

**Adolescent's own eating behaviour
at school in relation to (mis)perceived
peer eating norms**

Wageningen UR - MSc Thesis



Hmm..
What are
they eating?

**MSC thesis
HSO-80333**

**Adolescent's own eating behaviour at school in relation to
(mis)perceived peer eating norms**

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Preface

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Abstract

Background: Unhealthy eating behaviour poses potential health problems, related to the rising prevalence of overweight and obesity among Dutch adolescents. Research has shown that a (mis)perceived peer eating norm (*a (mis)match between the perceived peer norm and the actual peer norm*) can influence eating behaviour of adolescents strongly. There is limited knowledge, however, regarding the relationship between (mis)perceived peer (*students in the same tutor class*) eating norms and eating behaviour among (pre)vocational students. To date also little research has been done to assess perceived peer norms (*personal perceptions of others' behaviour or others' attitudes*) and actual peer norms (*prevailing norms at the collective level*) in relation to eating behaviour at school, derived from different settings. The aim of the current study was to examine the extent of misperceptions about peer consumption of fruit, bread products, snacks and sugar-sweetened drinks in three different settings during school-time among (pre)vocational students, as well as the relationship between both the actual – and perceived peer norm with students' own eating behaviour. **Methods:** A cross-sectional questionnaire, assessing own eating behaviour and perceived peer eating norms, was conducted among 598 (pre)vocational students, aged between 12 and 22 years old. Misperceptions regarding actual peer norms were examined, as well as relationships between both actual - and perceived norms to own eating behaviour for different product groups and settings. **Results:** Overestimations of the peer eating norms were seen for thirteen of in total fifteen assessed eating behaviours. Perceived peer norm was related to each of the eating behaviours of (pre)vocational students during school-time (most strongly to daily school consumption and school consumption of foods retrieved from the grocery store), while actual norm was related to bread consumption at school and to consumption from the school canteen. Interaction analyses did generally not reveal age and identity as moderators. **Conclusion:** Although actual peer norms appeared to more important for behaviour than hypothesised, perceived norms remain important in adolescents' (unhealthy) eating behaviour. In interventions promoting healthy eating, misperceptions about daily peer consumption of snacks and sugar-sweetened drinks (and school canteen consumption of these products) of (pre)vocational students in specific should be targeted to alter.

Keywords: Eating behaviour; adolescents; perceived norm; actual norm; misperception; (pre)vocational students

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1. Introduction

1.1 Background

Over the past decades, numbers of overweight and obesity have increased among Dutch adolescents (Schönbeck *et al.*, 2011). The prevalence of students who suffer from overweight and obesity differs per educational level. Students following secondary vocational education suffer significantly more from overweight and obesity than students from other types of secondary education (Vissers *et al.*, 2008). At the moment about 14 per cent of the Dutch vocational students is overweight and 4 per cent suffers from obesity (Rijpstra & Bernaards, 2011). These numbers are problematic, since overweight and obesity in adolescence are not only associated with adolescents' current health status but also with serious adverse long-term health effects such as diabetes, hypertension, ischaemic heart disease and stroke (Reilly & Kelly, 2011). Particularly *lower educated students* (students following prevocational or vocational education) often hold unhealthy eating habits (Ridder, Heuvelmans, Visscher, Seidell, & Renders, 2010; Rijpstra & Bernaards, 2011). As eating behaviour is an important determinant of overweight and health in general (WHO, 2003), it is important to quantify different factors influencing eating behaviour of (pre)vocational students.

Looking at the current eating behaviour of lower educated students, consuming daily breakfast was less common for them (61 % - 62 %) than for students following other types of secondary education in the Netherlands (79 % – 90 %), especially in comparison with university preparatory students (90 %). Also lower educated students consumed less wholemeal bread during breakfast than students following higher secondary education (Raaijmakers, Bessems, Kremers, & van Assema, 2010; Rijpstra & Bernaards, 2011). Concerning the consumption of fruit and vegetables of Dutch vocational students, it appeared that only 28 per cent of them consumed the daily recommended intake of vegetables and that a minority of 21 per cent consumed the recommended daily intake of fruit (Rijpstra & Bernaards, 2011). Besides, vocational education students have a higher snack and soft drink intake compared to higher level education students (van der Horst *et al.*, 2008).

Although adolescents in general know what is healthy, by all means for the extreme healthy or unhealthy food (Tacken *et al.*, 2010), they often do not make the healthy choice. A reason for this could be that Dutch vocational education students do not feel responsible for their own health behaviour (Ridder *et al.*, 2010). Although they see the need of behaving healthily, they mostly regard their parents and the school as responsible for creating healthy eating environments. Since students do not notice any health problems now, healthy eating behaviour might not be prioritised. Possible long-term health effects of unhealthy eating are thereby ignored. At such a moment of incongruence, the (social) eating environment might play an important role.

Eating behaviour in the (school) environment

The school food environment in specific plays an important, dynamic role in the eating behaviour of adolescents (French & Stables, 2003; Tacken *et al.*, 2010). During school-time there are several possibilities for students to purchase and consume food. In general three places to derive food from to eat at school are being distinguished; students can either (1) bring their own food from home, (2) buy school canteen (or vending machine) food or (3) buy food from a grocery store or snackbar nearby the school (Tacken *et al.*, 2010).

Several studies indicated numbers for adolescents' food consumption at school (Milder & Mikolajczak, 2012; Reinders *et al.*, 2012; Seliske, Pickett, Rosu, & Janssen, 2013), which are shown in Table 1.

Table 1. Adolescents' food consumption during school-time

	(% of the student population)
Frequent consumption at school	67.7
Home-brought food consumption at school (every school day)	40.0 – 74.0 (dependent on study school)
Frequent use of school canteen	50.0
Frequent consumption in snackbars/fast food restaurant during school breaks	7.4

The relationship between food retailers (e.g. grocery stores or snackbars) nearby the school and eating behaviour has been investigated in a large descriptive study conducted among young Canadian adolescents (Seliske *et al.*, 2013). The more food retailers surrounded the school, the more likely students were to obtain their food there. This is in line with earlier research (de Vet *et al.*, 2013; Martens, Van Assema, & Brug, 2005; Wouters, Larsen, Kremers, Dagnelie, & Geenen, 2010), which showed that easy food availability and accessibility of (unhealthy) foods was related to higher unhealthy food intake of adolescents. It is not known yet how often students visit grocery stores during school-time.

Thus, the school's availability and accessibility of foods have been shown to be important factors for the eating behaviour of adolescents. However, eating behaviour is a multidimensional concept and is also influenced by psychosocial factors.

Psychosocial factors influencing adolescents' eating behaviour

Several psychosocial factors play a role in adolescents' eating behaviour, especially in the social context of a school (Reinders *et al.*, 2012). Firstly, adolescents hold personal motivations for choosing certain foods and deal with conflicts between (long-term) values and motivations for consumption of different foods (Contento, Williams, Michela, & Franklin, 2006). Taste was found to be the most important factor for adolescents' food choice, while convenience, price and time followed as secondary determinants (Contento *et al.*, 2006; Neumark-Sztainer, Story, Perry, & Casey, 1999; Tacken *et al.*, 2010).

Important to consider is that motivations of food choice differ per mealtime and setting. When a meal was consumed at home, adolescents held different motives responsible for their food choice, such as 'healthful eating', than when they consumed a meal at school (Contento *et al.*, 2006). For example, vocational students who bought food in the school canteen, reported time as the most important motive for doing that. It was described as less time-consuming to buy food there than in the grocery store nearby. Also, they reported being frequently attracted by the fresh supply in the school canteen (Reinders *et al.*, 2012).

