Changing impulsive determinants of unhealthy behaviours towards rewarding objects

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Dual-system accounts have become increasingly popular to understand and predict behaviour across a range of domains. They provide a valuable heuristic to explain behaviour, but have also been criticised for being ill-defined (Keren & Schul, 2009). Currently, we will discuss a recent programme of research that employed a dual-system approach to understand health behaviour rather than discussing dual-process models in general. Specifically, bearing on the reflective impulsive model (RIM; Strack & Deutsch, 2004), Hofmann, Friese, and Wiers (2008) present a framework for understanding and predicting health behaviour by distinguishing between a reflective and an impulsive system. The reflective system is a relatively slow and resource-demanding system that can influence behaviour via higher-order mental operations such as reasoning, planning of goal pursuit and inhibiting or overriding pre-potent responses. The impulsive system is a relatively fast system that can unintentionally prepare behavioural impulses upon perception of objects (e.g., chocolate) based on the activation of associations in memory.

One appealing feature of this approach is that it provides an explanatory framework for a wide range of findings that suggest that reflective determinants of behaviour (such as conscious intentions) are more likely to affect behaviour when sufficient cognitive resources are available, and impulsive determinants (such as implicit affective associations or the reward value of objects) are more likely to affect behaviour when these cognitive resources are not available (e.g., under conditions of time pressure or cognitive load; Hofmann et al., 2008). It is important to note, however, that the evidence that is presented by Hofmann et al. to support these conclusions is correlational. In order to draw causal inferences with regard to the contributions of reflective and impulsive determinants in guiding health behaviour, experimental work is needed that manipulates these determinants. This issue especially pertains to the causal influence of impulsive determinants on behaviour, as manipulating impulsive determinants (e.g., the unintentional activation of motor impulses upon perception of rewarding objects) has received only limited attention (see Webb & Sheeran, 2006 for a meta-analysis on causal effects of reflective determinants on behaviour). Such experimental work may provide new

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insight on the causal influence of impulsive determinants on health behaviour, and provide a window to change unhealthy behaviour in new ways. Currently, we outline two ways of changing impulsive determinants of behaviour that may be helpful in reducing unhealthy behaviour upon perception of rewarding objects.

A first approach to manipulate impulsive determinants of health behaviour may be by modifying the reward value of impulse-evoking objects (e.g., cigarettes for smokers, alcoholic beverages for drinkers, tasty high-fat foods). The reward value of an object is a strong motivating force (Custers & Aarts, 2010), and perception of rewarding objects has been shown to prepare motor impulses to obtain the objects unintentionally (e.g., Krieglmeyer, Deutsch, De Houwer, & De Raedt, 2010; Veling & Aarts, in press). Reducing the reward value of objects may be accomplished by associating objects with negative affect (e.g., Aarts, Custers, & Holland, 2007), and avoidance-related negative affect (e.g., fearful facial expressions) in particular (Aarts et al., 2010). Specifically, Aarts et al. (2010) have found that repeatedly presenting an object near fearful facial expressions subsequently decreased participants’ motivation to obtain this object compared to when the object was repeatedly presented near neutral facial expressions. Notably, this decrease in motivation to obtain the object was specific for fearful expressions; angry facial expressions (negative affective signals that are related to both approach and avoidance motivation; Aarts et al., 2010; Carver & Harmon-Jones, 2009) actually increased motivation to obtain the object when the object was perceived as a potential reward that one could obtain. This study thus suggests that it may be possible to decrease the reward value of an object by associating objects with negative affect, but it also reveals that it is important to pay close attention to the motivational direction (e.g., approach vs. avoidance) of negative affect when one creates such associations (see also Houben, Havermans, & Wiers, 2010).

However, by merely changing affective associations impulse-related objects may still prepare action through activation of habitually prepared motor programmes to obtain these objects (e.g., Aarts & Dijksterhuis, 2000). Consequently, it appears worthwhile to test whether unintentionally evoked impulses upon perception of rewarding objects can be prevented more directly. Recent work indicates that this can be accomplished by associating rewarding objects with behavioural stop signals (Veling & Aarts, in press; Veling & Aarts, 2009; Veling, Holland, & van Knippenberg, 2008). A stop signal is a cue in the environment that causes people to inhibit their behaviour by suppressing prepared motor impulses. We recently tested whether repeatedly presenting stop signals near a specific rewarding object is indeed effective in reducing the impulse-evoking quality of this object.

Specifically, thirsty and non-thirsty participants were presented with a bottle of water (a rewarding object for thirsty participants), and this bottle was consistently associated with either go cues or no-go cues that, respectively, required a response or withholding a response (Veling & Aarts, 2009). Next, participants were asked to indicate the size of the bottle of water. Previous work has established that rewarding objects are perceived as larger (e.g., Bruner & Goodman, 1947; Veltkamp, Aarts, & Custers, 2008), possibly because these objects are more relevant for action. We replicated this effect (thirsty participants perceived the bottle as larger than non-thirsty participants), but this effect vanished after repeatedly associating the bottle of water with stop signals (i.e., no-go cues). This result suggests that repeatedly associating rewarding objects with stop signals can modify the impulse-evoking
quality of these objects such that subsequent perception of these objects no longer prepares action to obtain the objects unintentionally (Veling & Aarts, 2009).

In sum, we think that testing the effects of modifying impulsive determinants of behaviour is important to demonstrate the causal influence of impulsive determinants on health behaviour, and that this approach may generate new interventions to reduce occurrence of unintentionally displayed unhealthy behaviours. To date, our research has primarily focused on theoretical questions with regard to changing impulsive determinants of behaviour (e.g., what kind of negative affect can best be used to decrease the reward value of objects; how can stop signals best be used to change the impulse-evoking quality of rewarding objects) that need to be addressed before effective interventions can be developed to change behaviour. Future work may apply these insights to show how affective signals and stop signals can optimally be used to reduce occurrence of unhealthy behaviours, especially in demanding circumstances where impulsive determinants are hypothesised to have the strongest influence on health behaviour (Hofmann et al., 2008).

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References

