



## IMPULSIVITY, INTERFERENCE ON PERCEPTUAL TASKS AND HYPOTHESIS TESTING

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**Summary**—Dickman (1990) proposed two types of impulsive personality, functional and dysfunctional, and it has been suggested that these types are associated with different information processing styles on cognitive decision-making tasks. The aim of the present study was to investigate whether these different cognitive styles would be apparent on two simple perceptual tasks involving abilities to recognize ambiguous figures and find camouflaged figures, and one hypothesis generation task. Results showed that dysfunctional impulsivity was associated only with recognition of fewer ambiguous figures. In contrast, functional impulsivity was associated with superior recognition of the camouflage figures, and was significantly positively correlated with the number of responses generated on the hypothesis generation task. It is argued that these results are broadly consistent with the view that dysfunctional impulsivity is associated with an inability to inhibit competing responses, whereas functional impulsivity is associated with speed of information processing. However, there are indications that, on some tasks, the two tendencies may have moderating effects on each other.

### GENERAL INTRODUCTION

Research into impulsivity has approached the construct in various ways. According to Eysenck and Eysenck's (1963) psychometric studies, impulsivity together with sociability are sub-components of the broader trait of extraversion. However, others (e.g. Plomin, 1976) suggest that impulsivity and sociability represent distinct factors. Other research has focussed on impulsivity as a cognitive style. For example, Kagan (1965), and Kagan, Moss and Sigal (1963) proposed the cognitive style of reflection-impulsivity, based on children's responses on the Matching Familiar Figures Test. According to Kagan, impulsive children respond more quickly and make more errors on the task (Kagan, Rosman, Day, Albert & Phillips, 1964). However, empirical confirmation for an association between a preference for information processing strategies that emphasize speed at the expense of accuracy and an impulsive personality trait has not been definitive (Dickman & Meyer, 1988).

Dickman (1990) found psychometric evidence which may go some way towards explaining this discrepancy. His research suggests that impulsivity may not be associated with a single information processing style. Rather, he found evidence for two types of impulsive personality, using the Dickman Impulsivity Inventory; these were functional impulsives, whose impulsivity usually benefits the individual, and dysfunctional impulsives, who have a tendency to engage in impulsive behaviours which have negative consequences. The internal reliability coefficient of the functional scale was 0.74 and that of the dysfunctional scale was 0.85 ( $N = 477$ ), however, the correlation between the functional and dysfunctional impulsivity scales was relatively low. Both impulsivity measures were associated with sociability and boredom-proneness but they also exhibited different psychometric correlates: whereas dysfunctionality was associated with factors measuring a dislike of jobs requiring careful work and a dislike of planning ahead, functional impulsivity did not correlate with either of these two factors. The patterns of correlations between each type of impulsivity and other personality traits studied by Dickman were also different. Functional impulsivity was more closely associated with enthusiasm (i.e. rathymia), adventurousness and activity, whereas dysfunctional impulsivity was more strongly associated with disorderliness and a lack of concern about hard facts.

Dickman further found that the two types of impulsive personality apparently performed differently on a cognitive figure matching task. Whereas functional impulsives were fast and inaccurate on a task in which it paid to trade off accuracy for speed, the performance of dysfunctional impulsives on the same task was indistinguishable from that of people who scored low on impulsivity

in terms of both speed and accuracy. These findings led Dickman to conclude that the two types of impulsivity may be characterised by two different information processing styles or tendencies rather than a single one.

On the basis of the results from his cognitive figure matching task, Dickman (1990) suggested that functional impulsivity is related to speed of information processing. Thus functional impulsives tend to adopt a rapid response style on cognitive tasks which often makes them error-prone. However, he was not able to specify the precise cognitive correlates of dysfunctional impulsivity.

Further research by Brunas-Wagstaff, Bergquist and Wagstaff (1994) also suggest that functional impulsivity may be related to speed of information processing on a Stroop colour/word interference task (Stroop, 1935). But whereas Dickman's perceptual matching task did not reveal a cognitive correlate of dysfunctional impulsivity, the performance of dysfunctional impulsives was associated with errors on the Stroop task. The Stroop task requires Ss to name the colour of ink in which an incongruent colour-word is printed (e.g. selecting the colour 'green' in response to the word 'blue' printed in green ink). The tendency for dysfunctionals to make errors was not evident on a control colour-word matching task, and dysfunctionality was not associated with speed of information processing on either the Stroop task, or control. Therefore, Brunas-Wagstaff *et al.* concluded that dysfunctional impulsivity may reflect an inability to inhibit competing responses that would only be manifest on tasks which involve an element of interference. Dickman's perceptual matching task involved a straightforward match between two stimuli and involved no interference.

The aim of the present paper was to further investigate the proposed distinction between two functional and dysfunctional impulsive cognitive styles on two perceptual and one hypothesis testing task. It was predicted that functional and dysfunctional impulsivity would be associated with different cognitive strategies on these tasks. More specifically, it was predicted that whereas functional impulsivity would be associated with speed, dysfunctional impulsivity would be associated with a susceptibility to interference. However, as the constructs of functionality and dysfunctionality need not be mutually exclusive, i.e. a single respondent may achieve a high score on either scale, or a high or low score on both scales, performance on the tasks was also examined according to four possible impulsive types.

## EXPERIMENT 1

### *Introduction*

Following from the results of a Stroop interference task, Brunas-Wagstaff *et al.* (1994) concluded that dysfunctional impulsivity may be associated with a susceptibility to interference. However, although the Stroop task is widely held to be a test of interference, i.e. the effect relies on the fact that Ss find it especially difficult to inhibit reading the colour-words (Dyer, 1973), the task as presented to Ss in Brunas-Wagstaff *et al.*'s study also involved a decision-making component. Ss were required to decide which of two colour-word response options presented in white on a black background and displayed to the right or left of a computer screen was consistent with the colour in which a target word in the centre of the screen was displayed. To succeed on the task therefore, Ss needed to match a colour-word printed in a neutral colour (white) to the colour in which the target word was presented. It could thus be argued that the Stroop task placed unusually heavy demands on the processing abilities of dysfunctional impulsives. In other words, it could be the case that dysfunctional impulsives perform badly because they cannot cope with conditions of high cognitive load, rather than because of a simple inability to inhibit competing responses. If this is the case then dysfunctional impulsives should experience little difficulty in inhibiting irrelevant information on a relatively simple perceptual reversal task that involves minimal cognitive processing demands. The aim of Experiment 1 was to test this proposal.

The task in this first experiment involved judgments of ambiguous figures which can be interpreted in two ways (e.g. as a young woman or old woman). These ambiguous stimulus patterns alternate between two appearances upon prolonged observation. Ss are thus able to report an initial interpretation of such stimuli, but given time, most Ss are able to offer a second interpretation for each figure. However, to report the second of the two figures it is necessary to inhibit one's original interpretation of the visual array because only one of the two figures can be perceived at one time

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