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Can intuition improve deception detection performance?

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ABSTRACT

Two studies examined the role of processing style (intuitive vs. deliberative processing) in a deception detection task. In the first experiment, a thin slicing manipulation was used to demonstrate that intuitive processing can lead to more accurate judgments of deception when compared with traditional deliberative forms of processing. In the second experiment, participants who engaged in a secondary (concurrent) task performed more accurately in a deception detection task than participants who were asked to provide a verbal rationale for each decision and those in a control condition. Overall, the results converge to suggest that intuitive processing can significantly improve deception detection performance.

Improving human deception detection performance is a difficult undertaking. The popular story of Pinocchio tells of a little boy whose nose grew magically whenever he lied. Unfortunately, in real life there is no growing nose or specific cues that make lying immediately apparent to all (DePaulo et al., 2003), and performance in deception detection tasks is only slightly above chance levels (see Bond & DePaulo, 2006; Vrij, 2000). One promising line of inquiry has involved the assessment of indirect judgments of deception.

In their meta-analysis assessing the utility of various cues to deception, DePaulo et al. (2003) found that while direct cues (e.g., various verbal and non-verbal indicators) tend to yield small effects, cues that are assessed more "subjectively" (e.g., vocal immediacy, facial pleasantness, or level of narrative detail) showed significantly greater discrimination. Indeed, studies suggest that asking participants to render more holistic or "indirect" judgments regarding a sender can better discriminate truths vs. lies when compared with direct assessments of veracity (see DePaulo & Morris, 2004). In addition, studies show that participants appear to intuitively distinguish between liars and truth tellers via appropriate cues to deception (Anderson, DePaulo, & Ansfield, 1999), and through initial perceptions of veracity that are later "over thought" (Hurd & Noller, 1988). While the examination of indirect cues to deception has yielded some promising results, the current study examined related social psychological theory on intuitive judgments and more directly assessed its potential contribution to improving deception detection performance.

Information used to make decisions is generally believed to be processed using two different modes, namely via *intuitive processing* and *deliberative processing* (Gigerenzer, 2007; Wilson & Schooler, 1991). Intuitive processing has been referred to as an affective or experiential mode that is effortless, spontaneous, and holistic in nature. In contrast, deliberative processing requires conscious effort and is generally a slower, more analytic process. Although both processing modes are essential to good decision making, the vast majority of research has focused primarily on deliberative processing and regarded intuitive processing as the source of negative, problematic outcomes (Bargh & Williams, 2006; Gigerenzer, 2007). Recent research, however, has largely supported the importance of intuitive processing to everyday decision-making (Dijksterhuis, 2004; Gigerenzer, 2007).

One method used to assess intuitive judgments in the social psychological literature involves asking participants to view thin slices of behavior (i.e., brief clips of expressive behaviors) and to render judgments based upon incomplete information (cf. Ambady, Bernieri, & Richeson, 2000; Ambady & Rosenthal, 1992, 1993). In one of the more well-cited examples of thin slicing, Ambady and Rosenthal (1993) demonstrated that participants could accurately predict an instructor's ratings of teaching effectiveness in as little as 6 s. Thin slicing has been investigated in a variety of contexts over the years, including teacher expectations of students (Babad, Bernieri, & Rosenthal, 1991), parental expectations of children (Bugental & Love, 1975), performance ratings for management consultants (Ambady, Hogan, Spencer, & Rosenthal, 1993), judgments of sexual orientation (Ambady, Hallahan, & Conner, 1999), supervisor ratings of camp counselors (Blanck & Rosenthal, 1984), and judgments of testosterone levels (Dabbs, Bernieri, Strong, Campo, & Milun, 2001). Research suggests that thin slicing may have its impact by encouraging participants to evaluate information in a more *intuitive* manner (Ambady & Rosenthal, 1992).

The goal of the current study was to assess whether deception detection performance might be influenced by intuitive vs. deliberative processing styles. In Experiment 1 we assessed whether

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encouraging participants to engage in an intuitive processing style, via a thin slicing manipulation, might improve deception detection performance. In Experiment 2 we sought to replicate our findings and distinguish more directly between intuitive processing (via a concurrent task condition; see Ambady & Gray, 2002) and deliberative processing (via a verbal reasoning condition; see Wilson & Schooler, 1991). To foreshadow the results, both experiments converge to suggest that intuitive processing can significantly improve deception detection performance.

