Instagram food influencers: threat or opportunity?

Determining the impact of social media influencers' food related content on Flemish 12-18 year old adolescents' eating outcomes: An intervention

Katoo Derks

r0721664

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Supervisor: Prof. Dr. Tim Smits
Reporter: Laura Vandenbosch
Counselor: Yara Qutteina
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Table of contents

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Abstract

This thesis assed the impact of Flemish adolescents' exposure to Instagram influencers' food content (core or non-core) on their subsequent food intake, attitudes, and norms. It also studied the possible mediating role of food literacy between these effects and the potentially moderating role of identification with these influencers.

To this end, 323 Flemish adolescents took part in a two week intervention. They were randomly assigned to one of four influencer conditions in a two (core vs. non-core influencers) by two (high vs. low identification potential) experimental design and asked to follow this group of influencers for the duration of the intervention. The intervention was preceded and followed by interview meetings in which participants filled out a questionnaire.

The data was analyzed using MANOVA, MANCOVA, and Hayes process mediation analyses in SPSS. The results showed that participants who followed non-core influencers during two weeks indicated a higher self-reported non-core food intake and seemed to prefer non-core snacks. Participants who followed core influencers during two weeks scored significantly higher in their core food choices and had higher perceptions of their peer core food intake. No significant results on attitudes were found. Food literacy was not a significant mediator and identification did not significantly strengthen the effects of influencer food type on the outcome variables. However, identification did seem to have a moderating role when looking at the outcome variables of beverage intake specifically.

Health research has pointed to digital marketing as a possible contributor in the growing prevalence of overweight and obesity among adolescents (Chester & Montgomery, 2011; World Health Organization, 2016). However, it also increasingly emphasizes the possibilities that social media interventions hold to promote a healthier diet among adolescents (Yonker, Zan, Scirica, Jethwani, & Kinane, 2015). As research on the impact of influencer food promotion on adolescents' eating outcomes is scarce, this thesis adds to the literature by looking at the threats as well as the opportunities of food being promoted to adolescents by social media influencers.

Introduction

The World Health Organization named digital marketing as an important factor in the growing prevalence of overweight and obesity among adolescents (The World Health Organization, 2016). Overweight and obesity are one of the leading preventable causes of numerous diseases and even deaths in today's society (Vereecken, De Henauw, & Maes, 2005; World Health Organization, 2016). In 2016, more than 340 million children and adolescents between five and 19 years old were affected by this epidemic (World Health Organization, 2016). It seems that non-core foods (i.e. foods that are relatively low in nutrients, but high in saturated fats, cholesterol, added salt or sugar) are very popular among adolescents and generally preferred over core foods (i.e. foods such as vegetables, fruits, grains, milk and meat, that hold the necessary nutrients) (Das et al., 2017; National Health and Medical Research Council, 2017; Toumpakari, Haase, & Johnson, 2016). This results in a worldwide overconsumption of non-core foods for this age group (Das et al., 2017; World Health Organization, 2016). Belgian adolescents' diet for example, consists according to health policies, of a too high intake of added sugar and fat coming from non-core products (Matthys, De Henauw, Devos, & De Backer, 2003). As a result, obesity and overweight are, along with alcohol consumption, the most important health issues for Belgian adolescents (OECD/European Observatory on Health Systems and Policies, 2017). Moreover, poor eating habits that are formed and consolidated during adolescence may persist through adulthood and can be precursors of later health problems, such as heart diseases, different types of cancers, and diabetes (de Koning et al., 2012; Kelder, Perry, Klepp, & Lytle, 1994; Pan, 2004).

Adolescents' food related cognitions, attitudes, and behavior are formed and altered by various personal (e.g., lifestyle), interpersonal (e.g., peers) and environmental (e.g., cultural norms) factors (Story, Neumark-Sztainer, & French, 2002). Mediated food promotion has been identified as one such factor that can exert influence on adolescents' diet (Boyland et al., 2016; Buchanan, Kelly, Yeatman, & Kariippanon, 2018; Chester & Montgomery, 2011; Qutteina, De Backer, & Smits, 2019; World Health Organization, 2016). Today, adolescents increasingly spend their time on the Internet and on social media platforms such as Instagram and YouTube (Statista, 2021b; Vandendriessche & De Marez, 2020). Compared to traditional media such as television, these social media platforms allow their users to interact more directly, and in a more personal and engaging way with others (Chester & Montgomery, 2011; Constantinides & Fountain, 2008; Kelly, Vandevijvere, Freeman, & Jenkin, 2015). The popularity of social media among adolescents and the high engagement possibilities these platforms offer, have not gone unnoticed by food companies, who are increasingly moving their marketing efforts to these platforms (Chester & Montgomery, 2011; Powell, Harris, & Fox, 2013). Food brand or product messages aimed at adolescents are thus increasingly spread via a wide range of social media possibilities, which are less regulated and monitored than traditional media (Kelly, Vandevijvere, et al., 2015; Tan, Ng, Omar, & Karupaiah, 2018; World Health Organization, 2016). Moreover, it seems that adolescents generally encounter more non-core food (marketing) content compared to core food content on these platforms in general, and from the social media influencers on them specifically (Potvin, Pauzé, Roy, de Billy, & Czoli, 2019; Qutteina, Hallez, Mennes, De Backer, & Smits, 2019).

Social media influencers (hereafter referred to as influencers) are social media personalities that possess a substantial network of followers who are interested in the content these influencers share (Ki & Kim, 2019; Leboff, 2016). This content allows followers glimpses into their daily lives (e.g., their opinions, activities, meals, and snacks) (De Veirman, Cauberghe, & Hudders, 2017; Kelly, Vandevijvere et al., 2015). Together with the interactive environment of social media (e.g. the personal and direct way of communicating, the ability to like or comment on other's content), this often results in followers perceiving to have a para-social bond with influencers who are seen as trustworthy and relatable peers or opinion leaders (Colliander & Dahlén, 2011; De Veirman et al., 2017; Katz & Lazarsfeld, 1955). Moreover, as the adolescent life stage is characterized by an increased importance of peer influences, relatable influencers who are perceived as peers could be able to steer adolescents' (food related) behavior and cognitions (Story et al., 2002; Strasburger, Wilson, & Jordan, 2009; Qutteina, De Backer, et al., 2019).

Social media influencers' food promotion is thus presumed to have an influence on adolescents' eating outcomes (De Jans, Spielvogel, Naderer, & Hudders, 2021; Folkvord, Anschütz, Boyland, Kelly, & Buijzen, 2016). However, too little is known about the effects of influencers' food promotion on adolescents' eating cognitions and behavior (Qutteina, De Backer, et al., 2019). In response to this knowledge gap, The World Health Organization (2016) called for more extensive research into this topic, as additional insights are needed in order to adequately adapt social media food marketing policies to the realities of today's society and to minimize adverse effects from food promotion on social media (World Health Organization, 2010; Tan et al., 2018). Today, European and Flemish regulations of food marketing are mostly focused on traditional media and children younger than 12 years old, not taking into account adolescents' vulnerability to food promotion and the high engagement and personal communication possibilities of digital media (EU Pledge, 2021; World Health Organization, 2016). Moreover, influencer regulations are mostly based on self-regulation practices (EU Pledge, 2021; JEP, 2018). Therefore, this study reacts to the call for more research into digital food promotion aimed at adolescents and desires to contribute to the insights that may help guide future regulations (World Health Organization, 2016).

On the other hand, health promotion research also emphasizes the possibilities of employing marketing tools used in non-core food promotions in order to improve adolescents' dietary knowledge and core food intake (Chau, Burgermaster, & Mamykina, 2018; Yonker, Zan, Scirica, Jethwani, & Kinane, 2015). However, previous research on the effects of core food promotion on adolescents is rather scarce and seems to indicate that non-core food promotion generally causes stronger effects compared to core food promotion (Cairns, Angus, Hastings, & Caraher, 2013; Folkvord, Anschütz, Buijzen, & Valkenburg, 2012; Giese et al., 2014). This means that for core food promotion to have a relevant effect, strong persuasive techniques (e.g. social media influencers) might need to be used to increase the value of core food and normalize a more healthy diet among adolescents (Folkvord & de Bruijne, 2020; Folkvord et al., 2016).

Therefore, the current study's objective is to look at the threat as well as opportunity that social media influencers' food promotions pose for adolescents' diet. More concretely, the objective of the current study is to examine the impact of social media influencers' food related content on Flemish 12-18 year old adolescents' eating outcomes. With this aim, it intends to complement the existing literature on digital food marketing by filling three important gaps. The first contribution of this study is its comparison between the effects of non-core and core foods being

promoted by social media influencers. In other words, the current study aims to complement the body of research that is looking into relevant ways to improve adolescents' diet and nutrition knowledge, and may offer new insights into the differing effects of core and non-core food promotion (Chau et al., 2018; Folkvord & de Bruijne, 2020).

Second, this study examines the impact of food promotion on adolescents. Previous research focused extensively on the effects of digital food (marketing) content on either children (defined as younger than twelve or younger than 18 years old) or adults (defined as older than 18), which makes adolescents rarely the sole focus in these type of studies (Buchanan et al., 2018; Coates et al., 2019a; Norman et al., 2018; Qutteina, De Backer, et al., 2019). However, adolescents seem to be a primary target of food marketing, especially of foods in the non-core category (Chester & Montgomery, 2011; Powell, Harris, & Fox, 2013). Moreover, adolescents form an age group that is considered to be vulnerable to food marketing practices, as they are more independent (food) decision makers and less monitored by their parents compared to younger age groups, but lack advertising literacy and are generally more prone to impulsive and immediately rewarding behavior (e.g. eating non-core food) compared to adults (Pechmann, Levine, Loughlin, & Leslie, 2005; Qutteina, De Backer, & Smits, 2019; Rozendaal, Buijzen, & Valkenburg, 2010).

Lastly, this study contributes to the topic of food promotion aimed at adolescents by focusing on Instagram influencers. The social media platform Instagram is popular among adolescents worldwide, ranking in their top three favorite social media over the past years (Statista, 2021b). Additionally, it is also the platform adolescents appear to find the most food related content on and follow the most influencers on (Qutteina, Hallez, et al., 2019; Vandendriessche & De Marez, 2020). Nearly 70% of Flemish adolescents indicates to follow influencers on social media, which suggests that influencers have become a significant part of Flemish adolescents' social media use (Vandendriessche & De Marez, 2020). Although there has been some research on the effects of (Instagram) influencer food promotion that seems to indicate an impact on food cognitions and behavior, these studies were mainly focused on children, leaving the effects on adolescents to remain unclear (Coates et al., 2019; De Jans et al., 2021; Smit, Buijs, van Woudenberg, Bevelander, & Buijzen, 2020).

Theoretical framework and literature

1. Social media

Bandura's Social Cognitive theory posits that human behavior is a result of reciprocal and interlinked environmental (norms, community, social position) behavioral (skills, self-efficacy) and cognitive (knowledge, expectations, attitudes) factors (Bandura, 1986; 2009). Based on Bandura's theory, Story et al. (2002) developed a conceptual model of personal and environmental influencing factors on adolescent eating behavior and food choices. They identified four interwoven influences: individual factors (e.g., beliefs, behavior, lifestyle, food preferences), interpersonal influences (e.g., peers, caregivers), community settings (e.g., fast food outlets, convenience stores), and macrosystem influences (e.g., media, marketing, and social and cultural norms) (Story et al., 2002).

Following this framework, social media platforms are a macrosystem factor that can influence adolescents' eating behavior, cognitions, and norms. Social media such as Facebook, YouTube, and Instagram, are digital social network platforms that adolescents use daily for identity formation, social interaction, and entertainment purposes (Apestaartjaren, 2020; Vandendriessche & De Marez, 2020). As these platforms allow the transfer of worldviews, norms, knowledge, and opinions through pictures, videos and text, they can be regarded as important socializing agents in the life of today's adolescents (Bandura, 1986; Beaudoin, 2014; Chester & Montgomery, 2011; Elder, 1968; Kelly & Donohew, 1999). Social media enable social interaction with others through functions such as direct messages and the ability to like, share, or comment on the content of others (Constantinides & Fountain, 2008; Vandendriessche & De Marez, 2020). These others can be friends or acquaintances, but as social media enable users to find information and people from all over the world, users can also interact with (the content of) celebrities, brands, entertainment or news profiles (e.g. nws.nws.nws in Belgium), and social media influencers (Apestaartjaren, 2020; Constantinides & Fountain, 2008).

1.1. Social Media Influencers

In a broad sense, social media influencers can be regarded as "individuals who have developed sizeable social networks by sharing details about their personal lives, experiences, and opinions publicly through texts, pictures, videos, hashtags, location check-ins, etc." (Ki & Kim, 2019, p. 1). These influencers can be regular people or traditional celebrities such as actors or singers, but the general denominator that sets them apart from other social media users is their large follower base that is interested in for example, their daily lives, their opinions, their favorite brands and products, or their fitness or beauty routines (Khamis, Ang, & Welling; 2017; Ki & Kim, 2019). Influencers strategically brand or promote themselves to attract and engage followers who consider influencers to be a source of entertainment (e.g. humoristic videos or daily life content), or of information and inspiration, as influencers often hold some expertise regarding a specific topic (e.g. vegan recipes or beauty products), or a mix of both (Khamis et al., 2017; Ki & Kim, 2019). They possess thus "significantly more reach and resonance than the average person" on social media (Leboff, 2016, p. 170).

(Food) companies are increasingly working with influencers, who in exchange for monetary rewards or free products, promote a brand or products on their personal page (Influencer Marketing Hub, 2019). They do this by for example explaining how to use a product, or more subtly, by posting a picture with product placement (Influencer Marketing Hub, 2019; Ki & Kim, 2019). Influencers' posts are thus often a mix of sponsored and organic content (Abidin, 2016; Qutteina, Hallez, et al., 2019). This can enhance the persuasiveness of a sponsored message, as adolescents will likely use their cognitive capacities to process the entertainment or informational content from influencers instead of critically processing the marketing content (Buijzen, van Reijmersdal, & Owen, 2010).

Influencers can also promote food; the promotion of food can be defined as "any form of communication that is designed to increase the recognition, appeal, and/or consumption of particular food products, brands, and services" (Folkvord et al., 2016, p. 26). Therefore this study considers food influencers to be influencers whose food content is their main source of attraction and popularity (e.g., Sandra Bekkari or Jaimie Oliver) as well as influencers that owe their following to another attribute (e.g., humorous content or music), but post food content regularly (e.g. Mathieu Terryn). As influencer profiles are often a mix of promotional and organic content, this study will examine the impact of such food influencers' naturally occurring content (i.e. the mix of sponsored and non-sponsored posts) (Abidin, 2016; Qutteina, Hallez, et al., 2019).

2. The impact of food influencers on adolescents' food outcomes

It is important to understand why influencers can have an impact on adolescents' norms, attitudes and behavior. Through the high engagement and interaction opportunities that social media offer, adolescents have insight into influencers' values, interests and opinions. This can create the perception of a bond with the influencer as a friend that can be trusted, which is often accompanied by feelings of similarity, trustworthiness, liking, and familiarity (Colliander & Dahlén, 2011; Folkvord et al., 2019). Following the Source Credibility Model and the Source Attractiveness model, these are endorser characteristics that can increase an endorsers' persuasive power (Brown, 2015; Chapple & Cownie, 2017; Coates et al., 2019; Ohanian, 1990; Schouten, Janssen, & Verspaget, 2020; Qutteina, Hallez, et al., 2019). Moreover, followers tend to ascribe influencers' promotion of products solely to them genuinely liking these products and hereby often overlook monetary rewards as a driver of this promotion. This judgement is a consequence of the Correspondence Bias, which is the human predisposition to infer people's opinions and motivations from their words and behavior, while disregarding explanatory situational factors (Cronley, Kardes, Goddard, & Houghton, 1999; Gilbert & Malone, 1995).

Following Bandura's Social Cognitive Theory, influencers can influence their adolescent followers via social learning mechanisms such as the modelling of behavior and social interactions, or the conferring of perceived norms and outcome expectations (Bandura, 1989; Story et al., 2002). Adolescents may thus learn attitudes, norms, preferences and behavior from influencers, who take on the role of socializing agents (Bandura, 1989; Folkvord et al., 2019). For example, adolescents may see food intake or consumption behavior being modelled by influencers which can influence adolescents' own behavior, their outcome expectations, or descriptive and injunctive norms of food related behavior (Coates et al., 2019; Lapinski & Rimal, 2005). These

norms are respectively the beliefs about what others belonging to a group do (prevalence of behavior) and what others find acceptable (social sanctions) (Lapinski & Rimal, 2005). A study by Lally et al. (2011) suggests that adolescents have food norms (e.g., what and how much they think peers eat, and what food is acceptable or expected to be eaten in certain social situations) and that these norms influence their own diet. An influencer that is seen as relatable or as a role model, may thus be able to impact these normative food perceptions (Bandura, 1989; Colliander & Dahlén, 2011).

Taken together this means that when a certain behavior is perceived as acceptable or even expected and/or as having positive outcomes, it is more likely to be imitated (Bandura, 1986; Kelman, 1958; Lapinski & Rimal, 2005). For example, a post wherein an influencer is enjoying the consumption of non-core food with a group of smiling friends, can confer the perception that eating non-core food is what most people or peers do when eating with friends (descriptive norm), that this food is tasty, and that this will result in a cozy and fun evening (outcome perceptions). These portrayals can reinforce existing perceptions, attitudes, and corresponding behavior or lead to the internalization of new food norms and attitudes, which may cause behavior to change in line with that of the influencer (Beaudoin, 2014; Cohen, 2001; Lapinski & Rimal, 2005).

Additionally, the Reactivity to Embedded Food Cues in Advertising Model (REFCAM) and The Promotion of Healthy Foods Model are both food promotion models that can explain the effects of influencer core and non-core food promotion on adolescents' diet and food attitudes (Folkvord et al., 2016; Folkvord & Hermans, 2020). These models build on the classical conditioning effect wherein a conditioned stimulus (e.g., a likeable or credible influencer) becomes associated with a food cue (e.g., a picture of food). This food may then gain positive value or its value may be reinforced (e.g., increased liking), which can increase the appetite for similar foods and subsequently impact food intake (Folkvord et al., 2016).

The REFCAM from Folkvord et al. (2016) explains this process for non-core foods. As adolescents have an a priori liking for non-core foods, the value of these foods will probably be reinforced or relatively easy to increase by an influencer who is held in positive regard by adolescents (Das et al., 2017; Toumpakari et al., 2016). Because of this a priori liking of non-core foods, exposure to non-core food cues elicits physiological (e.g. gastric activity and salivation) and psychological (e.g. increased thoughts about food) reactions in adolescents. This may lead to an increased appetite and subsequent intake of similar foods. Higher intake of non-core foods may then sensitize adolescents to such food cues in the future, meaning they may experience stronger cue reactivity reactions. The result is a reciprocal relationship between food promotional cues and food intake (the incentive-sensitization process) (Folkvord et al., 2016). The preponderance of exposure to non-core foods from influencers might thus reinforce the value of these foods and impact adolescents' food intake (De Jans et al., 2021; Folkvord et al., 2016; Qutteina, De Backer, et al., 2019).

The Promotion of Healthy Foods Model focuses on the promotion of core foods, but also builds on the idea of conditioning effects (Folkvord & Hermans, 2020). It states that core food promotion should focus on increasing the attention towards and communicating positive values (liking or desiring) of core food (e.g., by having influencers promoting core foods) (Folkvord & de Bruijne, 2020; Folkvord & Hermans, 2020). This may in time increase the appetite for, and subsequent intake of core food among adolescents, which can normalize a more core based diet or snacking culture (Folkvord & Hermans, 2020).

The above mentioned processes and theories could suggest that influencers' food pictures on social media can impact food norms, preferences and intake among adolescents. Several systematic reviews indeed indicate that there might be an association between (digital) food marketing and adolescents' nutrition knowledge, preferences, and consumption (Boyland et al., 2016; Buchanan et al., 2018; Cairns et al., 2013; Giese et al., 2014; Kelly, Vandevijvere, et al., 2015; Qutteina, De Backer, & Smits, 2019). Moreover, adolescents appear to show similar effects to digital media food marketing as children and pre-adolescents, whose eating behavior seems to be impacted by influencer food marketing (Boyland et al., 2016; Coates et al., 2019a; Folkvord, et al., 2016). As such, food (marketing) images posted by influencers could have an impact on adolescents' food norms, attitudes and eating behavior (Buchanan et al., 2018; Coates et al., 2019a; Qutteina, De Backer, et al., 2019; Qutteina, Hallez et al., 2019). However, there is not enough evidence on the topic of food influencers and adolescents' eating behavior and cognitions to draw conclusions (Coates et al., 2019a; Qutteina, De Backer et al., 2019).

Following the theoretical framework set out in this study, seeing non-core food promoted by influencers in a way that is interactive as well as attractive, or entertaining, might serve as a cue to eat similar foods (Folkvord et al., 2016). This cue reactivity might be enhanced among adolescents, as they can react strongly to the promised short term reward of consuming non-core food (Galván, 2013). Moreover, seeing these foods promoted in a positive context or by a likeable influencer, may instigate meaning transfer through conditioning effects which may subsequently influence adolescents' attitudes towards the depicted foods (Folkvord et al., 2016). As influencers are often regarded as relatable others, their communicated food norms may impact adolescents' food norm beliefs and outcome expectations. This may subsequently affect adolescents' food intake (Birch, & Fisher, 1998; Lally, et al., 2011).