This shows that a different environment may elicit different beliefs and values relevant in decision-making about which foods to eat and indicates that the strategy of changing a person's eating behaviour might depend on the environment related to that specific eating behaviour.

As adolescents go to secondary school, parental influence lessens and unhealthy eating habits often develop under the influence of a peer group (Ridder *et al.*, 2010). Moreover, vocational students tend to see consumption of unhealthy foods as part of the school culture and socialising with friends. When consuming a meal at school, adolescents were influenced strongly by peers and their peers' motives regarding foods (Ridder *et al.*, 2010). This indicates the importance of peers and the school setting for adolescent's eating behaviour.

Tacken *et al.* (2010) interviewed Dutch secondary school students, including prevocational students. Students mostly reported bringing their own food for the school breaks, although they regarded purchasing food at school as more appealing and socially accepted than bringing food from home. During the lunch breaks at school the social gathering was reported as being more important than merely the eating and the kind of foods consumed. When going to a food retailer nearby, students often reported to join their peers as companion, as both secondary school students and vocational students see it as a social happening (Reinders *et al.*, 2012; Tacken *et al.*, 2010).

The canteen supply was seen as healthier than the grocery store supply by students, although both the school canteen and the grocery store generally offer healthy and unhealthy products (Tacken *et al.*, 2010). This indicates that the view of students regarding these settings in their food availability might be the consequence of their own (or the perception of their peers') eating behaviour at school, derived from these places. Further, this suggests that many students delegate the responsibility of their eating behaviour to their (physical and social) environment, which was also suggested earlier in the study by Reinders *et al.* (2012).

Interestingly, in the research by Tacken *et al.* (2010), adolescents more often answered the question positively whether they knew someone who eats really unhealthy than on the question if they knew someone who eats really healthy. Strikingly, about half of the same students reported their own eating behaviour as healthy.

Thus, not only perceive students their own eating behaviour to be healthier than the eating behaviour of the peers, but also a discrepancy between adolescents' perceived peer eating behaviour and actual peer eating behaviour is indicated. Further attention to this will be given in section 1.2 *Social norms*.

1.2 Social norms

Social norms can be defined as “*rules and standards that are understood by members of a group and that guide and/or constrain social behaviour without the force of laws*” (Cialdini & Trost, 1998). Without the force of laws in this case means that social norms are understood through social interaction, instead of being seen as strict rules.

1.2.1 Social norms approach

Peer influences and the role of peer influences in own behaviour was the focus of the social norms theory (Perkins & Berkowitz, 1986). Following the social norms approach (Berkowitz, 2004), which was built upon this theory, it is believed that people often incorrectly perceive the behaviour and/or attitudes of others to be different from their own when in reality they are similar. The idea is that this can cause people to change their behaviour according to this perceived norm, which mostly holds engaging in or rationalisation of unhealthy behaviour and/or the suppression of healthy behaviour. The social norms approach can be used as a guiding framework for health interventions and suggests that altering incorrectly perceived social norms about unhealthy (eating) behaviour of others (for example in health interventions at school), is expected to lead to healthier (eating) behaviour (Berkowitz, 2004).

Types of social norms

Social norms have been shown to be able to influence human behaviour in two ways, i.e. via injunctive social norms as a source and/or via descriptive social norms as a source. Descriptive norms describe what others do, so how other people behave. An example of a descriptive norm would be that “*the average Dutch person eats one piece of fruit per day.*” These norms are thought to shape behaviour in a heuristic way (so without elaborate cognitive processing), with the goal to behave accurately and efficiently (Rimal & Real, 2003; Robinson, Thomas, Aveyard, & Higgs, 2014). This heuristic pathway for descriptive norms was supported by a study conducted by Stok, de Ridder, de Vet, and de Wit (2014a), in which it was shown that descriptive peer norms did not influence intention to eat, but only actual eating behaviour.

As people are often dependent on others, they are often concerned about others’ evaluation of their own behaviour. Injunctive norms prescribe behaviour by describing the attitude of people towards how people should behave, involving the interpersonal concept of social approval and disapproval (Cialdini, Reno, & Kallgren, 1990). An example of an injunctive norm is “*Most people in the Netherlands approve of me eating one piece of fruit per day.*” In contrast to descriptive norms, injunctive norms are thought to shape behaviour in a less heuristic, more deliberate pathway. Furthermore two other classifications of social norms are distinguished in the literature; the perceived norm and the collective norm, also referred to as the actual norm.

Differences between collective norms and perceived norms

Collective (actual) norms refer to prevailing norms existing at the collective social level, while perceived norms refer to perceptions of social norms at the individual level (Lapinski & Rimal, 2005). An example of a collective norm is that most people in a social network keep the door open for the person coming after them. As they are seen as general codes of conduct, actual norms are generally hard to quantify. They can for example be measured at the social system level, e.g. through national media outings. Perceived norms exist on the individual level (Lapinski & Rimal, 2005) and are personal perceptions of others’ behaviour or others’ attitudes. Perceived injunctive norms refer to ‘*the perceived social pressure to perform or not to perform a certain behaviour*’ (Ajzen, 1991), while

perceived descriptive norms describe the perceived prevalence of a certain behaviour in a group (Lapinski & Rimal, 2005).

1.2.2 How are social norms related to eating behaviour?

Functions of social norms

Although the influence of social norms has been repeatedly shown in research about alcohol, smoking, drug use and other health-related behaviours (Berkowitz, 2005), the field has expanded towards eating behaviour in the past years. Following norms in eating behaviour can be seen as adaptive behaviour (used to adapt to different situations) which shortcuts the need to learn about safe foods (Higgs, 2015), since the collective wisdom of choosing certain foods is generally advantageous for individuals. Social norms can guide us in our daily eating behaviour by showing what others do and/or what others expect from us, with the goal to behave correctly and to gain affiliation (Cialdini & Trost, 1998). Furthermore, social norms are suggested to facilitate cooperation with and sharing foods with other people in a group, which was known to enhance evolutionary fitness in the past (Higgs, 2015).

Experimental studies examining the influence of perceived peer norms on eating behaviour

Several studies have investigated the influence of perceived norms on the eating behaviour of adolescents. In a recent study friend groups consisting of threesomes were examined, in which two of the three people were instructed to restrict their food intake of sweets while eating with their peer friends (Howland, Hunger, & Mann, 2012). It was found that intake of sweets while eating with peers was lower when these peer friends were informed to restrict their eating behaviour than when they were not informed. This direct social influence in the peer context sustained when this person was eating alone afterwards, which may direct towards a long-term effect of a descriptive friendship norm. Research on perceived norms has also been done by examining the effect of exposure to descriptive informational peer norms on eating behaviour. In a recent study among Dutch adolescents it was found that exposure to *high* descriptive peer fruit *intake norms* (*the norm contained a message that the majority of students ate sufficient fruits*) increased actual fruit intake (Stok *et al.*, 2014a). Thus, exposure to fruit intake norms can be helpful in interventions promoting healthy eating. A recent review examined fifteen experimental studies (Robinson *et al.*, 2014). These experiments were mostly conducted by providing people with a text containing a norm message or by providing them with an environmental norm cue; both were informational norms describing other people's behaviour. Both high intake norms and *low intake norms* (*the norm contained a message that the minority eats a particular food*) were able to influence both quantity – and type of food intake. When a high intake norm was given on unhealthy foods, more unhealthy foods were eaten, while less unhealthy foods were eaten when participants were exposed to a low intake norm concerning unhealthy foods. People were more likely to make similar choices as the referent group, especially if that group was similar or desirable (Robinson *et al.*, 2014).

