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Stop in the name of lies: The cost of blocking the truth to deceive

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ABSTRACT

Most researchers assume that deception involves a conflict between a predominant truth response and a deliberate deceptive response. Such a view is consistent with dual process theories that state that high-order cognition operates through fast-automatic processes that may conflict with slow-deliberate ones. In the present study, we tested whether one must inhibit the truth to deceive in light of inconsistent findings in the literature. One hundred and eighty-nine participants were tested across two *Negative Priming* paradigms that rest on the logic that the activation of a fast-automatic process will be hampered on a given display if it is inhibited on the previous display. Our findings suggest that truthful responses are predominant in healthy adults, which is why inhibitory control is required to activate a deliberate deceptive mode. We argue that the findings from deception studies could be best accounted for by dual process theories.

1. Introduction

Whether deception is intended to protect oneself (i.e., antisocial lies) or to protect others (i.e., prosocial lies) rests on the knowledge that (a) others can have a different mental representation of the world than oneself, and (b) one can bias another's mental representations through communication (Talwar & Crossman, 2011). Thus, deception typically requires theory of mind ability, i.e., the ability to attribute mental states to others (Premack & Woodruff, 1978; Talwar & Lee, 2008). With regard to theory of mind ability (Benson, Sabbagh, Carlson, & Zelazo, 2013; Dumontheil, Apperly, & Blakemore, 2010; Marcovitch et al., 2015), a growing body of evidence suggests that inhibitory control (i.e., the ability to suppress an automatic response to activate a more deliberate one, Diamond, 2013) may be required to deceive (Abe, 2011; Carlson, Moses, & Hix, 1998; Debey, De Schryver, Logan, Suchotzki, & Verschuere, 2015; Leduc, Williams, Gomez-Garibello, & Talwar, 2017). However, not all studies have provided evidence for the role of inhibitory control in deception (Caudek, Lorenzino, & Liperoti, 2017; Debey, Verschuere, & Crombez, 2012; Verschuere, Schumann, Sack, 2012). Transcranial Magnetic Stimulation (TMS) studies offer a an example of the discrepancy of the findings on the role of inhibitory control in deception: several studies provided evidence that a disruption or a facilitation of the activation of key regions of the prefrontal cortex (dorsolateral prefrontal cortex and inferior frontal gyrus) associated with behavioral control and response inhibition affect the ability to lie (Karton & Bachmann, 2011; Karton, Palu, Jõks, & Bachmann, 2014; Karton, Rinne, & Bachmann, 2014) but one study did not (Verschuere et al., 2012). Additional studies are thus needed to test whether inhibitory control is required in deception, and if so to further specify what is inhibited when one deceives someone else.

Deception has classically been studied either by directly asking participants to respond deceptively to autobiographical questions

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(e.g., Debey, Ridderinkhof, De Houwer, De Schryver, & Verschuere, 2015; Debey et al., 2015, 2012) or by indirectly measuring the effect of concealed information on participants' responses (e.g., Suchotzki, Verschuere, Peth, Crombez, & Gamer, 2015; Verschuere & De Houwer, 2011). One consistent finding of all these studies is that the participants commit more errors and require more time when engaged in a deceptive behavior than a truthful one (see Verschuere & De Houwer, 2011, for a review). A recent meta-analysis, including 114 studies reporting the reaction times associated with deception in different experimental paradigms, confirms that it takes more time to be untruthful than truthful (Suchotzki, Verschuere, Van Bockstaele, Ben-Shakhar, & Crombez, 2017). *The deception effect* (i.e., the difference in response times or error rates between the deception and the truth conditions) has been interpreted as reflecting the larger cognitive cost of engaging oneself in a deceptive than in a truthful behavior (Vrij, Fisher, Mann, & Leal, 2006). According to some researchers, deception requires more cognitive resources because one must resolve a conflict between an automatic truthful response and a deliberate deceptive response (e.g., Duran, Dale, & McNamara, 2010; Hadar, Makris, & Yarrow, 2012; Johnson, Barnhardt, & Zhu, 2004). For instance, Duran et al. (2010) asked adults to respond truthfully or deceptively to autobiographical questions through a remote control. The data revealed a specific motion pattern for deceptive responses that were characterized by a tendency to deviate towards the location of truthful responses. The analysis of the fine-grained motion pattern of motor responses in this study provides evidence that a conflict may occur when one is engaged in a deceptive behavior.

