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The Role of Attentional Control in Deception While Under Cognitive Load

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ABSTRACT

We examined the association between attentional control and the ability to lie. After being tested for individual differences in attentional control, pairs of participants answered autobiographical questions truthfully and dishonestly while under high and low cognitive load, with one participant answering questions and the other participant detecting their answers for veracity. Lying ability was assessed by participants' reaction times and their ability to evade detection. We hypothesized that RTs would be associated with detection accuracy, that low relative to high attentional control would be associated with longer lie RTs, and that high attentional control would be associated with a better ability to evade detection when lying under high cognitive load. Results demonstrated that RTs were indeed associated with detection accuracy and that attentional control is associated with RTs when lying, but not with deception detection. Cognitive load was not associated with any of the variables. We discuss many future research directions.

1 | Introduction

Deception is defined as a deliberate attempt to mislead others (DePaulo et al. 2003; Ekman 1985; Vrij 2008). It is theoretically more cognitively demanding than telling the truth (Gombos 2006; Zuckerman et al. 1981, 11), particularly for verbal lies in which the deceiver must lie spontaneously without the ability to prepare or rehearse their lie prior to its delivery (DePaulo et al. 2003; Greene et al. 1985; Sporer and Schwandt 2006). Increased cognitive demand when lying is attributable to many factors including having to consciously decide whether and how to lie, constructing a lie based on inferences about who is being lied to and the plausibility of the deceptive message, monitoring verbal and nonverbal behaviors when constructing and delivering the lie, and, sometimes, retrieving truthful information that is not readily accessible for various reasons (e.g., when being interrogated about a crime one committed many years prior) (Vrij 2015; Walczyk et al. 2003, 2014).

One method of assessing the cognitive difficulty of lying is by measuring reaction times (RTs), or the time taken to initiate a response once a question has been posed (DePaulo et al. 2003), with reliably longer RTs being associated with spontaneous lies than with spontaneous truthful responses (Suchotzki et al. 2017; Vendemia et al. 2005; Walczyk et al. 2003). RT may serve as a proxy measure for pauses, which only differ from RTs in that they occur after a response has been initiated. This is promising because pauses are shown to reliably discriminate lies from truthful responses in real-world settings (e.g., interrogations; Mann et al. 2002; Mann and Vrij 2006; Vrij and Mann 2001). Furthermore, we demonstrated in a previous study that RTs were associated with detection accuracy, such that longer RTs when lying were associated with increased lie detection accuracy and longer RTs when telling the truth were associated with decreased truth detection accuracy (Brennan and Hutchison 2025).

Because lying is theoretically more cognitively demanding than telling the truth, it is possible that lying ability may reliably differ

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between individuals of varying cognitive ability. Following this, there is interest in the association between lying ability and attentional control (aka “cognitive control” or “executive control”), which is defined as the ability to maintain goal-relevant information while resisting distracting or goal-irrelevant information so that tasks may be executed successfully (Burgoyne and Engle 2020). The role of attentional control in deception is twofold: deceivers must (1) successfully suppress distracting truthful information while constructing and delivering lies (Garcia et al. 2023; Gombos 2006) and (2) maintain attention on relevant details to ensure their lies are plausible, but also do not contradict any information delivered or previously known to the receiver of the lie (Debey et al. 2012; Walczyk et al. 2003). Walczyk et al.’s (2014) ADCAT theory implicates this dual role of attentional control in deception as facilitating effective lie generation in each of its components including the activation of truthful information in memory, the decision of whether and how to be dishonest, the lie’s construction, and delivery of the lie.

Evidence for the association between lying ability and attentional control is found in studies measuring brain activity. For example, it is well documented that brain regions implicated in higher-order information processing and cognitive control are more active when lying than when telling the truth (Christ et al. 2009; Spence et al. 2004). More specifically, Langleben et al. (2002) demonstrated that, relative to honest responses, deceptive behavioral responses (i.e., button presses) were associated with more activation in the dorsolateral prefrontal cortex and the anterior cingulate cortex, brain areas associated with general cognitive control and ongoing processing of conflicting information. Furthermore, Ganis et al. (2003) found that, relative to rehearsed lie responses, spontaneous lie responses were uniquely associated with activation in the anterior cingulate cortex, again suggesting the role of attentional control in producing unprepared falsehoods.

Other studies demonstrated the association between lying ability and attentional control by manipulating the liar’s ability to maintain attention when responding. For example, Debey et al. (2012) altered the response stimulus interval, or the time elapsed from a response on a previous trial until the onset of the question on the following trial, to assess its effects on lying ability. They showed that participants produced reliably longer RTs and committed significantly more erroneous responses on lie trials in which the response stimulus interval was long (5000ms) relative to when it was short (200ms), suggesting that successful lie responses were disrupted by the difference in response stimulus intervals. Additionally, in studies in which participants switch between truthful and dishonest responding, relative to when they repeat either response type, they tend to produce reliably longer RTs and more errors. These measures reflect the amount of attentional focus and preparation allocated toward responding (Foerster et al. 2017), as they are affected by whether participants are cued to answer truthfully or dishonestly before or during question presentation. They also reflect the proportion of truthful-to-dishonest trials answered prior to the switch (Van Bockstaele et al. 2015), as a greater number of truth relative to lie trials is associated with longer RTs and more erroneous responses. Together, these studies suggest that effectively maintaining attention on goal-relevant information is crucial to lying ability.

One main goal of the current experiment was to assess whether individual difference measures of attentional control (e.g., the Stroop task) are associated with lying ability. Currently, there are few studies demonstrating this association; however, there are studies showing a relationship between lying ability and scores on individual difference measures of working memory capacity, which is a closely related cognitive construct defined as the ability to maintain and manipulate information (Mashburn et al. 2023). Specifically, those higher in working memory capacity produced smaller differences between lie and truth RTs than those lower in working memory capacity in a study in which participants lied and told the truth about lists of words (Lo and Tseng 2018). Also, those higher in working memory capacity were better able to evade being detected by live detectors when lying under high cognitive load than those lower in working memory capacity (Maldonado et al. 2018). Furthermore, Maldonado et al. suggested that attentional control, and not working memory capacity, was responsible for this finding, speculating that it facilitated the coordination of many cognitively demanding tasks involved in lying (e.g., suppressing the truth while quickly retrieving relevant information). We offer a few reasons for Maldonado et al.’s speculation. First, working memory capacity is crucial for the ability to maintain and manipulate information during lie construction (Garcia et al. 2023; Walczyk et al. 2003, 2014). Second, research has demonstrated high correlations between individual difference measures of working memory capacity and performance on many real-world cognitive tasks (for review see Engle and Kane 2004). Furthermore, individual differences in working memory capacity are attributed to the ability to control attention (Burgoyne and Engle 2020; Engle 2002, 2018), suggesting it is attentional control that is responsible for the associations between performance on individual difference measures of working memory capacity and performance in various real-world tasks (Draheim et al. 2022). When considering the necessary role of maintenance and inhibition of information when lying, findings demonstrating a relationship between working memory capacity and lying ability, and that attentional control is responsible for individual differences in working memory capacity and their associations to performance on real-world tasks, we believe that performance on individual difference measures of attentional control may be associated with the ability to lie.