Furthermore, a recent study of Prinsen, de Ridder, and de Vet (2013) investigated the effect of the presence of empty food wrappers as environmental cue on the eating behaviour of people. When these wrappers were present, people themselves were more likely to eat that certain food than when these empty wrappers were not present. In a follow-up experiment they found out that participants were more likely to choose the product that previous participants had chosen, either unhealthy or healthy. This shows the possible long-lasting effect of a norm exposure, through an

environmental cue, on own eating behaviour.

Thus, exposing adolescents to low intake norms of unhealthy foods and/or to high intake norms of healthy foods (preferably of a salient reference group), either with an environmental cue that represents a peer norm or with an informational peer norm (e.g. via a text), can improve healthy eating behaviour.

Observational studies examining the relationship of perceived peer norms with eating behaviour

The relationship between perceived peer norms and adolescents' eating behaviour has also been investigated by several correlational studies.

Perceived peer encouragement of fruits and vegetables from significant other people were associated with a higher own intake of these products among 7th year grade students in the United States (Lytle *et al.*, 2003). This was supported by another study, where perceived peer encouragement of eating healthy foods was related to intention to eat healthily, as well as to higher intake of healthy foods by adolescents (Stok *et al.*, 2014c). Thus, perceived peer expectations about healthy food consumption are associated with healthy eating behaviour among adolescents. Besides, also perceived peer behaviour (the descriptive norm of a peer group) was associated with own eating behaviour of adolescents. For example in a study conducted among Tasmanian students, where the relationship between perceived friend consumption and own consumption of 22 different foods was assessed (Woodward *et al.*, 1996). The perception of friend food consumption was modestly associated with own reported consumption in 11 of the 22 foods. Especially for snacks and bread products, perceptions of peer norms were found to be related to own intake (Woodward *et al.*, 1996).

Furthermore, a recent cross-sectional study conducted among 3800 American adolescents showed that the perceived peer sugar-sweetened drink consumption norm was strongly related to sugar-sweetened drink intake (Perkins, Perkins, & Craig, 2010). A similar study showed that perceived peer fruit and vegetable -, sugar-sweetened drink - and snack consumption norms were strongly related to own eating behaviour of these foods (Lally, Bartle, & Wardle, 2011). Earlier research among Dutch prevocational students showed the relationship between injunctive norms regarding healthy products and own eating behaviour intentions of these products (Martens *et al.*, 2005). Thus, different correlational studies showed the relationship between perceived peer norms and eating behaviour, for different products. However, no research among lower educated students examining the relationship between descriptive peer norms and eating behaviour has been carried out before, nor were different settings taken into account in this kind of research.

In the more explorative studies, adolescents reported to eat quite similar to their peers (Contento *et al.*, 2006). It can be questioned whether they are mainly influenced by social influences such as social norms or because adolescents choose friends that have a similar eating pattern and similar values regarding nutrition. Parents estimated the influence of peers to be strong and to be even higher than their own influence on their child's eating behaviour (Ridder, Visscher, Hirasing, Seidell, & Renders, 2014). The striking thing however is that students themselves do not think that they are being influenced by their peers in their behaviour (Carter, Bennetts, & Carter, 2003; Reinders *et al.*, 2012).

Actual peer norms related to eating behaviour

Few studies have examined the relationship between actual norms and eating behaviour. Wouters *et al.* (2010) conducted a study among 12 – 18 year old adolescents in the Netherlands,

following different levels of secondary education. The actual peer (people in the same friendship group) norm was related to individual snack – and soft drink consumption and was stronger related to consumption among lower educated students. The relationship was also stronger when availability of snack and soft drinks at school was higher. In contrast, two other studies examining adolescents' eating behaviour did not find relationships between the actual peer (people in the same school year) norm and sugar-sweetened drink consumption, snack consumption and fruit and vegetables consumption (Lally *et al.*, 2011; Perkins *et al.*, 2010).

What factors might affect whether a perceived social eating norm is followed?

Several factors have the potential to alter the strength that perceived norms may have on the eating behaviour of adolescents. Social identity, type of food and setting can be seen as (potential) important moderators in adolescents' eating behaviour (Higgs, 2015; Stok *et al.*, 2014a; Stok, De Vet, De Ridder, & De Wit, 2014b) and will be discussed further. Furthermore, the potential of age to be a moderator will also be discussed.

Social identity

Social norms are seen as the link between personal (self) identity and social identities. As persons can hold a certain identity, groups can also have a common identity, to which people can live up and connect to. *'Social identities are cognitively represented as group prototypes that describe and prescribe beliefs, attitudes, feelings and behaviours that optimize a balance between minimization of in-group differences and maximization of intergroup differences'* (Terry, Hogg, & White, 1999). People can have personal affiliations with groups, by which their social identity is shaped (Tajfel, 2010). All people have belongings to be included in a certain social group. So do adolescents at school, for whom social (friendship) groups play an important role. Peer groups at school often share common characteristics or interests, through which a certain group identity is built (Carter *et al.*, 2003). *An example of a social identity could be that people believe everyone in their own friendship group to eat healthily, and to believe that people outside that friendship group eat less healthy.* When people socially identify with a certain group, it is more likely that they will conform their intention to behave and/or behaviour according to that certain group norm than when they cannot identify with that group (Terry *et al.*, 1999). To be able to identify with a group, people must feel affinity with the group or desire connections with a certain group (Higgs, 2015; Robinson *et al.*, 2014). This sense of group identification is suggested to be stronger than social proximity (Stok *et al.*, 2014b). *Social proximity* can be explained as forming interrelations with people close by, while perceiving these people (around us) to be more similar than others and thereby exerting more influence on our behaviour than people who are less social proximal (Robinson *et al.*, 2014).

Research has shown that identification with the reference group enhances the chance that a person will be influenced by the social group norm, especially concerning descriptive norms (Higgs, 2015; Stok *et al.*, 2014b). When group identification is absent, it is unlikely that group norms will influence personal behaviour. This also works the other way around. If a behaviour is unpopular among group members, and identification is strong, it is unlikely that people in the group will engage in that certain behaviour (Lapinski & Rimal, 2005). This is underpinned by several empirical studies. In the meta-analysis by Robinson *et al.* (2014), informational norms only affected adolescents' eating behaviour when they described their own social group's behaviour or the behaviour of a socially desirable group, and not when this norm described behaviour of other, socially undesirable groups. The same effect was shown by another study, in which university students conformed to a social norm more when identifying strongly with the referent group than when moderately or weakly

identifying with the referent group (Stok, Verkooijen, De Ridder, De Wit, & De Vet, 2014d). In a recent review on perceived norms it was also shown that identification with the group was crucial for the influence of the group norm (Stok *et al.*, 2014b).

Conforming to the norms of the social group may be a way to reinforce the social identity of the group. Another reason for the willingness to comply with a referent group norm could be that people in that group are perceived to be similar, which indicates that their behaviour provides useful information to follow (Robinson *et al.*, 2014).

Setting

As adolescents' school eating behaviour takes place in a public setting, it is likely that it can be affected by social influences such as peer norms, since students can both see their peers' behaviour and others can see their behaviour. Behaviours will become known to others, so it is more likely that norm following will happen in the school setting (and that people look at referents to determine the prevailing norm of a particular behaviour) than for example at home where peers cannot see eating behaviour (Lapinski & Rimal, 2005). Social sanctions can be a possible feared consequence for eating or avoiding certain foods at school (Lapinski & Rimal, 2005). An example of a perceived threat when not conforming to the norm in the peer setting at school could be that students lose friendships, since the non-conformance might threaten the group identity. On the other hand, engaging in a certain behaviour can serve perceived benefits, such as the strengthening of peer relationships (Rimal & Real, 2003). Thus, the school setting can be seen as a relevant setting for assessing peer norms in relation to eating behaviour. However, to date no studies have delineated social norm influences across different places to derive food from relevant for eating behaviour at school.

