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Research report

Time orientation and eating behavior: Unhealthy eaters consider immediate consequences, while healthy eaters focus on future health ☆

Fania C.M. Dassen *, Katrijn Houben, Anita Jansen

Department of Clinical Psychological Science, Maastricht University, Maastricht, The Netherlands

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ABSTRACT

Time orientation could play an important role in eating behavior. The current study investigated whether eating behavior is associated with the Consideration of Future Consequences scale (CFC). Specifically, it was examined whether unhealthy eaters consider the future less and are more concerned with immediate gratification. A related measure of time orientation is delay discounting, a process by which a reinforcer becomes less valuable when considered later in time. Recent research argues that the relation between time orientation and health behaviors is measured best at a behavior-specific level. In the current study, we explored the relationships between CFC and discount rate – both general and food-specific – and their influence on healthy eating. Participants with ages 18 to 60 ($N = 152$; final sample $N = 146$) filled in an online questionnaire consisting of the CFC, a food-specific version of the CFC (CFC-food), the Monetary Choice Questionnaire (MCQ) and an adapted MCQ version with snack food as a reinforcer. Self-reported healthy eating was positively related to the future subscale ($r = .48$, $p < .001$) and negatively to the immediate subscale of the CFC-food ($r = -.43$, $p < .001$). The general CFC and discount rate (MCQ and MCQ-snack) were not related to healthy eating (all $p > .05$). In order to predict behavior, measurements of time orientation should thus be tailored to the behavior of interest. Based on current results, shifting one's concern from the immediate consequences of eating to a more future-oriented perspective may present an interesting target for future interventions aimed at promoting healthy eating and reducing overweight.
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Introduction

Future-oriented thinking could be conducive to a healthier lifestyle. Adopting a healthy lifestyle poses a conflict between the short-term and long-term benefits of a person's actions (Joireman, Shaffer, Balliet, & Strathman, 2012). Consuming highly palatable unhealthy foods has immediate pleasurable results, whereas healthy eating may be less immediately rewarding, but offers benefits in the long run. An important source of self-control failures could be a tendency to give more importance to these short-term implications (e.g., taste, satiation), relative to long-term implications (e.g., health and body weight) (Liberman & Trope, 2008). Shifting the temporal focus away from these immediate benefits toward the future outcomes seems necessary in order to make healthy choices (Hall & Fong, 2007). The concept of consideration of future consequences (CFC) attempts to measure differences in the degree to which individuals consider the potential distant outcomes of their current behaviors and to what extent they are influenced by these potential outcomes (Strathman, Gleicher, Boninger, & Edwards, 1994). Present-oriented individuals tend to focus on the immediate consequences of their behavior, whereas future-oriented individuals give more importance to the future consequences, even if there are immediate costs (Strathman et al., 1994).

CFC has been linked to many health behaviors. Studies indicate that individuals with a future orientation are more likely to quit smoking (Kovač & Rise, 2007), show more dietary control (Piko & Brassai, 2009) and are more likely to exercise (Adams & Nettle, 2009). According to recent research, CFC-immediate and CFC-future are empirically distinguishable predictors, instead of CFC being seen as one continuum (Adams, 2012; Arnocky, Milfont, & Nicol, 2013; Joireman, Balliet, Sprott, Spangenberg, & Schultz, 2008; Joireman et al., 2012; Petrocelli, 2003; Rappange, Brouwer, & van Exel, 2009; Toepoel, 2010). Specifically, the CFC-immediate subscale comprises concern with immediate, short-term consequences of behavior (e.g., satisfying immediate concerns or needs) while the CFC-future subscale comprises concern with future, long-term consequences of behavior (e.g., achieving future outcomes or goals). Both subscales seem to relate differently to behavior. For example, Joireman et al. (2012) found healthy eating and exercising to be related only to the future subscale, which was in line with a

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* Corresponding author.
E-mail address: f.dassen@maastrichtuniversity.nl (F.C.M. Dassen).

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promotion orientation in which individuals focus on pursuing positive future outcomes, whereas no relationship with the immediate subscale was found.

A healthy lifestyle encompasses many different types of behavior, and time orientation does not appear to be uniform across behaviors. Recently, van Beek, Antonides, and Handgraaf (2013) found eating behavior to be predicted best by a food-specific version of CFC, and exercising behavior to be predicted by CFC for exercising. A study by Hall, Fong, and Cheng (2012) is consistent with these results, showing that only a behavior-specific time perspective measurement was predictive of self-management behavior initiation among individuals newly diagnosed with Type 2 diabetes. Therefore it is hypothesized that behavior-specific time orientation measures are more predictive of actual behavior, and therefore more useful than commonly used general measures of time perspective.