The promotion of non-core foods has previously been associated with more positive attitudes towards, an increased preference for, and a higher consumption of non-core foods among adolescents (Boyland et al., 2016; Buchanan et al., 2018; Kelly et al., 2015; Norman et al., 2018; Qutteina, De Backer, et al., 2019; Scully et al., 2012). As influencers play an important role in the lives of adolescents today and seem to communicate relatively more non-core food norms, it is important to know to which extent these influencers can impact adolescents eating outcomes and attribute to today's obesity epidemic (World Health Organization, 2016). Therefore, the first objective of the current study is to examine whether exposure to non-core food content by Instagram influencers leads to increased non-core food outcomes among Flemish adolescents. This is hypothesized as follows:

> H1a: Adolescents exposed daily to non-core food influencers on Instagram (for a duration of two weeks) will have a higher non-core food intake compared to adolescents that were

exposed daily to core food influencers on Instagram (for a duration of two weeks).

H1b: Adolescents exposed daily to non-core food influencers on Instagram (for a duration of two weeks) will have more positive attitudes towards non-core food compared to adolescents that were exposed daily to core food influencers on Instagram (for a duration of two weeks).

H1c: Adolescents exposed daily to non-core food influencers on Instagram (for a duration of two weeks) will have higher perceived descriptive and injunctive norms favoring non-core food compared to adolescents that were exposed daily to core food influencers on Instagram (for a duration of two weeks).

Most food promotion research has focused on the effects of exposure to non-core food rather than those of core food on adolescents' eating behavior (Boyland et al., 2016; Cairns et al., 2013; Folkvord & de Bruijne, 2020). However, the effectiveness of non-core food promotion has made health researchers consider the importance of gaining insight into these effective tools and techniques in order to deploy them to promote core foods (Folkvord & de Bruijne, 2020; Folkvord & Hermans, 2020; Yonker et al., 2015; Chau et al., 2018). Results of previous core food promotion studies are inconclusive, suggesting on the one hand that core food promotion might be associated with adolescents' food choices, attitudes and intake, although often to a smaller extent than non-core food promotion (Cairns et al., 2013; Dixon et al., 2007; Giese et al., 2014). Other studies however, did not find an effect of core food promotion on food outcomes among adolescents and pre-adolescents (Coates et al., 2019a; Folkvord & de Bruijne, 2020). A pilot study by Folkvord and de Bruijne (2020) for example, did not find a difference between the impact of red pepper promotion and non-core food promotion by popular Instagram influencers on adolescents' subsequent vegetable choices. This study however, showed one Instagram post in a paper survey, which does not align with the reality of influencer food messages on Instagram that may expose adolescents to multiple food posts in an interactive way (Abidin, 2016; Coates et al., 2019; De Veirman et al., 2017; Dixon et al., 2007; Knoll, 2015).

In line with the reasoning of the Healthy Food Promotion Model and the social learning mechanism, positive values, expectations and norms of core food may be communicated and modelled by core food influencers (Bandura, 1989; Folkvord & Hermans, 2020). This age group generally underestimates their peers' core food intake, which might be a perception that influencers can remedy (Bandura, 1989; Lally et al., 2011). To contribute to health research that is looking into mechanisms to promote a healthier diet among adolescents, the current study seeks to broaden the knowledge regarding the impact of Instagram influencers' core food promotion on adolescents' eating outcomes (Yonker et al., 2015; Chau et al., 2018). Therefore, the second objective in this study is to examine whether exposure to core food content by Instagram influencers leads to increased core food eating outcomes among Flemish adolescents. This objective leads to the following hypotheses:

H2a: Adolescents exposed daily to core food influencers on Instagram (for a duration of two weeks) will have a higher core food intake compared to adolescents that were exposed daily to non-core food influencers on Instagram (for a duration of two weeks).

H2b: Adolescents exposed daily to core food influencers on Instagram (for a duration of two weeks) will have more positive attitudes towards core food compared to adolescents that were exposed daily to non-core food influencers on Instagram (for a duration of two weeks).

H2c: Adolescents exposed daily to core food influencers on Instagram (for a duration of two weeks) will have higher perceived descriptive and injunctive norms favoring core food compared to adolescents that were exposed daily to non-core food influencers on Instagram (for a duration of two weeks).

Bandura's Social Cognitive theory posits that people might be more easily influenced by others they perceive to be similar to and identify with (Bandura, 1986; Byrne, 1997). Identification is a multilayered concept that has previously been defined in various ways. In line with Moyer-Gusé's (2008), the current research will consider it to be related to the previously mentioned feelings of similarity, liking, and the perception of a having bond with the influencer (Brown, 2015; Moyer-Gusé, 2008; Fransen et al., 2015: Schouten et al., 2020). In line with Bandura's theory, endorser research suggests that when followers perceive to be similar to the endorser (here an influencer) in age, race, gender, or even values and interests, they are inclined to identify themselves with that endorser (Basil, 1996; Brown, 2015; Ohanian, 1990; Schouten et al., 2020). Taken together, influencers that are similar in age, look good and produce engaging content (e.g., Jaimie-Lee Six for Flemish adolescents), may have stronger effects on adolescents' food attitudes and intake, relative to older influencers, with a family life and different interests (e.g., Sandra Bekkari).

Previous research alludes that identification with an endorser may indeed strengthen the effectiveness of advertising outcomes in general (Basil, 1996; Cialdini, 2009; Kelman, 1958; Schouten et al., 2020) and in a food promotion context specifically (Folkvord et al., 2019; Smits & Vandenbosch, 2012). Moreover, adolescence is a life stage characterized by identity exploration, the growing importance of peers, and fitting in. This often leads to comparison behavior with similar others on social media in order to construct and evaluate the self and to adapt their behavior to what they perceive to be the norm (Adams-Price & Greene, 1990; Beaudoin, 2014). Consequently, identification with an influencer may generate stronger validation and/or learning effects on adolescents' food related attitudes, cognitions and behavior (Bandura, 2009; Brown, 2015; Cohen, 2001; Folkvord, et al., 2019; Kelman, 1958; Schouten et al., 2020; Smits & Vandebosch, 2012). Therefore, this study's third objective is to examine whether identification with influencers generates stronger effects of food content promotion on Flemish adolescents' eating outcomes. This leads to the following hypotheses:

H3a: Identification with influencers strengthens the effects of daily exposure to non-core food influencers on Instagram (for a duration of two weeks) on adolescents' non-core food outcomes (intake, attitudes, and norms).

H3b: Identification with influencers strengthens the effects of daily exposure to core food influencers on Instagram (for a duration of two weeks) on adolescents' core food outcomes (intake, attitudes, and norms).

Lastly, as influencers can model and confer food related information and behavior, they can be a factors in adolescents' acquisition of nutrition knowledge and food literacy (Beaudoin, 2014; Cairns et al., 2013). Food literacy broadly refers to "the skills and knowledge to make healthy choices in a complex food environment" (Truman et al., 2017, p.211). This includes among other things, adolescents' knowledge of what is considered to be healthy and nutritious food, the skills they possess to prepare food, to eat consciously and to balance their food intake (Poelman et al., 2018; Vidgen, & Gallegos 2014).

Non-core food promotion has been brought forward as a factor that has adolescents perceiving non-core foods as healthier, increases their non-core purchase choices and their perceived norms of non-core consumption (Beaudoin, 2014; Cairns et al., 2013). Moreover, following the REFCAM model, promotion of non-core food may have a reciprocal effect on psychological (e.g., thoughts about food) and physiological (e.g., hunger) responses, meaning that exposure to non-core food cues may increase adolescents' non-core intake, which limits their resistance abilities to subsequent non-core cues (Jansen, 1998). In sum, influencers' non-core food promotion that is often depicted in excessive quantities, may thus distort adolescents' idea of what counts as a healthy diet, impair their ability to eat more consciously, and their ability to resist consuming excessive amounts of non-core foods (Cairns et al., 2013; Lally et al., 2011; Qutteina, Hallez, et al., 2019).

On the other hand, health research has been looking at social media interventions to communicate nutrition information (e.g., healthy portion sizes and recipes, how to recognize processed foods) to adolescents in order to increase their food knowledge and to make them choose their food more consciously (Chau et al., 2018; Yonker et al., 2018). Adolescents not only use social media daily, but also actively search the internet for nutritional, dietary and fitness information, which can explain why these social media interventions are considered to be relevant and show promising results (Chau et al., 2018). Moreover, an experimental study by Dixon et al. (2007) found that exposure to core food advertisements positively affected young adolescents' nutrition knowledge. Influencers who confer nutrition information and recipes may thus be able to broaden adolescents' food preparation skills and nutrition knowledge (Bandura, 1986; Chau et al., 2018; Dixon et al., 2007). Moreover, communicated health norms by endorsers seem to be able to stimulate similar health behavior in audiences via self-efficacy beliefs (Myrick, & Erlichman, 2020). Core food influencers who model conscious and core eating may thus instigate the mimicking of the modelled behavior or even encourage a healthier diet and/or the cooking of healthier food via enhanced self-efficacy beliefs (Bandura, 1986; Myrick, & Erlichman, 2020).

Food literacy has previously been associated with adolescents' eating behavior and more specifically, with the degree to which they are able to eat healthy (Vaitkeviciute, Ball, & Harris, 2015). More concretely, higher levels of food literacy among adolescents were found to be related to a higher fruit and vegetable intake (Vaitkeviciute et al., 2015; Vidgen & Gallegos 2014). Food literacy may thus be an important explanatory construct to take into account when looking at factors that influence adolescents' eating cognitions and behavior (Vaitkeviciute et al., 2015). Therefore, the fourth objective of this this study is to examine whether exposure to core or non-core food influencers' content is able to affect adolescents' level of food literacy differently and

if a resulting relative difference in food literacy is subsequently able to explain possible differences in core or non-core food outcomes. This is hypothesized as follows:

H4a: Food literacy mediates the relationship between daily exposure to non-core food influencers on Instagram (for a duration of two weeks) and adolescents' non-core food outcomes (intake, attitudes, and norms).

H4b: Food literacy mediates the relationship between daily exposure to core food influencers on Instagram (for a duration of two weeks) and adolescents' core food outcomes (intake, attitudes, and norms).

In sum, the objective of the current thesis is to assess the impact of Flemish adolescents' exposure to Instagram influencers core or non-core food content on their eating outcomes (intake, attitudes, and norms). Moreover, this study aims to shed light on whether high and low identification with these influencers has a differing impact on these outcomes. Additionally, it studies the possible impact of exposure to core or non-core influencers on adolescents' food literacy and whether this can subsequently explain differing food outcomes. Although social media has been researched in relation to food promotion, the combination of Instagram influencers and adolescents has, to our knowledge, not yet been studied. Lastly, this study's comparison of core and non-core food promotion by influencers may offer insights into two differing sides of the same coin. Figure 1 offers a schematic presentation of the previously discussed hypotheses that this study will test.

Figure 1. Tested model of this study

15
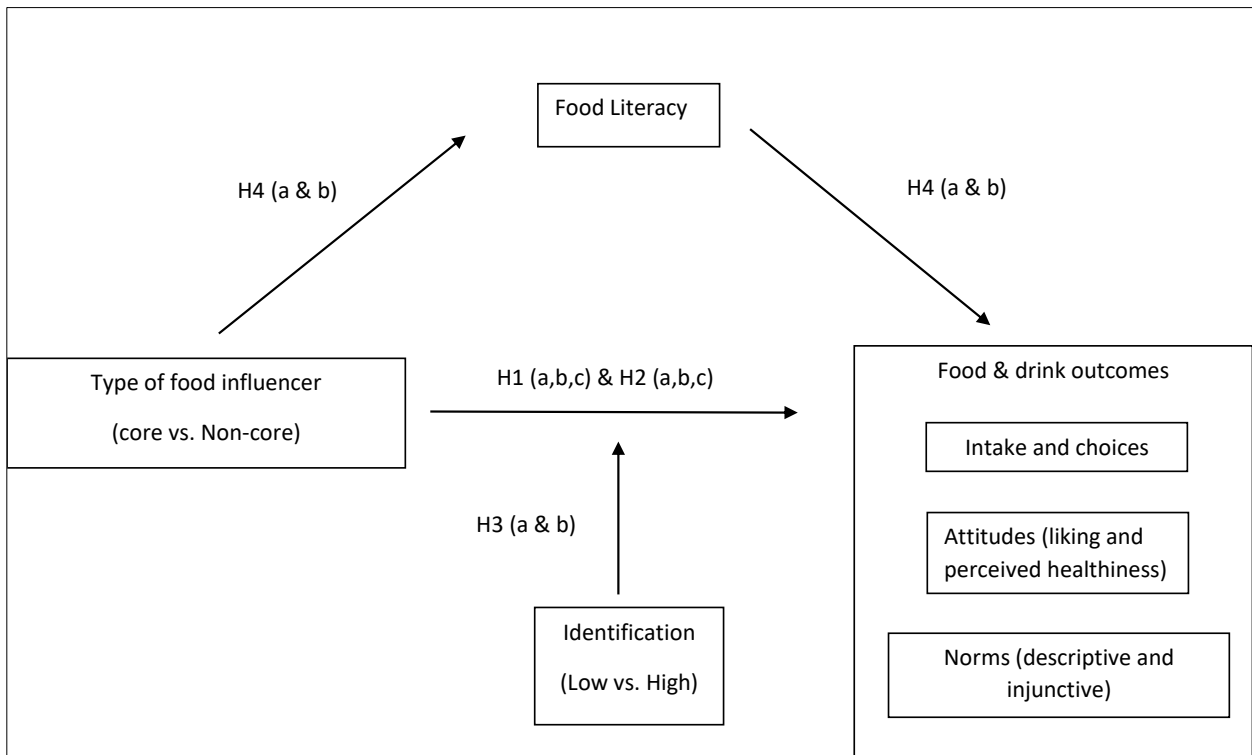
Method

1. Recruitment and sample

The data for this study was gathered by means of a convenience sample. A call to participate was repeatedly posted on Instagram stories, Facebook and TikTok, as these are the platforms Flemish adolescents interact the most on (Apestaartjaren, 2020; Vandendriessche & De Marez, 2020). This call contained the researcher's name and university, the target profile (i.e. 12-18 years old, living in Flanders and having an Instagram account) a short explanation of what would be expected of participants (i.e. 2 Zoom meetings with the researcher where a questionnaire would be filled in and the task to follow influencers for 2 weeks), and the possibility of winning one of the three vouchers that would be given to randomly chosen participants who completed the entire study. This call was also send to three youth movements, who shared it among their oldest groups (15-18 years old).

Additionally, 155 schools in the Flemish provinces Limburg, Antwerpen and Vlaams-Brabant were contacted via e-mail, with the explanation of the study design, its purpose, and a request for participation. This request was to either participate with students during school hours or to share the previously mentioned call for participants via the student platform Smartschool, so that willing students could individually decide to participate. For 90 schools, these e-mails were followed up by a phone call when no answer was received or when they requested additional information. However, schools were very reluctant to participate mainly due to the COVID 19 pandemic. Reasons for non-participation included: students and staff were overworked as a consequence of trying to adapt to online teaching, colleagues falling out sick and an overload of study participation requests.

Eventually, 9 schools shared the call for participants and 5 teachers participated with some of their students during online class. The original sample consisted of 334 participants, whereof 11 participants dropped out throughout the 2 weeks (between meeting one and meeting two) of the intervention. These adolescents came from the three previously mentioned provinces (Antwerpen, Limburg, Vlaams-Brabant).
The study procedure was revised and approved in 2018 by the Social and Societal Ethics Committee (SMEC) from KU Leuven, which is a multidisciplinary panel of experts that conducts ethical review of research in fields such as behavioral or social sciences (KU Leuven, 2021).

2. Design

This study followed an experimental two (core vs. non-core food content) by two (low vs. high identification) between-subjects design. A first distinction was thus made between influencers who mainly post core food content versus influencers who mainly post non-core food content. The second distinction was between influencers participants would likely identify themselves with and influencers they would less likely identify with. This resulted in four conditions, to which participants were randomly assigned by the Qualtrics randomizer function: core food influencers with high identification possibilities (n=80), core food influencers with low identification possibilities (n=78), non-core food influencers with high identification possibilities (n=78) and

non-core food influencers with low identification possibilities (n=87). This randomization can partly make up for the fact that the participants were not fully representative for the population, as it can control against biases in the findings. This way a priori differences between individuals can be randomly distributed across the conditions, which makes causal relationships between the experimental conditions and results more plausible (Gunter, 2013).

3. Stimuli

It was decided that adolescents would likely identify the most with influencers they might already know and influencers close to them in age (16-28 years old), as they may have similar interests (Brown, 2015; Schouten et al, 2020). Based on a scan of popular (food) influencers and data from a previous (unpublished) survey study (Qutteina, Hallez, Raedschelders, De Backer, & Smits, 2021), a preliminary list of influencers was drawn up. This list was tested in a pre- test focus group interview with 3 adolescents (12, 13 and 15 years old). They answered the following questions: *What makes you follow an influencer on Instagram? Who are your favorite influencers? Why do you like them? What age are your favorite influencers?* The preliminary influencer list was subsequently tested by asking the adolescents to rate each influencer on perceived similarity (similar interests, values), liking and attractiveness. This pre-test confirmed the previously mentioned identification criteria and further validated most of the pre-chosen influencers. However, to ensure sufficiently high exposure to food content, the list of influencers was limited to those who post on Instagram three to five food posts (minus stories) per condition each day. As such, influencer profiles were analyzed and a sum of food post per day, per condition was made. Table 1 offers an overview of the final list of influencers per condition. Although research seems to indicate that influencer gender does not heavily impact gender outcomes on general products (e.g. food) (Lokithasan, Simon, Jasmin, & Othman, 2019), it was made sure that each condition consisted of both male and female influencers, to enhance similarity and identification for male participants (Basil, 1996; Brown, 2015).

Table 1. Overview of influencers per condition

	High identification		Low identification	
Core food influencers	healthyhabits.celien floris_fitfood its.about.health fitfooodlover	healthyliciousvegan kalememaybe chickpeachick netocraves	Jaimie Oliver gkstories Sandra Bekkari Healthy.with.charlie	fitmencook lonijane mississippivegan Karolas_kitchen
Non-core food influencers	sweetportfolio blondeswhoeat Mathieu Terryn the_hunger_diaries	Eke Bosman Thenaughtyfork succulent bite Everything_delish	Gordon Ramsey bakedbydan zoebakes ny.foodie	rosannapansino jeremyjacobowitz ambitiouskitchen Stickaforkinme

4. Procedure

A small pilot test (N=3) was conducted before the actual data collection. This was done to test the study design, the survey and the clarity of the researcher's instructions on adolescent participants. After the two meetings a short focus group interview was conducted where questions regarding study and design clarity were asked. Participants' responses led to the indication that they had understood clearly what was expected of them. One problem arose: Eke Bosman has two profiles 'Eke Bosman' and 'Eke Bosman – snackspert'. As participants were meant to follow the food influencer account, the questionnaire was adapted to emphasize that participants had to follow the 'snackspert' account.

The data collection in February and March consisted of an intervention, that was preceded and followed by interview meetings in which participants filled out a questionnaire. For the intervention, participants were asked to follow one of the four abovementioned influencer groups for a duration of two weeks. Due to then prevailing COVID-19 regulations, both meetings were done via an online Zoom video call. During the first meeting moment introductions were made and participants received an oral and written explanation of the experiment, which discussed the research topic (i.e. social media and food), the expectation to follow influencers for two weeks and meet again, and participants' ethical rights (i.e. voluntariness, confidentiality, no harm or benefit). The possibility of winning one of the three vouchers after completing the experiment was also made clear. Hereafter, informed assent and consent were asked from all participants. Parents of adolescents under the age of sixteen had to sign an a priori active opt-in parental consent form (digital or paper).

Participants then filled out the questionnaire that inquired about their socio-demographic background and their social media use. At the end of the questionnaire, they were tasked with following the influencers belonging to the condition they were randomly assigned to. Measures were taken to ensure that participants would not become aware of the existence of different conditions, which might lead to a bias of hypothesis guessing (Gunter, 2013). Additionally, they were asked to set daily reminders to check the influencers' profiles. Both the reminders and the following of the influencers were checked by the researcher. If this was done correctly, the participant was reminded of meeting two and was then allowed to leave the meeting.

In the post intervention interview, exactly two weeks after the first meeting, participants were welcomed back in a Zoom video call in groups of five to ten. Before they received access to the questionnaire, they were asked if they fulfilled the assignment of watching the influencers daily. If they confirmed, a 20 minute questionnaire was given to them to complete in silence, as they were muted by the researcher to prevent bias. The questionnaire consisted of items asking about their core and non-core food intake of the past two weeks and their core and non-core norms and attitudes. A food literacy scale and an identification scale measuring identification with the assigned influencers were also included. Appendix 1 offers a more detailed description of the study protocol.

