

## A deceptive-training impacts a spatial-motor task

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Recently, deception research has shown that Reaction Times (RTs) are slower when people are required to lie than when they are asked to tell the truth (Debey *et al.*, 2015; for a review see Verschuere & De Houwer, 2011). These findings are in line with the assumption that lying requires greater amount of cognitive resources than telling the truth (e.g., Abe, 2011). It is widely held that the truthful response is the dominant response that it is activated first during a lying task, then the truthful response should be intentionally inhibited thereby causing a response conflict and a delay in RTs.

The explanations of the mechanism at the basis of the deception seems to share a similar rationale to the one acknowledged for the Simon effect. The standard Simon effect showed a faster performance when the task-irrelevant spatial dimension of the stimulus corresponds to the location of the response (corresponding trials), compared to when they do not correspond (non-corresponding trials). Accordingly, two different response processes are involved: the required response is activated on the basis of task instructions, whereas the response that spatially corresponds to the stimulus location is activated automatically. If the two responses are the same no conflict at the response-selection stage arises and there is a facilitation effect (e.g., Umiltà *et al.*, 1999). In contrast, when the two responses are different, the incorrect response must be inhibited, causing a delay in RTs. The Simon effect can be strongly modulated by means of the practice paradigm (Tagliabue *et al.*, 2000). More specifically, practicing with an incompatible spatial mapping (e.g., responding with the opposite response location to the one of the stimulus) before performing the Simon task eliminates the standard Simon effect. To explain this finding, it has been proposed that the practice session trained participants to activate incompatible short-term associations that remain active and influence performance in the subsequent task.

In the present study we aimed at investigating if a linguistic training task can modulate the Simon effect. More specifically, in the first session half of participants were required to respond truly and half of participants to respond deceptively to a series of true or false sentences. In the second session, all participant performed a standard Simon task. We hypothesized that, if it is reasonable to assume that lying entails, as well as a spatial incompatibility task, the inhibition of an automatic (truthful) response and reprogramming of the instructed (deceptive) response, then results should replicate ones found in the classical practice task, that is, participants according to the previous truthful/deceptive task, should show a Simon effect different in magnitude. More specifically, the group that was required to train the incompatible practice (i.e., deceptive responses), even at the linguistic-verbal level, should be able to train and improve the performance in the non-corresponding trials resulting in faster RTs, and consequently in a reduced Simon effect as compared to the control group that was required to train the compatible practice (i.e., truthful responses).

Twenty students participated (1 left-handed; 12 females; mean-age 22 years; mean sd 1.8 years). In the first session true and false sentences were presented at the center of the screen and participants were required to give truthful response (10 participants) or deceptive one (the other 10 participants) pressing the left button for responding "this sentences is true" and the right button for responding "this sentence is false". For example, in response to the true sentence "Sardegna is an Italian island" participants that were instructed to respond truly had to press the left button, while the participants that were instructed to respond deceptively had to press the

right button. On the contrary, in response to the false sentence “Nine is a even number” participants that were instructed to respond truly had to press the right button, while the participants that were instructed to respond deceptively had to press the left button.

In the second session a red or green square were presented to the right or to the left of the midline of the screen. Participants were required to press the right button for the green stimuli and the left button for the red ones. Analysis of the RTs indicated that deceptive responses were slower and showed a Simon effect reduced in magnitude ( $M=2368$  ms; 17 ms of Simon effect) as compared to truthful ones ( $M=1586$  ms; 23 ms of Simon effect).

These preliminary results were successful in replicating the RT lie effect, that is, compared to truthful responses, deceptive responses required greater amount of cognitive resources resulting in delayed RTs (e.g., Hu, Chen & Fu, 2012). Interestingly, the incompatible task practice (i.e., respond deceptively to the sentences) seems to influence the performance in the non-corresponding trials of the subsequent Simon task, showing how a linguistic training could impact a spatial-motor task.

## References

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