Age

Steinberg and Monahan (2007) showed that the amount of resistance adolescents can give towards peer influences differs per age. This resistance increases as adolescents get older, especially between 14 and 18 year olds. This may suggest the potential moderating effect that age has in the relationship between social norms and eating behaviour. Support for this idea was given by a study that found a stronger relationship between descriptive norms and behavioural intentions among younger samples (Rivis & Sheeran, 2003).

1.3.3 When perceived norms do not match actual norms

As was illustrated in the previous section, perceived social norms can shape eating behaviour of adolescents (Robinson *et al.*, 2014; Stok *et al.*, 2014b). However, these perceptions of the peer norm do not have to match with the actual peer norm (Rimal & Real, 2003), as was also discussed earlier in the social norms approach (Berkowitz, 2004). Actually, perceptions often appear to be different from reality (Lally *et al.*, 2011; Perkins *et al.*, 2010). When a *discrepancy exists between perceived norms and actual prevailing norms* they are discussed as *misperceptions*. An example of a misperception is when a person thinks that peers eat on average 1 piece of fruit per day (perceived peer norm), while peers actually eat 2 pieces of fruit per day (actual peer norm). In the current paragraph the role of these misperceptions in eating behaviour is further discussed.

Misperceived peer sugar-sweetened drink intake norms of adolescents (aged 11-18) were strongly related to sugar-sweetened drink intake (Perkins *et al.*, 2010). In this study the perceived norm accounted for 34 per cent of the variation in sugar-sweetened drink intake. The misperception lies in the fact that the mean perception of peer (people in the same school grade) intake of sugar-

sweetened drink was 2.64 servings a day, while the actual peer norm was only 1.49 servings a day. The majority (76 %) of the students overestimated their peer intake of sugar-sweetened drinks. If adolescents unjustly have the idea that others consume more unhealthy products than they actually do, as in the study of Perkins *et al.* (2010), it might lead to higher own unhealthy food intake. In another study, conducted among late adolescence students from the United Kingdom, these relations of misperceptions with eating behaviour were also shown (Lally *et al.*, 2011). Adolescents, aged 16 – 19, underestimated peer (people in the same school year) fruit and vegetable intake, while peer unhealthy snack intake and peer sugar-sweetened drink intake was overestimated. Both studies show that important misperceptions exist between perceived peer norms and actual peer norms and that perceived peer unhealthy food intake was generally overestimated, while perceived peer healthy food intake was generally underestimated. These misperceptions of eating behaviour of peers in adolescents may pose serious health consequences, since they might influence own eating behaviour. When knowing what the underlying factor for the misperception is in a population, it is easier to alter specific perceived peer norms for different populations. Three theories for the existence of misperceptions are discussed.

Pluralistic ignorance

Pluralistic ignorance can be explained as seeing yourself as part of the minority group of performing certain behaviours, while you are actually in the majority group, especially in the performance of risk-associated behaviours. It is related to the belief of seeing others as being more comfortable with a certain risk-associated behaviour than others actually are (Prentice & Miller, 1993). This might also imply that people perceive others to engage more easily in that particular behaviour than they actually do. People experiencing pluralistic ignorance think they are part of the minority group that behaves healthy. The proportion of others performing risk (or undesirable) behaviours is usually overestimated, while protective behaviours are usually underestimated (Berkowitz, 2005). The theory of pluralistic ignorance was supported by research of Tacken *et al.* (2010), where students saw themselves as part of the group of eating healthy more often than they reported their peers to be in that group.

False consensus effect

Another explanation for misperceptions regarding actual peer norms is that people who engage in unhealthy eating behaviour might experience a certain cognitive dissonance by doing so (Marks & Miller, 1987). When people experience a certain dissonance it is easier to change their perceptions of that specific behaviour than the behaviour causing the dissonance itself. (Part of) this dissonance can be resolved by perceiving others to be more similar to yourself than they actually are and by seeing yourself as part of the majority group (*false consensus effect*). In that case it might be that people project their own behaviour at the collective, which biases perception of peer norms. In that case unhealthy peer eating norms might be overestimated (Marks & Miller, 1987). This is a possible explanation for the existence of misperceptions, which is especially of interest for people engaging in unhealthy behaviour (since they might want to reduce their cognitive dissonance in specific).

False uniqueness effect

The third explanation for the existence of misperceptions is *false uniqueness*, which can be explained as people (especially those who are in the minority group of behaving healthy) seeing themselves as more different from others than they actually are (Suls & Wan, 1987). The proportion

of others engaging in desirable behaviours is underestimated. For example people eating one piece of fruit at school per day (healthy behaviour) can think that they are in the minority group and might falsely assume that they are more unique than they actually are. This false feeling of uniqueness may even lead to withdrawal from a certain group (Berkowitz, 2004).

1.4 The current study

Perceived descriptive peer norms play an important role in adolescents' eating behaviour (Robinson *et al.*, 2014; Stok *et al.*, 2014a; Stok *et al.*, 2014b; Stok *et al.*, 2014c). They are even more important because perceived norms are often not representative of the actual peer norm, but are strongly associated with adolescents' own eating behaviour (Lally *et al.*, 2011; Perkins *et al.*, 2010). However, there is a demand for more research on (perceived and actual) peer norms in relation to eating behaviour in lower educated adolescents (Robinson *et al.*, 2014). Until now, research aiming to identify the relationship between social norms and own eating behaviour (intentions) among Dutch students has merely focused on injunctive norms (Martens *et al.*, 2005). While injunctive peer norms have been shown to be related to eating behaviour (intentions) (Martens *et al.*, 2005; Ravis & Sheeran, 2003), descriptive norms were consistently (and more strongly) related to different kind of eating behaviours of adolescents (Lally *et al.*, 2011; Ravis & Sheeran, 2003; Stok *et al.*, 2014a). Therefore, the current study contributes to the demand of more research on social norms affecting eating behaviour by focusing on descriptive norms. In contrast to other studies, the focus lays solely on eating behaviour at school, which is assessed by looking at various product groups and settings. In this way it will be assessed whether perceived norms might also affect eating behaviour (derived from different settings) at school of the lower educated student population, which is new in the social norm research field. Further, in the current study the aim is to see whether perceived norm is differently related across different age and identity groups.

The current study aims to shed light on following research questions:

- 1) *Do misperceptions regarding peer eating norms among (pre)vocational students exist, and if yes, which?*
- 2) *What is the relationship between perceived peer eating norms at school and own eating behaviour at school among (pre)vocational students?*
- 3) *Is own eating behaviour at school of (pre)vocational students stronger related to perceived peer eating norms than to actual peer eating norms?*

Since the process of getting to know others' behaviours is always subjective and is likely to be different from what other people actually do (Rimal & Real, 2003), it is hypothesised that students will misperceive peer eating norms. Underestimations regarding perceived peer healthy eating norms and overestimations regarding perceived peer unhealthy eating norms are hypothesised, consistent with earlier studies about misperceptions of peer eating norms among adolescents (Lally *et al.*, 2011; Perkins *et al.*, 2010).

Research among lower educated students about the relationship between descriptive peer norms and eating behaviour has never been carried out before. However, since many previous

research showed a relationship between perceived descriptive peer eating norms and own eating behaviour, it is expected to find this relationship too in the current study. In an earlier study peer influence was found to be higher among younger adolescents compared to older adolescents (Steinberg & Monahan, 2007). This is a reason to hypothesise that a stronger relationship can be found between perceived norms and own eating behaviour for younger students in comparison with older students. Also it is expected that a higher identification with the peer referent group is associated with perceived norms being stronger related to own behaviour, which has been shown consistently in earlier studies (Higgs, 2015; Robinson *et al.*, 2014; Stok *et al.*, 2014b).