5. Measures

Questions in the post interview questionnaire (included in this section) were put in order of behavior to attitudes to norms, to minimize social desirability in behavioral and attitudinal questions (Roose & Meuleman, 2017). Due to prevailing COVID-19 regulations, the originally planned live interviews were substituted by Zoom meetings. Consequently, measuring live food intake and food choices was not an option. These measures were thus replaced by food choice and food frequency intake questions in the questionnaire.

Food choices

Participants were presented with a vending machine filled with seven core snacks or drinks (a bottle of SPA water, peanuts, a mandarin, a banana, an apple, yoghurt, and snack carrots) and seven non-core foods (Lays salt chips, Milka chocolate, Cécémel chocolate milk, Haribo Candy, a Bifi sausage, a bottle of Coca-Cola, and chocolate chip cookies). They were instructed to imagine standing in front of this machine and being able to buy three products. Participants could then select the items they would buy or choose to not buy anything by clicking on an indicated grey square. An image of the vending machine question is included in Appendix 2. For the analysis, participants core and non-core choices for the vending machine were summed, resulting in the variables 'vending core' and 'vending non-core'. More concretely, a participant who chose for example two non-core items and one core item from the vending machine, would score two on the variable 'vending non-core' and one on the variable 'vending core'.

Self-reported hunger

Participants' subjective level of hunger was measured by a visual analog (VAS) scale, ranging from 0 (left; "not at all hungry") to 5 (right; "very hungry"). They were asked to move the scale's arrow to a point that indicated their answer on the question 'how hungry do you feel right now?'. VAS scales are considered to be reliable instruments for measuring subjective food outcomes from children and adolescents (Coates et al. 2019; van Laerhoven, van der Zaag-Loonen, & Derkx, 2004).

Food intake

Self-reported food intake was measured with a previously validated food frequency questionnaire (Matthys, Meulemans, & Van Der Schueren, 2015). These questions asked participants to indicate the frequency and quantity with which they consumed specific foods or food groups during the two weeks of the experiment. Participants scored their frequency of food intake on a 6-point Likert-scale, with choice options being never (1), one day per two weeks (2), one day per week (3) two to four days per week (4), five to six days per week (5) and daily (6). Food intake quantity was measured with a 4-point Likert-scale, with quantity options given in milliliters or gram. To aid participants' in estimating the right quantities, each food group contained a comparison of food items in this group and their gram or milliliter (e.g. 1 mandarin = 60g, 1 kiwi = 75g, 1 banana = 130g, 1 apple = 140g and 1 orange= 140g).

For the analysis, foods and beverages were classified as either non-core or core using the Australian Guide for Healthy eating (National Health and Medical Research Council, 2017) and the food triangle from the Flemish institution 'Gezond Leven' (2017). Included core foods were: water, fruit, grains, oatmeal, meat and poultry, legumes, vegetables, nuts and seeds. Included non-core foods were: soft drinks, cornflakes, sweetened spreads, processed meats, sauces, sweet and salty snacks. Intake frequency and quantity were multiplied for each food and drink item. Then, scores for beverages and foods were added together and core and non-core items were separated into different variables. This resulted in the new variables 'non-core intake' and 'core intake'. These variables had scores ranging from 1 [= low intake] to 24 [= high intake].

Attitudes (liking and perceived healthiness) towards food and drinks

Based on measures used in Dixon et al. (2007), liking of food and drinks was measured by asking participants to rate how much they liked core (water, fruit, and vegetables) and non-core foods (soft drinks, sweet snacks, salted snacks, junk food, and processed meat) on a 5-point-likert-scale, ranging from 'hate it' (1) to 'love it' (5). The option 'never tried it before' (6) was also included. After this, they were asked to score the same foods on how healthy they think those foods are, again on a 5-point Likert-scale going from 'very unhealthy' (1) to 'very healthy' (5). For the analyses, four variables were created: liking of core food, liking of non-core food, perceived healthiness of core food, and perceived healthiness of non-core food. Each variable had scores ranging from 1 [= low/unhealthy] to 5 [= high/healthy].

Food and drink norms (descriptive and injunctive)

For the measurement of food norms, the same food and drink groups as in the attitudes measurements were used. Regarding descriptive norms, participants were asked to think about others of their age and to indicate how often they think their peers eat each type of food. They answered these questions on a 5-point Likert-scale ranging from 'very rarely' (1) to 'very often' (5). Next, their perceived injunctive norms were measured using the question 'Think about others of your age. How healthy do you think they perceive the consumption of these foods to be?', on a 5-point Likert-scale from 'very unhealthy' (1) to 'very healthy' (5).

Food Literacy

Adolescents' self-perceived food literacy was measured by the in Dutch validated food literacy scale from Poelman et al. (2018). This scale measures "the capability to make healthy food choices in different contexts, settings and situation" (Poelman et al., 2018, p. 1) with eight aspects of food literacy, namely "food preparation skills, resilience and resistance, healthy snack styles, social and conscious eating, examining food labels, daily food planning, healthy budgeting, and healthy food stockpiling" (Poelman et al., 2018, p.8). Participants answered questions like 'are you able to eat healthy while being stressed?' and 'do you eat vegetables as a snack?' on a 5-point Likert-scale ranging from 'yes, always' (1) to 'no, never' (5). Based on Poelman et al. (2018) the variable 'food literacy' ranging from one (low food literacy) to five (high food literacy) was created.

Identification with influencers

Adapted from Fransen et al. (2015), participants' identification with influencers was measured on a Likert-scale, ranging from 'strongly agree' (1) to 'strongly disagree' (7) , and included questions on the extent to which they liked, felt similar, perceived to have a bond, and identified with the influencers they had to follow during two weeks. These scores were rescaled so as to make a higher score on the variable 'identification' relate to higher levels of identification.
To ensure a correct translation of the originally English identification survey questions to Dutch, a back-translation procedure was used. Two people with good knowledge of the English and Dutch language were asked to translate the survey questions for the identification scale from English to Dutch. Thereafter, a third person translated these Dutch questions back to English. The English translation matched the original translation; the Dutch translation was thus considered to be of good quality (Brislin, 1970).

Sociodemographic variables, Instagram use and Body Mass Index (BMI)

Participants were asked to indicate their age, scaled from 12 to 18 years and their gender (boy, girl, or other). Their weight (in kilograms) and height (in centimeters) were also asked. Following Dixon et al. (2007), participants' BMI was calculated by dividing their weight (in kilograms) by their squared height (in meters). Additionally, participants' socioeconomic status was measured, based on the family affluency scale questions of the Health Behavior in School Aged Children surveys from The World Health Organization (Boyce, Torsheim, Currie, & Zambon, 2006). The composite of the Family Affluence Scale is a relevant scale to use for data that looks at relationships between socio-economic factors and health issues among adolescents (Boyce et al., 2006). Therefore, a composite of these scores was computed for this study, resulting in the variable 'socioeconomic status' ranging from five (lowest status) to fifteen (highest status). Lastly, adolescents' social media habits were also questioned, based on the Health Behavior in School Aged Children surveys and the Imec Digimeter (2019). Participants were asked how often they post, like or share food related content on social media (never, less than monthly, monthly, weekly, or daily) and how often they visit Instagram (less than daily, less than one hour per day, between one and three hours per day, or more than three hours per day).

6. Statistical Analyses

Following the differential susceptibility to media effects model, the dispositional factors age, gender, and the social factor socioeconomic status were considered to be relevant covariates when looking at effects on susceptibility to food promotion (Valkenburg & Peter, 2013). In line with the personal factors in Bandura's social cognitive theory and the framework of Story et al. (2002), food literacy was also considered to be an influencing factor on eating outcomes and thus added as a covariate. Lastly, to keep a priori differences and confounding factors from interfering, BMI, Instagram use and subjective hunger were also considered to be relevant covariates (Gunter, 2013).

Data was extracted from Qualtrics and all analyses were carried out in SPSS 27. Data-screening and cleaning was carried out by coding missing data and using boxplots to detect outlier scores on the outcome variables weight, height, age, food frequency and survey response times. Of these outcome variables, food frequency was the only with a score that bypassed three standard deviations. More specifically, one participant indicated to eat more than 75 gram sauce everyday. As this measure included cheese and meat sauce also, it was considered to be a plausible score. Five outliers of +3 standard deviations of response times were found, but those were considered to be due to participants not pressing 'send' after study completion.

Following the data-cleaning, a descriptive analyses was carried out using frequencies, means, standard deviations, percentages, and correlations. This was followed up by testing the assumptions for multivariate and univariate analyses that include covariates (normality, homogeneity of variance and covariance matrices, homogeneity of regression coefficients, multicollinearity, and independence of covariates) (Field, 2009). Next, manipulation of identification and randomization across conditions were checked. Lastly, the hypotheses as modeled in figure 1 were tested.

To investigate whether following non-core (H1 a, b, c) or core food influencers (H2 a, b, c) during two weeks had a differing impact on adolescents' eating outcomes a 1 (type of food influencer) x 2 (core vs. non-core) *multivariate analysis of variance* (MANOVA) (without covariates) was conducted. MANOVA's test whether groups can be distinguished by a combination of scores on several dependent variables that relate to an underlying construct (e.g. food norms) (Field, 2009). Additionally, MANOVA's consider interrelations between dependent variables, which enables them to identify the relative contribution of each individual variable in distinguishing groups (Huberty & Morris, 1989). For the testing of these hypotheses, type of food influencer (core or non-core) was the independent variable and core and non-core food intake, choices, attitudes (liking and perceived healthiness), and norms (injunctive and descriptive) were the dependent variables. After this, a *multivariate analysis of covariance* (MANCOVA) was conducted with these variables, but now including age, gender, BMI, subjective hunger, self-reported food literacy, Instagram use and socioeconomic status as covariates.

In line with hypothesis 3, interaction effects of type of food influencer (core vs. non-core) and identification condition (high vs. low) on food outcomes were tested. A 2 (type of food influencer core vs. non-core) × 2 (identification high vs. low) MANOVA was conducted, with the food outcomes (core and non-core food intake, choices, attitudes, and norms) as dependent variables.

Again, a similar MANCOVA analysis followed. To interpret interaction effects, the syntax [GLM AV BY OV1 OV2 /EMMEANS = TABLES(OV1*OV2)COMPARE(OV1)] was used. Prior to these interaction analyses, the assumption of multicollinearity was tested and was considered to met, as the largest VIF was 1.00 (<5) and tolerance did not go under .2 (the smallest value was .99) (Field, 2009). For the multivariate analyses, effect sizes were calculated using partial eta squared, with .02 indicating a small effect, .13 a medium effect, and .26 a large effect (Cohen, 2013).

Lastly, mediation effects of type of food influencer via food literacy on food outcomes (H4) were tested by using Model 4 of the PROCESS version 3.5.3 macro in SPSS (Hayes, 2013). All analyses used 5,000 bootstrap samples to estimate bias-corrected 95% confidence intervals, as not all outcome variables were normally distributed (Field, 2009). For each dependent variable (non-core and core food intake and choices, attitudes and norms), the model was run with all previously mentioned covariates, type of food influencer as the independent variable, and food literacy as mediator.

Results

1. Assumptions

As previously mentioned, the assumptions for both the MANOVA and MANCOVA analyses were tested prior to conducting these analyses. Kolmogorov-Smirnov tests revealed that the covariate BMI followed a normal distribution, but that the covariates age, food literacy, hunger, and family affluency did not. The Levene's test showed no significant differences in homogeneity of variances (p's>.05). The assumption of normality was thus only met for the covariate BMI, while the assumption of homogeneity of variance was met for all covariates. Additionally, only core food intake followed a normal distribution, meaning that neither the moderator identification, nor the dependent variables non-core food intake, attitudes, perceived healthiness, descriptive and injunctive norms followed a normal distribution for the entire sample. More details on the normality tests for the dependent variables, the moderator and the covariates for the sample as a whole and per condition can be found in Appendix 3. In order to ensure the correct interpretation of the data, the researcher opted not to transform the outcome variables and to keep using arithmetic means (Field, 2009). Moreover, early research suggests that F tests perform as they should in skewed distributions (Field, 2009)

The assumption of homogeneity of regression coefficients was also tested with a MANCOVA analysis for each group of dependent variables, prior to conducting the main MANCOVA analysis. For this study, no interaction effects between the covariates and the experimental effect of the four conditions as well as the core versus non-core conditions and high versus low identifications were found (p's>.05). Lastly, the assumption of homogeneity of covariance matrices was met for the analyses of food intake and norms (p's>.05), but not for the analyses of food attitudes (p's <.05).

2. Randomization and manipulation check

Prior to testing the hypotheses, randomization was checked by conducting ANOVA and Chi-square analyses. Randomization of participants across the four experimental conditions appears to be successful. The values of the covariates gender, $X^2(6) = 8.52$, $p=.20$, food literacy, $F(3, 314)$ =1.37, $p=.25$, age $F(3, 319) = 1.50$, $p=.21$, BMI $F(3, 317) = .37$, $p=.77$, hunger, $F(3, 316) = 2.52$, $p=.06$, Instagram use , $X^2 (9) = 3.38$, $p=.95$, and family affluency, $F(3, 319) = .34$, $p=.79$, did not significantly differ across conditions. This is a desirable result that indicates that the assumption of independence of covariates was met, which means that in this experiment, differences between groups can only be explained by the experimental manipulations.

Additionally, there was no significant difference found between the two core and non-core conditions in their value of the covariates $F(7, 305) = .86$, $p=.54$. Subsequent ANOVA and Chi-Square (for gender and Instagram use) tests confirmed this (p's >.05). This means that the assumption of independence of covariates was met for these group comparisons. Similarly, the values of the covariates between the low and high identification conditions also did not differ, $F(7, 305) = 1.35$, $p=.23$, with one exception: these conditions differed significantly in their rating of hunger, $F(1, 311) = 5.90$, $p <.05$. Participants in the two high identification conditions indicated on average to be more hungry ($M=2.75$, $SD= 1.18$) than participants in the low identification conditions ($M=2.43$, $SD= 1.10$).

The manipulation check consisted of a Mann-Whitney test that checked whether the high and low identification conditions differed significantly in their score on the identification scale included in the questionnaire. No significant difference occurred between the low and high identification conditions in their identification with the assigned influencers, U= 13473, p =.36. Although not significant, participants in low identification conditions had a lower mean rank (155.3), compared to the high identification condition (164.9), meaning the high identification groups had a greater number of high scores on the identification scale compared to the low identification groups. These results indicate that although participants in the high identification conditions liked their influencers more, felt more similar and bonded to them, they did not feel this to a significantly larger extent as the low identification conditions. An additional one-way independent Anova to compare the four individual conditions also did not show a significant difference, F(3, 318) = .25, p=.08. Manipulation of identification was thus not successful between the four conditions, nor between the identification conditions.

3. Descriptive statistics

All analyses were conducted on a sample of 323 Flemish adolescents consisting of 89 (27.6%) boys, 232 (71.8%) girls and 2 (.6%) 'other'. Their age ranged between 12 and 18 years old, with an average age of 15.66 years ($SD= 1.41$). As mentioned in the methods section, the composite of the variable 'socioeconomic status' ranges from 5 (lowest sum possible) to 15 (highest sum possible). On average participants came from relatively high affluence families ($M= 13.04$, $SD=1.10$). Additionally, most participants indicated that their mother's highest degree is a bachelor's degree (39.0%), followed by a university degree (35.3%), no degree (3.7%) and a high school degree (3.4%).

When answering the food choice questions post intervention, participants were on average moderately hungry (M= 2.58, SD= 1.13), as indicated by their score on the VAS hunger ratings (scaled from 1 to 5). When choosing their three vending snacks, participants chose on average more non-core snacks (M= 1.71, SD= .93) compared to core snacks (M= 1.19, SD= .92). Their favorite non-core snacks were chips (n=114, 35.0%), Haribo candy (n=109, 33.7%) and Milka chocolate (n=87, 27.0%). Additionally, the average participant was also moderately food literate, as indicated by the mean score of 3.23 (SD=.44) on the food literacy scale (scaled from 1 to 5).

The majority of participants never post (74.3%) or share (68.7%) food content on social media. The frequency of liking food posts is more evenly distributed across participants, with 24. 5% indicating to never like food related posts on social media, 27.2% indicating to do this less than monthly and 23.3% indicating to do this weekly. A more specific look at participants' time spent on Instagram, shows that most participants use Instagram daily, but less than one hour per day (n= 109, 33.7%) or one to three hours per day (n= 162, 50.2 %). Table 2 offers an overview of absolute and relative numbers of participants and their time spent on Instagram. Lastly, a large majority (n=280, 86.7%) indicated to follow influencers on social media. Table 3 presents participants' sociodemographic characteristics, their Instagram use, BMI and hunger ratings for the sample as a whole and as a function of their influencer food type condition.

Table 2. Participants' time spent on Instagram

Instagram use	
	n (%)
Less than daily	23 (7.1%)
< 1 hour per day	109 (33.7%)
1- 3 hours per day	162 (50.2%)
> 3 hours per day	28 (8.7%)
Total	322 (99.7%)

Table 3. Participants' socio-demographic characteristics, BMI, Instagram use and VAS for the sample as a whole and as a function of influencer food type condition

Covariate	Total	Condition (influencer food type x identification)			
		1	**2**	**3**	**4**
	(N=323)	Core food - High identification n= 80	Core food- Low identification n=78	Non-core food - High Identification n=78	Non-core food - Low Identification n=87
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Age	15.66 (1.41)	15.56 (1.41)	15.95 (1.29)	15.54 (1.44)	15.58 (1.44)
BMI	20.48 (2.89)	20.65 (2.36)	20.32 (3.21)	20.29 (2.86)	20.65 (3.07)
Hunger (VAS)	2.58 (1.13)	2.71 (1.19)	2.34 (1.01)	2.78 (1.17)	2.50 (1.09)
Family Affluency	13.04 (1.10)	13.01 (1.05)	13.12 (.97)	13.07 (1.22)	13.04 (1.01)
Food Literacy	3.23 (.44)	3.14 (.47)	3.28 (.42)	3.25 (.41)	3.22 (.43)
	n (%)	n (%)	n (%)	n (%)	n (%)
Instagram Use					
Less than daily	23 (7.1)	5 (6.3)	5 (6.4)	6 (7.7)	7 (8.0)
< 1 hour per day	109 (33.7)	30 (37.5)	23 (29.5)	25 (32.1)	31 (35.6)
1- 3 hours per day	162 (50.2)	37 (46.3)	45 (57.7)	40 (51.3)	40 (46.0)
> 3 hours per day	28 (8.7)	7 (8.8)	5 (6.4)	7 (9.0)	9 (10.3)
Gender					
Boy	89 (27.6)	28 (35.0)	20 (25.6)	21 (26.9)	20 (23.0)
Girl	232 (71.8)	52 (65.0)	58 (74.4)	57 (73.1)	65 (74.7)
Other	(.6)	0	0	0	2 (2.3)

The table in Appendix 4 gives an overview of the zero-order correlations between this study's outcome variables and the mediating (food literacy) and moderating (identification) variables. This table shows for example, that core food and drinks intake is significantly positively associated with liking of core food and drinks (r=.22, p<.01), with food literacy (r=.44, p<.01) and with identification (r=.12, p<.05). Non-core food and drinks intake on the other hand was significantly negatively associated with liking of core food and drinks (r=-.21 p<.01) and significantly positively with liking of non-core food (r=.47, p<.01) and with descriptive norms of non-core food (r=.22, p<.01) and food literacy (r=-.40, p<.01). Liking of core food was also significantly positively associated with self-perceived food literacy (r=.39, p<.01). Additionally, liking of non-core food was significantly positively correlated with normative perceptions of peer non-core food intake (r=24, p<.05) and significantly negatively associated with food literacy (r=.35, p<.01). Lastly, perceived healthiness of core food was significantly positively associated with injunctive norms of core food (r=.43, p<.01) and perceived healthiness of non-core food was significantly positively correlated with injunctive norms of non-core food (r.52, p<.05). The variables were never correlated stronger than r=.80, which indicates that multicollinearity should not be a problem and that each variable may relevantly contribute in explaining possible differences between groups (Field, 2009).

4. Explanatory Analysis

Type of food influencer (core vs. non-core) effects on core and non-core food intake

H1a and H2a proposed that the type of food influencer (core or non-core) adolescents were exposed to for two weeks would affect their food intake. More concretely, H1a posed that adolescents exposed to non-core food influencers for a duration of two weeks, would have a higher non-core food intake (self-reported intake and vending choices) compared to adolescents exposed to core food influencers for a duration of two weeks. H2a proposed the same, but for core food influencers and core food intake (self-reported intake and vending choices). These hypotheses were first tested with a MANOVA analysis. The results showed no significant effect of the type of food influencer on food intake, $F(4, 317)$ =1.91, p =.11, $\eta_p^2 = .02$. More concretely, following either type of food influencer during two weeks did not have an effect on intake of core food, $F(1, 320)$= 1.97, p=.21, $\eta_p^2 = .01$, intake of non-core food, $F(1, 320)$= 1.93, p=.17, $\eta_p^2 = .01$, core food choices, $F(1, 320)$= 3.62, p=.06, $\eta_p^2 = .01$, and non-core food choices, $F(1, 320)$= 4.15, p=.05, $\eta_p^2 = .01$. H1a and H2a were thus not supported according to this analysis.