Experiment 1

Method

Participants

Eighty undergraduate students from the University of Texas at El Paso participated in this experiment.

Design

A single factor between-subjects design was employed in which participants were randomly assigned to either a thin-slicing or control condition. The control group viewed each true vs. false statement in its entirety prior to providing a veracity judgment, while the thin-slicing group viewed only three 5 s video clips of each confession statement prior to providing a veracity judgment.

Materials

The videos employed in this study were those previously developed by Kassin, Meissner, and Norwick (2005). The five true and five false confession statements, provided by inmates of a correctional facility, were each approximately 3 min in duration. Following the thin slice methodology used in Ambady and Rosenthal (1993), three 5 s clips were extracted from each statement – randomly drawn from the beginning, middle, and end of each statement – which were then edited to form a single 15 s video.

Procedure

Participants were seated in front of a computer monitor and were randomly assigned to a condition within the study. Medialab software was used to present all stimuli and collect responses from participants. Participants were instructed that their task to was to distinguish between true and false confession statements provided by inmates of a correctional facility. Those in the control condition viewed the series of 10 confession statements in their entirety, while participants in the thin slice condition viewed the 15 s confession clips. Following each video, participants provided their veracity judgments by pressing one of two buttons to indicate whether the statement was truthful or deceitful. The presentation of videos was randomized for each participant to control for any potential order effects.

Results and discussion

Judgments of veracity were initially separated into the proportion of true confessions correctly identified as such (hits) and the proportion of false confessions incorrectly identified as true (false alarms). These hit and false alarm rates were then used to compute signal detection estimates of discrimination accuracy (d') and response bias (c) (see Fig. 1). On the measure of discrimination accuracy, significant differences were found such that participants in the thin-slice condition were significantly more accurate in their judgments when compared with participants in the control condition, $t(78) = 2.69$, $p < .01$, $d = .60$. In addition, only the thin-slice condition performed significantly better than chance levels, $z = 2.66$, $p < .01$, as opposed to the control condition which performed at chance levels, $z = 1.12$, *ns*.[1] No significant difference in response bias was observed, $t(78) = .78$, *ns*., $d = .06$.

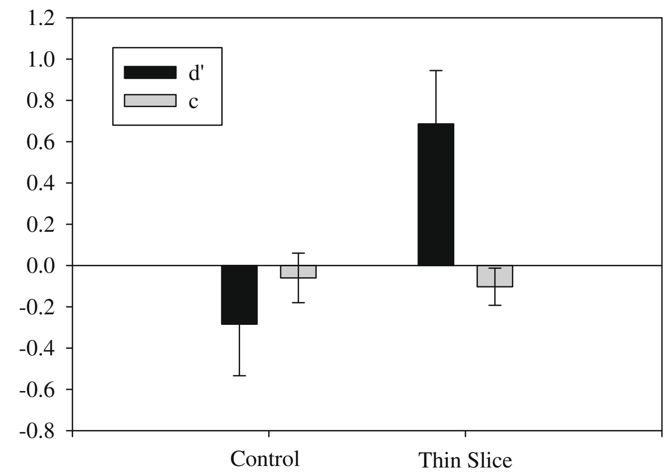

Fig. 1. Thin-slice vs. control group performance (discrimination and response bias) on a deception detection task (Experiment 1).

Overall, participants who engaged in a thin-slice task were significantly more accurate in differentiating between true and false statements. These results suggest that intuitive processes may be quite useful for detecting deception. Experiment 2 attempted to replicate this finding by employing an alternative paradigm introduced by Ambady and Gray (2002) in which intuitive processing was engaged by having participants complete a secondary (concurrent) task while viewing the stimulus videos. A deliberative processing condition was also created by employing a verbal reasoning task that has been shown to induce a more analytic perspective (see Wilson & Schooler, 1991).

Experiment 2

Method

Participants

One hundred and twenty undergraduate students from the University of Texas at El Paso participated in this experiment.

Design

A single factor between-subjects design was employed in which participants were randomly assigned to one of three conditions. The concurrent task condition involved the presentation of a perceptual-memory task that participants completed while viewing the videos. Participants in the control condition simply watched the videos absent any distraction. After viewing each video, both groups were asked to provide a veracity judgment. Participants in the verbal reasoning condition viewed the same videos, but were asked to provide a listing of reasons in support of their belief that the statement was true or false prior to providing a judgment of veracity.