Another goal of the current experiment was to test the cognitive load approach (Blandón-Gitlin et al. 2014; Vrij et al. 2006), which proposes that increasing the cognitive load (i.e., demand) of truthful and dishonest responding should disproportionately affect liars, relative to truth-tellers, enhancing lie detection accuracy. According to this approach, increasing cognitive load should make the cognitively costly act of lying even more difficult, making it less manageable than adding that same load to the less cognitively costly act of truth-telling. This proposition suggests that increasing cognitive load affects the liar’s (more so than the truth-teller’s) ability to maintain and manipulate information, meaning it acts on working memory (Sporer and Schwandt 2006; Vrij et al. 2006). However, because individual differences in working memory capacity are attributed to the ability to control attention (Draheim et al. 2022; Engle and Kane 2004), and because attentional control is highly predictive of performance on tasks in which cognitive load is increased (e.g., multitasking; Redick et al. 2016), it is worthwhile to assess

the speculation raised by Maldonado et al. (2018). Specifically, we aimed to test whether the relationship between cognitive load and lie detection accuracy found in that study was attributable to attentional control.

The cognitive load approach is effective at enhancing lie detection accuracy when used in conjunction with structured interviews (Vrij 2015); however, it has been examined less often in experimental settings assessing the cognitive processes involved in lie generation. In terms of RTs, some studies have successfully increased lie RTs using cognitive load manipulations (Visu-Petra et al. 2013; Williams et al. 2013), but overall results are mixed regarding the effects of increasing cognitive load on lie and truth RTs (Verschuere et al. 2018). More research is therefore needed to verify whether lie RTs can be reliably increased in experimental settings under cognitive load, so these results may be compared to applied settings.

The final goal of the current experiment was to replicate findings from our previous study (Brennan and Hutchison 2025) showing that RTs were associated with detection accuracy. That study was limited by a small sample of detectors ($N=3$) who viewed video recordings showing only participants' heads and upper bodies while giving truthful and dishonest responses. The restricted viewing area of participants shown on the recordings may have increased detectors' reliance on RTs when judging the veracity of their responses, as there were very few other potential cues available. In the current study, we aimed to use a large sample of detectors who were physically seated across from the respondent and, thus, could view them in person and in real time while they responded to questions. By accounting for these limitations posed in that previous study, we can be more certain that RTs are reliably associated with detection accuracy and that our results can be generalized to real-world detection settings.

2 | Current Experiment and Hypotheses

We tested the association between cognitive ability and lying ability when lying under cognitive load. To do this, we assessed lying ability by measuring participants' RTs when lying and telling the truth and assessed whether RTs were associated with the ability to evade detection when lying. Because deception detection relies on subjective judgments made by human lie detectors, we also incorporated self-report data to assess whether RTs are reported as used in detecting other participants' lie and truth responses and whether this self-reported data was associated with lie detection accuracy. We measured cognitive ability through three individual difference measures of attentional control. Furthermore, we increased the cognitive load on respondents by having them give both truth and lie responses under high and low cognitive load to determine whether increased cognitive load differentially affected the ability to lie in individuals lower in attentional control.

This study was inspired by our previous study (Brennan and Hutchison 2025) showing that truth and lie RTs influence detectability and by Maldonado et al. (2018), in which participants lower in working memory capacity were worse at evading detection when lying under high cognitive load relative to participants higher in working memory capacity. Although RTs were

not measured in Maldonado et al.'s experiments, approximately 75% of their participants (Experiment 1a) mentioned RTs as a primary source of information used when judging other participants' responses as lies. We used the same face-to-face detection format used in that study to test our predictions because it provided a better test condition to replicate the results of our previous study (Brennan and Hutchison 2025), and because it better approximates lie detection in applied settings. We hypothesized that:

H1. *RTs would be associated with lie and truth detection accuracy, such that longer lie RTs would be associated with an increased probability of correctly detecting lie responses and longer truth RTs would be associated with a decreased probability of correctly detecting truthful responses.*

This hypothesis is based on the findings from our previous study (Brennan and Hutchison 2025), the self-reported data from detectors in Maldonado et al. (2018), and Maldonado et al.'s speculation that their findings were associated with participants' RTs when lying and telling the truth.

H2. *Participants lower in attentional control would produce significantly slower lie RTs than participants higher in attentional control.*

This hypothesis is based on the notion that attentional control is necessary for effective maintenance of relevant information and suppression of distracting information (Burgoyne and Engle 2020), both contributing to faster and more efficient verbal lies (Gombos 2006; Walczyk et al. 2003, 2014).

H3. *Participants lower in attentional control would be significantly more detectable when lying under high cognitive load than participants higher in attentional control.*

This hypothesis is based on the findings from Maldonado et al. (2018) and their speculation that a better ability to evade detection when lying under increased cognitive load is associated with RT differences between individuals of varying attentional control.

3 | Method

3.1 | Participants

We aimed to run a large enough sample to detect a moderate-to-large interaction effect size (Cohen's d between 0.5 and 0.8) between our measures of lying ability and cognitive ability (i.e., an ANCOVA testing whether a repeated-measures load effect would interact with the covariate of attentional control). A power analysis using G*Power version 3.1.97 estimating a Cohen's $d=0.6$ (which corresponds to an effect size $f=0.3$) yielded a sample size of 152 participants for a repeated measures ANCOVA with power of 0.95. By the end of the semester, we had run 160 participants after removing 28 participants' data due to experimenter and equipment error. The sample was composed of 32.5% male and 67.5% female participants from the ages of 17 to 42 years old ($M=19.09$ years old), all from Montana State University participating via an online

SONA systems recruitment pool in which participants signed up for an hour-long session to receive partial course credit for an Introductory to Psychology course. This experiment was approved by the Montana State University Institutional Review Board, and all participants signed a written informed consent form immediately upon arrival.

3.2 | Design and Procedure

The experiment included both Load (high and low) and Response Type (truth and lie) manipulated within-subjects, attentional control as a between subjects continuous covariate, and RTs and detection measures as dependent variables. When participants arrived, they signed a consent form and then received a modified version of the 64-item autobiographical questionnaire from Maldonado et al. (2018) that they were instructed to answer truthfully. Following the questionnaire, research assistants, who were unaware of the experimental hypotheses, ran participants through the study. Specifically, although the research assistants knew the study included prompts for participants to give lie and truth responses, they were not told anything about the possible effects of cognitive load, any relation to attentional control, or anything regarding any hypothesized relation between RT, attentional control, and the different response types. Participants individually completed three tasks measuring attentional control and then performed the deception task in dyad pairs. At the end of the deception task, participants answered four questions in an exit survey and then were thanked for their participation and given a debriefing form. The entire session lasted approximately one hour.

