Drawing what lies ahead: False intentions are more abstractly depicted than true intentions

Sofia Calderon1 | Erik Mac Giolla1 | Karl Ask1 | Pär Anders Granhag1,2

1 Department of Psychology, University of Gothenburg, Gothenburg, Sweden
2 Norwegian Police University College, Oslo, Norway

Correspondence
Sofia Calderon, Department of Psychology, University of Gothenburg, P.O. Box 500, 405 30 Gothenburg, Sweden.
Email: sofia.calderon@psy.gu.se

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Abstract
The aim of this study was to examine how people mentally represent and depict true and false statements about claimed future actions—so-called true and false intentions. On the basis of construal level theory, which proposes that subjectively unlikely events are more abstractly represented than likely ones, we hypothesized that false intentions should be represented at a more abstract level than true intentions. Fifty-six hand drawings, produced by participants to describe mental images accompanying either true or false intentions, were rated on level of abstractness by a second set of participants (N = 117) blind to the veracity of the intentions. As predicted, drawings of false intentions were rated as more abstract than drawings of true intentions. This result advances the use of drawing-based deception detection techniques to the field of true and false intentions and highlights the potential for abstractness as a novel cue to deceit.

KEYWORDS
abstractness, construal level theory, drawings as a deception detection tool, true and false intentions

1 | INTRODUCTION

Until recently, research on deception detection focused almost exclusively on truths and lies about past events (Vrij, 2008). However, because many practical situations require an assessment of one’s stated intentions, research has begun to examine truths and lies about the future—true and false intentions (for a review of the topic, see Granhag & Mac Giolla, 2014). By true intentions, we mean alleged future actions genuinely intended to be carried out. By false intentions, we mean alleged future actions not intended to be carried out. In the current study, drawings depicting mental images accompanying either true or false intentions were rated for degree of abstractness. We predicted that drawings of mental images accompanying false intentions would be depicted, and consequently rated, more abstractly than drawings of mental images accompanying true intentions. Our prediction was informed by work on construal level theory (CLT; Trope & Liberman, 2010).

CLT suggests that one’s psychological distance from an event will influence how abstractly or concretely an event is mentally construed (Liberman & Trope, 2014). On the basis of theories of categorization (Rosch, Mervis, Gray, Johnson, & Boyes-Braem, 1976) and action identification (Vallacher & Wegner, 1987), abstract construals are said to be superordinate mental representations focusing on the gist of an event, whereas concrete construals are subordinate mental representations focusing on more particular details. An abstract construal of an event may manifest itself in the form of simpler (vs. more complex) scenes, a heightened focus on core (vs. surface) aspects of the event, or the use of broader (vs. narrower) categorization of objects related to the event (Trope & Liberman, 2010).

The degree of abstractness is in turn dependent on an individual’s psychological distance to the event. CLT proposes that psychologically distant events are more abstractly construed than psychologically proximal ones. Psychological distance refers to the degree of
divergence from the self, the here, and the now. Four types of psychological distance have been proposed and tested within the CLT framework: temporal, spatial, social, and hypothetical distance (for a recent meta-analysis, see Soderberg, Callahan, Kochersberger, Amit, & Ledgerwood, 2014). Hypothetical distance refers to the perceived likelihood of an event occurring and is of particular interest in the current study. Research on hypotheticality shows that events that are perceived as unlikely to occur are more abstractly represented than events that are perceived as likely to occur. For example, in a series of experiments, Wakslak, Trope, Liberman, and Alony (2006) manipulated the likelihood of different future events occurring. Specifically, participants were led to believe that there was either a 5% or a 95% chance of performing a set of simple future tasks later on in the experiment. As predicted by CLT, the low-likelihood events were more abstractly construed than the high-likelihood events. For example, people in the low-likelihood conditions categorized objects relevant for the future task into fewer, more generic groups, indicating a broader, more abstract mental representation of the objects.

Parallels with the research on CLT and likelihood can be drawn to research on true and false intentions. This is because true intentions come with a strong commitment to carry out the stated intention (Malle & Knobe, 2001) and hence refer to events that should be perceived as likely to occur. In contrast, false intentions, by definition, come with no commitment to carry out the stated intention. Therefore, they refer to events that should be perceived as unlikely to occur. In line with CLT, it follows that true intentions should be more concretely construed than false intentions.

