  $RQ_1$ , those who lie prolifically capitalize on the situation and opportunity for deception compared to those who engage in everyday lying, even when this opportunity is a one-time occurrence.

### *Individual-Level Characteristics and Prolific Lying*

*Dispositional traits.* The right panel of Table 2 reveals a direct replication of Study 1 effects and addresses  $RQ_2$ . Narcissism, Machiavellianism, and psychopathy positively predicted prolific lying across lie types, with psychopathy being the strongest Dark Triad trait connected to prolific lying. Those who engaged in prolific big lying were nearly 12 times more likely to be high on psychopathy, four times more likely to be high on Machiavellianism, and 4.5 times more likely to be high on narcissism than those who engaged in everyday big lying.

*Communication patterns.* The right panel of Table 3 reveals prolific white and big lying were linked to more personal pronouns than everyday white and big lying. Prolific white lying and prolific big lying also associated with a reduced rate of adjectives and perceptual terms compared to everyday white and big lying. Therefore, in a different study with new participants, Study 2 evidence is consistent with Study 1 ( $RQ_3$ ): communication traces of those lying prolifically can be indicated by word patterns (e.g., word count, personal pronouns, adjectives, perceptual terms). The full exploratory output is provided in the online supplement for Study 2 (Supplemental Table S3).

*Deception consensus effect.* Consistent with prior work (Markowitz & Hancock, 2018), participant rates of cheating ( $\rho = 0.432$ ,  $p < .001$ ), white lying ( $\rho = 0.439$ ,  $p < .001$ ), and big lying ( $\rho = 0.434$ ,  $p < .001$ ) were positively correlated with the perceptions of others' dishonesty for the same variables. These data offer support for the deception consensus effect and  $H_2$  (Markowitz & Hancock, 2018).

The deception consensus effect correlations were moderate for prolific ( $\rho = 0.463$ ,  $p < .001$ ) and everyday white lying ( $\rho = 0.337$ ,  $p < .001$ ). For big lies, the deception

consensus effect correlations were also moderate for those lying prolifically ( $\rho=0.375$ ,  $p=.001$ ) and those who engaged in everyday lying ( $\rho=0.304$ ,  $p<.001$ ). Therefore, the deception consensus effect appears to be robust across prolific and everyday lying (RQ<sub>4</sub>), with those lying prolifically trending toward a slightly stronger pattern overall.

### Capturing Prolific Lying

Consistent with Study 1, separate logistic regression models predicting those who engaged in prolific white lying or prolific big lying were built using age, gender (excluding those not identifying as male or female for the simplicity of statistical models;  $n=5$ ), cheating scores, all Dark Triad traits, and the four language dimensions from Table 3 as predictors.

In the first model, nearly 22% of the variance in prolific white lying was explained, with psychopathy ( $B=0.93$ ,  $SE=0.23$ ,  $z=4.05$ ,  $p<.001$ ,  $OR=2.53$ ) and Machiavellianism ( $B=0.53$ ,  $SE=0.23$ ,  $z=2.36$ ,  $p=.018$ ,  $OR=1.70$ ) as significant predictors. Personal pronouns ( $B=0.08$ ,  $SE=0.05$ ,  $z=1.68$ ,  $p=.094$ ,  $OR=1.08$ ) and adjectives ( $B=-0.05$ ,  $SE=0.03$ ,  $z=-1.78$ ,  $p=.074$ ,  $OR=0.95$ ) were marginally related to prolific white lying. A stepwise logistic regression model (forward selection using the Likelihood Ratio selection method) revealed that psychopathy, Machiavellianism, and adjectives significantly explained 20% of the variance on their own. Adding the perception of others' white lying frequency to this stepwise model explained nearly 6% more variance in prolific lying (26% total), and all four predictors were retained in the stepwise model.

In the second model, nearly 40% of the variance in prolific big lying was explained, with psychopathy ( $B=2.38$ ,  $SE=0.38$ ,  $z=6.32$ ,  $p<.001$ ,  $OR=10.81$ ) and narcissism ( $B=0.73$ ,  $SE=0.31$ ,  $z=2.37$ ,  $p=.018$ ,  $OR=2.08$ ) as significant predictors. A stepwise logistic regression model (forward selection using the Likelihood Ratio selection method) revealed psychopathy, narcissism, and personal pronouns significantly explained nearly 37% of the variance. Adding the perception of others' big lying rate to this model significantly explained nearly 7% more variance in prolific lying (44% total), and personal pronouns were dropped from the model while the perception of others' big lying rate and all Dark Triad traits were retained. Perception of others' big lying frequency was the second most predictive characteristic of prolific big lying.