Although little research has been done and a lack of clarity exists about the relationship between actual peer norms and eating behaviour among adolescents, it is hypothesised that perceived peer norms are stronger related to eating behaviour than actual peer norms, as was shown in earlier studies that examined the relationship between both perceived – and actual norm with eating behaviour (Lally *et al.*, 2011; Perkins *et al.*, 2010).

2. Methods

2.1 Participants

Via the coordinator of 'CSV' (Christelijke Scholengemeenschap Veenendaal) students of the vocational school 'ROCA12' (N = 350) and the prevocational school 'CSV' (N = 1200) were recruited. The two schools were located in the same building in Veenendaal, the Netherlands. Since not all class tutors chose to participate in the research and some students were absent on the day of their tutor's class data collection, the overall response rate was 39 % (N = 604). Following Field (2013), a sample size of 125 is sufficient when conducting regression analyses with 8 predictor variables. Extreme outliers of BMI and/or age variables with a standardized z-value of less than -3.29 or greater than 3.29 are unlikely to be representative of the population (Field, 2013), which is why these outliers were set to missing. When extreme erroneous and random data were seen in a case, these data were also indicated as missing values. Cases were only removed completely from the analysis when they had missing values for 50 per cent or more of the thirty food-related questions. In total six cases were deleted from the analysis.

In total the final sample (N = 598) comprised 46 different school classes, of which 38 classes (N = 541) originated from the prevocational school 'CSV'. The remaining 8 classes (N = 57) originated from the vocational school 'ROCA12'. 52.6 per cent (N = 309) of the final sample was male. Mean age of the participants was 15 years (SD = 1.7). Mean BMI was 20.2 (SD = 3.2), which could be calculated for 522 respondents.

2.2 Study design

In the current study a cross-sectional design was used. A questionnaire assessed demographics, own eating behaviour and perceived peer eating norms. Furthermore, observations were done during four lunch breaks during two school days to gain deeper understanding of student's eating behaviour at school. These observations were also used to inform the development of the questionnaire.

2.3 Procedure

The study design was developed in agreement with guidelines of the Social Sciences Ethical Committee of Wageningen University. Teachers and tutors were informed about the research by e-mail (see Appendix I). Because 'CSV' students are generally younger than eighteen, their parents were informed about the research using the passive consent method (Appendix I). Parents had the possibility to retract their child from the research and could object to participation by sending an e-mail to the executive researcher. Nonetheless, none of them did. Paper-and-pencil questionnaires were delivered to all tutors at the end of January 2015, together with the instruction (Appendix II) to administer the questionnaires during their tutor class. In this way as many students as possible were recruited, since the weekly tutor class, where all students of the same year group with the same tutor gather, is obliged. Furthermore, this prevented students from filling out the questionnaire more than once, as the questionnaire was anonymous. Students were informed about the goals of the study and asked for their consent prior to completion of the questionnaire. This was done by the tutors and by a cover letter (Appendix III). It was made clear that answers to the questions would be processed anonymously, that the data would only be used for the current research and that participation was voluntary. Completion of the questionnaire did not take longer than fifteen

minutes. Prior to the research a consultation with a committed vocational education student had taken place to ensure an understandable questionnaire for the students.

2.4 Measures

The questionnaire (see Appendix III) was in Dutch and comprised three parts. In the first part background variables were assessed, own eating behaviour in the second and perceived peer eating norms in the third part.

Descriptives. Sex, school class and age were demographic variables assessed in the questionnaire. Furthermore, school and number of school days per week were included as control variables. BMI was calculated from self-reported height and weight. An item assessing social identity the strength of the tie with the referent peer group (class mates) was included to measure social identity, i.e. "I feel a strong connection with my tutor class mates" assessed on a 5-points scale ranging from 1 (not at all) to 5 (very much so). This item was comparable to the peer identity item used by Stok *et al.* (2014d). Also teachers were asked to indicate social identity scores for students of their class.

Adolescents' own eating behaviour was assessed using fifteen items. Eleven items assessed *food consumption frequency* of fruit, bread products, snacks and sugar-sweetened beverages (from now on referred to as '*product groups*') at school, derived from three different places, i.e. food brought from home, food from the school canteen and food derived from the grocery store/snackbar (from now on referred to as '*settings*'). An example item is "How often do you bring bread products from home to school to eat at school?" with the following response options: "Never, less than once a week, 1x per week, 2x per week, 3x per week, 4x per week, 5x per week". The scores were recoded for data analyses, reflecting frequencies per week: for example 'less than once a week' was recoded as 0.5, '3x per week' as 3 and 'more than once a day' as 6. Products included in a certain product group were given as examples. Since fruit was generally not available in the current study's school canteens, no item assessing frequency of fruit consumption bought at the school canteen was included. Four items assessed *food consumption quantity* per day of each of the product groups at school. An example item is 'How many pieces of fruit per day do you usually eat during school-time?' Following a questionnaire for use among 10-17 year olds in different countries (de Vet *et al.*, 2013), the following six response options were used: fewer than 1 serving per day, 1, 2, 3, 4 and more than 4 servings per day. Variables were recoded for data analyses, reflecting food consumption per day: for example 'fewer than 1 serving per day' was recoded as 0, '3 per day' as 3 and 'more than 4 per day' as 5. Products included in a certain product group and serving sizes were given as examples per item. Following Haerens *et al.* (2008), all items referred to an average week in the past four weeks.

The product groups and settings used in the current research were derived from earlier research (Lally *et al.*, 2011; Perkins *et al.*, 2010; Reinders *et al.*, 2012; Woodward *et al.*, 1996). Similar to the classification of product groups used by Lally *et al.* (2011), bread products and fruit represented 'healthy' product groups, while snacks and sugar-sweetened beverages represented 'unhealthy' product groups.

Regarding the food consumption frequency items, a study by Paxton, Baxter, Fleming, and Ammerman (2011) was followed, who used two items to assess where children derived their eaten food from at school: "Did you bring any fruit from home to school?" and "how much of the fruit did you eat?" To avoid the questionnaire of the current study becoming too long, these items were merged into one item for the current research. The response scale was derived and adapted from

studies of Lally *et al.* (2011) and Lanfer *et al.* (2011). Since in the current research solely eating behaviour during school-time was assessed, less response options were given of consumption per day than in these previous studies. The 'don't know' option was removed to avoid unusable data, the scale was made continuous and a relevant school setting was added. To prevent reaching a ceiling effect on the questions (Rimal & Real, 2003), the option of 'more than once a day' was included as response option in the scale of the food consumption frequency questions.

Snacks are typically defined as foods and drinks consumed in between the three main meals of a day (Dubuisson *et al.*, 2012). However, since the current school has two breaks of comparable length per day, the definition of snacks as typical unhealthy treats (such as a bag of crisps), used in earlier research by Lally *et al.* (2011), was deemed more plausible and it was presumed that the definition of 'snacks' as a typical unhealthy treat would be well-known among (pre)vocational students. This was made even more explicit by giving typical unhealthy snack examples along with items assessing snack consumption at school. In earlier research 'snack' has been used to represent unhealthy foods (de Vet *et al.*, 2013) by a similar item: i.e. "How many snacks do you eat on an average day?" The snack product group was not described as 'unhealthy' in the questionnaire to avoid negative framing effects or socially desirable answers, as referred to by Lally *et al.* (2011).

Input from the observations was used as additional source to inform the development of the questionnaire.

Perceived peer eating norms of the respondents were assessed using fifteen items. These were similar to the own eating behaviour items with respect to setting, product groups, response options and examples of serving sizes. The only difference was that these items assessed perceived eating behavior of peers (e.g. 'how many pieces of fruit per day do you think peers eat during school-time?').

