



Adolescent impulsivity and soft drink consumption: The role of parental regulation



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ABSTRACT

The present study aimed to explore the process in which impulsivity might influence soft drink consumption in adolescents, addressing potential mediating effects of perceived parental regulation regarding unhealthy eating. A cross-sectional survey was performed among 440 13–15-year-olds in Eastern Norway. The survey questionnaire included measures of impulsivity, six types of maternal and paternal regulation (as perceived by the adolescents), and consumption of sugar-sweetened beverages (SSB). Parallel multiple-mediator analyses were performed to reveal potential mediating effects of perceived parental regulatory behaviors on the association between adolescent impulsivity and SSB consumption. Separate models were run for maternal and paternal regulation. Results from our model analyses (both maternal and paternal models) indicated that all the six measured parental regulatory behaviors jointly acted as mediators on the association between adolescent impulsivity and SSB consumption. However, only perceived maternal and paternal legitimacy of regulation showed a unique contribution to the mediated effect. This finding suggests that adolescents' perception of parental legitimate authority is of particular importance in explaining the relationship between impulsivity and unhealthy eating behaviors in adolescents. Future nutrition interventions targeting adolescents and their parents should take personal factors such as adolescents' level of impulsivity into account. Ultimately, what may be an appropriate approach to impulsive individuals and their parents may diverge from what may be an appropriate approach to less impulsive individuals and their parents.

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1. Introduction

Socio-cognitive models such as the Theory of Planned Behavior (TPB) (Ajzen, 1991), the Attitude-Social influence-Efficacy (ASE) model (De Bruijn, Kremers, de Vries, van Mechelen, & Brug, 2007) and other theories of reflective decision-making, have been quite successful in explaining health behaviors including (un)healthy eating (Baranowski, Cullen, Nicklas, Thompson, & Baranowski, 2003; Conner & Armitage, 2006). However, these theories do not explain the more automatic or impulse driven decision-making processes which are often involved in unhealthy behaviors

(Honkanen, Olsen, Verplanken, & Tuu, 2012). In fact, several variables, which are not included in the socio-cognitive models, are found to be related to consumption of unhealthy food items, for instance emotional eating (Newman, O'Connor, & Conner, 2007; Wallis & Hetherington, 2009), stress (Cartwright et al., 2003; Conner, Fitter, & Fletcher, 1999; O'Connor & O'Connor, 2004), concurrent activities such as television viewing (Bellisle, Dalix, & Slama, 2004; Snoek, van Strien, Janssens, & Engels, 2006) and tempting stimuli (Ouweland & Papies, 2010; Papies & Hamstra, 2010). The relationship between such variables and unhealthy eating is often complex, as variables may appear as predictors, mediators or moderators, and vary in salience across studies (Honkanen et al., 2012).

Impulsivity has been defined as the tendency to act without thinking, or as a predisposition toward rapid, unplanned reactions

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to internal or external stimuli without regard to potential negative consequences of these reactions to self or others (Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001). Hence, impulsivity represents a counterpart to the reflective and deliberate behaviors predicted by socio-cognitive models. Young children (infants and toddlers) have been characterized as impulsive and emotion driven, with little ability to delay gratification and insensitive to reason and reality (Mischel, Shoda, & Rodriguez, 1989). In other words, young children have a lack of self-control and a lower self-regulatory capacity than older individuals. Consequently, parents play an essential role in teaching them self-control and self-regulation skills (Yang, Kim, Laroche, & Lee, 2014). As a matter of fact, a multitude of studies have shown that parenting practices, which are specific behaviors defined by specific socialization goals (Darling & Steinberg, 1993), are undoubtedly associated with the development of self-regulatory capacity in children (Avakame, 1998; Finkenauer, Engels, & Baumeister, 2005; Karreman, van Tuijl, van Aken, & Deković, 2008; Valiente, Lemery-Chalfant, & Reiser, 2007). When the child reaches adolescence, a disjoint between impulsive/emotional drives and self-control may again be apparent because of the neurobiological changes that occur during this critical developmental period of life (Pechmann, Levine, Loughlin, & Leslie, 2005).