When controlling for the covariates (hunger, age, gender, food literacy, BMI, socioeconomic status and Instagram use), the *MANCOVA'S* showed a significant effect of influencer food type on participants' self-reported food intake and food choices, $F(4, 300)$= 3.16, p<.05, $\eta_p^2 = .04$. More specifically, a significant difference between the influencer food type conditions was found regarding self-reported intake of non-core food, with non-core conditions indicating a 6.12% higher non-core food intake (*M*=6.94, *SD*=2.46) compared to core conditions (*M*=6.54, *SD*= 2.67), $F(1, 303)$= 6.20, p<.05, $\eta_p^2 = .02$. No differences were found between the conditions' self-

reported core food intake F(1, 303)= 2.86, p=.09, $\eta_p^2 = .01$. This indicates that exposure to non-core food influencers for a duration of two weeks may have had an impact on adolescents' non-core food intake, while exposure to core influencers probably did not have such an effect. Furthermore, the MANCOVA revealed that the conditions also differed significantly on their non-core vending choices, F(1, 301)= 5.40, p<.05, $\eta_p^2 = .02$ and core vending choices, F(1, 301)= 4.35, p<.05, $\eta_p^2 = .01$, with participants in non-core food condition choosing on average more non-core food and beverage options and participants in core food conditions choosing more core vending choices, relative to the other condition. According to this MANCOVA, following either core or non-core influencers on Instagram during two weeks resulted in differing snack choices for the participants in this study. In sum, when controlling for relevant covariates, H1a was supported for food intake and food choice outcomes, while H2a was only supported for vending machine choices.

The MANCOVA analysis revealed significant effects of the covariates food literacy, F(4, 300)= 45.60, p<.001, $\eta_p^2 = .40.$ gender, F(4, 300)= 11.41, p<.05, $\eta_p^2 = .19.$ socioeconomic status, F(4, 300)= 2.35, p<.05, $\eta_p^2 = .05.$ and hunger, F(4, 300)= 6.03, p<.001, $\eta_p^2 = .11.$ on self-reported food intake and choice outcomes. More specifically, a higher level of food literacy was related to higher core and lower non-core intake and vending choices. Boys reported a higher overall food intake and chose more non-core vending snacks compared to girls. A higher socioeconomic status was related to a higher overall food intake and more core vending choices. Lastly, hunger was associated with higher self-reported non-core food intake and more non-core vending choices. See Appendix 5 for an overview of detailed statistical results per covariate.

An additional analysis tested whether the conditions differed on their ratio of non-core vending choices to core vending choices and the ratio core vending choices to non-core vending choices. The results from this additional MANCOVA analysis revealed that the food type conditions differed significantly on a ratio of their vending choices, F(6, 298)= 3.82, p<.05, $\eta_p^2 = .04$. More specifically, non-core food influencers conditions scored significantly higher compared to the core conditions on a ratio of non-core choices/core choices of the vending machine, F(1, 303)= 4.58, p<.05, $\eta_p^2 = .02$, but the groups did not differ significantly in their ratio core choices/non-core choices F(1, 303)= 3.74, p=.06, $\eta_p^2 = .02$. Table 4 shows the means for food intake and food choice variables as a function of the influencer food type condition.

Table 4. Means and standard deviations for food intake and food choice variables as functions of the influencer food type condition.

	Core influencers	Non-core influencers	Total
	Condition influencer food type		
	M (SD)	M (SD)	M (SD)
Food Intake			
Non-core	6.54 (2.67)*	7.00 (2.46)*	6.75 (2.57)
Core	8.30 (2.40)	8.63 (2.19)	8.47 (2.30)
Food choices (Vending)			
Non-core	1.60 (.89)*	1.81 (.95)*	1.71 (.93)
Core	1.28 (.88)*	1.09 (.94)*	1.19 (.92)
Ratio food choices (Vending)			
Core/non-core	1.17 (1.00)	1.00 (1.02)	1.08 (1.01)
Non-core/core	1.53 (1.05)*	1.80 (1.10)*	1.65 (1.07)

Note: *means differed significantly between influencer food type conditions at *p*<.05.

Type of food influencer (core vs. non-core) effects on attitudes towards core and non-core food

H1b and H2b proposed that influencer food type (non-core or core) affects adolescents' attitudes (liking of food and their perception of food healthiness). More specifically, H1b predicted more positive attitudes for non-core food in the non-core food influencers conditions, compared to the core food influencers conditions and H2b predicted more positive attitudes for core food in the core food influencers conditions, relative to the non-core food influencers conditions. As with the previous hypotheses, a MANOVA analysis was performed first with type of food influencer as a factor and attitudes (liking and perceived healthiness) towards non-core and core food as dependent variables. The results showed no significant impact of exposure to core or non-core food influencers on attitudes towards either core or non-core food, $F(4, 315)= 1.74$, p=.1, $\eta_p^2 = .02$. Specifically, following either type of food influencer during two weeks did not have an effect on participants' liking of core food, $F(4, 315)= 1.97$, p=.16, $\eta_p^2 = .06$, liking of non-core food, $F(4, 315)= 2.59$, p=.11, $\eta_p^2 = .01$, perceived healthiness of core food, $F(4, 315)= .42$, p=.52, $\eta_p^2 = .01$, and perceived healthiness of non-core food, $F(4, 315)= .01$, p=.94, $\eta_p^2 = .00$. H2a and H2b were thus not supported according to this analysis.

When controlling for the previously mentioned covariates, there was still no significant difference found between exposure to core or non-core food influencers on attitudes towards both core and non-core food, $F(4,299)= 1.40$, $p=.24$, $\eta_p^2 = .02$. See Appendix 6 for an overview of the between-subjects F tests. Both the MANOVA and MANCOVA analyses thus indicated that following either non-core influencers or core influencers for a duration of two weeks, did not impact adolescents' attitudes (liking and perceived healthiness) towards non-core and core foods in this study. Hypotheses 1b and 2b were thus not supported. Table 5 offers an insight into the mean scores of attitudes and perceived healthiness as a function of influencer food type condition.

The covariates food literacy, $F(4, 299)= 26.2$, $p<.001$, $\eta_p^2 = .26.$, gender, $F(4, 299)= 6.20$, $p<.001$, $\eta_p^2 = .08$, and socioeconomic status, $F(4, 299)= 4.34$, $p<.01$, $\eta_p^2 = .06$, had a significant effect on food attitudes. More concretely, a higher level of food literacy was positively related to liking of core food and negatively related to liking of non-core food. Girls had a higher liking of core food compared to boys. Lastly, a higher socioeconomic status was positively related to liking of non-core food. The covariates seemed to have no effect on perceived healthiness of both core and non-core food. See Appendix 5 for an overview of detailed statistical results per covariate.

Table 5. Means and standard deviations of food attitudes and perceived healthiness of food as functions of influencer food type

Condition influencer food type

	Core influencers	Non-core influencers	Total
	M (SD)	M (SD)	M (SD)
Attitudes			
Non-core food	3.91 (.67)	4.01 (.61)	3.96 (.64)
Core food	4.05 (.69)	4.18 (.62)	4.11 (.66)
Perceived Healthiness			
Non-core food	1.84 (.56)	1.83 (.60)	1.83 (.58)
Core food	4.64 (.60)	4.59 (.73)	4.62 (.67)

Note: All *p* values of compared means were not significant, *p* >.05

Type of food influencer (core vs. non-core) effects on descriptive and injunctive norms of core and non-core food

H1c and H2c proposed that influencer food type affects adolescents' descriptive and injunctive food norms. Again, a MANOVA analysis was performed first with type of food influencer as factor and non-core and core food descriptive and injunctive norms as dependent variables. The results indicated no significant differences between exposure to core or non-core food influencers on descriptive and injunctive norms of food overall, $F(4, 312)= 2.27$, $p=.06$, $\eta_p^2 = .03$. More concretely, following either type of food influencer during two weeks did not have an effect on participants' descriptive norms of non-core food, $F(1, 315)= .12$, $p=.73$, $\eta_p^2 = .00$, injunctive norms of core food, $F(1, 315)= .24$, $p=.62$, $\eta_p^2 = .00$, or injunctive norms of non-core food, $F(1, 315)= 3.57$, $p=.06$, $\eta_p^2 = .01$. However, participants' descriptive norms of core food differed significantly between influencer food type conditions, $F(1, 315)= 6.09$, $p<.05$, $\eta_p^2 = .02$, This indicates that groups differed on their descriptive norms of core food, but that their differences disappear when all norm variables are combined (non-core descriptive norms and injunctive norms). Following these MANOVA results, adolescents exposed to core food influencers and adolescents exposed to non-core influencers for a duration of two weeks did not differ significantly in their injunctive and descriptive norms overall. However, between-subjects results indicated that these two groups differed significantly when looking at their descriptive norms of core food only. H2a and H2b were thus not supported according to this analysis.

Controlling for the covariates, influencer food type did have a significant effect on adolescents' food norms, $F(4, 296)= 2.54$, $p<.05$, $\eta_p^2 = .03$. More concretely, the food type conditions differed in their descriptive norms of core food, $F(1, 296)= 6.85$, $p<.01$, $\eta_p^2 = .02$., with participants exposed to core food influencers during two weeks perceiving their peers to eat core food more often (*M*= 3.47, *SD*= 0.71) than participants exposed to non-core influencers during two weeks (*M*= 3.25, *SD*= 0.77). Exposure to core or non-core influencers for a duration of two weeks did not impact descriptive norms of non-core food, $F(1, 296)= .01$, $p=.15$, $\eta_p^2 = .00$, injunctive norms of non-core food, $F(1, 296)= 3.51$, $p=.06$, $\eta_p^2 = .01$, or injunctive norms of core food, $F(1, 296)= .40$, $p=.53$, $\eta_p^2 = .00$ of the adolescents participating in this study. H1c was thus not supported and H2c was only supported for descriptive norms. Table 6 offers an insight into the mean scores of descriptive and injunctive norms as a function of influencer food type condition.

Only the covariate gender had a significant effect on norms, $F(4, 296)= 4.59$, $p<.01$, $\eta_p^2 = .06$. More specifically, girls perceptions of their peers' non-core food intake was higher (*M*=3.90, *SD*=.57) compared to boys' perceptions of their peers' non-core food intake (*M*=3.58, *SD*=.60) , $F(1, 299)= 10.52$, $p<.01$, $\eta_p^2 = .03$. See Appendix 5 for an overview of detailed statistical results per covariate.

Table 6. Means and standard deviations for descriptive and injunctive norms as functions of the influencer food type condition.

Condition influencer food type

	Core influencer	Non-core influencer	Total
	M (*SD*)	*M* (*SD*)	*M* (*SD*)
Descriptive norms			
Non-core food	3.78 (0.58)	3.80 (0.60)	3.79 (0.58)
Core food	3.47 (0.71)*	3.25 (0.77)*	3.36 (0.75)
Injuncitve norms			
Non-core food	2.07 (0.54)	2.21 (0.67)	2.15 (0.61)
Core food	4.60 (0.73)	4.55 (0.86)	4.57 (0.80)

Note: ∗ Means differ significantly between influencer food type conditions at $p < 0.01$. All other comparisons were not significant.

Identification with influencers as a moderator of influencer food type effects on food outcomes

H3 proposed that higher levels of identification with the influencers who participants had to follow during two weeks, would moderate food outcomes. To test this interaction effect, identification condition was added as a factor in 2 (low vs. high identification) x 2 (non-core vs. core influencer food type) MANOVA and MANCOVA models after each main analysis. No interaction effects between type of food influencer (core vs. non-core) and identification (low vs. high) were observed for any of the dependent food outcome variables (food intake, attitudes, and norms) (*p*'s>.05), disconfirming H3a and b.

More concretely, the food outcomes of adolescents who followed more similar influencers and were expected to identify to a greater extent with those influencers compared to adolescents in the low identification conditions, seemed to not have been impacted more strongly by exposure to either core or non-core influencers (during two weeks) compared to the food outcomes of adolescents in the low identification condition. Additionally, identification condition as a factor also did not have a main effect on any of the food outcomes (*p*'s>.05). As mentioned earlier, the manipulation of identification appeared to not be successful, so this outcome could be expected. Table 7 gives an overview of the MANOVA and MANCOVA results for the main effects of identification on all food outcomes and its interaction effect with type of food influencer on all food outcomes.

However, when looking at food intake in a more detailed way by splitting food intake into separate food and drink variables, a significant interaction of type of food influencer and identification was found on soft drinks intake $F(1, 319)= 8.52$, $p<.01$, $\eta_p^2 = .03$, but not for water intake, $F(1,319)= 2.45$, $p=.12$, $\eta_p^2 = .01$. A subsequent post-hoc test was conducted and a plot was ordered to interpret this difference. It appears that in high identification conditions, participants exposed to non-core influencers reported a significantly higher intake of soft drinks ($M=6.47$, $SD=4.43$) compared to participants exposed to core influencers ($M=4.76$, $SD=4.55$). Similarly, a MANCOVA analysis also found a significant interaction effect of influencers' food content (core or non-core) and identification (low or high) on self-reported intake of water $F(1, 302)= 4.91$, $p<.05$, $\eta_p^2 = .02$ and soft drinks $F(1, 302)= 10.35$, $p<.01$, $\eta_p^2 = .03$. With participants in high identification, core food influencer conditions now scoring significantly higher on their water intake ($M=16.11$, $SD=.68$) compared to high identification, non-core food influencer conditions ($M=15.05$, $SD=.69$).

Table 7. MANOVA and MANCOVA statistics for main and interaction effects of identification condition on food outco

	MANOVA			MANCOVA		
Dependent variables	**Main effect of identification condition**					
	F(df)	*p*	partial eta squared	*F*(df)	*p*	partial eta squared
Food intake and choices	.47 (4, 315)	.76	.01	1.41 (4, 298)	.23	.02
Food attitudes (liking and perceived healthiness)	1.86 (4, 313)	.12	.02	1.50 (4, 297)	.20	.02
Food norms (descriptive and injunctive)	.61 (4, 310)	.65	.01	.37 (4, 294)	.83	.03
	Type of food influencer x identification					
Food intake and choices	1.07 (4, 315)	.37	.01	.35 (4, 298)	.84	.01
Food attitudes (liking and perceived healthiness)	.07 (4, 313)	.99	.00	1.00 (4, 297)	.86	.00
Food norms (descriptive and injunctive)	.81 (4, 310)	.52	.01	2.54 (4, 294)	.39	.01

Mediation effects of type of food influencer via food literacy on food outcomes

H4 proposed that the effects of core and non-core food influencers on adolescents' eating outcomes would to some extent influence their food literacy, which would in turn affect their food outcomes. For each dependent variable (non-core and core food intake and choices, attitudes and norms), a PROCESS model 4 was run with all previously mentioned covariates, type of food influencer as the independent variable, food literacy as mediator, and food outcomes (intake, attitudes, and norms) as dependent variables.

Direct effects were in agreement with the previously reported MANCOVA outcomes. This means that following non-core influencers for two weeks resulted in a significantly higher self-reported non-core food intake and on average more non-core vending choices, compared to participants who followed core influencers for two weeks. Following core influencers for two weeks resulted in higher perceptions of peer core food intake and on average more core vending choices, compared to participants who followed non-core influencers for a duration of two weeks. Direct effects of influencer food type on core food intake, on core and non-core attitudes (liking and perceived healthiness), on non-core descriptive norms, and on core and non-core injunctive norms were non significant.

Regarding the associations between food literacy and the outcome variables, food literacy had on the one hand a significant effect on self-reported non-core food intake (b = -2.14, t= -7.56, SE = .28, $p<.001$, 95% CI = [-7.70, -1.58]), self-reported core food intake (b = 2.40, t= 9.63, SE = .25, $p<.001$, 95% CI = [1.91, 2.89]), non-core food choices (b = -.64, t= -5.84, SE = .11, $p<.001$, 95% CI = [-.86, -.43]), core food choices (b = .67, t= 6.03, SE = .11, $p<.001$, 95% CI = [.45, .89]), liking of non-core food (b = -.54, t= -6.80, SE = .08, $p<.001$, 95% CI = [-.69, -.38]) liking of core food (b = .57, t= 7.34, SE = .08, p<.001, 95% CI = [.42, .73]).

On the other hand, food literacy did not have an impact on perceived healthiness of core food (b = -.10, t= -1.12, SE = .09, $p=.27$, 95% CI = [-.27, .07]) or perceived healthiness of non-core food (b = .05, t= .63, SE = .08 $p=.53$, 95% CI = [-.10, .20]), descriptive norms of non-core food (b = -.12, t= -1.64, SE = .08, $p=.10$, 95% CI = [-.27, .02]), descriptive norms of core food (b = -.07, t= -.76, SE = .10, $p=.45$, 95% CI = [-.27, .12]), injunctive norms of core food (b = -.04, t= -.41, SE = .11, $p=.68$, 95% CI = [-.26, .17]), and injunctive norms of non-core food (b = .16, t= 1.97, SE = .08, $p=.05$, 95% CI = [.00, .32])

However, as type of food influencer never had a significant effect on food literacy (b = .03, t= .60, SE = . 05, $p=.55$, 95% CI = [-.07, .13]), food literacy did not mediate the effect of type of food influencer on food outcomes (food intake, attitudes and norms). H4a and b were thus not supported. Direct, indirect and total effects of the tested mediation models are presented in table 8. The tested mediation model is schematically presented in figure 2.

Figure 3 offers an overview of all significant findings. Lastly, an explorative mediation analysis of the effects of identification condition on food outcomes via self-reported identification was conducted. No mediation effects of level of identification with influencers on any of the food outcomes were found (p's>.05).

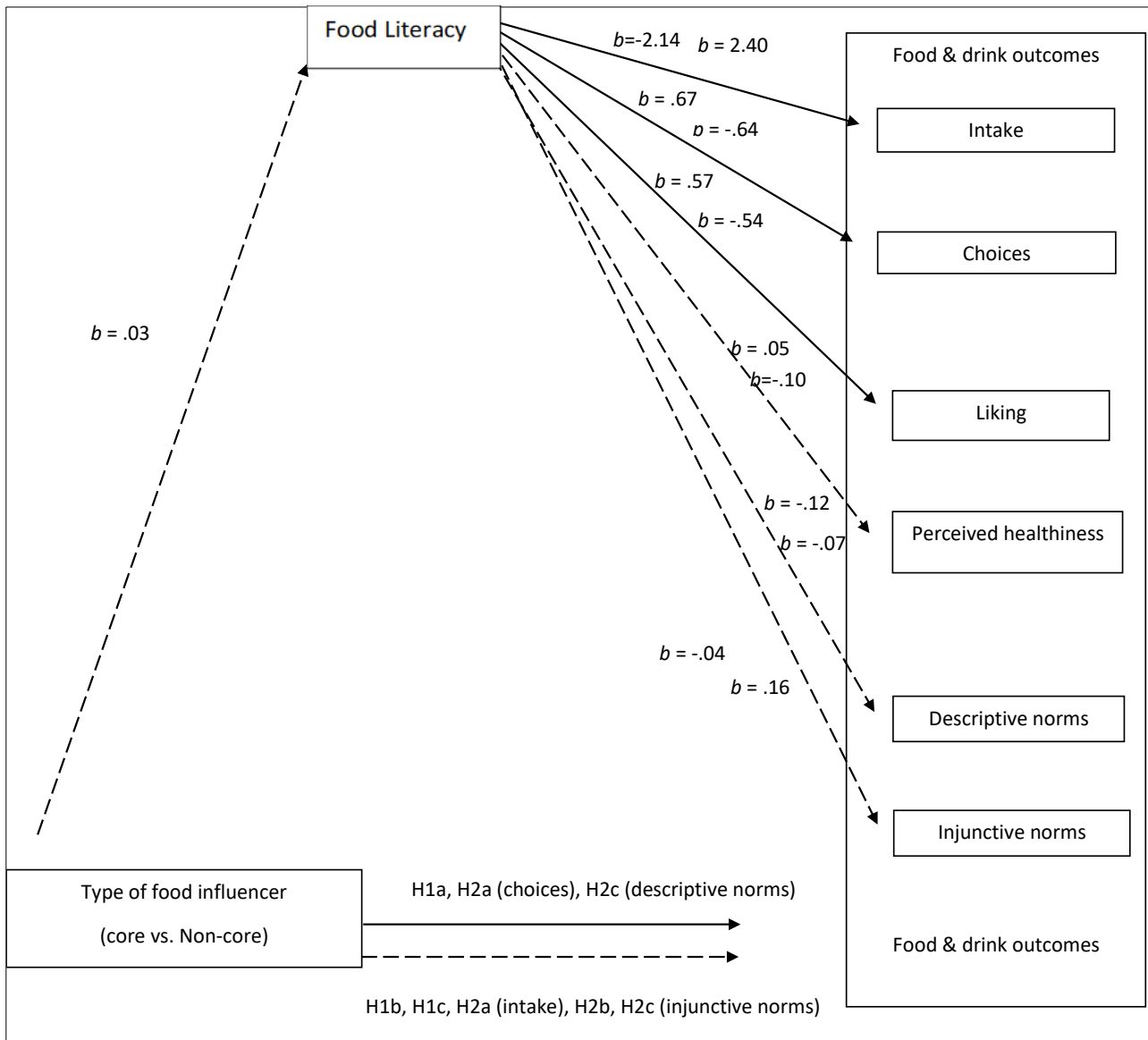**Figure 2. Schematic overview of mediation analyses (H4)**

