



Personality, time-of-day preference, and eating behavior: The mediational role of morning-eveningness [☆]



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ARTICLE INFO

Article history:

Received 7 October 2014

Received in revised form 14 November 2014

Accepted 13 December 2014

Available online 2 January 2015

Keywords:

Big Five personality traits

Time-of-day preference

Eating behavior

Chronotype

Dietary habits

Three-Factor Eating Questionnaire

Morningness–eveningness

Five-factor model

ABSTRACT

Although prior research has established that eating behaviors are related to both the Big Five personality traits and time-of-day preference, no research has directly examined if time-of-day preference mediates personality differences in eating behavior. We directly tested this model by assessing participants' ($N = 279$) Big Five personality traits, time-of-day preference, and three-factors of eating (i.e., restrained eating, uncontrolled eating, and emotional eating) using validated questionnaires. Mediation analyses revealed that time-of-day preference partially mediated the relationship between the personality factors (conscientiousness, neuroticism, and extraversion) and eating behavior, primarily uncontrolled eating. These results indicate that time-of-day preference, in part, accounts for personality differences in eating behavior. This emphasizes the need to assess time-of-day preference when examining the relationship between personality and health-related behaviors.

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1. Introduction

The wide variety of routine behaviors that individuals exhibit can often be accounted for by individual differences, such as the Big Five personality factors. For this reason, personality is often examined as a predictor of health-related outcomes, such as eating behavior (e.g., Bogg & Roberts, 2004; Provencher et al., 2008). Another individual difference that is also frequently associated with eating behavior is time-of-day preference (e.g., Sato-Mito et al., 2011; Schubert & Randler, 2008). Time-of-day preference is conceptualized as an individual's peak performance time when he or she is at his or her most capable, physically and cognitively. Although both of these individual differences are related to eating behavior, no research has examined if time-of-day preference accounts for personality differences in eating behavior. Thus, the current research extends recent work (Walker, Kribs, Christopher, Shewach, & Wieth, 2014) by examining this mediational model.

1.1. Personality and eating behavior

A number of studies have documented the relationship between the Big Five personality traits and eating behavior. Research consistently shows that conscientiousness is both positively associated with healthy eating behavior, such as restrained eating (Elfhag & Morey, 2008; Provencher et al., 2008), and negatively associated with unhealthy eating behavior, such as emotional eating and external eating (i.e., eating in response to cues, such as sight and smell; Elfhag & Morey, 2008; Heaven, Mulligan, Merrilees, Woods, & Fairouz, 2001). Conversely, the trait of neuroticism tends to positively predict unhealthy eating behavior, such as emotional eating and external eating (Heaven et al., 2001; Provencher et al., 2008), and it negatively predicts restrained eating (Elfhag & Morey, 2008). Research has also demonstrated that extraversion is negatively associated with emotional eating and positively associated with restrained eating (Elfhag & Morey, 2008). Likewise, studies have shown that openness is positively related to restrained eating (Elfhag & Morey, 2008; Heaven et al., 2001) and agreeableness is negatively related to external eating (Provencher et al., 2008).

1.2. Personality and time-of-day preference

Researchers have frequently examined how personality factors relate to time-of-day preference. It is well established that more

[☆] Notes: This work was supported by a grant from the Hewlett-Mellon Fund for Faculty Development at Albion College, Albion, MI.

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conscientious people tend to have more of a morning preference (Adan et al., 2012; Tsaousis, 2010). Agreeableness also tends to be related to morningness, but to a lesser extent (Tsaousis, 2010). Conversely, neuroticism is often shown to be associated with an evening preference (Adan et al., 2012). Although research on the remaining personality traits (i.e., extraversion and openness) appears to be less consistent, a recent review of the literature suggests that they are generally unrelated to time-of-day preference (Adan et al., 2012). In the current study we focus on how an individual's personality influences their time-of-day preference, similar to Adan et al. (2012) and Tsaousis (2010). Although the opposite relationship is theoretically plausible, we focus on the impact of personality on time-of-day preference largely because time-of-day preference is substantially heritable. Genetics account for approximately 40% to 50% of the variability in time-of-day preference (e.g., Hur, 2007), while the other 50% to 60% is a function of other individual differences, such as personality (Walker et al., 2014).

1.3. Time-of-day preference and eating behavior

Several studies have established that individuals with a morning preference tend to have healthier eating behaviors. For instance, morningness positively predicts restrained eating and negatively predicts uncontrolled eating, perceived hunger (i.e., high level of perceived hunger), and Body Mass Index (BMI; Schubert & Randler, 2008). Moreover, people with an evening preference tend to eat for longer periods of time, eat larger portions, skip more meals, and watch TV more frequently while eating (Lucassen et al., 2013; Meule, Roeser, Randler, & Kübler, 2012; Sato-Mito et al., 2011).