[1] We also assessed whether the difference in performance accuracy between the two conditions may have been due to fatigue on the part of participants who viewed the full-length videos as opposed to the brief clips. A 2 (thin-slice vs. control) × 10 (trial order) repeated measures ANOVA revealed main effects of condition, $F(1,78) = 4.85$, $p < .05$, $\eta^2 = .06$, and trial order, $F(9,702) = 3.32$, $p = .001$, $\eta^2 = .04$; however, the interaction proved non-significant, $F(9,702) = 1.29$, *ns*., $\eta^2 = .01$, suggesting that the order effects were consistent across conditions and that differences between the conditions were not likely a product of fatigue.

Materials

The same true and false confession statements and Medialab software from Experiment 1 were used in the present experiment.

Procedure

The instructions and procedures used in the previous experiment were identical to those employed here, with the exception that additional instructions were provided to both the concurrent task and verbal reasoning groups. All participants viewed the full-length videos used in Experiment 1. Participants in the concurrent task condition were asked to complete a variation of the N-back procedure while watching the videos. This task involved the presentation of a series of letters at a rate of 1 s per letter with a 1 s inter-stimulus-interval (ISI) (Watter, Geffen, & Geffen, 2001). Participants were instructed that they should attempt to remember the letter presented and that at certain random intervals a target letter would appear in red font. When presented with a target letter, participants indicated on the keyboard whether the target letter was the same as the letter they had viewed 3-back by pressing the left arrow for 'YES' and the right arrow for 'NO'. Letters were presented to either the left or the right of each video, centered on the vertical and placed an even distance from the edge of each video. The video played continuously throughout the letter presentation. Performance on this task averaged 81% accuracy across all participants, and was significantly above chance (50%), $t(39) = 16.32$, $p < .01$. Participants in the verbal reasoning condition were informed that after viewing each confession statement they would be asked to provide a series of eight reasons in support of their decision that the suspect was being truthful vs. deceptive. Only after providing these eight reasons did the computer permit them to continue and provide a judgment of veracity. In all conditions, the presentation of videos was randomized for each participant to control for any potential order effects.

Results and discussion

As in Experiment 1, performance was assessed by computing estimates of discrimination accuracy (d') and response bias (c) (see Fig. 2). On the measure of discrimination accuracy, a single-factor Analysis of Variance (ANOVA) yielded a significant main effect, $F(2, 117) = 3.78$, $p < .05$, $\eta^2 = .06$. Planned comparisons confirmed the prediction that participants in the concurrent task condition would perform significantly better than those in the verbal reasoning, $t(78) = 2.56$, $p < .01$, $d = .57$, and control conditions, $t(78) = 1.81$, $p < .05$, $d = .40$. No significant difference was observed between the verbal reasoning and control conditions, $t(78) = .31$, *ns*., $d = .21$. Consistent with Experiment 1, only the concurrent task condition performed significantly better than chance, $z = 2.79$, $p < .01$, while both the control and verbal reasoning conditions performed at chance levels, $zs = .60$ and .76, respectively.[2] On the measure of response bias, a significant main effect was also observed, $F(2, 117) = 12.69$, $p < .001$, $\eta^2 = .18$. Pairwise comparisons revealed that participants in the concurrent task condition were more likely to judge statements as truthful when compared with participants in the verbal reasoning, $t(78) = 5.06$, $p < .01$, $d = 1.11$, and control conditions, $t(78) = 3.06$, $p < .01$, $d = .68$.

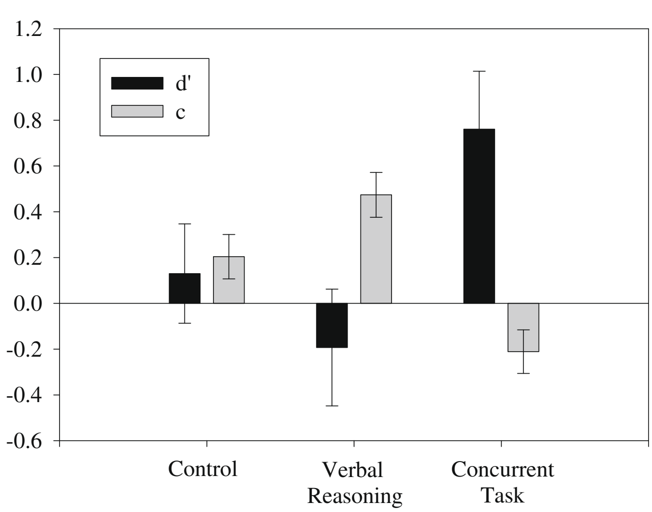

Fig. 2. Performance (discrimination and response bias) on a deception detection task as a function of the processing manipulation (Experiment 2).