3.2.1 | Questionnaire

Participants answered a 64-item questionnaire similar to the one used in Maldonado et al. (2018). The questions required simple 1-to-2-word short answers. Maldonado et al. chose questions with simple 1-to-2-word answers because they allowed for the intrusion of a correct response that needed to be suppressed when lying, which controlled for the complexity of answers (Walczyk et al. 2013). In addition, having them answer so many questions initially allowed them to avoid repeating answers during testing by only asking a pseudo-randomized 32 of the original 64 questions, with eight questions asked in each of the Load $\times$ Response Type conditions. This allowed for the examination of RTs without establishing episodic stimulus-response contingencies between questions and responses. Questions included "As a child, what was your favorite toy?" and "In high school, what was your mascot?" It is possible that participants may not remember their favorite toy when they were children or were home schooled, and so we allowed truthful responses to include "I don't know" and "Does not apply" for these situations. When they were later instructed to tell the truth to the questions from the questionnaire during the deception task, they would simply have to restate their original answers. When they were later instructed to lie to questions from the questionnaire, they would have to fabricate new answers to these questions, which were verified to be different responses by the research assistant running the experiment. The full 64-item questionnaire is shown in Appendix A.

3.2.2 | Attentional Control Tasks

We used the Stroop-Squared, Flanker-Squared, and Simon-Squared tasks (Burgoyne et al. 2023) to assess individual differences in attentional control. The Stroop-Squared task, like the traditional Stroop task, presents participants with words whose meanings may or may not be congruent with the color in which they are written. In this task, participants are instructed to choose one of two response options whose meaning matches the color of a stimulus. For example, if the stimulus is the word "Red" written in blue and the response options are "Red" written in red and "Blue" written in blue, the correct response is the blue-colored "Blue" response option even though it conflicts with the meaning of the stimulus word. In the Flanker-Squared task, the stimulus and response options are flanker items consisting of 5 arrows (e.g., "<<>><<"). Participants are instructed to choose one of two response options whose central arrow is pointing in the same direction as the flanking arrows of a stimulus. So, if the previous example given represented the stimulus, a correct response option could be ">><<>>". For the Simon-Squared task, a stimulus is represented by an arrow symbol (e.g., "→") and response options are the words "Left" and "Right" appearing below the stimulus on either side of the screen. Participants must choose the response option whose meaning matches the pointing direction of the stimulus and must ignore the side of the screen in which the response option is located to be successful in the task (see Burgoyne et al. 2023 for more information regarding the squared task's validity, reliability, and administration).

3.2.3 | Deception Task

First, the participant pairs were situated in the same room at separate computers, such that they could see each other throughout the deception task. Both participants heard and read along to task instructions presented on their computers stating that they would switch roles in the experiment. One participant would serve as the respondent, answering questions as quickly and convincingly as possible, while at the same time the other participant would serve as the detector, judging the respondent's answers as truthful or dishonest. Then, after answering a block of questions, the participants would switch roles such that the respondent would become the detector and vice versa. The roles of respondent and detector are described more in the following.

When the task began, the respondent would first see an onscreen 4×4 matrix (adapted from Heyman et al. 2015) for 4 s containing either four dots in a straight line for the low load condition or six dots scattered throughout the matrix for the high load condition. Respondents were instructed to remember the location of the dots for later recall. After the matrix disappeared, respondents were presented with eight trials composed of pseudo-randomly picked questions from the 64-item questionnaire. Each trial began with a response cue reading either "Truth" or "Lie" appearing centrally on the respondent's computer screen for 2 s indicating how they should answer the upcoming question. Questions were then presented via audio recordings from the respondent's computer speakers while the words "Answer after question" were written on the respondent's computer screen. Once the question was fully presented auditorily, the respondent gave their answer into a microphone attached to an E-Prime

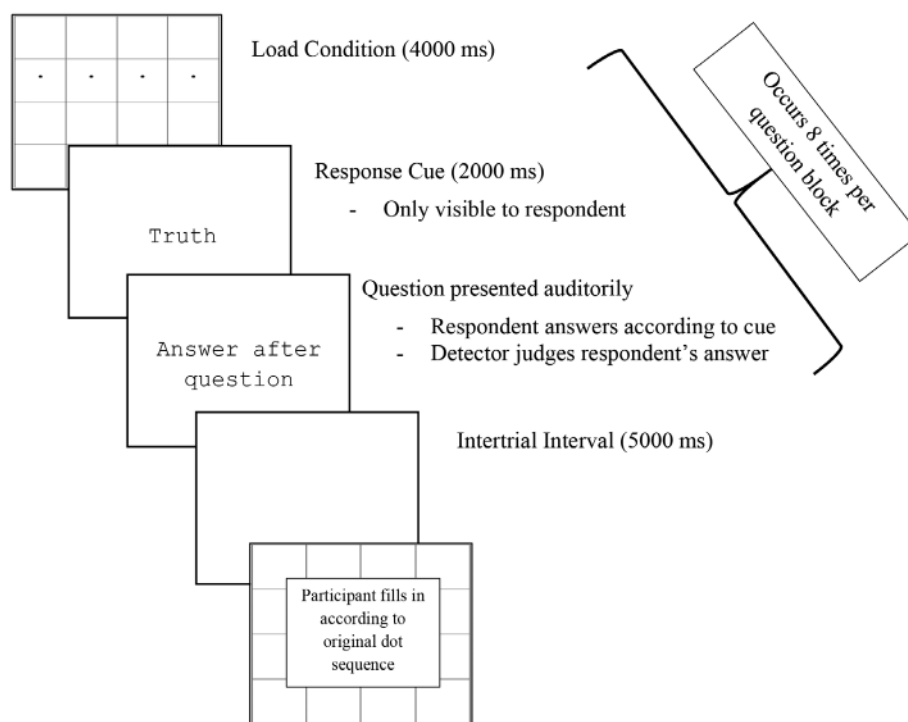


FIGURE 1 | Low load truth trial procedure example of the deception task.

serial response box that automatically recorded their RTs. After each answer given by respondents, a 5000 ms blank screen appeared on the respondent's computer screen followed by the response cue that preceded the next trial. After answering all eight questions within a question block, a blank 4×4 matrix appeared on the respondent's computer screen, and they manually filled in the locations of the dot sequence from memory on a blank matrix in a packet given to them by the research assistant. The respondent's performance on the cognitive load dot matrix task was determined by how many dots they recalled in the correct locations within the matrix, receiving one point for each correct location.

Detectors judged each answer given by respondents in real time by pressing various keys on their respective computer keyboards. Specifically, they were instructed to press "L" if they thought the respondent was lying, "T" if they thought the respondent was telling the truth, or "R" whenever the respondent failed to answer or when they could not give either a truth or lie judgment (e.g., when they could not understand the respondent's answer). Examples of the sequence of events completed during blocks of questions under high and low load are illustrated in Figures 1 and 2, respectively.

Each participant served as both the respondent and the detector a total of four times, switching roles after each block of eight questions. As the respondent, each participant completed two question blocks under low load and two question blocks under high load, for a total of 16 questions answered under each load condition. Four versions of questions (i.e., versions "A1–A4" and "B1–B4") were counterbalanced across load and response type for each half of the 64-item questionnaire. Thus, in each experimental session, one participant from the pair would answer one version ("A") containing half of the questions from the questionnaire and the other participant would answer the other version ("B") containing the

other half of the questions. The order in which questions were answered (i.e., the pseudorandom nature of truthful and dishonest responding) and blocks of questions containing a high or low cognitive load dot matrix pattern were determined by the version's number. This resulted in approximately equal numbers of participants completing each half of the questions across the versions counterbalanced by response type and load ($n=21$, $n=20$, $n=20$, and $n=19$ for versions "A1", "A2", "A3", and "A4", respectively, and $n=20$, $n=21$, $n=19$, and $n=20$ for versions "B1", "B2", "B3", "B4", respectively). A total of ~5120 observations (160 detectors judging 32 responses each) were judged as truthful and dishonest across the entire participant sample, which is well above the number of observations (~4000) to ensure reliable detection accuracy measures (Levine et al. 2022).