Table 8. Direct, indirect and total effects of the mediation of food literacy between type of food influencer (core vs. non-core) and food outcomes

Food outcomes	Indirect effect			Direct effect				Total effect			
	B	SE	Boot LLCI/ULCI	B	SE	t	Boot LLCI/ULCI	B	SE	t	Boot LLCI/ULCI
Intake											
core food	.07	. 12	-.17/.31	.36	.22	1.65	-.07/.78	.43	.25	1.74	-.06/.91
non-core food	-.06	. 11	-.27/.15	.60*	.25	2.42	.11/.08	.53*	.27	1.99	.01/1.06
Choices											
Core food	.02	.03	-.05/.09	-.20*	.10	-2.10	-.39/-.01	-.18	.10	-1.79	-.38/.02
non-core	-.02	.03	-.09/.04	.22*	.10	2.32	.03/.41	.20*	.10	2.02	.01/.41
Liking											
core food	.02	.03	-.04/.08	.09	.07	1.51	-.04/.14	.11	.07	1.51	-.03/.25
non-core food	-.02	.03	-.07/.04	.12	.07	1.72	-.02/.25	.10	.07	1.39	-.04/.25
Perceived healthiness											
core food	-.00	.01	-.02/.01	-.05	.08	-.63	-.20/.10	-.05	.08	-.67	-.20/.10
non-core food	.00	.01	-.01/.01	.00	.10	.01	-.13/.13	.00	.10	.04	-13/.00
Descriptive norms											
core food	-.00	.01	-.02/.01	-.22**	.10	-2.62	-.39/-.06	-.23**	.10	-2.65	-.40/-.10
non-core food	-.00	.01	-.02/.01	.01	.10	.13	-.12/.14	.00	.10	.07	-.12/.13
Injunctive norms											
core food	-.00	.01	-.02/.01	-.04	.09	-.46	-.23/.14	-.04	.10	-.48	-.23/.14
non-core food	.01	.01	-.01/.03	.13	.07	1.85	-.01/.03	.13	.07	1.91	-.00/.27

*Note: *p<.05, **p<.01.   Influencer food   type: 1=non-core   ,   0=core*

Figure 3.Overview of significant findings
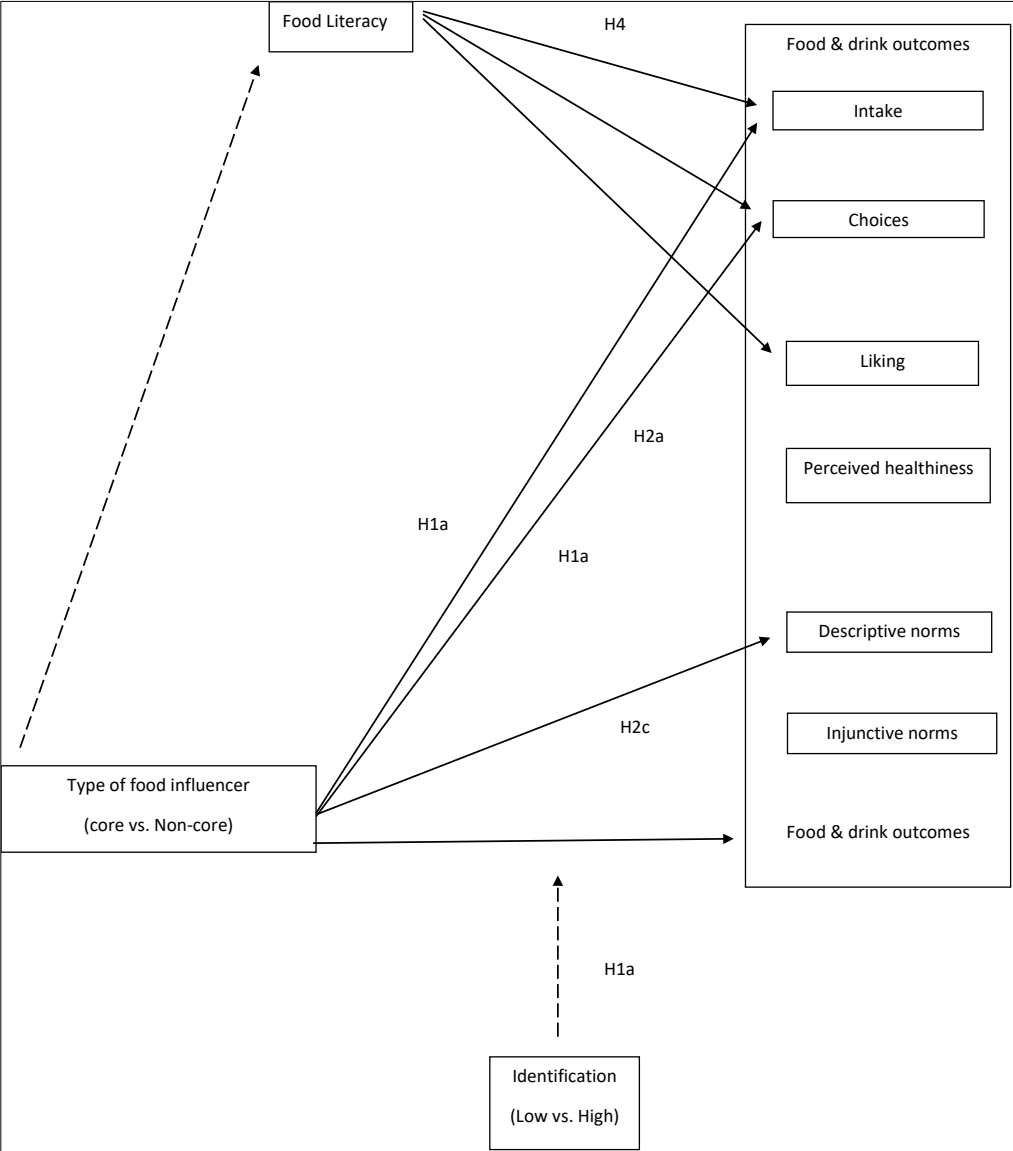
Note: --------- **included for comprehension purposes, but findings were not significant**

Discussion

The aim of the current study was to determine the impact of Instagram influencer's food related content on Flemish adolescents' food outcomes (intake, choices, attitudes, and norms). This is a highly relevant topic in today's digital society, at a time when adolescents' eating habits are worsening and (digital) food marketing has been pointed out as a possible contributing factor (Buchanan et al., 2018; Chester & Montgomery, 2011; Kelly, Vandevijvere, et al., 2015; World Health Organization, 2016). However, health institutions are also increasingly calling attention to the possibilities of using digital interventions to reach adolescents in a more relevant way in order to improve nutrition knowledge and diet (Chau et al., 2018; Yonker, et al., 2015). Social media is considered to be a relevant socializing agent in the lives of adolescents today and influencers are often regarded as models or peers from who adolescents may learn behavior, attitudes and normative perceptions (Bandura, 1986; Beaudoin, 2014; Chester & Montgomery, 2011; Elder, 1968). These considerations make social media influencers relevant factors to consider when looking at adolescents' food attitudes, behavior, and cognitions (Coates et al., 2019; Coates et al., 2019a; Qutteina, Hallez, et al., 2019).

Research on the impact of influencer food promotions on adolescents' eating outcomes is rather scarce for both core and non-core food promotions, which is the gap the current research aimed to fill (Coates et al., 2019; Coates et al., 2019a; Qutteina, De Backer et al., 2019). In this study 323 Flemish adolescents were randomly assigned to one of four influencer conditions in a two (core vs. non-core food influencers) by two (high vs. low identification) experimental design. Participants were asked to follow the group of influencers they were assigned to for a duration of two weeks. After these two weeks, the impact of the intervention on food outcome variables (intake, choices, attitudes, and norms) was analyzed as well as the potentially mediating role of food literacy and the moderating role of the identification manipulation.

1. Principal findings

Following the framework of Story et al. (2002) on relevant factors that may influence adolescents' food related behavior, this study's main focus was the impact of the macrosystem factor social media influencers. These influencers may influence the interrelated concepts of food related behavior, norms and attitudes through the interpersonal bond adolescents perceive to have with these influencers (Coates et al., 2019; Colliander & Dahlen, 2011). However, this model also posits that various other interrelated personal and social factors can influence adolescents' eating behavior (Story et al., 2002). In line with this, the results of this study indicate that factors gender, food literacy, and socioeconomic status may play a part in steering adolescents' eating behavior, attitudes, and cognitions. These findings are also in line with the differential susceptibility to media effects model that posits that dispositional factors (e.g., gender) and social factors (e.g., socioeconomic status) are conditioning factors to consider in media effects (Valkenburg & Peter, 2013). Individual food factors may thus affect adolescents' eating outcomes alongside the effects of influencer food type, which can explain why the results of the MANOVA analysis indicated that exposure to influencers' food content did not have a significant impact on any of the food

outcomes. However, in the subsequent MANCOVA analyses, significant influencer effects on food intake, choice and norms appeared. These findings will now be discussed per food outcome construct (intake and choices, attitudes and norms).

First, adolescents who followed non-core influencers for two weeks reported a significantly higher non-core food and drink intake during the two weeks of the intervention, compared to adolescents who followed core food influencers. Following the Social Cognitive Theory, influencers might have impacted adolescents' non-core food intake by modelling this behavior or by reinforcing the outcome expectations of eating non-core food (e.g., by referring to their tastiness) (Bandura, 1989; Lapinski & Rimal, 2005). Although this study found no effect on participants' norms regarding non-core food, Lally et al. (2011) suggested that adolescents generally already overestimate their peers' non-core food intake. As descriptive norms of non-core food and non-core food intake were indeed correlated in this study, normative perceptions might have been reinforced (instead of increased) by the non-core food influencers, which may have impacted participants' intake (Birch, & Fisher, 1998; Lally, et al., 2011). Exposure to non-core content may have also triggered participants' hunger and thoughts about non-core foods, which following the cue reactivity idea from the Reactivity to Embedded Food Cues in Advertising Model (REFCAM), may lead to an increased appetite for and subsequent intake of similar foods (Folkvord et al., 2016; Jansen, 1998). In line with previous research, this study thus suggests that adolescents' non-core food intake can be impacted by the promotion of these foods (Boyland et al., 2016; Buchanan et al., 2018; Norman et al., 2018; Qutteina, De Backer, et al., 2019; Scully et al., 2012). Moreover, influencer food promotion seems to affect adolescents in the same way it affects younger children (Coates et al., 2019; Coates et al., 2019a; Folkvord, et al., 2016). These results may thus support previous studies that call for food promotion regulations to be adapted to recognize adolescents' vulnerability (Qutteina, De Backer, et al., 2019).

Second, this study found that Flemish adolescents from the non-core food influencers condition chose more non-core vending choices and that similarly, adolescents from the core influencers condition chose more core vending choices, relative to the other influencer food type group. The influencers' modelled behavior and preferences may thus have had an effect on adolescents when they were faced with making food and drink choices (Bandura, 1989). Additionally, following the REFCAM model (Folkvord et al., 2016) adolescents' repeat exposure to non-core food seems to have affected adolescents' non-core food intake. This might have made adolescents more susceptible to subsequent non-core food cues (i.e. the incentive-sensitization process), for example when faced with the vending machine choices (Folkvord et al., 2016). Adolescents might thus have been more sensitized to react psychologically and physiologically to the vending machine pictures (cues) from non-core foods that were similar to those they were exposed to for two weeks (Folkvord et al., 2016). The promotion of core food however, only resulted in relatively more core vending snack choices. This choice outcome might be due to the 'reward' of actually eating the non-core snack (adolescents have an a priori liking of non-core food) being taken out, as this was a hypothetical question, which may have made descriptive norms on core food gain relevant influencing potential on their conscious food choices (Birch, & Fisher, 1998; Lally, et al., 2011; Toumpakari et al., 2016). These finding are in line with the

systematic review of Cairns et al. (2013), which posed that promotion of both core and non-core food can effect food choices among children and young adolescents.

The core and non-core food influencer conditions did not differ on their self-reported core food intake. The core food diet modelled by the influencers was thus not sufficiently mimicked by the participants (Bandura, 1986). Previous research that examined promotional effects of both core and non-core foods also found relatively stronger effects of non-core food promotion on adolescents food intake (Cairns et al., 2013; Giese et al., 2014). This may be due to adolescents' a priori preference for non-core foods, which might make increasing non-core intake easier than increasing core intake (Das et al., 2017; Toumpakari et al., 2016). These not significant findings are also in line with the pilot study conducted by Folkvord and de Bruijne (2020), where influencer promotion of red peppers did not increase subsequent vegetable intake among adolescents.

Regarding the second outcome variable attitudes, this study found no effects of core and non-core food promotion on adolescents' liking or perceived healthiness of these foods. This is in contradiction with previous research that found an effect of core and non-core food promotion on core and non-core food attitudes (Cairns et al., 2013; Dixon et al., 2007; Kelly et al., 2015; Qutteina, De Backer, & Smits, 2019). One possible reason for this finding is that adolescents might not have sufficiently bonded with or sufficiently liked the influencers to instigate conditioning effects (Bandura, 2009; Folkvord et al., 2016; Ohanian, 1999). Indeed adolescents in all four conditions scored relatively moderate on the identification scale. However, similar to previous endorser and persuasion research, it seems that attitudes do not need to be affected first in order to see behavioral changes (food intake) coming from influencer promotions (Kelly, King et al., 2015; Ki & Kim, 2019).

The third group of outcome variables were descriptive and injunctive core and non-core food norms. It was hypothesized that exposure to influencers' core or non-core food content would heighten perceived descriptive and injunctive norms of these foods. This study only found an impact of exposure to core food influencers on adolescents descriptive norms of peer core food intake, meaning that seeing influencers' eating habits may have heightened adolescents' perceptions of the prevalence with which core foods are consumed by their peers (Lapinski & Rimal, 2005). A possible explanation of only finding significant effects on descriptive core food norms, is that adolescents generally overestimate their peers' non-core food and drink intake, and underestimate their peers' core food and drink intake (Lally et al., 2011). Norms communicated by the non-core food influencers may have already been aligned with adolescents' own perceptions of their peer non-core intake, whereas core intake norms might have been lower compared to communicated norms by influencers (Lally et al., 2011). As peer norms may subsequently impact adolescents' food intake and choices (Birch, & Fisher, 1998; Lally, et al., 2011), this difference in core food descriptive norms may explain why adolescents who followed core food influencers chose more core food choices. Although this study found no association between core food norms and choices and intake, it might be interesting for future intervention research to study the potentially mediating role of norms between exposure to influencers' food posts and food intake.

The manipulation of identification was not successful, which can explain why no moderation effect of identification on any of the general food outcomes (intake, choices, attitudes, and norms) was found. Adolescents from high identification conditions appeared to not feel a stronger bond with, or more similar to their influencers compared to adolescents following the influencers from the low identification conditions (Basil, 1996; Brown, 2015; Moyer-Gusé, 2008). Similar age was thus not a relevant enough criteria on its own. Future research should include other criteria that might influence (wishful) identification (e.g. an additional focus on attractiveness) to enhance the difference in identification (Basil, 1996; Ohanian, 1990). Also, participants indicated in the post interview that the influencer food content they were exposed to was sometimes excessive, which could have diminished perceived similarity of interests with the influencers for participants that were moderately interested in food content (Basil, 1996; Brown, 2015; Moyer-Gusé, 2008; Ohanian, 1990).

However, when separating the variables reported food and beverage intake and looking at reported beverage intake individually, there was an interaction effect of influencers' food content (core vs. non-core) and identification (low vs. high) on self-reported intake of water and soft drinks. More concretely, in high identification conditions, reported water intake was higher for the core food influencer conditions and reported soft drink intake was higher for the non-core conditions. As there was no difference in identification between these conditions, but influencers can have an impact on beverage intake, it could have been that the influencers in the high identification conditions posted more beverage related content and that this was mimicked by the participants (Bandura, 1986; Smit et al., 2020).

Contrary to expectations, the effects of following either core or non-core influencers for two weeks were not mediated by food literacy. Being assigned to either core or non-core food influencer conditions did not have a differing impact on participants' self-perceived level of food literacy. In line with this, participants' perceived healthiness of core and non-core was not affected in this study, which can be seen as an aspect of food literacy (Poelman et al., 2018; Vidgen, & Gallegos 2014). This might be due to the duration of the intervention being too short to relevantly measure the knowledge and skill acquisition related to food literacy (e.g., new cooking skills, recognizing the quality of fresh foods) (Poelman et al., 2018). In line with previous research however, food literacy seemed to be positively associated with core food intake and liking and negatively associated with non-core food intake and liking (Vaitkeviciute et al., 2015).

2. Study Limitations

This study was not without limitations. First, the obtained significant results had rather small effect sizes ($\eta_p^2 < .13$) (Cohen, 2013). However, food promotion research generally obtains small to medium effect sizes, as multiple other environmental, personal, and interpersonal factors exert influence on adolescents eating behavior (Dixon et al., 2007).

Second, this study used self-report measures, which are susceptible to social desirability and memory biases. These biases may cause over- or underreporting of self-perceived food intake and food literacy (Roose & Meuleman, 2017). The measurement of food intake may thus have been less valid compared to the measurement of real food intake. However, due to the prevailing COVID-19 restrictions at the time of the research, this was not an option. Moreover, self-reporting

scales are frequently used instruments in studies that look into food habits and perceptions (e.g., Hallez, Qutteina, Boen, & Smits, 2021; Rhea, Cater, McCarter, & Tuuri, 2020). The food literacy scale though, was validated for an adult sample and might have included questions that were not in line with younger adolescents reality (e.g. 'can you prepare fish in different ways?') (Poelman et al., 2018). Additionally, the scoring of the identification scale was counterintuitive, with a score of one meaning high identification and a score of seven referring to low identification. Although this scoring was explicitly mentioned in the question and the numbers were labelled with their meaning, it might have led to some participants scoring their level of identification reversely, which decreases the validity of this measurement.

Fourth, the experimental design was such that participants had to follow the assigned influencers during two weeks. As mentioned in the methods section, measures were taken to ensure they followed the influencers (this was checked by the researcher) and looked at their profiles every day (an alarm was set on the participants' phones as a reminder). In the second meeting, participants were asked if they had completed their task as requested. If participants answered non-conformity (two did), their results were taken out of the analysis. However, having absolute certainty that each participant fulfilled their tasks during the two weeks of the experiment was not possible. Also, in line with characteristics of experiments, this study acknowledges that it may not have controlled entirely for extraneous factors that could have affected the outcome variables (Gunter, 2013).

Lastly, participants were partly recruited by answering autonomously to the call for participation, which limits this study with a self-selection bias due to this use of a non-probability, convenience sample (Gunter, 2013). As the call for participation mentioned social media and food, adolescents who have an interest in these topics may have been more likely to participate (Roose & Meuleman, 2017).

3. Study strengths

A first strength of this study is it's ecological validity. The study design was set up in a way that exposure to the media stimuli (food influencers) was not taken out of its natural context (Gunter, 2013). Second, the experimental design of the study, along with the randomization of participants, the temporal order, and the consideration of relevant control variables, allowed for causal conclusions (Gunter, 2013).

Most importantly, this study aimed to fill the gap in current food promotion research regarding the effects of influencer food promotion on adolescents' eating habits. Adolescents are an age group that is under reached in their reactions to food marketing in general and to influencer food promotion specifically (Qutteina, De Backer et al., 2019). The findings support health institutions' claims that digital food (marketing) content of non-core food can have negatively affect adolescents' diet (World Health Organization, 2016). Regulations should adapt to the realities of today's adolescents' lives and the relevant factors that influence their eating cognitions and behaviors (World Health Organization, 2016).

On the other hand, promising results of core food promotion on adolescents' descriptive norms were found. These findings may offer initial support to the idea of using influencers to promote a healthier lifestyle among adolescents (De Jans et al., 2021; Folkvord & de Bruijne, 2020). As descriptive peer norms can impact adolescents' eating behavior, an interesting angle for future research might be to examine exposure to core food influencers over a longer time period to see if changes in behavior occur via descriptive norms (Birch, & Fisher, 1998; Lally et al., 2011). This study encourages more extensive research into core food promotion possibilities by influencers who are popular among adolescents (Folkvord & de Bruijne, 2020).

4. Conclusion

In conclusion, this study sheds an experiment-based light on the effects of exposure to Instagram food influencers' (core and non-core) food promotion on Flemish adolescents' food outcomes (intake, preferences, attitudes, and norms). It appears that their non-core food intake can be impacted by exposure to influencers' non-core food content. This results in an unhealthy food diet short term, but may lead to overweight or other severe health issues (e.g. cardiovascular diseases) in the long haul (World Health Organization, 2016). Therefore, this study supports previous calls to increase protection for this age group on social media to keep them from making impulsive non-core food choices and mimicking unhealthy behavior modelled by influencers (Bandura, 1986; Qutteina, Hallez et al., 2019). On the other hand, this study found promising results regarding changes in adolescents' descriptive core food norms. Therefore, in line with previous health intervention research and the Promotion of Healthy Foods Model, this study reiterates the importance of looking at social media tools, such as influencers, to promote and normalize core food intake among adolescents (Folkvord & de Bruijne, 2020; Folkvord & Hermans, 2020).