### General Discussion

The evidence in two studies suggests prolific lying is linked to demographics (e.g., age, gender), situation-level characteristics (e.g., cheating), and individual-level characteristics (e.g., aversive personality traits, language patterns, and interpersonal perceptions of dishonesty). Consistent with prior research, those who lie prolifically tend to be younger and self-identify as male compared to those who engage in everyday lying (Serota & Levine, 2015; Serota et al., 2010). Those who lie prolifically are more likely to be high on Dark Triad personality traits, mainly psychopathy, than those who

engage in everyday lying. Finally, those who lie prolifically can be identified by adjectives, verbosity, and interpersonal dishonesty perceptions.

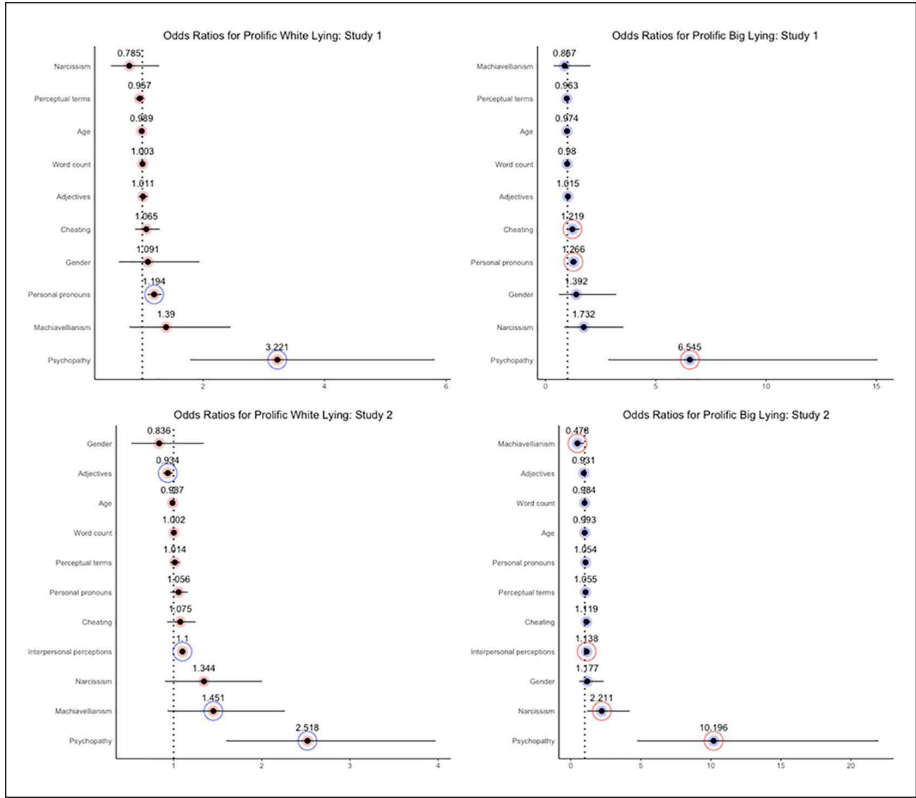
There are several contributions of this work worth highlighting. First, several positive replications were reported in connection to prior evidence, including the link between cheating behavior and self-reports (Halevy et al., 2014), plus demographic characteristics of prolific lying (versus everyday lying). Second, the evidence in this paper suggests communication traces (e.g., language patterns) offer a new lens into those who lie prolifically and their general language use, and many of the effects were replicated across both studies in this paper. The Dark Triad patterns suggest all aversive personality traits were positively associated with prolific lying, though psychopathy is generally the strongest predictor. The replications reported across two studies strengthen the reliability of this evidence. As a collection, the characteristics in this paper can explain up to 44% of the variance in prolific lying. This is a nontrivial amount of variance explained, and is in the range of or exceeds other examinations using similar characteristics to predict deception, in general (e.g., Jones & Paulhus, 2017). The separation of white and big lies also offers a nuanced theoretical perspective of how prolific lying manifests at the situation-level and individual-level, which other work has largely failed to provide.

### *Toward A Deeper Understanding of Prolific Lying*

Who tends to lie prolifically? The present evidence argues that prolific lying can be identified by a constellation of characteristics, which are organized in Figure 1 by ascending order of effect sizes. Circled values are those retained in the stepwise logistic regression models. The stepwise models revealed psychopathy undergirds prolific lying across lie types, therefore suggesting a foundational link between thrill-seeking and prolific lying. Perhaps those who lie prolifically start as people who are dispositionally motivated and excited by novel and intense experiences. The process of deceiving for personal gain and the energy that comes from pursuing some personal reward with deception may facilitate such behavior.