3.2.4 | Exit Survey

After completing the deception task, each participant was instructed to fill out a four question exit survey (shown in Appendix B). Exit survey questions asked participants to self-report whether they believed they were good at either lying or at detecting lies (both answered as a categorical "Yes" or "No" response) and to respond open-endedly with which cues they looked for when judging the other participants' responses as lies or truths.

4 | Results

4.1 | Data Scoring

Correct responses for respondents in the deception task were based on their answers on the autobiographical questionnaire. Correct lie responses were any responses given that differed

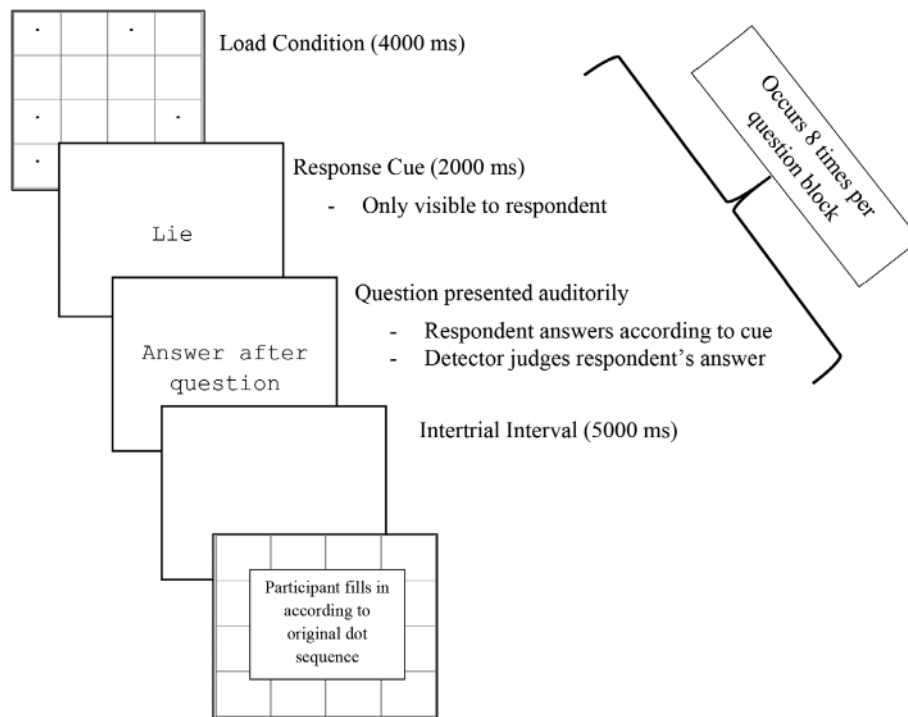


FIGURE 2 | High load lie trial procedure example of the deception task.

from the answer marked on the questionnaire when instructed to lie, whereas correct truth responses were responses that matched those from the questionnaire when instructed to tell the truth. Only these correct responses were included in all RT analyses, and questions that participants did not answer were omitted prior to analysis. This involved removing trials with microphone errors (0.3%) or when the participant did not answer or comply with instructions (11.6%). Next, because RT distributions tend to be positively skewed, outliers were removed per Van Selst and Jolicoeur's (1994) nonrecursive procedure, which removed an additional 1.7% of the correct RTs.¹

The ability of detectors in the deception task to discriminate respondents' deceptive from truthful responses (i.e., the ability of respondents to evade detection) was examined using signal detection analysis (Macmillan and Creelman 2005) with d' (standardized hit score minus standardized false alarm divided by the square root of 2) and C (the negated sum of the standardized hit and false alarm scores divided by the square root of 2) as criterion variables. These formulas are based on two alternative forced choice designs (Macmillan and Creelman 2005, 271).² We use Macmillan and Creelman (2005, 21) correction by changing 0 or 1 values to 0.05 and 0.95, respectively.

Participants' responses to the questions in the exit survey asking if they believed they were good liars or good lie detectors were coded as 1 = "Yes" and 0 = "No." For the open-ended questions regarding which cues participants looked for when judging the other participants' responses as lies or truths, coding responses involved an evaluation by the first author of whether their answer suggested using RTs to judge responses as truthful or dishonest by the detector. Specifically, open-ended responses to the question asking what cues detectors used when judging the respondents' answers as lies were coded as 1 = they mentioned

long reaction times (e.g., "took a while to answer"; "thought about answer for a couple of seconds") and 0 = they did not mention long reaction times. Open-ended responses to the question asking what cues detectors used when judging the respondents' answers as truths were coded as 1 = they mentioned short reaction times (e.g., "very quick answers"; "immediate answer/response") and 0 = they did not mention short reaction times.

All confidence intervals reported are 95% confidence intervals. In all analyses reported below, significant effects contain a two-tailed p -value < 0.05 and we report partial eta-square (η_p^2) as our measure of effect size.

4.2 | Attentional Control Tasks

We created a composite measure of attentional control using principal components analysis. Principal components analysis reduces lists of variables into linear components by extracting the maximum amount of their total variance (Kline 2016). Intercorrelations among the three squared tasks and the component measure of attentional control are shown in Table 1. We observed moderate correlations between each individual task score (all r 's > 0.3) and strong correlations between each task score and the component measure of attentional control (all r 's > 0.7).

4.3 | Cognitive Load Manipulation Check

Because participants performed two blocks of questions under both high and low cognitive load, they were able to receive a total of 8 points for recall performance under low load (4 memorized dots per block) and 12 points for recall performance

under high load (6 memorized dots per block). Each participant's proportion of accurate dot recall was determined by dividing their total number of correctly identified dot locations by the total possible score within each load condition. A paired samples *t*-test determined participants were significantly more accurate under low load than under high load ($\mu=0.94$ for low load; $\mu=0.71$ for high load; $t(159)=11.003$, $p<0.001$, CI [0.180, 0.259]). This decrease in dot recall performance from low to high load is comparable to the load effects observed in Maldonado et al. (2018) ($\mu=0.99$ for low load; $\mu=0.83$ for high load), and Brennan and Hutchison (2025) ($\mu=0.95$ for low load; $\mu=0.80$ for high load), confirming that the high load condition was indeed significantly more difficult than the low load condition across multiple independent samples.

4.4 | Exit Survey

Percentages from participants' self-reported responses for the categorical and open-ended questions in the exit survey are shown in Table 2. This data shows that a minority of participants considered themselves to be good at lying (32.1%) or good at detecting others' lies (28.3%). For the open-ended questions, approximately 78% of participants reported using RTs when detecting both truthful and dishonest responses given by other participants, which is similar to the 75% of participants who mentioned using RTs when detecting other participants' responses in Maldonado et al. (2018, Experiment 1a).