Our goal with the present experiment was to test this prediction by building on previous work examining true and false intentions and episodic future thought (EFT). EFT refers to the ubiquitous phenomenon of projecting oneself into future situations, which often gives rise to vivid mental images (Szpunar, 2010). In a previous study on EFT and intentions, Granhag and Knieps (2011) found that those stating a true intention reported to experience mental images related to their stated intention to a higher extent than those stating a false intention. In addition, self-report measures show that the mental images accompanying true intentions are experienced as clearer compared as the mental images accompanying false intentions (Granhag & Knieps, 2011; Knieps, Granhag, & Vrij, 2013). Previous research also shows that visualizing a future goal helps in goal attainment, thereby highlighting the functional value of such mental images of the future (see, e.g., Adriaanse et al., 2010 who investigated mental constrasting strategies as a self-regulatory strategy). In other words, goal intentions in general, and true intentions as studied within deception research in particular, seem to be linked to mental images.

Importantly for our purposes, the participants in the Granhag and Knieps (2011) study were asked not only to describe their future intentions but also to draw their respective mental images. The content of these drawings, however, was not analyzed. In the current experiment, we asked a large group of raters to judge how concrete or abstract they perceived these drawings to be. Informed by CLT, we predicted that drawings of mental images accompanying false intentions would be rated as more abstract than drawings of mental images accompanying true intentions.

## 2 METHOD

### 2.1 Participants and material

In total, 200 American participants (90 female, $M_{age} = 36.1$ years, ages ranged from 20 to 71) were recruited via the online service Amazon’s Mechanical Turk and completed the study in exchange for $1. Of these participants, 83 failed a manipulation check (see below) and were therefore excluded from analyses. With the final sample size of 117 participants (52 female, $M_{age} = 35.5$ years, ages ranged from 20 to 69), an estimated power of 99% was obtained for a dependent $t$-test, on the basis of an alpha value of 0.05 and an effect size of Hedges’ $g = 0.475$ (found in the most extensive meta-analysis to date investigating the effect of psychological distance on construal level: Soderberg et al., 2014).

### 2.2 Stimulus material

The stimulus material consisted of black and white hand drawings produced by truth tellers and liars using paper and pencil. These drawings were collected in a previous study investigating EFT and true and false intentions (Granhag & Knieps, 2011). In this previous study, truth tellers were asked to plan a non-criminal act, which was to purchase a gift for a friend at a shopping mall. Liars, on the other hand, were asked to plan a mock criminal act, which was to plant illegal material on a shelf in a shopping mall. Liars were also asked to plan a cover story, which was thematically similar to the truth tellers’ true intention (i.e., purchase a gift for a friend at a shopping mall). They were told to stick to this cover story in case they were questioned about their intentions. On the basis of the instructions the truth tellers received, it was assumed that they perceived it as likely to purchase a gift for a friend (i.e., a psychologically close event). On the basis of the instructions the liars received, it was assumed that they perceived it as unlikely to purchase a gift for a friend (i.e., a psychologically distant event).2

Both truth tellers and liars were intercepted and taken to an interview before following through with their respective plans. During the interview, participants were asked to describe their future intentions. In addition, participants were asked whether they had experienced any mental images related to their intentions, and if so, they were asked to provide a sketch drawing of their most prominent mental image. Fifty-six drawings were collected, 33 drawings of true intentions, and 23 drawings of false intentions. The uneven distribution was because more truth tellers than liars reported having experienced mental images during the interview. These drawings provided the stimulus material for the current study.

### 2.3 Procedure

Participants in the present study completed an online questionnaire administered via the Qualtrics survey platform. They were told that participants in a previous study had been asked to imagine going to a nearby shopping center to purchase a gift and then asked to draw this scene. They were further instructed to evaluate these drawings in terms of how concrete or abstract they appeared to them. Participants were
given a description of what constitutes "abstract" and "concrete" as typically defined within the CLT framework (Trope & Liberman, 2010):

By concrete we mean drawings that represent complex scenes, refer to a specific context, focus on surface aspects of a task, and include details that are irrelevant to the goal at hand (in this case purchasing a gift in a shopping center).

By abstract we mean drawings that represent simple scenes, that are decontextualized, refer to core aspects of a task, and include details that are relevant to the goal at hand (in this case purchasing a gift in a shopping center).

Participants made ratings of abstractness on a scale from 1 (very concrete) to 7 (very abstract) directly after each drawing had been presented to them. The drawings were presented in seven sets, with eight drawings in each set, and an as equal number of truthful and deceptive drawings in each set as possible (either four liars and four truth tellers or three liars and five truth tellers). The order of the drawings within each set, as well as the order in which the sets were presented to participants, was randomized. After each set had been shown, participants were given a short break. During the breaks, they were further reminded of the definition of abstract and concrete (in bullet points), as well as reminded of the setup in the previous study from which the drawings were taken.

In order to ensure that participants had correctly understood the concept of "abstractness" as described in the instructions, all participants answered a manipulation check question after having completed all their ratings. The manipulation check consisted of four descriptions. Two described abstract scenes ("decontextualized simple scenes" and "core goal, relevant aspects"), whereas the other two described concrete scenes ("surface goal, irrelevant aspects" and "context-specific complex scenes"). Participants categorized these descriptions as either abstract or concrete. An incorrect answer on this manipulation check resulted in exclusion from analyses.