Actual peer norms as used in further analyses were estimated per student, following Perkins *et al.* (2010) and Lally *et al.* (2011). Herefore, the mean own eating behaviour for each product group and setting, within each class, excluding each respondents' own value was calculated. For the misperception calculation the median actual norm was used.

Misperceptions regarding actual peer norms were calculated. Following Perkins *et al.* (2010) and Lally *et al.* (2011), the median of own eating behaviour within each school class was used for calculating the actual norm which was used to define misperceptions. Hence misperceptions were then based on actually entered values by the participants, where every answer had a similar weighing. Subsequently misperceptions were calculated by subtracting the actual peer norm from each respondents' perceived peer eating norm. Then mean misperceptions for each of the fifteen actual peer norms were calculated. Misperceptions can both be an overestimation or an underestimation of the actual peer norm. If the misperception coefficient is positive this indicates that students overestimate the peer eating norm, which means that students think that peers consume more of a product than they actually do. If students underestimate the peer eating norm, they think that peers consume less of a product than they actually do (or at least less than peers report to consume).

2.5 Data Analyses

All data were analysed using IBM SPSS Statistics 22. Means and standard deviations for descriptives, own behaviours and perceived peer norms were calculated. Each variable was checked for its normal distribution. Paired t-tests (Wilcoxon signed-rank tests for non-normally distributed variables) were carried out to examine whether participants reported differently for perceived peer norms compared to own eating behaviour. Zero-order correlations examined the strength of the relationships between background characteristics, own eating behaviour and perceived peer eating norms. Pearson correlation coefficients were obtained for normally distributed variables, while for non-normal and/or categorical variables Spearman correlations were obtained. Also zero-order correlations were run between actual peer norms and own eating behaviour. For about half of the teachers it was checked, using a paired t-test, whether social identity scores they gave for students of their class, were different from their social identity scores of students themselves.

Misperceptions regarding actual peer norms

It was examined if, and if so, which misperceptions (discrepancies between perceived peer eating norms and actual peer eating norms) exist and whether these possible misperceptions differ for healthy or unhealthy products (research question 1). A one-sample t-test (one-sample Wilcoxon signed rank test for non-normally distributed variables) was carried out to test whether mean misperceptions differed significantly from zero. Lastly, misperceptions regarding actual daily peer consumption of healthy products (misperceptions of bread products and fruit were summed) were compared to misperceptions regarding actual daily peer consumption of unhealthy products (misperceptions of snack and sugar-sweetened drinks were summed), using a paired t-test.

Relationships between perceived peer eating norms and own eating behaviours

Hereafter, following earlier research (Lally *et al.*, 2011; Perkins *et al.*, 2010; Stok *et al.*, 2014c; Woodward *et al.*, 1996), multiple regression analyses were conducted to investigate the predicting capabilities of perceived behaviour variables (predictors) on own eating behaviour (research question 2). A normal distribution of the dependent variable, linearity, homogeneity of variances and independent regression errors were assumed (Field, 2013). Linear regression analyses were run using the 'enter' method hierarchically in several steps (see Figure 1). In the first step background variables were included (sex, BMI, age, school, number of school days per week). In step 2a actual norm was added to the model. In step 2b perceived norm was added, whereas in step 3 both actual norm and perceived norm were included in the model.

For testing the hypothesized role of age and identity as moderators in the relationship between perceived norm and own eating behaviour (research question 2), interactions of age * perceived norm and identity * perceived norm were calculated. A check was made for multicollinearity between all the predictor variables. Since high multicollinearity ($r > 0.800$) was seen between the interaction variables and perceived norm and between the interaction of age * perceived norm and the interaction of identity * perceived norm, separate regressions were run for the interactions of age (step 4a) and identity (step 4b). When significant interactions were found, a median split was applied to examine the direction of the interaction.

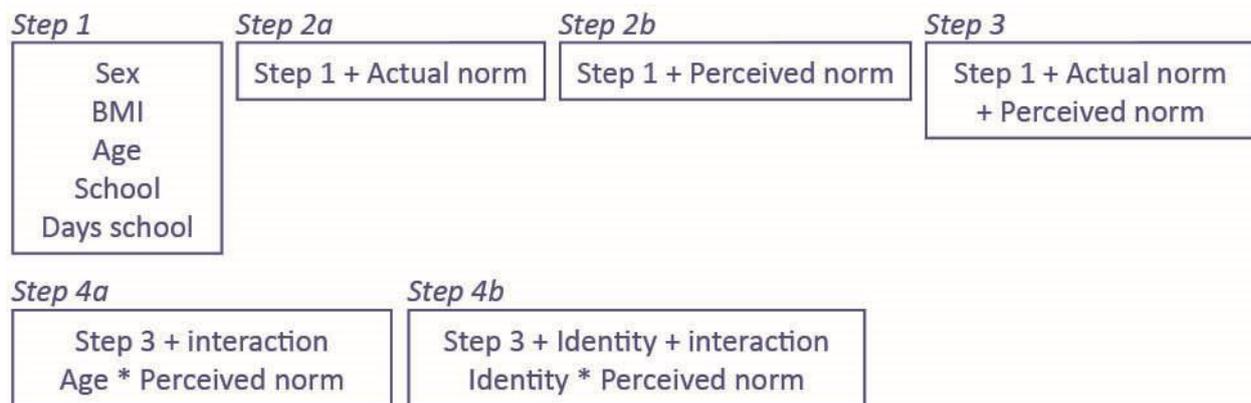


Figure 1. Steps in multiple linear regression (hierarchical)

Relationships between actual peer eating norms and own eating behaviour

In the multiple regression analyses the predicting capabilities of actual norm on own eating behaviour were investigated (research question 3). Therefore actual norm was added to the model in step 2a. In step 3 both actual norm and perceived norm were included in the model to be able to compare their predictive capabilities of own eating behaviour (research question 3). Furthermore, it was examined how the model fit with only actual norm added (step 2a) differed from the model with only perceived norm added as a predictor (step 2b). See Figure 1 for all steps in the regression analyses.

In case the dependent variable (own eating behaviour) was distributed non-normally, both a regression with square root transformed dependent variables and a logistic regression were run. Of all transformations, the square root transformation was most successful in reducing non-normality. Only for bread product consumption from home the transformation did not produce a more normal distribution, so there the non-transformed data have been used. A logistic regression was run as a check, where the dependent variable was transformed into a dichotomous variable. Although some differences existed between the logistic regression and the square root transformed regression in explained variance and in predicting capabilities of actual norm, they were sufficiently comparable. Therefore, only the linear regression with the square root transformed dependent variables are being reported in the Results. Cases were excluded listwise in the regression analyses.

3. Results

3.1 Descriptives

On average students went to school on 4.6 days per week and felt strongly affiliated with their tutor class mates (M Identification with the peer group = 4.0, SD = 0.8). This did not differ from the score the teachers gave for their students. Table 2 shows the means and standard deviations of the key study variables. Students reported on average to consume 3.55 times per week (SD = 1.82) bread products brought from home and 2.97 times per week (SD = 1.94) sugar-sweetened drinks brought from home. Furthermore the overall actual norm (own eating behaviour of the whole sample) of consumption frequency of products from the school canteen and the grocery store/snackbar showed an intake distribution skewed to the left, with median values of 0.00 and 0.50. On average 2.27 slices of bread per day (SD = 1.43) and 1.77 servings of sugar-sweetened drinks (SD = 1.42) were consumed during school-time.