To assess whether participants' self-reported data for their responses to the question asking if they believed they were a good liar was associated with their lying ability, we correlated the recoded values for this variable with their detector's values for d' and C and their lie-truth RT difference scores within each load condition and collapsed across both load conditions. As shown

in Table 3, their self-reported data for this question is uncorrelated with any of the lying ability measures.

To assess whether participants' self-reported use of RTs as deception and/or truth cues and whether they believed they were a good lie detector were associated with their lie detection ability, we correlated the recoded values for these variables with their values for d' and C within each load condition and collapsed across both load conditions. As shown in Table 4, their self-reported data for these questions was uncorrelated with any of the lie detection ability measures.

4.5 | Hypothesis Testing

4.5.1 | Multiple Regression

To test our first hypothesis that longer lie RTs would be associated with an increased probability of correctly detecting lie responses and longer truth RTs would be associated with a decreased probability of correctly detecting truthful responses, we first regressed d' on the trimmed RT values in separate analyses within their respective load conditions. We did this to determine whether RTs predicted d' differently based on whether responses were given under high or low cognitive load. Neither regression model was significant [$r^2=0.015$, $F(2, 159)=1.224$, $p=0.297$, for high load; $r^2=0.021$, $F(2, 159)=1.690$, $p=0.188$, for low load]; however, regression coefficients in each model were in the predicted direction, such that lie RTs positively predicted d' and truth RTs negatively predicted d' . Following this, we again regressed d' on the trimmed RT values collapsed across both load conditions. This regression model was significant [$r^2=0.093$, $F(2, 159)=8.057$, $p<0.001$], with lie RTs serving as a significant positive predictor of d' [$\beta=0.397$, $t(157)=3.872$, $p<0.001$ for lie RTs] and truth RTs serving as a significant negative predictor of d' [$\beta=-0.347$, $t(157)=-3.385$, $p<0.001$ for truth RTs]. In other words, lies were more accurately detected from individuals who took longer to lie and were less accurately detected from individuals who took longer to tell the truth. These results support our first hypothesis and are consistent with findings from our previous study (Brennan and Hutchison 2025) in which RTs predicted d' but did not interact with cognitive load.

We also tested whether RTs predicted the detectors' criteria in judging other participants' responses as lies or truths by regressing C on the trimmed RT values in separate analyses within their respective load conditions. Neither regression model was significant [$r^2=0.004$, $F(2, 159)=0.296$, $p=0.745$, for high load; $r^2=0.037$, $F(2, 159)=2.996$, $p=0.053$, for low load]. We also regressed C on the trimmed RT values collapsed across both load

TABLE 1 | Intercorrelations between the attentional control tasks.

	1	2	3	4
1. Stroop squared	—			
2. Flanker squared	0.386**	—		
3. Simon squared	0.332**	0.374**	—	
4. Attentional control composite	0.752**	0.781**	0.744**	—

Note: The last line indicates the strength of each task loading on the attentional control composite score.

**Indicates significant correlations at the $p<0.01$ level.

TABLE 2 | Self-reported percentages from the exit survey questions.

	Good liar ^a		Good lie detector ^a		Lie cues ^b		Truth cues ^b	
	Yes	No	Yes	No	RTs	No RTs	RTs	No RTs
%	32.1	67.9	28.3	71.7	77.5	20.6	77.5	20.6

Note: "RTs" indicates participants who mentioned reaction times as a primary method of detecting lie or truth responses by the other participant. "No RTs" indicates participants who did not mention reaction times as a primary method of detecting lie or truth responses by the other participant.

^aDenotes these percentages were derived from a sample of $N=159$ participants.

^bDenotes these percentages do not include three additional participants who did not fall under either category (e.g., they mentioned long RTs as indicating truthful responses and short RTs as indicating deceptive responses).

TABLE 3 | Intercorrelations between self-reported data for “good liar?” question and measures of lying ability.

	1	2	3	4	5	6	7	8	9	10
1. Good liar	—									
2. d' HL	−0.056	—								
3. d' LL	0.099	0.107	—							
4. d'	0.028	0.750**	0.738**	—						
5. C HL	−0.021	0.000	−0.016	−0.010	—					
6. C LL	0.026	−0.186*	0.000	−0.127	0.244**	—				
7. C	0.003	−0.119	−0.010	−0.088	0.784**	0.794**	—			
8. RT Diff HL	−0.027	0.120	0.163*	0.189*	0.002	0.117	0.076	—		
9. RT Diff LL	−0.080	0.245**	0.143	0.261**	−0.047	−0.086	−0.084	0.127	—	
10. RT Diff	−0.073	0.247**	0.203*	0.302**	−0.031	0.014	−0.011	0.721**	0.779**	—

Abbreviations: HL, high load condition; LL, low load condition; RT Diff, the difference between lie and truth reaction times.

*Indicates significant correlations at the $p < 0.05$ level.**Indicates significant correlations at the $p < 0.01$ level.**TABLE 4** | Intercorrelations between self-reported data for “good lie detector?” and the lie/truth cue questions and measures of lie detection ability.

	1	2	3	4	5	6	7	8	9
1. Good detector	—								
2. Lie cues	0.001	—							
3. Truth cues	0.076	0.280**	—						
4. d' HL	−0.091	0.075	−0.045	—					
5. d' LL	−0.019	−0.035	−0.017	0.107	—				
6. d'	−0.074	0.027	−0.041	0.750**	0.738**	—			
7. C HL	0.058	0.124	0.047	0.000	−0.016	−0.010	—		
8. C LL	−0.023	−0.009	−0.016	−0.186*	0.000	−0.127	0.244**	—	
9. C	0.022	0.073	0.019	−0.119	−0.010	−0.088	0.784**	0.794**	—

Abbreviations: HL, high load condition; LL, low load condition.

*Indicates significant correlations at the $p < 0.05$ level.**Indicates significant correlations at the $p < 0.01$ level.

conditions, but this regression model was also not significant [$r^2 < 0.001$, $F(2, 159) = 0.021$, $p = 0.979$], suggesting that RTs were not associated with detectors' criteria in judging the veracity of other participants' responses.

4.5.2 | ANOVA Results

We tested our second and third hypotheses using the general linear model. To test our second hypothesis, that participants lower in attentional control would produce significantly slower lie RTs than participants higher in attentional control, we first ran a 2×2 repeated measures ANOVA with both Load and Response Type as within subject factors and RTs as the dependent measure. Table 5 presents the mean trimmed RTs from all participants in each condition. This analysis yielded a main effect of Response Type ($F(1, 159) = 203.606$, $p < 0.001$, $\eta_p^2 = 0.562$), demonstrating that lie RTs were reliably longer than truth RTs. Neither the main effect of Load ($F(1, 159) = 0.002$, $p = 0.968$,

$\eta_p^2 = 0.000$), nor the Response Type $\times$ Load interaction ($F(1, 159) = 0.640$, $p = 0.425$, $\eta_p^2 = 0.004$) were significant. Next, we ran a 2×2 ANCOVA that included Attentional Control as a between subjects continuous covariate. Supporting our second hypothesis, the Response Type $\times$ Attentional Control interaction was significant ($F(1, 158) = 5.059$, $p < 0.001$, $\eta_p^2 = 0.031$). As shown in Figure 3, participants' lie RTs decreased as their Attentional Control scores increased ($r = -0.197$, $p = 0.013$), but their truth RTs did not ($r = -0.084$, $p = 0.290$). Neither the Load $\times$ Attentional Control ($F(1, 158) = 0.222$, $p = 0.638$, $\eta_p^2 = 0.001$), nor the Response Type $\times$ Load $\times$ Attentional Control interactions ($F(1, 158) = 0.000$, $p = 0.998$, $\eta_p^2 = 0.000$) were significant. These results suggest that those higher in attentional control were quicker to respond deceptively than those lower in attentional control, but that our cognitive load manipulation was unrelated to RTs or attentional control.