Traditionally, impulsive tendencies in youth have been linked to risk behaviors such as substance use (including cigarette smoking and alcohol consumption), gambling and high risk sexual behavior (Donoghue, 2001). More recently, unhealthy behaviors such as poor diet and lack of exercise have also been associated with impulsivity in adolescents (Wills, Isasi, Mendoza, & Ainette, 2007). Moreover, a recent meta-analytic review performed by Thamocharan, Lange, Zale, Huffhines, and Fields (2013) shows that obese youth tend to be more impulsive than their lean peers. As stated by Nederkoorn, Braet, Van Eijs, Tanghe, and Jansen (2006), it makes sense to assume that impulsive individuals are less able to retain control over eating behavior, and thus will be more inclined to give in to temptations of palatable, high caloric foods and beverages, resulting in excess weight gain. However, research examining the role of impulsivity in pediatric eating behavior is scarce (Thamocharan et al., 2013). Food items that have been associated with obesity, especially in youth, include sugar-sweetened beverages (SSB) (Basu, McKee, Galea, & Stuckler, 2013; Grimes, Riddell, Campbell, & Nowson, 2013; Moreno & Rodríguez, 2007; Mrdjenovic & Levitsky, 2003; Vartanian, Schwarz, & Brownell, 2007). In Norway, which is the setting for the current study, there seem to have been a recent decrease in SSB consumption among 11–13-year-olds (Stea, Øverby, Klepp, & Bere, 2012). However, previous Norwegian research has reported a considerable energy intake from added sugar and SSB in children and adolescents (Øverby, Lillegaard, Johansson, & Andersen, 2004). What is more, soft drink consumption is shown to track from childhood to adolescence (Totland et al., 2013), and further into adulthood (Kvaavik, Andersen, & Klepp, 2005). Given the links between youth impulsivity and obesity, and between SSB consumption and obesity, it seems important to identify factors that may contribute to an increased understanding of the processes underlying the associations between personal characteristics such as impulsivity and unhealthy dietary behaviors such as SSB consumption in adolescents. Understanding these processes, and acknowledging that adolescence is a critical period in the development of unhealthy eating behaviors (Striegel-Moore & Bulik, 2007), are imperative to develop effective interventions tailored to this particular group of the population. Moreover, the general tendency of increased impulsivity, and hence, an increase in potential harmful behaviors (including unhealthy eating) in adolescence, highlights the importance of appropriate parental guidance and regulation also at

this developmental stage.

It is well known that adolescence is characterized by a gradual shift from parental to peer influence (Erikson, 1963). Thus, during adolescence parental influence over food choice has to compete with the influence from advertising and peer pressure (Shepherd & Dennison, 1996). Eating behavior is (as many other types of behaviour) deeply linked to the construction and expression of identity both at a personal and a social level (Bisogni, Connors, Devine, & Sobal, 2002; Vartanian, Herman, & Polivy, 2007), and particularly in this phase of life it fulfills a function of self-expression (Guidetti & Cavazza, 2008). However, the eagerness of adolescents to take over responsibility for food choice is not necessarily matched with their ability to make healthy food decisions. Adolescents have a reputation for unhealthy eating (Cavadini et al., 1999; Story, Neumark-Sztainer, & French, 2002), and interventions directed towards this group of the population have had moderate success (Davis et al., 2000; Klepp et al., 2005). Furthermore, research has found that adolescents understand at an abstract level the (un)healthiness of foods, but have limited concern about future health (Bissonette & Contento, 2001; Brown, McIlveen, & Strugnell, 2000). Although peer influence is significant, adolescents are, nevertheless, strongly influenced by their parents' attitudes and behaviors (Story et al., 2002). As primary socialization agents, parents are gatekeepers of their children's dietary behaviors (Birch & Fisher, 1998) – at least as long as they are living at home.

Research has shown that parents use a variety of food-related parenting practices to influence their children's food intake (Birch & Davidson, 2001; Blissett, 2011; Patrick & Nicklas, 2005). Many of these practices are aspects of control over child eating, such as food restriction and pressure to eat, and may therefore be termed *controlling food parenting practices*. Although controlling food parenting practices seem to be widely used by parents in an attempt to secure a well-balanced diet and a healthy weight status for their children (Faith, Scanlon, Birch, Francis, & Sherry, 2004), some studies have indicated that the use of such practices may have negative consequences for children's weight trajectories by disrupting self-regulation of food-intake (Birch & Fisher, 1998; Farrow & Blissett, 2008; Johnson & Birch, 1994; Orrell-Valente et al., 2007). Additionally, previous experimental research on young children have suggested that the use of restrictive food parenting practices may increase the appeal of the restricted food and lead to overconsumption in situations where restrictions are removed (Birch, Fisher, & Davidson, 2003; Fisher & Birch, 1999). However, there are also studies reporting no association, or even a negative association, between parental food restriction and young children's eating and/or weight (Campbell et al., 2010; Carnell & Wardle, 2007; Powers, Chamberlin, van Schaick, Sherman, & Whitaker, 2006). Larsen et al. (2015) suggest that the interaction between a child's characteristics (e.g. impulsivity) and the home food environment (including various food parenting practices) can be regarded as a dual process, where parents act as the “frontal lobes” of their child suppressing unhealthy dietary behaviors. However, as children grow older, they are exposed to a wider spectrum of influences, without the parents being present to guide them. Thus, if parents (through their parenting practices) can help their children develop self-regulatory skills, including self-control, the children will be equipped with important tools to steer their behaviors and responses in a desirable direction, and thus overcome undesirable genetic, peer and other social influences during the life course (Sanders & Mazzucchelli, 2013).

There is a line of research on parenting based on the Self-Determination Theory (SDT) (Ryan & Deci, 2000), which is a general theory adapted from the field of motivational psychology (Grolnick, Deci, & Ryan, 1997; Soenens & Vansteenkiste, 2010).

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