The concept of CFC thus tries to capture the relative weight one gives to immediate, short-term implications of behavior versus the future, long-term implications. As such, this concept seems similar to the concept of delay discounting, which entails giving future outcomes less weight relative to more immediate outcomes (Frederick, 2006). CFC and discount rate are both related to how an individual perceives tradeoffs between the present and the future. Delay discounting reveals how the value of a reinforcer decreases as the delay to the receipt of the reinforcer increases, and a higher discount rate is indicative of a higher impulsivity (Ainslie, 1975). Research has shown that smaller immediate rewards are preferred over greater delayed rewards. Inability to delay gratification in a delay discounting task seems to reflect impulsive eating: the behavioral difficulties in overcoming short-term rewards of eating unhealthy food, despite the greater long-term benefits to health that could be obtained if immediate gratification is resisted. Research has shown that higher discount rate (e.g. quicker devaluation of the reinforcer when received later in time) combined with high food reward sensitivity was indeed predictive of a higher caloric consumption in a laboratory taste test (Appelhans et al., 2011; Rollins, Dearing, & Epstein, 2010). Earlier studies also show evidence for a relationship between body mass index and delay discounting (Jarmolowicz et al., 2014; Weller, Cook III, Avsar, & Cox, 2008), although other studies failed to find this association (Nederkoorn, Smulders, Havermans, Roefs, & Jansen, 2006; Rasmussen, Lawyer, & Reilly, 2010).

Most discounting research has been conducted on choices regarding money. However, for other reinforcers, research suggests stimulus-specific discounting patterns. Smokers, for example, discount cigarettes more than non-smokers (Field, Santarcangelo, Sumnall, Goudie, & Cole, 2006), and alcoholics discount alcohol more steeply than non-alcoholics (Petry, 2001). In some cases there is little or no correlation between the discounting of different types of reward, indicating that these reward types are associated with different types of impulsivity (Green & Myerson, 2013; Jimura et al., 2011). By showing different discount rates for different outcomes, it seems that how an individual discounts one outcome does not necessarily indicate how that individual will discount all types of outcome (Weatherly & Derenne, 2011; Weatherly & Ferraro, 2011; Weatherly & Terrell, 2010). Given that discount rates can differ within and among individuals across various types of rewards (e.g. cigarettes, drugs, and alcohol), we wonder whether unhealthy eaters respond uniquely to food, such that they discount food more steeply than healthy eaters. Similar to CFC, discount rate is probably measured best with behavior-specific reinforcers in order to predict unhealthy eating. Indeed, there is some research to support this notion; Rasmussen et al. (2010) found discounting pattern for food to be related to body fat percentage, whereas a similar pattern in discount rate for money was not found. However, their design did not allow the direct comparison of food and money as the units and time intervals used for the delays were qualitatively different.

Because the constructs of time orientation and delay discounting are conceptually similar, the literature often uses these terms interchangeably. The overlap between these constructs is apparent: steep delay discounting seems analogous to a present-moment orientation, choosing immediate pleasure over long-term reward. However, despite shared association and conceptual similarities, studies which investigated both constructs show that correlations between CFC and delay discounting measures are small (Adams & Nettle, 2009; Daugherty & Brase, 2010; Joireman et al., 2008), indicating that these constructs, although related, are not the same. Therefore, it is important to further investigate the relationship between time perspective and discount rate, and their relative influence on specific behavior, namely eating. The goal of the current study, therefore, was threefold. First, the relationship of CFC and the food-specific version of the CFC with eating behavior was assessed. Since consideration of future consequences is thought to be measured best at a behavior-specific level (Hall et al., 2012; van Beek et al., 2013), it was hypothesized that healthy eating would be better predicted by CFC-food rather than CFC in general. Second, it was examined whether eating behavior is more strongly related to food-specific discount rate compared to discount rate for money (general discount rate). It was hypothesized that less healthy eating would be particularly related to elevated discounting patterns when choices were about highly palatable snack food. Third, the combined effects of discount rate and CFC on healthy eating were investigated. Individuals who do not tend to foresee future consequences, probably discount steeper and make the choice for immediate rewards more often. On the contrary, individuals who generally consider the long term consequences of their behavior will probably also discount less, reflecting a lower impulsivity. The relation between CFC and discount rate was hypothesized to be strongest for the behavior-specific measurements. These possibilities were therefore examined in the present study.

Methods

Participants

A sample of 152 Dutch speaking participants (118 females) between the ages of 18 and 60 was recruited for this study. One participant was excluded from analyses because of missing data in the questionnaires, resulting in a final sample of 151 participants. The mean age of participants was 31.5 years ($SD = 11.52$). The majority of the sample (77%) had completed, or was currently completing, a bachelor's degree or higher. Mean BMI was 25.9 ($SD = 5.9$). The link to the online questionnaire was spread via social media, forums about lifestyle, dieting and cooking, and via the student recruitment system for psychology students of the University of Maastricht. The study was approved by the Ethical Committee of the Faculty of Psychology and Neuroscience at Maastricht University.

Measures

Consideration of Future Consequences scale and Consideration of Future Consequences scale-Food

In order to measure time orientation, participants filled in the 14-item Consideration of Future Consequences scale (CFC; Joireman et al., 2012). The CFC consists of the Immediate- and Future-subscale, both consisting of 7 items. Joireman et al. (2012) recently added 2 items to the original 5-item Future-subscale to improve the internal consistency. Participants indicate their agreement with the statements on a 7-point Likert scale, ranging from 1 = "totally disagree" to 7 = "totally agree." To determine a total score, items of the immediate-subscale were reverse scored and the mean of all items was taken, with higher overall scores indicating greater concern

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