To test our third hypothesis, that participants lower in attentional control would be significantly more detectable when lying under high cognitive load than participants higher in attentional control,

we ran separate ANCOVAs with d' and C as the dependent measures, Load as the within subject factor, and Attentional Control as a continuous between subjects covariate. The analysis in which d' was the dependent variable was not significant ($F(1, 158)=0.840$, $p=0.361$, $\eta_p^2=0.005$), indicating the ability of respondents to evade detection when lying under high and low load was not associated with individual differences in Attentional Control. This suggests that our manipulation of cognitive load did not affect detectors' abilities to correctly judge responses as truthful or dishonest regardless of individual differences in the respondent's Attentional Control. The analysis in which C was the dependent variable was also not significant ($F(1, 158)=0.174$, $p=0.631$, $\eta_p^2=0.001$), indicating that the detector's criteria in judging respondent's answers under high and low load was not associated with individual differences in the respondents' Attentional Control.

5 | Discussion

We found support for our first two hypotheses, such that RTs were associated with detection accuracy and that lie RTs decreased as attentional control increased. The results supporting our first hypothesis are consistent with responses to exit survey questions in which most of our participants mentioned RTs as a primary cue used when judging the veracity of other participants' responses. The results supporting our second hypothesis are promising because they suggest the ability to lie may be associated with overall cognitive ability and because there is a lack of scientific evidence of an association between lying ability and attentional control assessed using individual difference measures. Finally, we showed

that the attentional control of respondents was not associated with the lie detection ability of detectors and that, despite our high cognitive load condition being significantly more difficult than our low cognitive load condition, this load manipulation did not affect the ability to quickly or convincingly produce lies.

5.1 | Attentional Control and Lying Ability

To assess why lie RTs decreased as attentional control increased, we return to the ADCAT theory (Walczyk et al. 2014), which suggests higher attentional control is associated with quicker access to (i.e., retrieval of) truthful information, quicker decision making, more rapid lie construction, and better monitoring of speech and other behaviors. In our experiment, the decision to lie or tell the truth was made for participants on each trial, leaving the other three components as potential contributors to our results. Our results showed that attentional control was unrelated to truth RTs, and post hoc correlational analyses demonstrated no relationship between attentional control and accuracy for lie or truth responses (all r 's $< |0.11|$, all p 's > 0.18), suggesting no difference in access to truthful information or in monitoring answers for correctness. This may suggest our results are attributable to more efficient lie construction for participants high in attentional control. Effective lie construction would require both efficient inhibition of truthful information and reallocation of attention to plausible false information. This is consistent with experimental findings showing that lie success is associated with maintaining the goal of lying and appropriately reallocating attention when necessary (Debey et al. 2012; Foerster et al. 2017; Van Bockstaele et al. 2015).

Finding an association between attentional control and lying ability using individual difference measures to assess attentional control adds to the existing literature in which the association between lying and cognitive control was demonstrated through neuroimaging and experimental manipulations. Previous findings from studies measuring the related executive function of inhibition (Burgoyne et al. 2023; Miyake and Friedman 2012) using individual difference measures have been less conclusive.

TABLE 5 | Reaction time means and standard deviations (in ms).

	High load	Low load	Difference
Lie	1581 (522)	1563 (492)	17
Truth	1189 (388)	1209 (381)	(−19)
Difference	391***	354***	

***Indicates the difference is significant at the $p < 0.001$ level.

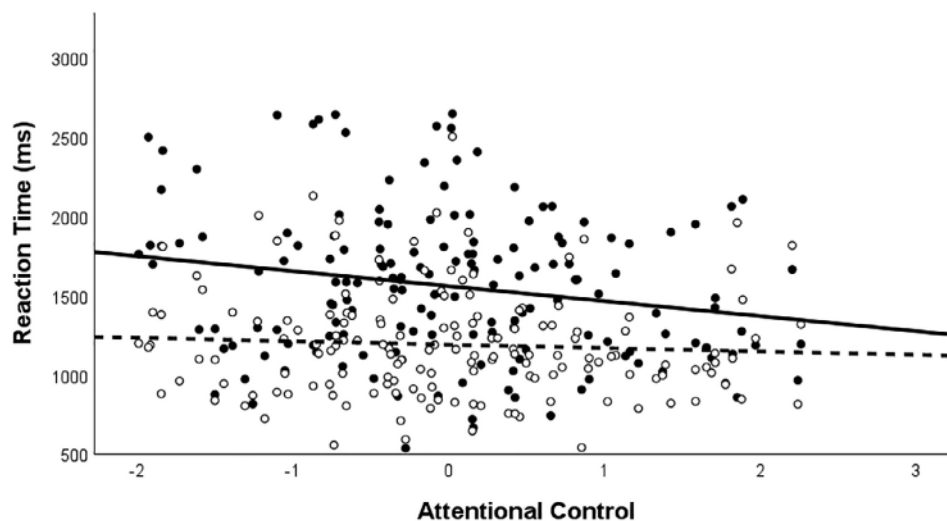


FIGURE 3 | The interaction between response type and attentional control. Lies are indicated by the solid black line and filled dots. Truths are indicated by the dotted line and unfilled dots.

For example, Visu-Petra et al. (2013) found that, although measures of working memory capacity were significantly positively associated with lie RTs in a concealed information test procedure that followed a mock crime, measures of inhibition were only non-significantly ($p < 0.06$) negatively related to these lie RTs. Additionally, Morgan et al. (2009) showed that mean RTs on a modified version of the Stroop task predicted the difference between spontaneous lie and truthful RTs. However, it is unclear what the nature of this relationship is, as they mentioned the initial spontaneous lie and truth RT difference was not significant and did not clarify how the mean RTs on the modified Stroop task were measured.³ Because we used three valid and reliable measures to create our composite measure of attentional control (Burgoyne et al. 2023), we can be certain that our results are reliable relative to previous findings. This is promising, as it strengthens claims made in review papers discussing the association between cognitive control and lying ability (Garcia et al. 2023; Gombos 2006). Additionally, considering that researchers have suggested the use of cue constellations rather than individual cues to classify liars and truth-tellers (DePaulo et al. 2003; Vrij 2008), our results suggest that the combination of cues and cognitive individual difference measures may aid in the objective classification of special populations of deceivers.

