

Determinants of adolescent bicycle use for transportation and snacking behavior

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Abstract

Background. The prevalence of obesity has reached epidemic proportions in many countries and is largely due to behavioral factors that disrupt the energy balance. The purpose of the study was to test how well our conceptual model, combining features from the Theory of Planned Behavior and the Theory of Triadic Influence, explained two behaviors related to the energy balance, namely bicycle use for transportation and snacking behavior in a Dutch adolescent sample.

Methods. Data was gathered in an 1997 cross-sectional sample of adolescents ($n = 3,859$; mean age 14.8 years SD = 1.6) on snacking behavior, bicycle use, demographics, and potential environmental, cognitive and psychological determinants. Data was analyzed using bivariate correlations, multiple linear and binary logistic regression analyses.

Results. Less snacking behavior was associated with female gender and a more positive intention, a more positive attitude, and stronger perceived behavioral control towards restricting snacking. Students who used their bicycle for transportation were more likely to attend secondary education, to be native Dutch, to go to school in a less-urbanized city, to be younger, had a more positive intention and perceived stronger behavioral control and subjective norm towards bicycle use.

Conclusions. The inclusion of environmental factors increased our understanding of bicycle use for transportation and snacking behavior in adolescents. The environmental factors are suggested to be taken into account in interventions aimed at changing these behaviors in more healthy directions.

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Introduction

The prevalence of obesity is increasing rapidly in developed and developing countries [1–3] and presents a major health risk because of its association with a wide range of conditions such as type 2 diabetes, heart disease, hypertension, osteoarthritis, some cancers, disability for work, and premature death [4,5]. Obesity also impacts on the number of life-years [6]. There is evidence for increasing trends of

overweight and obesity in children and adolescents in the United States and Europe, including the Netherlands [7–14]. Childhood and adolescent obesity is an important determinant of adult obesity [15–17] and is associated with age-specific psychosocial problems such as teasing, poor self-image, emotional problems, stereotyping, and distress [18–22]. Since the rise in obesity prevalence has occurred within a limited number of decades, genetic factors are not likely to be the main cause of its increasing prevalence [23]. Obesity is the result of a positive energy balance in which the energy intake (from the diet) exceeds energy expenditure (from physical activity) over a longer period of time. Since most obesity treatment programs fail to achieve long-term results, a stronger focus on prevention seems necessary [24,25].

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Various energy balance related behaviors have been identified, such as regular physical activity [25] and the consumption of fiber [26], but also the consumption of energy dense foods [26], large portion sizes [27–29], and engaging in an inactive life style [30–32]. In order to develop effective weight gain prevention interventions, it is necessary to have insight into the determinants of behaviors related to the energy balance. Health behaviors, including energy balance related behaviors, are usually studied using social-cognitive theories and one of the most frequently used is the Theory of Planned Behavior [33,34]. This theory postulates that a particular behavior can be predicted from the intention to perform this behavior. The intention, in turn, can be predicted from three main psychosocial or proximal factors related to that behavior, namely attitude, subjective norm, and perceived behavioral control. A person's attitude towards a specific behavior is a result of their beliefs about the consequences of that behavior and the person's evaluation of those beliefs. The subjective norm consists of a person's belief about what important others think about this person performing this behavior. Perceived behavioral control is a result of beliefs concerning access to the necessary resources and opportunities to perform the behavior successfully, weighted by the power of each factor. Apart from its influence on behavioral intention, perceived behavioral control is also assumed to influence behavior directly [34]. Ajzen [35] and Ajzen and Fishbein [36] point out that attitude, subjective norm, and perceived behavioral control can be accurately assessed through direct questions, if the underlying beliefs are not the focus of the study. Attitude can be directly assessed through questions that ask respondents to evaluate the behavior under study on, for instance, a good–bad scale and a pleasant–unpleasant scale, while subjective norm can be directly assessed by asking a person if important others

around him or her believe he or she should engage in the behavior under study. Perceived behavioral control can be directly assessed by asking a person about his or her perception of the extent to which the behavior under study is easy or difficult and the individual's perception of his or her abilities to succeed in performing the behavior. Various studies have shown that the above-mentioned proximal factors have considerable value in explaining and predicting health-related behaviors [37], including energy balance related behaviors [38,39].

Several potential additional “external” or distal determinants of energy balance related behaviors have recently been proposed, such as environmental influences [40–42], parenting styles [43], ethnicity [44,45], gender, and psychological factors [43]. According to the Theory of Planned Behavior [35], these distal variables are thought to have an effect on behavior through the three proximal variables and intention. However, the Theory of Planned Behavior does not focus on these distal variables. A theory that does is the Theory of Triadic Influence [46], which states that distal determinants of health behaviors can be divided into three types of influence, namely the cultural environment, the social environment, and biological and personality factors. Cultural factors represent the broad macro-environment, including factors such as religion and ethnicity. The social situation represents the immediate micro-environment, including influences such as family structure, parenting styles, and factors relating to the physical environment. Biological and personality factors represent stable intra-personal influences, originating in inherited dispositions (gender, age) and personality characteristics. Our conceptual research model (see Fig. 1) combined the Theory of Planned Behavior with the more distal factors of the Theory of Triadic Influence.

The purpose of the current study was twofold. First, we tested how well our conceptual model explained snacking

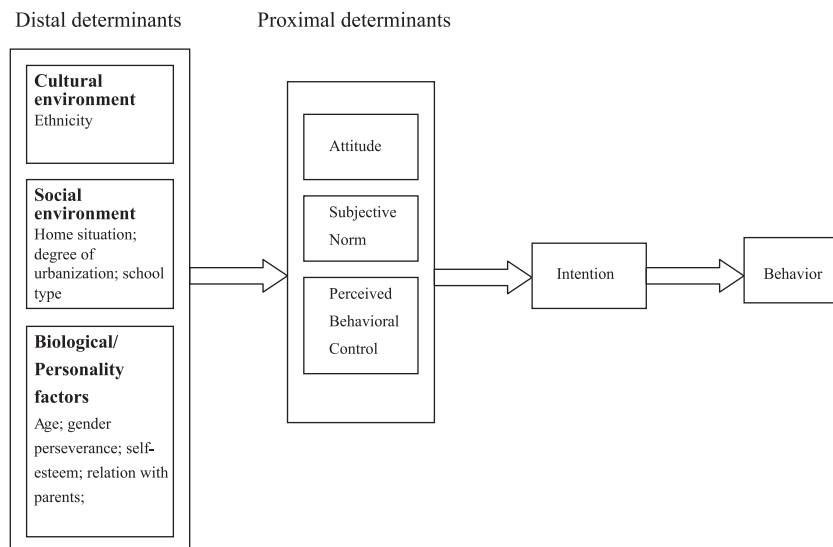


Fig. 1. Conceptual research model.

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