For almost all product groups and settings participants thought that peers ate more than they did themselves. Especially for food purchases from the school canteen and the grocery store, students thought estimated that their peers consumed more than they did themselves. For daily snack consumption at school students also thought that peers consumed more (M = 2.08, SD = 1.21) than they did themselves (M = 1.06, SD = 1.19). Only for perceived consumption frequency of home-brought fruit, bread products and sugar-sweetened drinks, students did not report peers to consume more than themselves.

Table 2. Own eating behaviour, perceived descriptive peer eating norms and misperceptions regarding peer norms

	Own eating behaviour			Perceived peer eating norm			Comparing means [^]	Misperceptions [^]	
	<i>M</i>	<i>SD</i>	<i>Median (IQR)</i>	<i>M</i>	<i>SD</i>	<i>Median (IQR)</i>	<i>T-test value/ Z value</i>	<i>M</i>	<i>SD</i>
Frequency per week									
Fruit from home	0.98	1.46	0.00 (0.00-2.00)	1.03	1.20	0.50 (0.00-2.00)	-1.51	0.61***	1.25
Bread products from home	3.55	1.82	4.50 (3.00-5.00)	3.45	1.52	4.00 (2.00-5.00)	-1.57	-0.65***	1.61
Snacks from home	1.76	1.66	1.50 (0.50-3.00)	2.71	1.49	3.00 (2.00-4.00)	-12.24***	1.27***	1.64
Sugar-sweetened drinks from home	2.97	1.94	3.00 (1.00-5.00)	3.26	1.54	3.00 (2.00-5.00)	-3.00	-0.15	1.86
Bread products from the school canteen	0.93	1.16	0.50 (0.00-1.00)	2.49	1.53	2.00 (1.00-3.00)	-16.21***	1.98***	1.53
Snacks from the school canteen	0.96	1.19	0.50 (0.00-1.00)	2.64	1.51	3.00 (2.00-3.00)	-16.95***	2.03***	1.54
Sugar-sweetened drinks from school canteen	0.76	1.34	0.00 (0.00-1.00)	2.41	1.55	2.00 (1.00-3.00)	-16.84***	2.20***	1.55
Fruit from grocery store/snackbar	0.29	0.85	0.00 (0.00-0.00)	1.03	1.36	0.50 (0.00-2.00)	-11.59***	1.01***	1.37
Bread products from grocery store/snackbar	0.64	1.20	0.00 (0.00-0.50)	1.50	1.44	1.00 (0.00-2.00)	-12.74***	1.32***	1.42
Snacks from grocery store/snackbar	0.67	1.11	0.00 (0.00-1.00)	1.59	1.36	1.00 (0.50-3.00)	-13.00***	1.31***	1.34
Sugar-sweetened drinks from grocery store/snackbar	0.78	1.28	0.00 (0.00-1.00)	2.10	1.63	1.00 (0.50-3.00)	-14.71***	1.83***	1.62
Servings per day	<i>M</i>	<i>SD</i>	<i>Median (IQR)</i>	<i>M</i>	<i>SD</i>	<i>Median (IQR)</i>	<i>T-test value/ Z value[^]</i>	<i>M</i>	<i>SD</i>
Daily fruit consumption	0.73	1.04	0.00 (0.00-1.00)	1.23	1.19	1.00 (0.00-2.00)	-8.99***	0.93***	1.19
Daily bread product consumption	2.27	1.43	2.00 (1.00-3.00)	2.50	1.20	2.00 (2.00-3.00)	-3.40**	0.26***	1.25
Daily snack consumption	1.06	1.19	1.00 (0.00-2.00)	2.08	1.21	2.00 (1.00-3.00)	-17.50***	1.33***	1.33
Daily sugar-sweetened drinks consumption	1.77	1.42	2.00 (1.00-3.00)	2.37	1.25	2.00 (2.00-3.00)	-8.74***	0.72***	1.42

[^]. Means of own eating behaviour and perceived eating norm were compared with a t-test for these variables: Snacks from home, daily bread product consumption, daily snack consumption, daily sugar-sweetened drinks consumption. All other comparisons were made based on the Wilcoxon Signed ranks test. The Bonferroni correction was applied ($\alpha = .05/15 = .003$).

[^]. Mean misperceptions were calculated by subtracting the median actual norm of the tutor class from the individual's perceived descriptive peer norm. T-tests/Wilcoxon signed-rank test compared the mean misperceptions against a test value of zero.

IQR. Interquartile range

** . $p < .003$ (two-tailed)

*** . $p < .001$ (two-tailed)

3.2 Misperceptions

A person misperceives peer eating behaviour when the actual norm of the tutor class subtracted from the individual's perceived peer norm is significantly different than 0. All misperception values are shown in Table 2. Misperceptions, mostly overestimations, existed for fourteen out of fifteen actual norms. Regarding the food frequency peer norms, the largest misperceptions were seen for food and/or drinks consumed from the school canteen. So students thought that peers consumed food from the school canteen more often than peers actually did (at least more than peers reported themselves). An underestimation was shown for one peer norm; students thought that peers consumed bread products brought from home less often than they actually did. For fruit and bread products consumption brought from home and daily bread products consumption only small (though significant) misperceptions were seen. Larger misperceptions could be seen among daily product consumption at school. From these food quantity variables, the largest misperception was seen for perceived peer snacking behaviour, where participants overestimated the daily peer consumption of snacks at school with 1.33 portions ($SD = 1.33$). Regarding daily fruit and snack intake students perceived their peers to consume much more than they actually did. No misperceptions were observed in the weekly frequency of bringing sugar-sweetened drinks from home to drink at school.

Misperceptions of daily peer consumption of healthy products, i.e. the misperception of peer daily fruit consumption plus the misperception of peer daily bread products consumption, ($M = 1.18$, $SD = 1.90$) were significantly smaller (M difference = -0.87 , $p < .001$) than misperceptions of daily peer consumption of unhealthy products, i.e. misperceptions of peer snack consumption plus the misperception of peer sugar-sweetened drink consumption ($M = 2.06$, $SD = 2.29$).

3.3 Relationships of actual norm and perceived norm with own eating behaviour

Correlations

In Appendix IV the correlation matrix between own eating behaviour variables, perceived norm variables and background characteristics is presented. Perceived eating norm variables were significantly, weakly to moderately, related to own eating behaviour. Own and perceived bread product consumption from the canteen were correlated weakly ($r = .095$, $p < .05$). Moderate relationships ($r > .300$ - $r < .500$) were shown among variables comprising perceived and own consumption of snacks, sugar-sweetened drinks and bread products from the grocery store or snackbar, as well as between perceived and own daily snacking behaviour. Different product groups comprising own consumption from the school canteen intercorrelated moderately to strongly with each other. Thus, when students bought a certain product in the school canteen they were also more likely to buy other products from the school canteen. For example, snack consumption and bread products consumption from the school canteen were correlated strongly ($r = .522$, $p < .01$). Furthermore, strong correlations were seen between bread products, snacks and sugar-sweetened drinks consumption at school, derived from the grocery store. For example, own snack and own sugar-sweetened beverage consumption at school, retrieved from the grocery store, correlated strongly ($r = .680$, $p < .01$). Moderate to strong intercorrelations were also seen among perceived snack, bread products and sugar-sweetened drink consumption derived from the school canteen, suggesting that when students perceived peers to consume a certain product from the school canteen, they were also more likely to perceive peers to consume another product from the school

canteen.

In appendix V the correlation matrix between demographics, self-reported behaviour, and actual norms can be found. Among eight of the fifteen perceived eating behaviour variables, weak relationships between own eating behaviour and its corresponding actual norm were seen.