3 | RESULTS

A two-way random, absolute agreement, average-measures Intraclass Correlation Coefficient (ICC) analysis was conducted in order to determine whether participants rated the drawings in a similar fashion. The interrater reliability was excellent, ICC = 0.935, 95% CI [0.908, 0.957]. This means that participants agreed to a high degree on which drawings were more abstract and which drawings were more concrete.

Two variables were created by averaging participants’ overall ratings of deceptive and truthful drawings. A paired samples t-test revealed that liars’ drawings were rated as more abstract (M = 5.39, SD = 0.83) than truth tellers’ drawings (M = 5.06, SD = 0.79), t(116) = 7.01, p < .001, d_w = 0.404, 95% CI [0.290, 0.518]. In addition, a Bayesian paired samples t-test revealed a Bayes factor of BF_{10} = 5.29 × 10^{10}. Simply put, the data are over 50 million times more probable under the alternative hypothesis than under the null hypothesis. This strongly supports the prediction that liars’ drawings would be perceived as more abstract than truth tellers’ drawings and suggests that false intentions are construed at a higher, more abstract level than true intentions.

4 | DISCUSSION

We hypothesized that false (vs. true) intentions should be mentally represented at a more abstract (vs. concrete) level, because they refer to unlikely (vs. likely) future actions. In support of our hypothesis, we found that drawings of mental images accompanying false intentions were rated as more abstract than drawings of mental images accompanying true intentions. The current study is, to our knowledge, the first to use CLT (Trope & Liberman, 2010) to successfully uncover a novel cue to deception: degree of abstractness.

Past research on deception detection has been criticized for its lack of theoretical grounding in basic psychological research (Vrij & Granhag, 2012). This has led to calls for more theory-driven approaches to this research topic (Vrij, 2015). The current findings are in line with this reasoning, as they suggest novel deception cues derived from basic social cognitive research. More specifically, it opens up the possibility to make predictions about true and false intentions on the basis of the assumptions of CLT. In doing so, the study also expands the scope of CLT by applying it to a deception detection context. Our findings were based on drawings of true and false intentions. However, because we propose that the driving factor is the mental representation itself, it is possible that differences in abstractness should also emerge at the verbal level of statements of true and false intentions (but see Calderon, Mac Giolla, Granhag, & Ask, 2017, who failed to find any differences in abstractness in statements of true and false intentions).

The current study is also interesting in relation to previous work on creativity and psychological distance. For example, people tend to be more creative when making decisions for socially distant targets (others) than for socially proximal targets (the self; Polman & Emich, 2011). Of particular interest in the current context is the recent finding that decreasing participants’ subjective probability of a scenario, by asking them to make downward adjustments of an initially higher probability estimate, led to them making more creative drawings related to the scenario (Maglio & Polman, 2016). This indicates that people depict events in a more creative way when subjective probability is lower. When applied to the current context, Maglio and colleagues’ results lead to the interesting hypothesis that drawings of false intentions may be more creative, than drawings of true intentions, due to differences in subjective probability. Future research should examine whether such a link exists, and if so, how creativity may also relate to abstractness.

From a more practical point of view, the results can relate to recent work in drawing-based deception detection techniques. The use of drawings is a promising innovation for detecting deception, which has resulted in some of the largest cues to deceive in the published deception literature (for a review, see Mac Giolla, Granhag, & Vernham, 2017). The underlying theoretical rationale for the predicted differences between liars’ and truth tellers’ drawings is, however, somewhat difficult to readily translate to intention contexts. In brief, drawing-based deception detection methods assume that truth tellers...
have experienced the event they depict, whereas liars have not. Truth tellers’ experience of the event should provide them with the spatial and visual information necessary to competently produce drawings of the event. Because liars lack this experience, their ability to draw the event should be hampered, at least in comparison with truth tellers (Vrij et al., 2010; Vrij, Mann, Leal, & Fisher, 2012). In intention situations, neither truth tellers nor liars have experienced the event they describe. Hence, both groups may find the task similarly difficult. But, by focusing on the construal level of future events, and on the novel cue abstractness, the current study demonstrates how it may be possible to extend drawing-based deception detection techniques to intention situations. It should, however, be kept in mind that this is the first study to analyze drawings depicting true or false intentions from the perspective of CLT and that the diagnostic value of this cue to deceit, in its current form, is limited.

