



Automatic and nonautomatic processes in dietary restraint: Further evidence for a commonality between food and drug abstinence

Jeffrey M. Brunstrom*, Gemma L. Witcomb

Department of Human Sciences, Loughborough University, Loughborough, LE11 3TU Leicestershire, UK

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Abstract

The deleterious effect of dietary restraint on cognitive performance is now well established. However, recent evidence suggests that this impairment shares characteristics with those found in abstinent drug users. In this study, high ($n=21$) and low-to-medium restrained eaters ($n=41$) completed a reaction-time task, once while imagining their favourite food and once while imagining their favourite holiday. Afterwards, these participants ate lunch and then completed a second set of reaction-time measures. Both before and after lunch, ratings of the vividness of the scenarios were similar across groups. Likewise, the groups produced similar ratings of hunger, thirst, and desire to eat. However, as predicted, performance was significantly impaired in restrained eaters, but only while imagining food, and only before lunch. No impairments were observed in the low-to-medium restrained group. This finding provides further evidence that Tiffany's [Psychol. Rev. 97 (1990) 147] model of drug-related urges can be generalised to dietary restraint. The merits of conceptualising dietary restraint in terms of automatic and nonautomatic processes are discussed, together with suggestions for future research.

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1. Introduction

For some time now, we have known that vigilance is degraded in individuals who are currently dieting to lose weight (Rogers & Green, 1993). These kinds of impairment do not appear to be related to the physiological consequences of calorie restriction (for a review, see Gibson & Green, 2002). Rather, they seem to represent a specific impairment in working-memory capacity. Green, Elliman,

* Corresponding author. Tel.: +44-1509-223048; fax: +44-1509-223940.

E-mail address: J.M.Brunstrom@lboro.ac.uk (J.M. Brunstrom).

and Rogers (1997) found that measures of working-memory span are correlated with ratings of “desire to eat.” On this basis, they suggested that impairments are likely to reflect a failure to allocate attentional resource, rather than a general deficit in resource capacity. Consistent with this idea, Green and Rogers (1998) found that those components of working memory that are believed to process “worries” (the central executive and the phonological loop; Rahee, 1993) are also impaired in current dieters.

Restrained eaters tend to be preoccupied with thoughts concerning food and weight (Herman & Polivy, 1980; Laessle, Platte, Schweiger, & Pirke, 1996). One possibility then is that restraint-related impairments can be appreciated in terms of a simple central-capacity model of divided-task performance (Norman & Bobrow, 1975). By this account, performance becomes degraded on those occasions when the demands of a task, combined with the resource associated with restraint-related cognitions, exceed some upper threshold on available cognitive capacity. One drawback, however, is that this model may be too simplistic. Is it really plausible that restrained eaters experience a continuous unbroken sequence of cognitions relating to food and body weight? Why should restrained eaters be unable to momentarily exclude these extraneous thoughts while they focus their attention on a task? One way to resolve these difficulties may be to argue that food- and weight-related thoughts are not continuous but are triggered by some specific event. Once these thoughts are evoked, they are difficult to ignore. This interpretation is germane to the focus of the present study because it is consistent with recent speculation about the cognition underlying drug urges and cravings (Tiffany, 1990).

According to Tiffany's (1990) cue reactivity model (see also Cepeda-Benito & Tiffany, 1996; Tiffany & Conklin, 2000), over a history of repeated practice, aspects of drug procurement and consumption behaviour become controlled by automatic action schemata. These schemata are not unlike the automatic processes proposed by Norman and Shallice (1985). They can be conceptualised as cognitive “short cuts” that become activated when an individual is exposed to an appropriate “enabling stimulus” (e.g., a shoe). The advantage of automatic schemata is that they can be executed without drawing on attentional resource (e.g., tying a shoelace). In the abstinent user, however, these action schemata remain. This means that when an enabling stimulus is presented, considerable commitment must be recruited from nonautomatic processes in order to inhibit the otherwise inevitable outcome. These nonautomatic activities are manifest as cravings and urges. Many contemporary models suggest that urges are necessary for drug use to occur. What distinguishes Tiffany's approach is that drug use is regarded as automatic, and urges are essentially nonautomatic cognitions that either facilitate or inhibit schema-driven behaviour. One of the advantages of Tiffany's conceptualisation is that it furnishes specific predictions that can be tested empirically.

The extent to which a task consumes processing capacity can be inferred by considering whether or not it influences performance in a second, concurrent, task (e.g., Posner, 1978; and more recently, Brunstrom & Higgs, 2002). For example, if a task requires attention, then performance in a concurrent simple reaction time (SRT) task will be degraded relative to occasions when reaction times are elicited in isolation—The level of attention is assumed to be related to longer reaction times. Green, Rogers, and Elliman (2000) applied this logic to test whether Tiffany's cue reactivity model might generalise to both drug and food abstinence. They reasoned that if cognitive impairment results from the activation of automatic schemata, then it will be more pronounced when concurrent enabling stimuli are food- rather than non-food-related. Following similar studies of nicotine and alcohol addiction (Bradizza, Lisman, & Payne, 1995; Cepeda-Benito & Tiffany, 1996), Green et al. (2000) tested this idea by asking participants to perform an SRT task twice, once while imagining their favourite food

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