Next, at least for these samples and for white lies, communication characteristics—linguistic traces and interpersonal perceptions about dishonesty—are the second most predictive characteristics of prolific lying after Dark Triad traits based on the stepwise data. Prolific lying is not only an intrapersonal phenomenon defined by aversive personality traits, but it is an interpersonal phenomenon with connections to perceptions as well. For big lies, after Dark Triad traits such as psychopathy and narcissism, cheating behavior and communication characteristics play a crucial role. Together, these models help to tell a new theoretical story about prolific lying, the characteristics that identify people who lie prolifically, and how different lie types matter. This work extends truth-default theory (Levine, 2014, 2020) in new ways by articulating different pathways of identifying those who lie prolifically (e.g., the situation, the individual) and how lie type moderates these pathways as well.

While demographics such as age and gender are generally associated with prolific white and prolific big lying, the present evidence reveals they are relatively less critical compared to other variables (in terms of their effect size). This work therefore offers nuance and depth



**Figure 1.** Prolific lying characteristics across white and big lies. Note. Error bars are 95% CIs. Circled values are those retained in the stepwise logistic regression models (forward selection). Vertical lines are  $x = 1$ . Odds ratios in this figure reflect values from full model results (e.g., in Study 2, the models that include all relevant variables, including interpersonal perceptions of dishonesty).

to our understanding of prolific lying. It is important to recognize, however, with more investigations into prolific lying, the orientation of characteristics in Figure 1 might change (e.g., the relative importance of the variables). Plus, measuring the stability of these characteristics over time is a critical next step for this type of research to examine if those who lie prolifically are indeed prolific liars (Serota et al., 2021). The current work still develops a new systematic and evidence-based model of prolific lying relative to everyday lying as described by demographic, situational, dispositional, and communication characteristics.

### Limitations and Future Directions

The studies in this paper used convenience samples and therefore, collecting individuals who are more representative of the United States should be considered in future

work. A cross-cultural deception study would help to identify if the prolific lying characteristics described in this paper extend beyond Western societies and English-speaking cultures. Further, the financial incentives for cheating were relatively low in both studies, leaving an opportunity for low-stakes deception via the anagram and matrix tasks. Perhaps amplifying the financial incentives would modify the cheating effects and introducing an opportunity to tell a high-stakes big lie may reveal additional behavioral differences between prolific and everyday lying. As others suggest (Dunbar et al., 2016), many situational characteristics interact with the seriousness of a lie (e.g., if the lie is altruistic or self-serving, if the lie is about an interpersonal or intergroup context). Such moderators should be included in future work to identify if those lying prolifically and those who engaged in everyday lying differ in their socialization patterns and their deception goals.

An a priori power analysis ensured enough participants were recruited for these studies, though the effect size estimate was based on the relationship between prolific lying and age. Some of the language results in the online supplement might require additional participants to pick up on much smaller effects. Therefore, future research should continue to conduct power analyses and use large sample sizes to detect small-to-medium effects that might occur across measures. In the analyses, Welch's *t*-tests were also used to account for heterogenous variances between groups. Heterogeneity may bias significance test results, which is why bootstrapping the confidence intervals for effect sizes were crucial for these data as well.

Further, the language results reported in this paper suggest there are general communication characteristics that separate prolific from everyday lying, but it is unclear if those who lie prolifically communicate differently when they deceive in-the-moment compared to those who engage in everyday lying. The current work is correlational and future studies should identify if these language traces are revealed in experimental work as well.

There are several outstanding questions about prolific lying that should be considered in future work. Chief among them is the stability of prolific lying and lie behavior based on the characteristics identified in this paper. Participant cheating and self-report behaviors should be measured at multiple time points (e.g., Serota et al., 2021) because it is unclear if someone who cheats in one situation will cheat on other occasions as well (a type of test-retest reliability for deception characteristics). To make claims about particular individuals and their prolific lying tendencies, future work should calculate their average lying rate and standard deviation, plus their distribution of lies, to evaluate if someone who lies prolifically in one setting also lies prolifically in another setting longitudinally (e.g., are they a prolific liar?). Other work should also use different writing tasks to evaluate how well the language effects replicate. Future research should evaluate how other communication processes (e.g., motivation, different deception goals) can add to the characteristics of prolific lying established in this paper.

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## Supplemental Material

Supplemental material for this article is available online.

## Notes

1. In some cases, people who lied prolifically based on their reported white lie frequency were described as those who engaged in prolific white lying and people who lied prolifically based on their reported big lie frequency were described as those who engaged in prolific big lying. These phrases helped to enhance the manuscript's readability.
2. The number of participants who engaged in prolific white lying was 38 and the number of participants who engaged in prolific big lying was 13.
3. For age, a post-hoc power analysis ( $\alpha = .05$ , two-tailed) revealed that this study achieved 98% power for white lies and 89% for big lies.
4. The number of participants who engaged in prolific white lying was 76 and the number of participants who engaged in prolific big lying was 22.

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## Author Biography

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