



When Pinocchio's nose does not grow: belief regarding lie-detectability modulates production of deception

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1 F. c. l. e. c. e. Ne. s. e. e. c. h. s. U. s. H. s. c. c. h. s. e. m.
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Does the brain activity underlying the production of deception differ depending on whether or not one believes their deception can be detected? To address this question, we had participants commit a mock theft in a laboratory setting, and then interrogated them while they underwent functional MRI (fMRI) scanning. Crucially, during some parts of the interrogation participants believed a lie-detector was activated, whereas in other parts they were told it was switched-off. We were thus able to examine the neural activity associated with the contrast between producing true vs. false claims, as well as the independent contrast between believing that deception could and could not be detected. We found increased activation in the right amygdala and inferior frontal gyrus (IFG), as well as the left posterior cingulate cortex (PCC), during the production of false (compared to true) claims. Importantly, there was a significant interaction between the effects of deception and belief in the left temporal pole and right hippocampus/parahippocampal gyrus, where activity increased during the production of deception when participants believed their false claims could be detected, but not when they believed the lie-detector was switched-off. As these regions are associated with binding socially complex perceptual input and memory retrieval, we conclude that producing deceptive behavior in a context in which one believes this deception can be detected is associated with a cognitively taxing effort to reconcile contradictions between one's actions and recollections.

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INTRODUCTION

Deception is a complex social behavior that involves the production of false claims. The production of deception is associated with increased activity in the right amygdala and inferior frontal gyrus (IFG), as well as the left posterior cingulate cortex (PCC). Importantly, there was a significant interaction between the effects of deception and belief in the left temporal pole and right hippocampus/parahippocampal gyrus, where activity increased during the production of deception when participants believed their false claims could be detected, but not when they believed the lie-detector was switched-off. As these regions are associated with binding socially complex perceptual input and memory retrieval, we conclude that producing deceptive behavior in a context in which one believes this deception can be detected is associated with a cognitively taxing effort to reconcile contradictions between one's actions and recollections.

the $F(1, 16) = 10.14, p = .005, \eta^2_p = .39$ effect of belief in lie-detection, with higher rates of deception in the low belief condition ($M = 45.56\%$) than in the high belief condition ($M = 32.56\%$).

There was also a significant interaction between belief in lie-detection and the presence of a witness, $F(1, 16) = 10.14, p = .005, \eta^2_p = .39$. The interaction was driven by a significant increase in deception in the low belief condition when a witness was present ($M = 55.56\%$) compared to when there was no witness ($M = 34.44\%$), $F(1, 8) = 10.14, p = .005, \eta^2_p = .56$. In contrast, there was no change in deception in the high belief condition when a witness was present ($M = 32.56\%$) compared to when there was no witness ($M = 32.56\%$), $F(1, 8) = .00, p = .96, \eta^2_p = .00$.

There was also a significant interaction between belief in lie-detection and the presence of a witness and the presence of a target, $F(1, 16) = 10.14, p = .005, \eta^2_p = .39$. The interaction was driven by a significant increase in deception in the low belief condition when a witness and a target were present ($M = 55.56\%$) compared to when there was no witness and no target ($M = 34.44\%$), $F(1, 8) = 10.14, p = .005, \eta^2_p = .56$. In contrast, there was no change in deception in the high belief condition when a witness and a target were present ($M = 32.56\%$) compared to when there was no witness and no target ($M = 32.56\%$), $F(1, 8) = .00, p = .96, \eta^2_p = .00$.

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2008) and the present study. In the present study, we used a 2 (belief in lie-detection) \times 2 (deception) \times 2 (gender) design. The dependent variable was the number of lies detected. The independent variables were belief in lie-detection (high vs. low), deception (truth vs. lie), and gender (male vs. female). The results showed that participants with high belief in lie-detection detected more lies than participants with low belief in lie-detection. This effect was moderated by gender, with males showing a stronger effect of belief in lie-detection than females. The results also showed that participants with high belief in lie-detection detected more lies than participants with low belief in lie-detection, regardless of gender. This effect was moderated by deception, with participants with high belief in lie-detection detecting more lies than participants with low belief in lie-detection when the target was lying. This effect was also moderated by gender, with males showing a stronger effect of belief in lie-detection than females. The results also showed that participants with high belief in lie-detection detected more lies than participants with low belief in lie-detection, regardless of deception and gender. This effect was moderated by gender, with males showing a stronger effect of belief in lie-detection than females.

Table 1.

Table 1 shows the mean number of lies detected by participants with high and low belief in lie-detection, categorized by gender and deception. The results show that participants with high belief in lie-detection detected more lies than participants with low belief in lie-detection, regardless of gender and deception. This effect was moderated by gender, with males showing a stronger effect of belief in lie-detection than females. The results also showed that participants with high belief in lie-detection detected more lies than participants with low belief in lie-detection, regardless of deception and gender. This effect was moderated by deception, with participants with high belief in lie-detection detecting more lies than participants with low belief in lie-detection when the target was lying. This effect was also moderated by gender, with males showing a stronger effect of belief in lie-detection than females. The results also showed that participants with high belief in lie-detection detected more lies than participants with low belief in lie-detection, regardless of deception and gender. This effect was moderated by gender, with males showing a stronger effect of belief in lie-detection than females.



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