Although a reliable difference in abstractness between true and false intentions was observed, the effect size was rather modest; simply put, there was a substantial overlap in abstractness between the two groups. One potential reason for the relatively small observed effect is that the participants in the current study (i.e., the raters) were only given very brief instructions and a short time to familiarize themselves with the concepts of “abstract” and “concrete.” A second potential reason for the small effect has to do with the brief instructions given to participants in the original study from which the stimulus material was adopted (i.e., the truth tellers and liars who produced the drawings; Granhag & Knieps, 2011). In this previous study, participants were simply told to draw a mental image of their intention. Future studies could examine if more extensive training or fine-grained coding schemes for raters, or more specific instructions for the drawing task (e.g., how to draw and what aspects of the intention to draw), would increase the diagnosticity of the abstractness cue.

A potential caveat should be noted regarding the generalizability of the current finding. In real-life situations, where people’s motivation to be believed is naturally stronger than in a laboratory setting, liars may try harder to provide concrete drawings as a strategy to appear credible. Indirect support for this possibility comes from research showing that liars strategically add details to their verbal accounts in order to be believed (Nahari, Vrij, & Fisher, 2012). If liars, in a similar fashion, strategically increase the concreteness of their drawings, it may reduce the differences in abstractness between truth tellers and liars that can be detected in the real world. It should be noted, however, that adding details to a description (as in the study by Nahari et al., 2012) is not necessarily the same thing as increasing the concreteness of the description. In fact, a detail can be either general or specific in nature. Moreover, because abstract phenomena are naturally less verifiable (Semin & Fiedler, 1991)—but still as rich in content (Trope & Liberman, 2010)—as concrete phenomena, liars may instead feel that they benefit from a strategy of being more abstract. If so, liars’ strategies may, in fact, amplify the difference in abstractness that can be observed in real-life, high-stake scenarios. An interesting line of future research would be to explicitly ask participants to be as concrete as possible in their drawings. It seems plausible that truth tellers would respond by increasing the concreteness of their drawings, whereas liars would resist the instruction in order not to provide verifiable, incorrect details. Such a result would provide insights into ways to actively enhance existing differences in abstractness between liars’ and truth tellers’ drawings.

4.1 | Limitations

Some limitations with the current study should be mentioned. First, there is likely a difference in valence between the two conditions from which the drawings were produced, which might have affected the results. Participants with a true (non-criminal) intention were asked to buy a gift at a shopping mall for a friend (i.e., positive behavior). In contrast, participants with a false (mock criminal) intention were asked to plant illegal material and then lie about having done so (i.e., immoral behavior). Because positivity is related to abstraction and negativity to concreteness (Eyal, Liberman, Trope, & Walther, 2004), valence may have acted as a suppressor of the predicted effect (i.e., exerting an influence in the opposite direction). This could potentially have led to an underestimation of the observed effect.

Second, the current study has a limitation in that there was no control question of participants’ perceived likelihood of performing the tasks in the study from which the stimulus material was collected. We can assume that those with a true intention perceived it as likely that they would perform the shopping task, because they were explicitly instructed to do so. We can also assume that those with a false intention perceived it as unlikely that they would perform the shopping task, because they were instructed to perform another task (i.e., plant illegal material). An explicit measurement would, however, have strengthened the assumption that differences in the perceived likelihood (i.e., psychological distance) are driving the effect found in the current study. Other studies on true and false intentions, which have used similar experimental setups as Granhag and Knieps (2011), have found that participants perceive it as likely that they will perform their instructed tasks (Mac Giolla & Granhag, 2014; Mac Giolla, Granhag, & Ask, 2017; Mac Giolla, Granhag, & Liu-Jönsson, 2013). Arguably, similar ratings would have emerged had the question been asked by Granhag and Knieps (2011).

5 | CONCLUSION

The goal of this study was to test whether there are systematic differences between how truths and lies about the future are construed and whether these differences can be elicited using a drawing task. Our findings show that this indeed seems to be the case. This is a promising start for a novel theory-driven approach to distinguishing between statements of true and false intent.

ENDNOTES

1 Data collected via Amazon Mechanical Turk have shown comparable levels of quality to data collected via traditional methods, such as undergraduate student samples (Buhrmester, Kwang, & Gosling, 2011).

2 In the Granhag and Knieps (2011) study, participants with a false intention reported to have lied to a higher extent (M = 4.43, SD = 1.82) than participants with a true intention (M = 2.00, SD = 1.41) about their planned actions. Although this is not a direct manipulation check of the assumption that liars (vs. truth tellers) perceived it as less (vs. more) likely to perform the task, it indirectly supports this assumption.
Due to the high attrition rate, a second paired samples t-test was conducted including the excluded participants. This analysis also revealed a significant effect of truth status on judged abstraction, t(199) = 9.08, p < .001, daw = 0.376, 95% CI [0.269, 0.484].

A default Bayesian approach was used with Cauchy’s prior width set at 0.707, as recommended by Rouder, Speckman, Sun, Morey, and Iverson (2009).

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