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Appendix

Appendix 1

<u>Protocol COVID-19 alternative</u>

<u>- to be implemented</u>

==Always make sure to use a video (audio and picture) call for all meetings. If one is not possible, postpone the meeting until a solution is found.==

A. First online video meeting with participants

Always make sure to use a video (audio and picture) call for all meetings. If one is not possible, postpone the meeting until a solution is found. The video call should be organized on the participant's computer so as to leave the participant's phone free for other intervention tasks (e.g following influencers, reminders, etc). It might be better to use light video call apps on the computer to avoid any computer overload. Therefore Zoom was used to conduct the meetings.

Recruiting participants via youth movements, schools and Facebook:
- Older than 16 years: to be filled in by an adolescent him or herself: A short questionnaire with explanation about the study, asking after the child's age, whether they have an Instagram profile, asking for their e-mail address and to choose meeting moments.
- Under 16 years old: parental consent and a short questionnaire with explanation about the study, asking after the child's age, whether they have an Instagram profile, asking for their e-mail address and to choose meeting moments

1. Obtain consent

a. **For minor adolescents under 16:**

       i.**First obtain parental consent (prior to video face-to-face meeting) via:**

- **Online Parental Consent: Link to Qualtrics consent form sent via email through school (or youth movement, etc.), OR**
- **Paper parental consent: Hard copy of parental consent, OR**
- **In case of schools and youth movements, both online and hard copies of parental consent**

Note: The choice (of online or paper parental consent) goes back to the preference of the parent (if contacted individually, or the preference of school or youth movement)

       ii.**Obtain minor adolescent's consent: ONLY after obtaining parental consent can you obtain the minor adolescent's consent (referred to as assent)**

- **Consent is obtained during the first video meeting**
- **Participant consent can is completed online where the participant clicks "Yes, I agree to participate"**

b. **For adolescents older than 16: sign their own consent during the first meeting**

- **Consent is obtained online during the first video meeting**
- **Participant consent can is completed online where the participant clicks "Yes, I agree to participate"**

-> Remind them 3-4 days before the meeting. E-mail or message participants their meeting dates and hours and that you would like them to use their computer for the meeting, not a smartphone. Ask them to conduct the meeting while sitting in a silent room, with good Wi-Fi and with their video and microphone on. Ask them to make sure their computer has enough battery or to have a charger nearby. Send your invite for Zoom and remind them to keep this e-mail to be able to find the link.

<mark>Meeting 1 preparations:</mark>

Researcher: Sit in a quiet, not distracting room and have the excel monitoring sheet on a laptop with me and have the Qualtrics link ready.
Timing: Aim for after lunch hour, so that participants are not hungry.

At the beginning of the meeting: Participant: Ask the participant to go sit in a quiet room, to call via laptop with video and sound (or pc) and to use a mobile device to answer the questionnaire and to go to a room where they have good Wi-Fi. Advice them to have a charger near in case it's necessary.
<mark>Enable waiting room (to prevent disturbances)</mark>

2.   How to receive informed consent from participant?

Explain and obtain the informed consent as follows:
   a. Check for those under 16 for parental consent before meeting them
    b. Introduce yourself, the project, the three phases of the project

- **For the first part of data gathering, adolescents will receive the first questionnaire and explanation about the study via Zoom in February 2021. The goals of the research, as well as what is expected of the students, will be explained.**
- **This meeting is done with each participant individually. For collaboration with schools, individual meetings were impossible: as a solution classes were split (beforehand by the teacher) into groups of 5 -10 students. This was done to keep the groups manageable and overseeable and so the researcher would be able to answer their individual questions.**
- **Enable waiting room AND chat to researcher only**

- **Introduction: 'Hi, nice to meet you and welcome. My name is Katoo Derks. How are you? Are you comfortable and in a room where you are able to fill in the questionnaire in peace? I am very happy that you want to participate in my study. I am a master student Communication Sciences at (faculty of social sciences) KU Leuven and I am here today to invite you to participate in a research study. The topic of this study is social media and eating."**
-Say: 'You will be given a questionnaire to fill in and at the end you will find a list of influencers to follow with your Instagram account during two weeks. After two weeks, we will have a follow up   meeting."

   b.   **Explain what participation entails, and the duration of participation**

   c.   **Explain the three principles of ethical practice that we follow:**

   d.   **Voluntariness: "Your participation in this study is voluntary, meaning it is your decision to decide whether you want to participate, if there is any question you wish to skip, it is up to you, if at any time you wish to withdraw, again this is up to you"**
   e.   **Confidentiality: "Anything you answer is completely confidential, all your answers will be secured and protected by password or in locked cabinets. Only members of the research team have access to this data. When we report the results of this study, we do not say person x or from school x said so and so, we report in group, e.g. adolescents aged 12-18 reported so and so"**

   f.   **Harm and benefit: "I cannot promise you any personal benefit for your participation in this study (other than the voucher and the greater benefit to science and the community, e.g. possible recommendations for schools and public health and communication campaigns in Flanders). Having said that, that is no harm from participating in this study, as it is a simple study where you follow influencers, and then fill out a questionnaire."**

g.   Explain to the participant that, once they complete the study (following influencers and checking their accounts), they will be compensated by having a chance to win a voucher in compensation for their time and efforts.

h. Next, tell the participant all this information will be in the first page of the questionnaire. Allow them time to read the consent form on their own. Explain to them that they will find an ID number at the end of the survey, along with the list of influencers and that they will be asked to send this to you. This is done to be able to guarantee confidentiality while analysing the data and later on. 'I will send you the link for the survey in the chat box.. you will also find the consent form there. Please read this carefully and let me know if you have any questions.

DISCLAIMER: Due to the time consuming nature of the meetings (10-15 minutes), schools refused to let students do meeting 1 individually, as this would take multiple class hours to do. Participation of schools was necessary to boost the sample to its desired outcome of 330 participants. Because of the research's online nature and students following classes online from home, they could do meeting 1 in small and manageable groups of 5, without talking to each other or seeing each other's screen. The researcher muted each student, enabled the 'chat to researcher only' function and had them send screenshots to the researcher privately as evidence for following the right influencers and setting a reminder to check the influencers' profile daily. This was done to prevent hypothesis guessing. Only then were they allowed to leave the meeting.

Schools: Students have to follow all the influencers, send their ID in the chat (chat to researcher only is enabled, so they cannot see this from each other) and take a screenshot as evidence that they have followed the influencers. They will send this to the researcher privately, so they cannot see the difference between conditions. The researcher posts these steps into the chat and tells the students that when they arrive at the list of influencers, to follow these steps. Tell the students you are going to mute them, so that everyone may fill in the survey without disruptions. Should they have a question, they may ask this via the chat (chat to researcher only is enabled). The researcher will answer this privately (chat to individual) or answer this for the group, if relevant. Ask if everything is clear.

https://kuleuven.eu.qualtrics.com/jfe/form/SV_3W98G7XffwwJtnn

 i. Give the participant time to read the consent form and ask if the participant has any questions concerning the informed consent;
i.Questions -> Answer them and ask if there are any other questions;
ii.No questions -> Participant agrees to online questionnaire, and starts the short questionnaire

3.   Opening   interview   questionnaire:
Ask to fill in a very short Qualtrics Questionnaire measuring demographic variables. Ask the participants answering the survey on their phone, to view it horizontally by allowing their phone screen to rotate (from the phone menu itself). Meanwhile you stay silent waiting for them to complete the questionnaire. To maintain a more standard approach to the intervention (& ensure

that all participants have experienced the same study with only the stimuli differing), Do not answer any questions unless they are <mark>urgent or technical questions</mark> (e.g. problems with the questionnaire, page is not showing, etc).

Instructions posted in the chat:
1) **Kopieer je ID nummer van de laatste vraag in de survey en stuur dit in de chat**
2) **Volg al de influencers - gedaan? Ga naar 'volgend' op je Insta profiel, klik bij 'sorteren' op 'laatste' en laat dit zien aan de onderzoeker / neem een screenshot als bewijs (school). Stuur dit naar Katoo Derks (mij) op Facebook (school)**
3) **Duw daarna op volgende om de survey af te ronden**
4) **Gelieve niet over het onderzoek te praten met vrienden/klasgenoten om de kwaliteit van het onderzoek te bewaren, dankjewel :)**

4. <mark>Randomize participants into the four conditions by using Qualtrics</mark>. After filling in the questionnaire, participants will see a randomized thank you statement with instructions that differ depending on the condition. Participants will be asked to tell and show which instructions they have received (as determined by the different conditions). Ask them fto copy and paste their ID in the chatbox (chat to researcher only is enabled) (= Participant ID + condition + name of participant). Save this information in your monitoring excel file. Tell them to finish the survey = press next.

Follow this by explaining the instructions as in the following step (6).

When participant finishes:
5. <mark>Give instructions</mark> (depending on the condition);
Participants are asked to follow the influencers they were assigned.
The intervention study start and end hours: This should be standard among all participants (if for some reason it is not, then take note of that in your monitoring file, and later check if data from this participant are different from others). The study starts at 6 am (the day following the interview), and ends 14 days later at 6 am. Set the exact dates with the participant, and keep a record of these dates in the excel monitoring file. Ask them to show you that they follow the influencers.(check facebook for screenshots = schools)

6. Set up reminders: OM ZEKER TE ZIJN DAT HET ONDERZOEK GOED LOOPT ZOU IK JE WILLEN VRAGEN OF JE 2 HERINNERINGEN PER DAG IN JE AGENDA WILT ZETTEN ALSOOK ONZE EINDAFSPRAAK
Ask the participant to set up 3 reminders on their phone.
-> Daily reminders to check the instagram accounts of influencers and their own feed page : these reminders are at 4pm and 7pm 'INFLUENCERS BEKIJKEN'
-> Meeting 2 reminder: 3 hours before meeting - meeting 2 met katoo
---------Repeat the hours and date of meeting 2 to them.
-> Vraag om IC te bewaren die je stuurt via e-mail/chat
→ vraag hen om niet te praten over de studie met anderen die ook meedoen, om de objectiviteit en kwaliteit van het onderzoek te bewaren. (explicitly for schools!)

Always ask the participant to show you that they have set up the reminder (with a ring) as requested.

Make sure your participant is ready to start the study: ask if they understand what they are expected to do. Thank them for their participation and the time they took to help you. Ask them if they have questions or concerns about the study. Tell them if they have concerns about the study later, they may always e-mail the addresses on their Informed consent forms. Wish them good luck the next two weeks and tell them you look forward to seeing them in two weeks.

-> Send them 3-4 days before the next meeting e-mail with an invite for the online meeting with their dates and hours.E-mail or message participants their meeting dates and hours and that you would like them to use their computer for the meeting, not a smartphone. Ask them to conduct the meeting while sitting in a silent room, with good Wi-Fi and with their video and microphone on. Ask them to make sure their computer has enough battery or to have a charger nearby. Send your invite for Zoom and remind them to keep this e-mail to be able to find the link.

B.   Second online video meeting with participants

These meetings are made in groups ranging between 5-10 participants.

Always make sure to use a video (audio and picture) call for all meetings. If one is not possible, postpone meeting until a solution is found. The video call should be organized on the participant's computer so as to leave the participant's phone free for other intervention tasks (e.g. filling out the questionnaire undisturbed (p.s. questionnaire can also be completed on the computer or tablet). It might be better to use light video call apps on the computer to avoid any computer overload. Zoom was used again.

- • Once they have completed 14 full days of participation, meet with participants online and conduct the closing interview.
- • Post Questionnaire measuring socio-demographic variables, social media use, media literacy, food norms and whether or not the participant realizes what is being researched;

Meeting 2 preparations:

Researcher: Sit in a quiet, not distracting room and have the excel monitoring sheet on a laptop with me, have the Qualtrics links to the end survey and the food frequency questionnaire + the participant's ID ready somewhere so you can easily copy paste it in the chat to send to the participant.

Timing: Aim for after lunch hour, so that participants are not hungry.

Enable waiting room AND chat to researcher only
Participant: In the invite e-mail for the meeting, participants were asked to go sit in a quiet room with good Wi-Fi, asked to call via laptop with video and sound (or pc) and told that they may use a

mobile device to answer the questionnaire. They were advised to have a charger near in case it's necessary. Repeat this information at the beginning of the video call.

- **Tell your participants: 'Hi, good to see you all again. As you all probably know, we are here for the closing meeting for my thesis research. Two weeks ago we met to start the research. I hope everything went well. I am very grateful for your participation, it meant a lot to me. Today, I will ask you to fill in a questionnaire about influencers and your points of view, to close up. (You can briefly remind them that their participation is voluntary and they don't have to answer a question they don't like). If you have any problems accessing the questionnaire or technical difficulties, please do not hesitate to ask me via the chat box.'**

- **Make sure the function of chatting to researcher only is enabled.**

- **Tell them that only if they have an urgent (e.g. technical, problems with the questionnaire, page is not showing, etc.) question, they can type their question in the chatbox to the researcher only. This is a function in Zoom. If necessary and usefull, the researcher will copy and paste the question in the group chatbox and answer for the group. If not possible then answer them out loud in front of the others. Emphasize that they may not use the chat function to chat with each other (in Zoom you can disable the chat: only chatting to researcher is enabled). Only if they do it like this will they be eligible to win a voucher. (This is also repeated in the chat box).**
- **Tell them you will give them their participant ID in de chat, as they will need to fill it in or copy and paste it twice. Lastly, tell them that when they are ready, they may leave in silence, so as not to disturb other participants and unfollow the influencers.**

  https://kuleuven.eu.qualtrics.com/jfe/form/SV_0kaT0WG3PgJWZZc

- **Gelieve je camera aan te zetten :)**
- **Ik mute jullie zodat jullie ongestoord kunnen werken**
- **Dringende vraag -> chatbox**
- **Participant ID stuur ik jullie en moeten jullie 2x invullen doorheen de vragenlijst**
- **Klaar? Dankjewel om mee te doen! Je maakt nu kans op het winnen van een van de waardebonnen, je mag rustig de meeting verlaten :)**

- **Post the link in the Qualtrics questionnaire. Send the link to the end survey first and ask participant to go to the link either on laptop, phone or another mobile device. Ask the participants answering the survey on their phone, to view it horizontally by allowing their phone screen to rotate (from the phone menu itself). The researcher then provides the participant with the correct ID to fill in (based on the monitoring file) via the chat function in zoom. This can be done individually by typing in the ID in individual participant chat boxes. Within 5 minutes check the researcher then checks their Qualtrics responses to ensure that the participant entered the correct ID, in the event that the participant did not enter the correct ID, notify the participant.**

Ensure that the participant fills in the correct ID in a second comments question that asks to fill in the ID before the questions that are linked to one of the 4 conditions.

- **To be sure to have a link between the incorrect ID and the condition the participant was assigned to, write a comment of the wrong ID in the monitoring worksheet along with the rest of the participant's data.**

- **At the end of the survey, there will be a statement in which the participant is thanked for his/her cooperation. It will also state that the participants may unfollow the influencers they were assigned to and that if they have any further questions, to mail the e-mail addresses in the informed consent or that of the researcher. It mentions that participants will receive a debriefing e-mail when the entire study is finished, which will also include the winners of the vouchers. Participants are asked to not talk about the research with friends/ classmates who still have to participate and are asked to leave the meeting in silence.**
- **Participants were compensated for their participation with the chance to win vouchers**
- **Debriefing via e-mail (will be sent after entire study is done);**

> Hallo 😊
>
> De voorbije maand heb je meegedaan aan mijn onderzoek over sociale media en voeding. Ik ben je daar nog steeds heel dankbaar voor! Zoals aangegeven bij de laatste vragenlijst, stuur ik jullie nu nog een afsluitende e-mail met uitleg over het doel van het onderzoek.
>
> Het experiment wilt achterhalen of er bij Vlaamse adolescenten een verband is tussen het zien van voeding op Instagram, gepost door influencers (zowel voedingreclame als niet-gesponsorde stories en posts over voeding) en de ideeën en gedragingen rond voeding. Concreet werden jullie ingedeeld in 4 verschillende groepen. De helft van jullie kreeg de opdracht om influencers die voornamelijk gezonde voeding posten te volgen, de andere helft moest influencers die voornamelijk ongezonde voeding posten volgen. Die ongezonde en gezonde influencers waren geselecteerd om voor jullie ofwel leuke en relateerbare personen te zijn, ofwel personen met wie jullie minder voeling zouden hebben. Nu willen we onderzoeken of er in verschil is tussen deze 4 groepen (gezond en relateerbaar, gezond en minder relateerbaar, ongezond en relateerbaar, ongezond en minder relateerbaar). Wij hopen dat de resultaten van deze studie bijdragen tot inzichten in hoe (gesponsorde) posts over voeding op Instagram het eetgedrag van Vlaamse jongeren beïnvloedt. Op basis van dit onderzoek wensen wij dan ook richtlijnen en adviezen te kunnen formuleren, die toekomstige discussies en reguleringen omtrent dit thema kunnen dienen.
>
> Ik wil ook nog eens herhalen dat de informatie die je ons gaf, vertrouwelijk zal blijven. Dit betekent dat hetgeen je geantwoord hebt tijdens het experiment, enkel door het onderzoeksteam gekoppeld kan worden aan je persoonlijke gegevens (naam, e-mailadres etc.). Ook zal jouw naam nooit vermeld worden in het uitschrijven van het onderzoek.
>
> Als je nog vragen hebt, twijfel dan niet om mij (op dit e-mailadres) of mijn onderzoeksteam te contacteren op de opgegeven contactgegevens van het

geïnformeerde toestemmingsformulier dat jij of je ouders in het begin van dit onderzoek hebben ingevuld.

Groetjes,

Katoo

Appendix 2. Study Questionnaire

Survey 1

1. Consent/assent form

2. Naam en voornaam van de deelnemer

3. Datum van geïnformeerde toestemming

4. Demographics

[Gender]

1. Wat is jouw geslacht?

> 1. Jongen
> 2. Meisje
> 3. Anders

[AGE]

2. Hoe oud ben je (in jaren)?

Jonger dan 12

12

13

14

15

16

17

18

Ouder dan 18

3. Wat is het hoogste diploma dat je **mama** heeft behaald?
- O   Geen
- O   Lagere school
- O   Middelbare school
- O   Hogeschool
- O   Universiteit

The Family Affluence Scale

4.Heeft jouw gezin een auto of andere gemotoriseerde voertuigen?
- 0 Nee
- 1 Ja, een
- 2 Ja, twee

5.Heb jij bij jouw thuis je eigen slaapkamer?
- 0 Nee
- 1 Ja

6.Hoeveel computers (ook laptops en tablets, exclusief gameconsoles en gsm's) heeft jouw gezin?
- 0 Geen
- 1 Een
- 2 Twee
- 3 Meer dan twee

7.Hoeveel badkamers (kamer met bad / douche of beide) zijn er in uw woning?
- 0 Geen
- 1 Een
- 2 Twee
- 3 Meer dan twee

8.Heeft je gezin een vaatwasser?
- 0 Nee
- 1 Ja

5. Gebruik Sociale Media

In wat volgt stellen we je enkele vragen over je sociale mediagebruik. Gelieve telkens 1 antwoord aan te duiden

Hoe vaak gebruik je Instagram? (Met 'gebruiken' bedoelen we het openen en bekijken vanInstagram) (Imec Digitmeter, 2019).

1. Minder dan dagelijks
2. Minder dan 1 uur per dag
3. Tussen 1 en 3 uur per dag
4. Meer dan 3 uur per dag

Nu willen we graag weten wat **jij** liket en post op sociale media.

[POST]

Hoe vaak POST jij nieuwe/originele berichten op sociale media?

1. Nooit
2. Minder dan maandelijks
3. Maandelijks
4. Wekelijks
5. Dagelijks

[POSTFOOD]

Hoe vaak POST jij nieuwe/originele berichten **over eten** op sociale media?

1. Nooit
2. Minder dan maandelijks
3. Maandelijks
4. Wekelijks
5. Dagelijks

[LIKE]

Hoe vaak LIKE jij berichten **over eten** op sociale media?

1. Nooit
2. Minder dan maandelijks
3. Maandelijks

4. Wekelijks
5. Dagelijks
6. Meerdere keren per dag

[SHARE]

Hoe vaak DEEL jij berichten over eten **van andere personen** op sociale media?

1. Nooit
2. Minder dan maandelijks
3. Maandelijks
4. Wekelijks
5. Dagelijks
6. Meerdere keren per dag

Volg je influencers op Instagram? (denk aan sociale media mensen die je volgt en die je niet persoonlijk kent, maar die je wel inspireren en wiens ideeën, meningen en aanbevelingen belangrijk voor je zijn)

Ja

Neen

Randomization thank you and instructions statement:

 Bedankt voor je deelname aan het onderzoek en het invullen van de survey!

Voor de komende 14 dagen willen we je vragen om de volgende influencers te volgen: ….