Not surprisingly, the relationship between time-of-day preference and eating behavior appears to be embedded in human biology (Kanerva et al., 2012). Circadian rhythms can dictate when one feels hungry (Mendoza, 2007), and these rhythms also manifest in time-of-day preference. The hurried pace of modern US society is not set up to accommodate the circadian rhythms of some people, especially those with an evening preference. Evening people often have sleep cycle disruptions due to changes in their sleep schedule during the workweek when they must rise before their preferred time (Roenneberg et al., 2007). Research has shown that these disruptions can negatively impact one's health (e.g., increased appetite and obesity; Knutson, Spiegel, Penev, & Van Cauter, 2007; Patel & Hu, 2008). Thus, this biologically-based connection between time-of-day preference and eating behavior suggests that time-of-day preference may account for personality differences in eating behavior.

1.4. The current study

Existing research has established relationships between personality and eating behavior and time-of-day preference and eating behavior. However, to our knowledge, no research has examined a model that includes time-of-day preference as a potential mediator of the relationship between personality and eating behavior. To test this model, participants completed a 60-item personality questionnaire (Costa & McCrae, 2008), the Morning-Eveningness Questionnaire (Horne & Östberg, 1976), and the Three-Factor Eating Questionnaire (Karlsson, Persson, Sjöström, & Sullivan, 2000).

Consistent with previous research, we hypothesized that conscientiousness, extraversion, agreeableness, and openness would positively predict healthy eating behavior (restrained eating) and negatively predict unhealthy eating behavior (uncontrolled eating and emotional eating). Conversely, we predicted that neuroticism would positively relate to unhealthy eating behavior and negatively relate to healthy eating behavior. Also consistent with existing research, we predicted that morning people would express

healthier eating behavior than evening people. However, unique to the present research, we hypothesized that time-of-day preference would mediate the relationship between personality and eating behavior. Specifically, we expected that conscientiousness and agreeableness would negatively predict uncontrolled eating and emotional eating (and positively predict restrained eating), but that these relationships would be mediated by time-of-day preference. Because extraversion and openness are not typically related to time-of-day preference, we anticipated these models would be nonsignificant. We also believed that the positive relationship between neuroticism and both uncontrolled eating and emotional eating (and negative relationship with restrained eating) would be mediated by time-of-day preference (see Fig. 1 for the general mediation model). We believed that these combined findings would demonstrate the mediational role of time-of-day preference in the relationship between personality and eating behavior.

2. Method

2.1. Participants

We recruited a sample of 279 (151 men and 128 women) participants through Amazon's Mechanical Turk worker pool (<https://www.mturk.com/>), and they received \$1.50 for participation in this study. Because of institutional regulations, participation was limited to U.S. workers only. Utilizing this population for psychological research has yielded a more demographically diverse sample than the typical undergraduate population, while still maintaining the reliability of data collected via traditional methods (Buhrmester, Kwang, & Gosling, 2011). Prospective participants learned that they would be completing a series of individual difference measures. They completed all measures in one 30-min period. Participants ranged in age from 18 to 82 years ($M = 34.08$, $SD = 11.45$) and had an average BMI of 26.23 ($SD = 6.92$).

2.2. Materials and procedure

2.2.1. NEO-FFI-3

Participants first completed Costa and McCrae's (2008) 60-item NEO-FFI-3 measure of the Big Five personality factors, conscientiousness (e.g., "I work hard to accomplish my goals"; $\alpha = .90$), agreeableness (e.g., "I generally try to be thoughtful and considerate"; $\alpha = .83$), extraversion (e.g., "I like to have a lot of people around me"; $\alpha = .88$), openness (e.g., "I have a lot of intellectual curiosity"; $\alpha = .83$), and neuroticism (e.g., "I often feel tense and jittery"; $\alpha = .92$). All responses were made on a 1 (*strongly disagree*) to 5 (*strongly agree*) scale. We averaged the 12 items for each factor to form a score for that factor.

2.2.2. Morning-eveningness questionnaire

Participants then completed Horne and Östberg's (1976) Morning-Eveningness Questionnaire (MEQ) to measure time-of-day preference. The MEQ is a 19-item measure that is the most

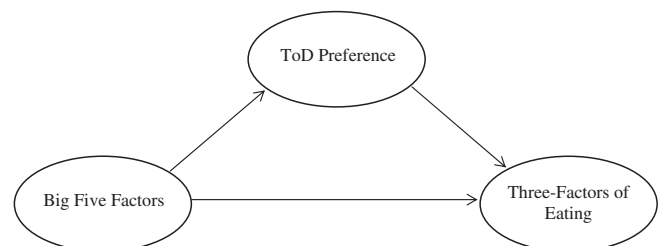


Fig. 1. Time-of-day (ToD) preference mediating the relationship between the Big Five personality factors and the three-factors of eating.

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