5.2 | Self-Reports vs. Objective Measures of Deception Ability

We used self-report measures to assess the correspondence between participants' subjective beliefs about their abilities to lie or to detect lies and their objective lying and lie detection abilities. Our results suggest no relationship between these subjective and objective measures, which is consistent with longstanding beliefs that there is no relationship between these types of measures (Nisbett and Wilson 1977) and findings suggesting a lack of correspondence between self-reported cues used to detect deception and cues that are objectively associated with deception (Hartwig and Bond 2011). We wanted to explore this relationship because our hypotheses were based on findings from Maldonado et al. (2018), in which approximately 75% of participants mentioned RTs as a primary cue used to detect deception, suggesting their influence on lie detection accuracy for many participants. In the current study, a comparable percentage of participants (~78%) mentioned RTs as a primary cue used when judging other participants' responses as both truthful and dishonest. Additionally, we replicated findings from our previous study (Brennan and Hutchison 2025), such that longer lie RTs were associated with an increase in d' and longer truth RTs were associated with a decrease in d' . This replication is important, given a potential critique was that our previous study had a small number of detectors. Because our current study observed a similar relationship between RTs and detection accuracy with a much larger sample of detectors, we can be more certain that this finding is reliable.

Together, our findings suggest that RTs may be both consciously considered and intuitively accessed when discriminating other participants' responses as truthful or dishonest. Given that our results suggest the influence of RTs on detection ability, it is interesting that there was no correspondence between our other subjective and objective measures of lie detection ability. It is

possible that using categorical variables to assess whether individuals consider themselves to be good liars or lie detectors did not allow for an appropriate amount of variability to assess correlations with the objective lying and lie detection measures. It may also be the case that self-reported cues may differ based on when they are reported (i.e., whether they are reported before or after the deception task) and whether participants mentioned RTs only or RTs along with other cues. We were able to test this final alternative explanation by recoding these variables according to whether participants only mentioned RTs, mentioned RTs along with other cues, or did not mention RTs at all, but this post hoc analysis did not produce any significant correlations between these variables suggesting that other alternative explanations should be tested.

5.3 | Attentional Control, Cognitive Load, and Lie Detection

We did not find support for our third hypothesis. Specifically, the ability to evade detection when lying was not associated with attentional control and did not differ between high and low cognitive load. This hypothesis was based on Maldonado et al.'s (2018) finding that d' under high cognitive load decreased as working memory capacity increased. Furthermore, we used the same cognitive load manipulation as Maldonado et al., which did not affect any of our dependent measures or interact with other independent variables in our analyses (see Brennan and Hutchison 2025 in which we outline many potential reasons why this cognitive load manipulation did not affect lie RTs or d').

It is possible that this finding from Maldonado et al. (2018) is explained by similarities between the cognitive load manipulation and their measures of cognitive ability. Specifically, they measured working memory capacity through complex span tasks in which the measure of cognitive ability is participants' accuracy in recalling letters in a particular sequence. The cognitive load manipulation used in both that study and the current study involves recalling the position of dots within a matrix after a certain number of trials of an unrelated task. Both of these secondary tasks rely primarily on memory performance and do not necessarily disrupt performance on the primary experimental deception task. Furthermore, Maldonado et al. found that errors made on truthful trials (there were significantly more errors on truth than lie trials in that study) significantly decreased as working memory capacity increased, again suggesting their complex span measures of working memory capacity were potentially more associated with memory performance in the deception task than RTs (i.e., remembering their truthful answer from the initial 64 item questionnaire).

To test this possibility, we conducted a post hoc correlational analysis using the current data comparing dot memory performance in the secondary task with accuracy of truthful responding. Indeed, consistent with the results from Maldonado et al. (2018), accuracy of truthful responding in the current study was significantly correlated with the proportion of correctly recalled dot positions in the high load condition of the cognitive load task ($r = 0.186$, $p = 0.018$). However, accuracy of truthful responding was uncorrelated with the composite measure of

attentional control ($r=0.051$, $p=0.523$). Thus, memory measures are likely better predictors of truthful responding in this paradigm than attention measures. This suggests that, along with what was outlined regarding this load manipulation in Brennan and Hutchison (2025), one additional emphasis in future research should be on whether load manipulations directly implicate memory or attentional control processes. Our results suggest that attentional control is associated with the ability to quickly generate lies, but that working memory capacity is associated with accuracy of truthful information and the ability to tell convincing lies. It is possible that load manipulations affecting inhibitory control and maintenance of goal information would disrupt this ability to quickly lie and, subsequently, the ability of detectors to correctly judge these lies as dishonest.

Despite our results not supporting our third hypothesis, our experiment serves as a step toward further tests of the relationship between cognitive abilities and the ability to deceive under varying levels of cognitive load. To our knowledge, this is the first attempt at examining the relationship between lie and truth RTs given by individuals of varying attentional control under cognitive load and live deception detection. Further, our current experiment accounts for the criticisms raised in our previous studies (Brennan and Hutchison 2025) in that deception detection was carried out in-person (and not from video recordings of participants' responses) by a large sample of detectors. Our experimental design can be used in future experiments testing similar relationships and has the potential to inform applied deception detection settings. For example, our use of live detectors may have increased the realistic nature of the experimental lying situation, contributing to RTs that approximate those given by individuals in interview or interrogation settings in which being believed by the interviewer is necessary for avoiding serious consequences. Additionally, our design allows researchers to assess these RTs in relation to attentional control, which has the potential to inform applied settings of the differences in RTs exhibited by unique populations of liars. Our hope is that future research can use our experimental paradigm as a template to further test these relationships, so it may aid in applied settings in the classification of liars and truth-tellers.

5.4 | Limitations and Future Research Directions

It is very promising that we found an association between lying ability and attentional control; however, we do agree with the speculation made by researchers that different types of lies may require different cognitive processes, or at least different intensities of the same cognitive processes (Ganis et al. (2003); Morgan et al. 2009). Following this, one limitation is that we assessed only spontaneous lies regarding autobiographical information. We would be better able to generalize our findings if we assessed multiple types of lies (e.g., rehearsed) with multiple measures of cognitive ability (e.g., working memory capacity and general fluid intelligence). Future research should attempt to assess various types of lies with robust measures of various cognitive constructs.

Additionally, although our study was powered a priori to detect moderate-to-large effect sizes, yet the significant interaction supporting our second hypothesis produced a small effect size

($\eta_p^2=0.031$). Thus, the observed interaction effect falls below the effect size for which the study was originally powered. We believe that, although small, the observed effect size between the type of response given and attentional control is meaningful. Future research should attempt to replicate this effect using large samples to ensure it is reliable.

It may also be possible that self-report measures allowing for more variability between responses would produce different results regarding the correspondence between subjective beliefs about lying and lie detection ability and actual performance on these measures. Future research should assess Likert type scales assessing individuals' confidence in their ability to lie and to detect lies and should assess whether RTs are mentioned as the sole cue used in detection ability or along with other mentioned cues. Given that RTs have been associated with lie detection performance (Brennan and Hutchison 2025), subjective measures allowing more variability in responding may provide evidence of the influence of RTs on the ability to correctly judge the veracity of others' responses.