As predicted, participants who engaged in a concurrent task were significantly more accurate in differentiating between true and false statements when compared with the control and verbal reasoning conditions. Consistent with Experiment 1, these results suggest that intuitive processes can significantly improve deception detection performance. Interestingly, a bias towards perceiving truth was also observed within the concurrent task condition. Future research would be useful for assessing the extent to which this particular effect is replicable and practically significant, as discussed below.

General discussion

The goal of the current study was to extend research on human deception detection by assessing the role of intuitive vs. deliberative processing. Experiment 1 employed a thin slicing methodology to investigate the extent to which intuitive processing might improve deception detection performance. Results confirmed this hypothesis as participants viewing the 15 s video performed better at distinguishing truth from deception when compared with participants who viewed the entire 3 min video. Experiment 2 investigated the role of intuitive vs. deliberative processing in deception detection using a concurrent task vs. verbal reasoning manipulation, respectively. Results again confirmed the hypothesis that participants in the concurrent task condition performed better at discriminating truth from deception when compared with participants in the verbal reasoning condition.

The current studies add to a growing literature on intuitive processing and suggest that social judgments can be successfully performed based upon minimal information or diminished attentional resources (Dijksterhuis & Nordgren, 2006; Gigerenzer, 2007). We note that while our studies relied upon prior research indicating a link between automatic or intuitive processing and the thin-slicing (Experiment 1) and concurrent task (Experiment 2) manipulations used (see Ambady et al., 2000), it remains possible that these manipulations may not completely immerse participants in an intuitive or automatic mode of processing (see Gonzalez-Vallejo, Lassiter, Bellezza, & Lindberg, 2008).

While our studies provide converging evidence that intuitive processing can facilitate performance on a deception detection task, it is important to note several aspects of the results. First, the increase in accuracy between the groups averaged between 10% and 15% across experiments. While this may seem small, past research has shown that such increases in accuracy may be of practical benefit to improving human deception detection performance. For example, a meta-analysis of the "training" literature in the deception detection arena found an average increase in accuracy of about 4% for those in the training vs. control conditions (Frank & Feeley, 2003). In contrast, Vrij and colleagues (Vrij et al.,

[2] We also assessed the relationship between accuracy on the concurrent task and deception detection accuracy. Though the correlation failed to reach the conventional level of significance, $r(40) = .29$, $p = .07$, the positive relationship suggested that participants who were more accurate on the current task were also more accurate in distinguishing between truth and deception.

2008) have shown that by increasing the cognitive load of the liar, police officers were able to improve their detection performance by approximately 12%. Similar improvements in accuracy demonstrated in the present experiments may have appreciable impact in everyday practice when compared with modern training interventions often advocated to law enforcement.

Second, the increase in accuracy found in Experiment 2 was also associated with a response bias towards perceiving *truth*. Prior research has shown that experienced police investigators are not superior to lay individuals at deception detection; however, investigators are more likely to judge statements as deceptive, whereas lay individuals are more likely to judge statements as truthful (Bond & DePaulo, 2006; Meissner & Kassin, 2002). It would appear that the intuitive processing manipulation employed in Experiment 2 exacerbated a truth bias that our lay participants brought with them into the laboratory. It will be important to further assess this effect in future studies, as it is possible that intuitive processing may provide a situation in which participants are more likely to engage their biases – a finding that could question the usefulness of such an approach with law enforcement officer who are prone to demonstrating a bias toward perceiving deception and guilt (Kassin et al., 2005; Meissner & Kassin, 2002, 2004).

Finally, the current studies used methodologies that may not be easily implemented outside of the laboratory (i.e., thin-slicing and concurrent task procedures). In addition, it may be useful to assess the extent to which the intuitive processes examined in the current studies might relate to other "indirect" methods of lie detection (see Depaulo & Morris, 2004). It is likely that participants in the current study were evaluating deception based upon their general impressions of the sender, using cues that are of greater diagnostic value (DePaulo et al., 2003). To the extent that methods of detection may be developed to promote the use of intuition and impression-based cues, as well as other cognitive or story-based cues that have shown to be diagnostic, significant improvement in deception detection performance may be achievable in practice.

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