Gelieve je participant ID door te geven aan de onderzoeker

Survey 2

1. Gelieve je participant ID in te vullen

2.   Gelieve je voornaam in te vullen

3.   Honger

Hoe hongerig voel je je op dit moment?

1.Helemaal geen honger

2.(Geen honger)

3.(Een beetje honger)

4.(Veel honger)

5.Heel veel honger

5. Vending Machine

Beeld je in dat je voor een verkoopautomaat staat en dat je 3 euro op zak hebt en elk artikel 1 euro kost. Welke 3 eet- of drinkwaren zou je willen kopen? Selecteer alsjeblieft 3 items: selecteer het item door erop te klikken.

Indien je niets zou willen uit deze verkoopautomaat, klik dan alsjeblieft op het grijs scherm rechtsboven op de automaat om naar de volgende vraag te gaan.
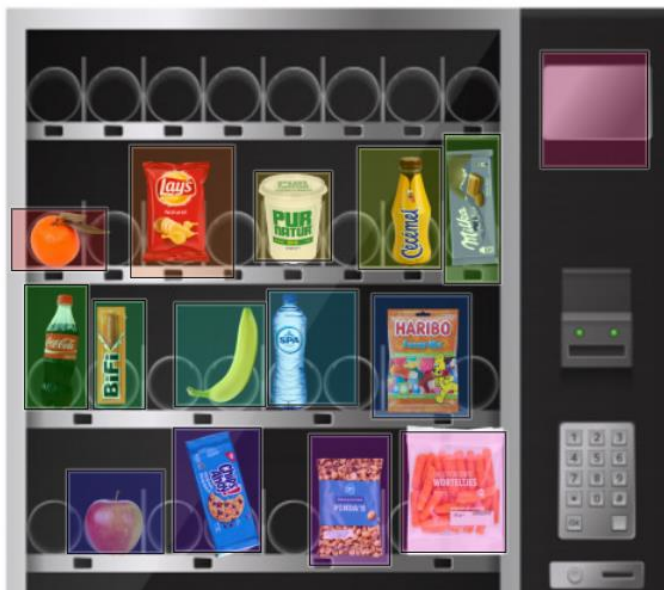
6. Food Frequency questionnaire

De volgende vragen peilen naar hoe vaak jij bepaalde soorten voeding en drank eet of drinkt.

Per voedingsmiddel (of voedingsmiddelengroep) wordt gevraagd hoe vaak én hoeveel jij er gewoonlijk van eet of drinkt. Denk hierbij aan jouw voedingsgewoonten van de voorbije twee weken en tracht voor jezelf een "gemiddelde" te bedenken.

Hoe vaak drink jij water? <fr_frisdr>

o   nooit <1>

o   1 dag per twee weken<2>

o   1 dag per week <3>

o   2-4 dagen per week <4>

o   5-6 dagen per week <5>

o   elke dag <6>

Op de dagen dat je water drinkt, hoeveel drink jij dan gemiddeld per dag? (1 tas = 125 ml, 1glas = 150ml, 1 beker = 225ml) <po_water>

o   500 ml of minder <1>

o   500 tot 750 ml <2>

o   750 tot 1250 ml <3>

o   meer dan 1250 ml <4>

Hoe vaak drink jij frisdranken (light)? <fr_frisdr>

o   nooit <1>

o   1 dag per twee weken<2>

o   1 dag per week <3>

o   2-4 dagen per week <4>

o   5-6 dagen per week <5>

o   elke dag <6>

Op de dagen dat jij frisdrank (light)drinkt, hoeveel drink jij dan gemiddeld per dag? (1 tas = 125ml, 1 glas = 150ml, 1 beker = 225ml en 1 blikje = 330ml) <po_frisdr>

o   250 ml of minder <1>

o   250 tot 500 ml <2>

o   500 tot 750 ml <3>

o   meer dan 750 ml <4>

Hoe vaak eet jij fruit (vers fruit, blik- en diepvries fruit, gedroogd fruit)? <fr_fruit>

o   nooit <1>

o   1 dag per twee weken<2>

o   1 dag per week <3>

o   2-4 dagen per week <4>

o   5-6 dagen per week <5>

o   elke dag <6>

Op de dagen dat jij fruit eet, hoeveel eet je dan gemiddeld per dag? (1 mandarijn = 60g, 1 kiwi = 75g, 1 banaan = 130g, 1 appel = 140g en 1 sinaasappel = 140g) <po_fruit>

o   150 g of minder <1>

o   150 tot 300 g <2>

o   300 tot 450 g <3>

o   meer dan 450 g <4>

Hoe vaak eet jij bruin of volkoren beschuit, pistolet, stokbrood of brood? <fr_bbrood>

o   nooit <1>

o   1 dag per twee weken<2>

o   1 dag per week <3>

o   2-4 dagen per week <4>

o   5-6 dagen per week <5>

o   elke dag <6>

Op de dagen dat jij bruin of volkoren beschuit, pistolet, stokbrood of brood eet, hoeveel eet jij dan gemiddeld per dag? (2 beschuiten = 20g, 1 snede van een klein brood = 20g, 1 snede van een groot brood = 30g en 1 pistolet = 50g) <po_bbrood>

o   90 g of minder <1>

o   90 tot 150 g <2>

o   150 tot 210 g <3>

o   meer dan 210 g <4>

Hoe vaak eet jij muesli of havermout? <fr_ontgra>

o   nooit <1>

o   1 dag per twee weken<2>

o   1 dag per week <3>

o   2-4 dagen per week <4>

o   5-6 dagen per week <5>

o   elke dag <6>

Op de dagen dat jij muesli/havermout eet, hoeveel hiervan eet jij dan gemiddeld per dag? (1 kom ontbijtgranen = 45g = 3 eetlepels muesli/havermout) <po_ontgra>

o   30 g of minder <1>

o   30 tot 60 g <2>

o   60 tot 90g <3>

o   meer dan 90g <4>

Voeg jij suiker toe aan jouw muesli/havermout ? (zoals honig, ahornsiroop, kokosbloesemsuiker, grenadine, siroop, …) <zoet_muesli>

o   Altijd <1>

o   Bijna altijd (90% van de gevallen) <2>

o   Vaak (70% van de gevallen) <3>

o   Soms (50% van de gevallen) <4>

o   Zelden (30% van de gevallen) <5>

o   Bijna nooit (10% van de gevallen) <6>

o   Nooit <7>

Hoe vaak eet jij cruesli/cornflakes (ontbijtgranen met suiker toevoeging)? <fr_cornflakes>

o   nooit <1>

o   1 dag per twee weken<2>

o   1 dag per week <3>

o   2-4 dagen per week <4>

o   5-6 dagen per week <5>

o   elke dag <6>

Op de dagen dat jij cruesli/cornflakes eet, hoeveel hiervan eet jij dan gemiddeld per dag? (1 individueel doosje (bv Coco Pops) = 30g en 1 kom ontbijtgranen = 45g) <po_cornflakes>

o   30 g of minder <1>

o   30 tot 60 g <2>

o   60 tot 90g <3>

o   meer dan 90g <4>

Hoe vaak eet jij zoet beleg (zoals choco, siroop, honing, confituur)? <fr_zobeleg>

o   nooit <1>

o   1 dag per twee weken<2>

o   1 dag per week <3>

o   2-4 dagen per week <4>

o   5-6 dagen per week <5>

o   elke dag <6>

Op de dagen dat jij zoet beleg eet, hoeveel hiervan eet jij dan gemiddeld per dag? (10g voor 1 snede van een klein brood en 15g voor een snede van een groot brood) <po_zobeleg>

o   15 g of minder <1>

o   15 tot 30 g <2>

o   30 tot 60 g <3>

o   meer dan 60 g <4>

Hoe vaak eet jij vleeswaren (charcuterie, broodbeleg of koude maaltijd) zoals gerookte/gekookte ham, kippenwit, salami, paté, vleessalades, américain <fr_vleeswa>

o   nooit <1>

o   1 dag per twee weken<2>

o   1 dag per week <3>

o   2-4 dagen per week <4>

o 5-6 dagen per week <5>

o elke dag <6>

Op de dagen dat jij vleeswaren eet, hoeveel hiervan eet jij dan gemiddeld per dag? (1 plakje van 10 cm diam. = 18 g, 1 plakje van 10 op 10 cm = 20 g, 1 eetlepel américain of vleessalade = 30 g, 1 portie smeerbaar beleg op een klein belegd broodje = 50 g, 1 portie smeerbaar beleg op een groot belegd broodje = 75 g) <po_vleeswa>

o 30 g of minder <1>

o 30 tot 45 g <2>

o 45 tot 60 g <3>

o meer dan 60 g <4>

Hoe vaak eet jij vlees of gevogelte (zoals kip, kalkoen)? <fr_vlees>

o nooit <1>

o 1 dag per twee weken<2>

o 1 dag per week <3>

o 2-4 dagen per week <4>

o 5-6 dagen per week <5>

o elke dag <6>

Op de dagen dat jij vlees of gevogelte eet, hoeveel hiervan eet jij dan gemiddeld per dag? 1 varkenslapje of 1 braadworst of 1 kotelet of 1 kipfilet = 150 g, 1 biefstuk = 175 g <po_vlees>

o 100 g of minder <1>

o 100 tot 150 g <2>

o 150 tot 180 g <3>

o meer dan 180 g <4>

Hoe vaak eet jij peulvruchten zoals kikkererwten, linzen, bruine bonen? (niet meegerekend: snijbonen, sperziebonen, tuinbonen, doperwten) <fr_peul>

o nooit <1>

o 1 dag per twee weken<2>

o   1 dag per week <3>

o   2-4 dagen per week <4>

o   5-6 dagen per week <5>

o   elke dag <6>

Op de dagen dat jij peulvruchten eet, hoeveel hiervan eet jij dan gemiddeld per dag? 1 eetlepel peulvruchten = 30g <po_peul>

o   50 g of minder <1>

o   50 tot 75 g <2>

o   75 tot 100 g <3>

o   meer dan 100 g <4>

Hoe vaak eet jij groenten zowel bereid als rauw? <fr_groenten>

o   nooit <1>

o   1 dag per twee weken<2>

o   1 dag per week <3>

o   2-4 dagen per week <4>

o   5-6 dagen per week <5>

o   elke dag <6>

Op de dagen dat jij groenten eet, hoeveel hiervan eet jij dan gemiddeld per dag? (1 eetlepel geraspte wortelen of 3 blaadjes sla = 20g, 1 portie op een klein, lang belegd broodje = 25g, 1 eetlepel bereide groenten = 30g, 1 portie op een groot, lang belegd broodje = 35g, 1 tomaat = 150g) <po_groenten>

o   60 g of minder <1>

o   60 tot 180 g <2>

o   180 tot 300 g <3>

o   meer dan 300 g <4>

Hoe vaak eet jij sauzen zoals mayonaise, witte saus, vinaigrette, vleessaus, kaassaus? <fr_saus>

o   nooit <1>

o   1 dag per twee weken<2>

o   1 dag per week <3>

o   2-4 dagen per week <4>

o   5-6 dagen per week <5>

o   elke dag <6>

Op de dagen dat jij sauzen eet, hoeveel hiervan eet jij dan gemiddeld per dag? (1 koffielepel mayonaise = 10g, 1 eetlepel saus = 20g en 1 eetlepel mayonaise = 25g) <po_saus>

o   25 g of minder <1>

o   25 tot 50 g <2>

o   50 tot 75 g <3>

o   meer dan 75 g <4>

Hoe vaak eet jij zoete snacks zoals chocolade, gebak, koeken, chocomousse, roomijs, koffiekoeken? <fr_zoesnacks>

o   nooit <1>

o   1 dag per twee weken<2>

o   1 dag per week <3>

o   2-4 dagen per week <4>

o   5-6 dagen per week <5>

o   elke dag <6>

Op de dagen dat jij zoete snacks eet, hoeveel hiervan eet jij dan gemiddeld per dag? (50 g = 1 bol ijs / 1 reep chocolade / 2 koekjes/ Luikse wafel / 1 koffiekoek) <po_zoesnacks>

o   50 g of minder <1>

o   50 tot 75 g <2>

o   75 tot 100 g <3>

o   meer dan 100 g <4>

Hoe vaak eet jij hartige snacks zoals chips? <fr_zousnacks>

o   nooit <1>

o   1 dag per twee weken<2>

o   1 dag per week <3>

o   2-4 dagen per week <4>

o   5-6 dagen per week <5>

o   elke dag <6>

Op de dagen dat jij hartige snacks eet, hoeveel hiervan eet jij dan gemiddeld per dag? 1 klein zakje chips = 40g <po_zousnacks>

o   50 g of minder <1>

o   50 tot 75 g <2>

o   75 tot 100 g <3>

o   meer dan 100 g <4>

Hoe vaak eet jij noten, zaden en pitten zonder suiker- of zouttoevoeging? <fr_notenzaden>

o   nooit <1>

o   1 dag per twee weken<2>

o   1 dag per week <3>

o   2-4 dagen per week <4>

o   5-6 dagen per week <5>

o   elke dag <6>

Op de dagen dat jij noten, zaden of pitten zonder suiker- of zouttoevoeging eet, hoeveel hiervan eet jij dan gemiddeld per dag? (1 handje noten = 25g) <po_notenzaden>

o   25 g of minder <1>

o   25 tot 50 g <2>

o   50 tot 75 g <3>

o   meer dan 75 g <4>

Hoe vaak eet jij gefrituurde voeding (frietjes, kroketten, gefrituurd vlees, gefrituurde groenten enz)? <fr_frituur>

- o   nooit <1>

- o   1 dag per twee weken<2>

- o   1 dag per week <3>

- o   2-4 dagen per week <4>

- o   5-6 dagen per week <5>

- o   elke dag <6>

7. Attitudes towards food(Q207)

In de volgende vragen, polsen we naar jouw mening over voeding. Kies het antwoord dat het best overeenkomt met jouw mening. Er zijn geen juiste of foute antwoorden.

Hoe graag **eet jij** elk van deze producten? (Duid per rij één optie aan)

Haat het ……………………………………………… hou ervan   Nog nooit geproefd

1☐   2☐   3☐   4☐   5☐   6☐

	Haat het				Hou ervan	**Nog nooit geproefd**	Variable
Gesuikerde dranken *zoals Cola, Sprite, verpakt fruitsap, sportdranken*	1	2	3	4	5	8	LIKE1
Water (Ongesuikerd)	1	2	3	4	5	8	LIKE2
Zoete snacks *zoals chocolade, koekjes, snoep*	1	2	3	4	5	8	LIKE3
Zoute snacks *zoals Tuc koekjes, borrelhapjes, chips*	1	2	3	4	5	8	LIKE4
Fruit: *Wat je mag meetellen zijn verse vruchten of diepvriesvruchten die rauw, gekookt, gebakken en geperst (vers geperst sap/smoothie) zijn. Wat je niet mag meetellen: gefrituurd, uit blik/bokalen, fruit verwerkt in kant-en-klaar gerechten, fruitsappen die niet vers geperst zijn.*	1	2	3	4	5	8	LIKE5

Groenten: *Wat je mag meetellen: verse groenten en diepvriesgroenten, en die mogen rauw, gestoomd, gekookt, gebakken in de oven of verwerkt tot sap/smoothies zijn. Wat je niet mag meetellen: gefrituurd, groenten uit blik, groenten uit kant-en-klaar bereidingen.*	1	2	3	4	5	8	LIKE6
Hamburgers of pizza	1	2	3	4	5	8	LIKE7
Gefrituurde voeding zoals frietjes, kroketten, gefrituurd vlees, gefrituurde groenten enz	1	2	3	4	5	8	LIKE8
Vleeswaren (charcuterie, broodbeleg of koude maaltijd) zoals gerookte/gekookte ham, kippenwit, salami, paté, vleessalades, américain	1	2	3	4	5	8	LIKE9

Hoe **gezond** zijn deze producten volgens jou? (Q209)

(Duid per rij één optie aan)

Heel ongezond …………………………………………………………………..heel gezond

1□　　　　**2**□　　　　**3**□　　　　**4**□　　　　**5**□

	Heel ongezond			Heel gezond	
Gesuikerde dranken *zoals Cola, Sprite, verpakt fruitsap, sportdranken*	1	2	3	4	5	HEALTH1
Water (Ongesuikerd)	1	2	3	4	5	HEALTH2
Zoete snacks *zoals chocolade, koekjes, snoep*	1	2	3	4	5	HEALTH3
Zoute snacks *zoals Tuc koekjes, borrelhapjes, chips*	1	2	3	4	5	HEALTH4
Fruit: *Wat je mag meetellen zijn verse vruchten of diepvriesvruchten die rauw, gekookt, gebakken en geperst (vers geperst sap/smoothie) zijn. Wat je niet mag meetellen: gefrituurd, uit blik/bokalen, fruit verwerkt in kant-en-klaar gerechten, fruitsappen die niet vers geperst zijn.*	1	2	3	4	5	HEALTH5

	1	2	3	4	5	
Groenten: *Wat je mag meetellen: verse groenten en diepvriesgroenten, en die mogen rauw, gestoomd, gekookt, gebakken in de oven of verwerkt tot sap/smoothies zijn. Wat je niet mag meetellen: gefrituurd, groenten uit blik, groenten uit kant-en-klaar bereidingen.*	1	2	3	4	5	HEALTH6
Hamburgers of pizza	1	2	3	4	5	HEALTH7
Gefrituurde voeding zoals frietjes, kroketten, gefrituurd vlees, gefrituurde groenten enz	1	2	3	4	5	HEALTH8
Veeswaren (charcuterie, broodbeleg of koude maaltijd) zoals gerookte/gekookte ham, kippenwit, salami, paté, vleessalades, américain	1	2	3	4	5	HEALTH9

[DIET]

8. Descriptive norms (Q218)

In de volgende vragen, polsen we naar jouw mening over voeding. Kies het antwoord dat het best overeenkomt met jouw mening. Er zijn geen juiste of foute antwoorden.

Denk aan **andere mensen van jouw leeftijd,** hoe vaak denk je dat zij doorgaans deze types voeding eten?
(Duid per rij één optie aan)
Heel zelden ………………………………………………………… heel vaak
1☐   2☐   3☐   4☐   5☐

	Heel zelden			Heel vaak	Variable
Gesuikerde dranken *zoals Cola, Sprite, verpakt fruitsap, sportdranken*	1	2	3	4	5	KIDLIKE1
Water (Ongesuikerd)	1	2	3	4	5	KIDLIKE2
Zoete snacks *zoals chocolade, koekjes, snoep*	1	2	3	4	5	KIDLIKE3
Zoute snacks *zoals Tuc koekjes, borrelhapjes, chips*	1	2	3	4	5	KIDLIKE4
Fruit: *Wat je mag meetellen zijn verse vruchten of diepvriesvruchten die rauw, gekookt, gebakken en geperst (vers geperst sap/smoothie) zijn. Wat je niet mag meetellen: gefrituurd, uit blik/bokalen, fruit verwerkt in kant-en-klaar gerechten, fruitsappen die niet vers geperst zijn.*	1	2	3	4	5	KIDLIKE5
Groenten: *Wat je mag meetellen: verse groenten en diepvriesgroenten, en die mogen*	1	2	3	4	5	KIDLIKE6

rauw, gestoomd, gekookt, gebakken in de oven of verwerkt tot sap/smoothies zijn. Wat je niet mag meetellen: gefrituurd, groenten uit blik, groenten uit kant-en-klaar bereidingen.						
Hamburgers of pizza	1	2	3	4	5	KIDLIKE7
Gefrituurde voeding zoals frietjes, kroketten, gefrituurd vlees, gefrituurde groenten enz	1	2	3	4	5	KIDLIKE8
Veeswaren (charcuterie, broodbeleg of koude maaltijd) zoals gerookte/gekookte ham, kippenwit, salami, paté, vleessalades, américain	1	2	3	4	5	KIDLIKE9

9. Injunctive norms

In de volgende vragen, polsen we naar jouw mening over voeding. Kies het antwoord dat het best overeenkomt met jouw mening. Er zijn geen juiste of foute antwoorden.

Denk na over **andere mensen van jouw leeftijd**, hoe gezond vinden zij het volgens jou om deze types voeding te eten?