Given that inhibitory control is defined as the ability to suppress an automatic response to favor the activation of a more deliberate one (Botvinick, Braver, Barch, Carter, & Cohen, 2001; Diamond, 2013; Miyake et al., 2000), it has been hypothesized as one of the key mechanisms to successfully deceive (Debey et al., 2012; Debey, Ridderinkhof, De Houwer, De Schryver, & Verschuere, 2015). Developmental studies have provided evidence in favor of this assumption (Debey, De Schryver, Logan, Suchotzki, & Verschuere, 2015; Leduc et al., 2017; Williams, Moore, Crossman, & Talwar, 2016a) by showing that deceptive abilities appear to follow the same inverted U-shaped pattern as inhibitory control abilities: increasing from childhood to adult and decreasing with older age (Debey, De Schryver, et al., 2015). In addition, inhibitory control abilities and deception abilities seem to be related in children as suggested by the results in a *temptation resisting paradigm.* In this classical deceptive paradigm, children have difficulties in maintaining their lies when confronted with a series of questions intended to uncover whether they had broken the rule to not peak at a toy (Talwar & Lee, 2002). Critically, this difficulty in concealing any information that would reveal their deceptive behavior, referred to as a lack of *semantic leakage control*, correlates with inhibitory control abilities (Leduc et al., 2017; Talwar, & Lee, 2008). Neuroimaging findings in adults converge in showing that the regions classically involved in conflict detection, (i.e., the Anterior Cingulate Cortex) as well as the regions known to support inhibitory control (i.e., the Inferior Frontal Gyrus, Dorsolateral Prefrontal Cortex) appear to be more activated during deceptive behaviors than truthful behaviors (Christ, Van Essen, Watson, Brubaker, & McDermott, 2009; Johnson et al., 2004; Johnson, Henkell, Simon, & Zhu, 2008; Spence et al., 2004; Vartanian, Kwantes, & Mandel, 2012). However, these previous studies provide correlational but not causal evidence for the role of inhibitory control in deception.

Only few studies have attempted to test the causal role of inhibitory control in deception using different theoretical backgrounds and through various experimental manipulations (Debey et al., 2012; Debey, Ridderinkhof, et al., 2015; Fenn, Blandón-Gitlin, Coons, Pineda, & Echon, 2015). On the one hand, some researchers have reasoned that if deception relies in part on inhibitory control, then engaging participants' inhibitory control resources on one task should facilitate deception on another task due to a transfer of inhibitory control from one task to the other. Consistent with this assumption, Fenn et al. (2015) demonstrated that adults who were already engaged in a self-control task (i.e., controlling their bladder after drinking a large amount of water) were better at lying to the extent that their lies were more difficult to uncover in comparison to adults who were not engaged in such a self-control task (i.e., no need to control their bladder as they drank a small amount of water). On the other hand, some researchers have made the opposite assumption and have suggested that engaging participants' inhibitory control resources before a deceptive task would subsequently decrease their limited inhibitory control resources and thus hamper their deceptive abilities. Following this logic, Debey et al. (2012) approached the role of inhibitory control in deception by manipulating the inter-stimulus interval (ISI). They hypothesized, in line with Duncan's *goal neglect* theory (1995), that increasing the ISI would tax participants' cognitive control resources and result in a larger *deception effect* (i.e., difference in response times or error rates between the deceptive and truthful trials). Although their study evidenced that larger ISI increases the *deception effect,* they also reported contradictory findings in a second experiment based on the *ego depletion* theory (Baumeister, Bratslavsky, Muraven, & Tice, 1998). Indeed, they were not able to demonstrate that depleting participants' inhibitory control resources affected their subsequent ability to deceive. In sum, addressing the same question but through different experimental manipulations embedded in different theoretical frameworks led to inconsistent findings (Debey et al., 2012; Fenn et al., 2015). Such discrepancies call for additional studies using different methodological approaches to determine whether inhibitory control plays a role in deception.

Although dual process theories posit that high order-cognition operates through fast-automatic processes (referred to as type 1 processes) that may conflict with slow-deliberate ones (referred to as type 2 processes) (Darlow & Sloman, 2010; Evans & Stanovich, 2013; Evans, 2011; Kahneman, 2011), and it has been successfully used as a theoretical framework to make sense of the data garnered in multiple domains (Bahçekapili & Yilmaz, 2017; Barbey & Sloman, 2007; Cassotti, Agogué, Camarda, Houdé, & Borst, 2016; Stupple & Waterhouse, 2009; Yilmaz & Saribay, 2017), to our knowledge no study has explored deception through the lens of such framework. This is surprising given that most of the researchers in the field of deception consider deception to be a deliberate process and truth to be an automatic one that fits well with the dissociation of type 1 and type 2 processes in dual process theories. Thus, anchored in dual process theories, we investigate whether one must inhibit the truth (type 1 process) to deceive (type 2 process). To do so, we chose to use a *Negative Priming* paradigm. The original attentional *Negative Priming* paradigm (see Tipper, 1985, 2001), was used to evidence the inhibition of attentional distractors by evaluating the cost of activating a stimulus that was previously inhibited. In the test condition, the stimulus presented on the prime as a distractor is subsequently presented as a target on the probe while the distractor stimulus and the target one are unrelated in the control condition. By comparing participants' performance