Finally, despite previous findings of an association between working memory capacity and the ability to evade detection when lying under increased cognitive load (Maldonado et al. 2018), our findings do not support a similar relationship with attentional control. Two potential limitations should be addressed considering this finding. First, future research should use separate cognitive load manipulations in which cognitive load is increased through either memory or attentional control processes. This would allow for examination of any differences in the effects of these two cognitive processes on lie RTs and on the ability to evade detection when lying. The second limitation involves the design of future deception detection experiments. More specifically, it is suggested (Levine et al. 2022) that obtaining reliable measures of lie detection accuracy requires an adequate number of detectors that detect an adequate sample of senders (i.e., liars), but preferably all detectors should be instructed to detect the same sample of senders.⁴ Our experiment had adequate power; however, each detector only detected the responses of one respondent, meaning that results may differ in a differently designed detection experiment. Future research should attempt to associate attentional control with the ability to evade detection when lying in experiments designed according to the suggestions of Levine et al., to verify any potential differences between these differently designed experiments.

6 | Conclusions

Our goal in the current experiment was to test the association between lying RTs, lie detection accuracy, cognitive load, and attentional control. We found an association between attentional control and lying RTs, but attentional control was not associated with cognitive load or with the ability to evade detection when lying. Furthermore, we replicated previous findings suggesting that RTs are associated with detection accuracy. To add to these findings, we used self-report measures to assess the correspondence between subjective evaluations of lying ability and lie detection ability and objective performance on these measures, but we found no association between these subjective and objective measures. Finally, we provide suggestions about load

manipulations used to increase the cognitive demand of lying and to potentially increase lie detection accuracy that are based on the theoretical relationship between lying and cognitive processes. We believe lying is associated with general cognitive ability, but that this relationship is complex and requires further exploration to determine all the nuanced differences between different types of lies and different cognitive abilities.

Author Contributions

Evan Brennan: conceptualization, investigation, writing – original draft, methodology, writing – review and editing, formal analysis, data curation. **Keith A. Hutchison:** conceptualization, investigation, writing – review and editing, methodology, formal analysis, supervision, data curation.

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The authors have nothing to report.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are openly available in Open Science Framework at https://osf.io/pa6wj/files/osfstorage?view_only=.

Endnotes

¹ We ran a separate analysis in which we trimmed cases from the RT data in which participants committed speech disfluencies (e.g., saying “uhh” before responding) to assess whether including this data had affected our results. In this analysis, approximately 9% of correct RTs containing speech disfluencies were additionally removed, but our results were not significantly different from those that we reported.

² We performed the analyses using standard formulas for d' ($(Z_{\text{Hits}} - Z_{\text{FalseAlarms}})$) and C [$1 - (Z_{\text{Hits}} - Z_{\text{FalseAlarms}})/2$] (Macmillan and Creelman 2005) as well and the results were not significantly different from those that we reported.

³ In Morgan et al. (2009) they used cognitive tasks from the multi-cognitive rapid assessment battery, which is composed of nine cognitive tasks testing separate cognitive constructs. In each task they used both RT and accuracy measures to assess various cognitive abilities. In the filtering task mentioned here as a modified version of the Stroop task, there were both congruent and incongruent trials from which they measured RTs and accuracy, but they mentioned that the “average RT” was the predictor variable of the spontaneous lie-truth RT difference measure. It is unclear whether they meant that this is the average across both conditions, or that it is the average of just congruent trials. In either case, this means that better Stroop performance (i.e., quicker RTs) was associated with worse lying ability (i.e., larger RT difference between spontaneous truth and lie trials), which suggests an opposing relationship to the one proposed here.

⁴ One consideration to this suggestion made by Levine et al. (2022) is that the data used in their analysis was derived from an experiment

designed like ours. More specifically, their data was taken from Masip et al. (2020) in which 50 senders also served as 50 detectors of each other's lie and truth responses, with each sender providing a total of 8 responses to be detected. In our previous study (Brennan and Hutchison 2025), a small sample of detectors ($N=3$) detected large samples of senders ($N=76$ in Experiment 1 and $N=155$ in Experiment 2), and correlations between detectors strengthened from the first to the second experiment suggesting that using the same group of detectors to detect an adequate sample of senders yields reliable detection accuracy measures.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Data S1:** Supporting Information.

Appendix A

Modified Autobiographical Questionnaire

Questions:

Please answer each question on this page truthfully. Write your responses in the blanks following each question.

If you do not know the truthful answer, or if the question does not apply to you, you can write either "do not know," or "n/a" in the blank space provided.

1. As a child what was the name of the elementary school?

2. In what city/town was your father born?

3. What is your birth year? _____
4. What is your dream vacation country? _____
5. What is the last name of your psych 100 teacher? _____
6. What is the name of your first kiss? _____
7. What was your first car? _____
8. What is the last name of your mother's father?

9. Who is your current employer? _____
10. What was the name of your school in sixth grade?

11. Who is your current hero? _____
12. As a child, what was your favorite activity? _____
13. What is your college major? _____
14. What is the last name of your father's mother? _____
15. In what city/town was your mother born? _____
16. What was the name of your first pet? _____
17. What TV show did you never watch? _____
18. What would it be if you could learn one other language?

19. In what city/town were you born?

20. What was your favorite birthday? _____
21. As a child, what was your bedroom color?

22. What is your favorite band? _____
23. What is your dream car? _____
24. In high school, what was your cap/gown color? _____
25. What would it be if you could choose any superpower?

26. Who is your favorite actor/actress? _____
27. In high school, what was your least favorite class?

28. As a child, what was your favorite toy?

29. What is the last name of your celebrity crush? _____
30. What is your father's job? _____
31. What would it be if you could bring anything onto a deserted island? _____
32. What is your birth month? _____
33. As a child, what was your favorite vacation? _____
34. Who is your favorite teacher? _____
35. What was your favorite high school sport? _____
36. As a child, what was your favorite food? _____
37. What is your favorite sports team? _____
38. What is your favorite movie? _____
39. What is your favorite song? _____
40. What is your favorite season? _____
41. What is your favorite past time? _____
42. What is your favorite TV show? _____
43. As a child, what was the name of your best friend?

44. As a child, what was your least favorite chore? _____
45. What would it be if you could be any fictional character?

46. Who would it be if you could be any celebrity?

47. What did you last eat? _____
48. In high school, what was your mascot? _____
49. What is your most prized possession? _____
50. What is your dream yearly salary? _____
51. What is your dream job? _____
52. When did you get your first computer?

53. What is your house's exterior color? _____

54. What would it be if you could choose only one partner quality?

55. As a child, what was your desired adult occupation?

56. What is your favorite drink? _____

57. What would it be if you could only eat one thing?

58. When did you last get a haircut? _____

59. At what age did your parents marry? _____

60. What would it be if you could only visit one state?

61. When did you last fall asleep? _____

62. When did you last talk to your parents?

63. What is your mother's job? _____

64. What TV show did you watch last? _____

Appendix B

Exit Survey

1. Do you consider yourself to be a good liar? Yes _____ No _____.
2. Do you consider yourself to be a good lie detector? Yes _____ No _____.
3. In just a few words, describe anything you noticed from the other participant that indicated when they were lying.
4. In just a few words, describe anything you noticed from the other participant that indicated when they were telling the truth.