(Duid per rij één optie aan)

Heel ongezond……………………………………………………………….heel gezond

1□   2□   3□   4□   5□

	Very Unhealthy			Very Healthy	
Gesuikerde dranken *zoals Cola, Sprite, verpakt fruitsap, sportdranken*	1	2	3	4	5	INJ1
Water (Ongesuikerde)	1	2	3	4	5	INJ2
Zoete snacks *zoals chocolade, koekjes, snoep*	1	2	3	4	5	INJ3
Zoute snacks *zoals Tuc koekjes, borrelhapjes, chips*	1	2	3	4	5	INJ4
Fruit: *Wat je mag meetellen zijn verse vruchten of diepvriesvruchten die rauw, gekookt, gebakken en geperst (vers geperst sap/smoothie) zijn. Wat je niet mag meetellen: gefrituurd, uit blik/bokalen, fruit verwerkt in kant-en-klaar gerechten, fruitsappen die niet vers geperst zijn.*	1	2	3	4	5	INJ5
Groenten: *Wat je mag meetellen: verse groenten en diepvriesgroenten, en die mogen rauw, gestoomd, gekookt, gebakken in de oven of verwerkt tot*	1	2	3	4	5	INJ6

sap/smoothies zijn. Wat je niet mag meetellen: gefrituurd, groenten uit blik, groenten uit kant-en-klaar bereidingen.						
Hamburgers of pizza	1	2	3	4	5	INJ7
Gefrituurde voeding zoals frietjes, kroketten, gefrituurd vlees, gefrituurde groenten enz	1	2	3	4	5	INJ8
Veeswaren (charcuterie, broodbeleg of koude maaltijd) zoals gerookte/gekookte ham, kippenwit, salami, paté, vleessalades, américain	1	2	3	4	5	INJ9

10. Food Literacy

In wat volgt, polsen we naar hoe jij omgaat met voeding. Kies het antwoord dat het best overeenkomt met jouw dagelijkse gewoontes. Er zijn geen juiste of foute antwoorden

(Duid per rij één optie aan)

	Ja, altijd	Ja, meestal wel	Soms wel, soms niet	Nee, meestal niet	Nee, nooit	Variable
I. Food preparation skills						
1.Kan jij verse groentes op verschillende manieren maken? *Bijvoorbeeld koken, stomen of bakken of in verschillende gerechten*	1	2	3	4	5	LITERACY1
2.Vind jij het moeilijk om een maaltijd met meer dan 5 verse ingrediënten te maken?	1	2	3	4	5	LITERACY2
3. Kan jij zelf een recept veranderen? *Bijvoorbeeld als je een van de ingrediënten niet hebt*	1	2	3	4	5	LITERACY3
4. Kan jij verse vis op verschillende manieren maken? *Bijvoorbeeld grillen, bakken of stoven of in verschillende gerechten*	1	2	3	4	5	LITERACY4

5. Kan jij een maaltijd maken met verse ingrediënten? *Dus zonder pakjes en zakjes?*	1	2	3	4	5	LITERACY5
6. Kan jij zien, ruiken of voelen wat de kwaliteit is van vers eten? *Bijvoorbeeld van vlees, vis of fruit*	1	2	3	4	5	LITERACY6
II. Resilience and resistance						
7.Lukt het jou om 'nee' te zeggen tegen lekkere dingen wanneer je dat wilt? *Bijvoorbeeld traktaties en borrelhapjes*	1	2	3	4	5	LITERACY7
8. Stel je voor: jij komt ergens waar je lekkere dingen ruikt en ziet. Lukt het jou dan om dit niet te kopen? *Bijvoorbeeld op het station, bij het tankstation of bij de bakker*	1	2	3	4	5	LITERACY8
9.Lukt het jou om gezond te eten wanneer je gestresseerd bent?	1	2	3	4	5	LITERACY9
10. Kies jij eten dat past bij jouw stemming (humeur)? *Bijvoorbeeld wanneer je verdrietig of boos bent.*	1	2	3	4	5	LITERACY10
11. Lukt het jou om gezond te eten wanneer de dingen anders gaan dan verwacht? *Bijvoorbeeld bij onverwacht bezoek, bij te weinig tijd*	1	2	3	4	5	LITERACY11
12. Eet jij een zak chips, snoep of een pak koekjes in één keer leeg?	1	2	3	4	5	LITERACY12

III. Healthy snack styles						
13. Neem jij voor jezelf gezonde tussendoortjes mee voor onderweg? *Bijvoorbeeld fruit, mini-tomaatjes of nootjes*	1	2	3	4	5	LITERACY13
14. Eet jij groenten als tussendoortje?	1	2	3	4	5	LITERACY14
15. Eet jij fruit als tussendoortje?	1	2	3	4	5	LITERACY15
16. Heb jij voor jezelf gezonde tussendoortjes in huis? *Bijvoorbeeld nootjes, worteltjes, mini-tomaatjes of komkommer*	1	2	3	4	5	LITERACY16
IV. Social and conscious eating						
17. Vind jij het belangrijk om aan tafel te eten, wanneer je samen met anderen eet?	1	2	3	4	5	LITERACY17
18. Vind jij het belangrijk om gelijktijdig te eten, wanneer je samen met anderen bent?	1	2	3	4	5	LITERACY18
19. Ben jij met andere dingen bezig tijdens het eten? *Bijvoorbeeld lezen, werken of televisie kijken*	1	2	3	4	5	LITERACY19
V. Examining food labels						
20. Kijk jij op de etiketten hoeveel calorieën, vet, suiker of zout er in producten zitten?	1	2	3	4	5	LITERACY20
21. Vergelijk jij de calorieën, vet, suiker of zout van verschillende producten?	1	2	3	4	5	LITERACY21

VI. Daily food planning						
22. Als jij iets te eten neemt, let jij er dan op wat je later op de dag nog gaat eten?	1	2	3	4	5	LITERACY22
23. Als jij iets te eten neemt, let jij er dan op wat je eerder op de dag al hebt gegeten?	1	2	3	4	5	LITERACY23
VII. Healthy budgeting						
24. Koop jij gezond eten, ook als het wat duurder is? *Bijvoorbeeld groenten, fruit of volkorenproducten*	1	2	3	4	5	LITERACY24
25. Koop jij gezond eten, ook wanneer je weinig geld hebt? *Bijvoorbeeld groente, fruit of volkorenproducten*	1	2	3	4	5	LITERACY25
VIII. Healthy food stockpiling						
26.Heb jij 4 of meer verpakkingen van chips, zoutjes of hartige snacks in huis?	1	2	3	4	5	LITERACY26
27. Heb jij 4 of meer verpakkingen snoep, koek of chocolade in huis?	1	2	3	4	5	LITERACY27
28. Heb jij 4 of meer flessen frisdrank met suiker of limonade met suiker in huis?	1	2	3	4	5	LITERACY28
29. Heb jij 4 of meer pakken vruchtensap in huis?	1	2	3	4	5	LITERACY29

11.A Gelieve je participant ID nogmaals in te vullen.

11. B Identification Scale

In de volgende vragen polsen we naar jouw mening over de influencers die we je gevraagd hebben te volgen de afgelopen twee weken. Kies het antwoord dat het best overeenkomt met jouw mening. Er zijn geen juiste of foute antwoorden.

Op een schaal van 1 tot 7, waar 1 'helemaal akkoord' en 7 'helemaal niet akkoord' betekent, hoezeer ga je akkoord met volgende uitspraken over de groep van Instagram influencers die we je gevraagd hebben te volgen de afgelopen twee weken?

	Helemaal Akkoord 1	2	3	4	5	Helemaal niet akkoord 6
Ik identificeer mezelf met influencers zoals deze						
Ik ben heel blij om influencers zoals deze te volgen						
Ik voel me zeer verbonden met influencers zoals deze						
Ik zie mezelf als een lid van dezelfde groep als influencers zoals deze						

11 c Rangschik de volgende influencers op basis van de mate waarin je je verbonden voelt met hen. Van de influencer waarmee je je het **meest (=1)** verbonden voelt tot de influencer waarmee je je het **minst (=8)** verbonden voelt:

12. BMI

[numberboxes; range 120cm to 200cm]

[Open question, Program the question to limit responses to the range provided in centimeters]

[HEIGHT]

Hoe groot ben je (ongeveer)?

_____ centimeters

Ik weet het niet ………8

[numberboxes; range 30k -230k]

NOTE TO PROGRAMMERS Open question, program the question to limit responses to the range provided in kilos.]

[WEIGHT]

Hoeveel weeg je (ongeveer)?

_____ kilogram

Ik weet het niet ………8

13. EXTRA

a. Heb jij voedingsallergieën of -intoleranties (bijv. Tarwe, gluten, noten, lactose...) of een medische aandoening die jouw voedselkeuzes beperken?

i.ja - wat kan/mag je niet eten of drinken?

_____

ii. Neen

_____

b. Heb je nog opmerkingen over dit onderzoek?

_____

c. Wat vond je van de influencers die je hebt gevolgd?

_____

d. Waar denk je dat de studie over gaat?

_____

Appendix 3. *Normality tests of covariates and outcome variables*

Kolmogorov-Smirnov test of normality D (df)

	Entire sample	Per condition			
		1	2	3	4
Covariates					
BMI	.04 (317)	.06 (76)	.08 (74)	.07 (77)	.09 (81)
Age	.17 (317)*	.15 (76)*	.18 (74)*	.17 (77)*	.15 (81)*
Family Affluency scale	.27 (317)*	.27 (76)*	.25 (74)*	.27 (77)*	.26 (81)*
Food Literacy	.06 (317)**	.08 (76)	.09 (74)	.07 (77)	.07 (81)
Hunger	.18 (317)*	.17 (76)*	.23 (74)*	.20 (77)*	.19 (81)*
Dependent variables					
Attitudes NC	.10 (316)*	.12 (76)**	.15 (74)*	.12 (77)**	.10 (81)
Attitudes C	.17 (316)*	.14 (76)*	.18 (74)*	.18 (77)*	.16 (81)*
Perceived Healthiness NC	.19 (316)*	.21 (76)*	.16 (74)*	.18 (77)*	.23 (81)*
Perceived Healthiness C	.28 (316)*	.29 (76)*	.28 (74)*	.30 (77)*	.29 (81)*
Descriptive Norms NC	.08 (316)*	.10 (76)**	.13 (74)**	.12 (77)**	.09 (81)
Descriptive Norms C	.10 (316)*	.11 (76)**	.10 (74)	.11 (77)**	.13 (81)**
Injunctive Norms NC	.13 (316) *	.14 (76)**	.12 (74)**	.14 (77)*	.13 (81)**
Injunctive Norms C	.30 (316)*	.29 (76)*	.28 (74)*	.30 (77)*	.32 (81)*
Intake NC	.04 (323)*	.10 (80)	.07 (78)	.07 (78)	0.11 (87)**
Intake C	.08 (323)	.08 (80)	.06 (78)	.07 (78)	.06 (87)
Choice NC	.201 (323)*	.24 (80)*	.23 (78)*	.23 (78)*	.23 (87)*
Choice C	.204 (323) *	.24 (80)*	.23(78)*	.21(78)*	.22 (87)*
Identification	.10 (319)**	.12 (76)**	0.1 (74)	0.1 (77)	.12 (81)**

Note : NC = Non-core, C= core. Significantly different from a normal distribution at *p<.001, **p<.05

The distribution of the outcome variables can be described by looking at the values of Skew (i.e. the measure of symmetry) and Kurtosis (i.e. length of tails). By calculating the z-scores of Kurtosis and Skew for the distribution of the dependent variables ((Kurtosis-0)/SEkurtosis) and (Skew-0)/SEskew)), significant

deviations from a normal distribution become clear (Ghasemi & Zahediasl, 2012). Compared to a normal distribution, the variable non-core food intake was significantly right skewed with a slightly longer tail. Core and non-core food choices had significantly shorter tails compared to a normal distribution, with core being slightly right skewed and non-core slightly left skewed. Descriptive norms of core foods was slightly left skewed with a shorter tail, whereas descriptive norms of non-core food was significantly left skewed, with a slightly longer tail. Attitudes towards core and non-core food were both significantly left skewed with longer tails than expected in a normal distribution. Perceived healthiness and injunctive norms of core and non-core both had longer tails and were significantly skewed, with the core distributions having a left skew and the non-core a right skew.

Ghasemi, A., & Zahediasl, S. (2012). Normality Tests for Statistical Analysis: A Guide for Non-Statisticians. *International Journal of Endocrinology and Metabolism*, *10*(2), 486–489. https://doi.org/10.5812/ijem.3505

Appendix 4. Zero-order correlations between this study's most important constructs

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Core food intake	Range=13.5; M=8.47; SD=2.3													
Non-core food intake	.04	Range=16.43; M=6.75; SD=2.57												
Attitudes core	.22**	-.21**	Range=3.67; M=4.11; SD=0.66											
Attitudes non- core	-.05	.47**	-.06	Range=4.33; M=3.96; SD=0.66										
Perceived healthiness core	.05	.01	.07	.13*	Range=4; M=4.62; SD=0.66									
Perceived healthiness non-core	-.02	.10	.01	.00	-.61**	Range=3.67; M=1.83; SD=0.58								
Descriptive norms core	-.09	-.10	.06	.00	.05	.02	Range=4; M=3.36; SD=0.75							
Descriptive norms non-core	-.03	.22**	.18**	.24**	.09	-.03	-.33**	Range=3.33; M=3.78; SD=0.59						
Injunctive norms core	.03	-.08	.07	.01	.43**	-.38**	.10	.08	Range=4; M=4.56; SD=0.81					
Injunctive norms non-core	.03	.05	.08	-.13*	-.31**	.52**	-.16**	.03	-.55**	Range=3.5; M=2.14; SD=0.61				
Food Literacy	.44**	-.40**	.39**	-.35**	-.05	.03	-.05	-.09	-.01	.11	Range=2.28; M=3.23; SD=0.44			
Identification	.12*	-0.01	.11*	-.04	-.05	.02	-.02	.04	-.02	.04	.14*	Range=5.75; M=2.62; SD=1.21		
Vending choice core	.20**	-.28**	.25**	-.32**	-.01	-.06	-.03	-.01	.03	.05	.35**	.06	Range=3; M=1.18; SD=.92	
Vending choice non-core	-.22**	.33**	-.25**	.33**	-.02	.08	.02	.08	-.04	.01	-.34**	-.02	-.86**	Range=3; M=1.71; SD=.93

Note: *p<.05, **p<.01

Appendix 5. Covariates in the MANCOVA analyses with parameter estimates

Core food intake

Covariates	F(df)	p	Eta	B	SE	t
Age	1.02 (1, 304)	.31	.00	.08	.08	1.01
Gender	41.58 (1, 304)	.00	.12	-1.63	.25	-6.45
BMI	.37 (1, 304)	.54	.00	.02	.04	.61
Socioeconomic status	4.2 (1, 304)	.04	.01	.21	.10	2.05
Instagram use	.49 (1, 304)	.49	.00	.11	.15	.70
Hunger	1.97 (1, 304)	.16	.01	.14	.10	1.4
Food Literacy	88.80 (1, 304)	.00	.22	2.34	.25	9.42

Non-core food intake

	F(df)	p	Eta	B	SE	t
Age	.01 (1, 304)	.93	.00	-.01	.09	-.09
Gender	34.98 (1, 304)	.00	.10	-1.73	.29	-5.91
BMI	.76 (1, 304)	.39	.00	-.04	.05	-.87
Socioeconomic status	3.84 (1, 304)	.05	.01	.24	.12	1.96
Instagram use	7.28 (1, 304)	.01	.02	.48	.18	2.70
Hunger	14.15 (1, 304)	.00	.04	.41	.11	3.76
Food Literacy	62.68 (1, 304)	.00	0.17	-2.27	.29	-7.92

Core vending choices

	F(df)	p	Eta	B	SE	t
Age	3.34 (1, 304)	.07	.01	.07	.04	1.83
Gender	.38 (1, 304)	.54	.00	.07	.11	0.62
BMI	.00 (1, 304)	.98	.00	.00	.02	0.03
Socioeconomic status	.03 (1, 304)	.87	.00	.01	.05	0.17
Instagram use	.03 (1, 304)	.88	.00	.01	.07	0.16
Hunger	.05(1, 304)	.00	.03	-.14	.04	4.79
Food Literacy	43.50 (1, 304)	.00	.12	.73	.11	6.60

Non-core vending choices

	F(df)	p	Eta	B	SE	t
Age	4.06 (1, 304)	.05	.01	-.07	.04	-2.02
Gender	.18 (1, 304)	.67	.00	-.05	.12	-.42
BMI	.02 (1, 304)	.90	.00	.00	.02	.13
Socioeconomic status	.36 (1, 304)	.55	.00	-.03	.05	-.60
Instagram use	1.38 (1, 304)	.24	.00	.08	.07	1.18
Hunger	32. 62 (1, 304)	.00	.07	.21	.04	4.79
Food Literacy	43.50 (1, 304)	.00	.11	-.71	.11	-6.30

	Attitudes core food					
	F(df)	*p*	Eta	B	SE	t
Covariates						
Age	1.86 (1, 302)	.17	.01	.03	.03	1.36
Gender	20.98 (1, 302)	.00	.07	.36	.08	4.58
BMI	.08 (1, 302)	.78	.00	.00	.01	-.28
Socioeconomic status	.01 (1, 302)	.94	.00	.00	.03	.07
Instagram use	.33 (1, 302)	.56	.00	-.03	.05	-.58
Hunger	1.16 (1, 302)	.28	.00	.03	.03	1.08
Food Literacy	53.94 (1, 302)	.00	.15	.57	.08	7.35
	Attitudes non-core food					
Age	.03 (1, 302)	.87	.00	.00	.02	-.16
Gender	.34 (1, 302)	.56	.00	-.05	.08	-.58
BMI	.03 (1, 302)	.87	.00	.00	.01	.16
Socioeconomic status	12.75 (1, 302)	.00	.04	.12	.03	3.57
Instagram use	.44 (1, 302)	.51	.00	.03	.05	.66
Hunger	3.47 (1, 302)	.06	.01	.06	.03	1.86
Food Literacy	42.96 (1, 302)	.00	.13	-.51	.08	-6.55
	Perceived Healthiness core food					
Age	3.24 (1, 302)	.07	.01	.05	.03	1.80
Gender	1.14 (1, 302)	.29	.00	.09	.09	1.07
BMI	.20 (1, 302)	.65	.00	.01	.01	.45
Socioeconomic status	1.73 (1, 302)	.19	.01	.05	.04	1.31
Instagram use	.24 (1, 302)	.63	.00	-.03	.05	-.49
Hunger	.43 (1, 302)	.51	.00	.02	.03	.65
Food Literacy	.52 (1, 302)	.47	.00	-.06	.09	-.72
	Perceived Healthiness non-core food					
Age	.46 (1, 302)	.50	.00	-.02	.02	-.68
Gender	2.58 (1, 302)	.11	.01	-.12	.08	-1.61
BMI	1.45 (1, 302)	.23	.01	-.01	.01	-1.20
Socioeconomic status	.75 (1, 302)	.39	.00	.03	.03	.87
Instagram use	.67 (1, 302)	.42	.00	.04	.05	.82
Hunger	.02 (1, 302)	.88	.00	.00	.03	-.15
Food Literacy	.12 (1, 302)	.73	.00	.03	.08	.35

Descriptive norms core food

	F(df)	p	Eta	B	SE	t
Covariates						
Age	.00 (1, 299)	.96	.00	.00	.03	.05
Gender	1.70 (1, 299)	.19	.01	.13	.10	1.30
BMI	.10 (1, 299)	.75	.00	-.01	.02	-.32
Socioeconomic status	2.05 (1, 299)	.15	.01	.06	.04	1.43
Instagram use	.20 (1, 299)	.65	.00	.03	.06	.45
Hunger	.67 (1, 299)	.42	.00	.03	.04	.82
Food Literacy	.87 (1, 299)	.35	.00	-.09	.10	-.93

Descriptive norms non-core food

	F(df)	p	Eta	B	SE	t
Age	.40 (1, 299)	.53	.00	.02	.02	.64
Gender	10.52 (1, 299)	.00	.03	.24	.08	3.24
BMI	.16 (1, 299)	.69	.00	.01	.01	.40
Socioeconomic status	.22 (1, 299)	.64	.00	.02	.03	.47
Instagram use	.22 (1, 299)	.64	.00	-.02	.05	-.47
Hunger	4.04 (1, 299)	.05	.01	.06	.03	2.01
Food Literacy	2.05 (1, 299)	.15	.01	-.11	.08	-1.43

Injunctive norms core food

	F(df)	p	Eta	B	SE	t
Age	.30 (1, 299)	.59	.00	.02	.03	.55
Gender	2.11 (1, 299)	.15	.01	.15	.11	1.45
BMI	.46 (1, 299)	.50	.00	.01	.02	.68
Socioeconomic status	.02 (1, 299)	.89	.00	.01	.05	.14
Instagram use	.38 (1, 299)	.54	.00	.04	.07	.62
Hunger	1.34 (1, 299)	.25	.00	-.05	.04	-1.16
Food Literacy	.13 (1, 299)	.72	.00	-.04	.11	-.36

Injunctive norms non-core food

	F(df)	p	Eta	B	SE	t
Age	.02 (1, 299)	.88	.00	.00	.03	.16
Gender	1.01 (1, 299)	.32	.00	-.08	.08	-1.00
BMI	.57 (1, 299)	.45	.00	-.01	.01	-.76
Socioeconomic status	.04 (1, 299)	.85	.00	.01	.03	.19
Instagram use	.13 (1, 299)	.72	.00	-.02	.05	-.36
Hunger	1.69 (1, 299)	.20	.01	.04	.03	1.30
Food Literacy	3.52 (1, 299)	.06	.01	.15	.08	1.88

Appendix 6.
Mancova F test output for the impact of influencer food type (core vs. non-core) on attitudes (H1b and H2b)

Attitudes	MANCOVA		
	F(df)	p	partial eta squared
Liking			
core	1.96 (1, 306)	.16	.01
non-core	3.54 (1, 306)	.06	.01
Perceived healthiness			
core	.37 (1, 306)	.55	.01
non-core	.01 (1, 306)	.92	.00