Associations with adolescents' eating behaviour

Fruit consumption at school

Table 3 shows the outcomes of the regression analyses on fruit consumption at school. Perceived peer norm showed to be an important predictor of own fruit consumption, while actual norm did not. Perceived norm was a significant predictor ($\beta = .19, p < .001$) of fruit brought from home. In this relationship, identity acted as a significant moderator ($\beta = .66, p < .01$). When students identified with peers more strongly, perceived norm was more strongly related to fruit brought from home. Actual norm was only weakly related to fruit consumption at school, brought from home. A poor model fit was seen when predicting consumption of fruit derived from the grocery store/snackbar. However, perceived norm still showed to be significantly related to (and more strongly than actual norm) fruit consumption, derived from the grocery store/snackbar. Perceived norm was strongly related to daily fruit consumption at school, while actual norm was not.

Table 3. Multiple regression analyses of perceived norm and actual norm on school fruit consumption

	Fruit brought from home (β)	R ²	Fruit from the grocery store/snackbar (β)	R ²	Daily fruit consumption (β)	R ²
Step 1¹		0.02		0.01 [^]		0.02
Step 2a		0.03		0.01 [^]		0.04
Actual norm	.10*		.10*		.12*	
Step 2b		0.06		0.02 [^]		0.08
Perceived norm	.20***		.13***		.24***	
Step 3		0.07		0.03		0.09
Actual norm	.06		.09		.08	
Perceived norm	.19***		.12**		.23***	
Step 4a						
Age as moderator	.12		-.61		.44	
Step 4b						
Identity as moderator	.66**		-.09		-.43	

¹. Background variables entered in step 1: BMI, sex (first category = 'boys'), age, school (first category = CSV), days of school per week. β values from step 1: Fruit brought from home: BMI ($\beta = .13, p = .01$); sex ($\beta = .00, p = .99$); age ($\beta = -.12, p = .06$); school ($\beta = .04, p = .43$); days of school per week ($\beta = .04, p = .42$); Fruit from the grocery store/snackbar: BMI ($\beta = .04, p = .41$); sex ($\beta = -.06, p = .22$); age ($\beta = -.03, p = .62$); school ($\beta = .02, p = .66$); days of school per week ($\beta = .02, p = .77$); Daily fruit consumption: BMI ($\beta = .11, p = .03$); sex ($\beta = -.01, p = .76$); age ($\beta = -.05, p = .39$); school ($\beta = -.00, p = .94$); days of school per week ($\beta = .12, p = .02$)

R². R square value of the model

[^]. Model fit (R²) was not significant

*. $p < .05$.

**. $p < .01$

***. $p < .001$

Bread products consumption at school

Table 4 shows the outcomes of the regression analyses on the consumption of bread products at school. Both perceived norm and actual norm were related to bread products consumption at school (Table 3). Both actual norm ($\beta = .15, p < .01$) and perceived norm ($\beta = .14, p < .01$) were shown to be important predictors for bread products consumption at school, brought from home. However, a vast amount of variance regarding this outcome variable could be explained by background variables. Perceived norm and actual norm were almost equally related to the consumption of bread products from the school canteen. Perceived norm was a strong predictor of consumption of bread products derived from the grocery store/snackbar, while actual norm was not related to this consumption. An additional 7 per cent of the variance was explained by perceived norm only. For daily bread product consumption at school, perceived norm ($\beta = .21, p < .001$) showed to be somewhat stronger related than actual norm ($\beta = .16, p < .001$), $R^2 = .17$. In the relationship between perceived norm and daily bread product consumption, age showed to be a significant moderator ($\beta = -.89, p < 0.05$). The lower the age, the stronger the relationship between own daily bread consumption at school and perceived peer norms of daily bread consumption at school.

Table 4. Multiple regression analyses of perceived norm and actual norm on school bread products consumption

	Bread products brought from home (β)	R ²	Bread products from the school canteen (β)	R ²	Bread products from the grocery store/snackbar (β)	R ²	Daily bread products consumption (β)	R ²
Step 1¹		0.13		0.02 [^]		0.03		0.09
Step 2a		0.15		0.03		0.03		0.13
Actual norm	.19***		.13**		.04		.19***	
Step 2b		0.15		0.03		0.10		0.15
Perceived norm	.17***		.13**		.26***		.23***	
Step 3		0.17		0.04		0.10		0.17
Actual norm	.15**		.11*		.02		.16***	
Perceived norm	.14**		.12**		.26***		.21***	
Step 4a								
Age as moderator	-.63		.31		.52		-.89*	
Step 4b								
Identity as moderator	-.26		-.23		.19		-.07	

¹. Background variables entered in step 1: BMI (first category = 'boys'), age, school (first category = CSV), days of school per week. β values from step 1: Bread products brought from home: BMI ($\beta = .02, p = .61$); sex ($\beta = -.12, p = .01$); age ($\beta = -.22, p = .06$); school ($\beta = .11, p = .04$); days of school per week ($\beta = .15, p < .01$). Bread products from the school canteen: BMI ($\beta = -.01, p = .90$); sex ($\beta = -.08, p = .09$); age ($\beta = -.00, p = .97$); school ($\beta = -.04, p = .49$); days of school per week ($\beta = .09, p = .09$). Bread products from the grocery store/snackbar: BMI ($\beta = -.01, p = .80$); sex ($\beta = -.01, p = .75$); age ($\beta = .18, p < .01$); school ($\beta = .01, p = .19$); days of school per week ($\beta = .03, p = .59$). Daily bread products consumption: BMI ($\beta = .02, p = .72$); sex ($\beta = -.28, p < .001$); age ($\beta = -.11, p = .07$); school ($\beta = .10, p = .06$); days of school per week ($\beta = -.04, p = .41$)

R². R square value of the model

[^]. Model fit (R²) was not significant

*. $p < .05$.

**.. $p < .01$

***. $p < .001$

Snack consumption at school

Results of the regression analyses on snack consumption at school are presented in Table 5. Irrespective of where snacks were obtained (i.e., home, school canteen or grocery store/snackbar), perceived norm showed to be a significant and stronger predictor than actual norm. Perceived norm was strongly related ($\beta = .24, p < 0.001$) to snack consumption at school, brought from home, while actual norm could predict this behaviour weakly. Snack consumption at school from the school canteen could be significantly predicted by actual norm ($\beta = .12, p < 0.05$) and perceived norm ($\beta = .16, p < 0.001$). However, both variables did not produce a high R square change in the model. Perceived norm was strongly related ($\beta = .28, p < 0.001$) to both snack consumption at school, derived from the grocery store and to daily snack consumption at school. Actual norm was not. For both outcome variables, an additional 8 per cent of the variance was explained by perceived norm only. Adding actual norm did not produce a higher model fit. The relationship between perceived peer norms and school snack consumption did not differ across different levels of age and identity.

Table 5. Multiple regression analyses of perceived norm and actual norm on school snack consumption

	Snacks brought from home (β)	R ²	Snacks from the school canteen (β)	R ²	Snacks from the grocery store/snackbar (β)	R ²	Daily snack consumption (β)	R ²
Step 1¹		0.05		0.05		0.02 [^]		0.03
Step 2a		0.07		0.06		0.02 [^]		0.03
Actual norm	.14*		.12*		-.00		.04	
Step 2b		0.11		0.07		0.10		0.11
Perceived norm	.26***		.16***		.28***		.28***	
Step 3		0.13		0.09		0.10		0.11
Actual norm	.12*		.12*		-.03		.03	
Perceived norm	.24***		.16***		.29***		.28***	
Step 4a								
Age as moderator	.05		.57		.23		-.32	
Step 4b								
Identity as moderator	.13		-.19		.21		-.20	

¹. Background variables entered in step 1: BMI, sex (first category = 'boys'), age, school (first category = CSV), days of school per week. β values from step 1:

Snacks brought from home: BMI ($\beta = -.15, p < .01$); sex ($\beta = .08, p = .06$); age ($\beta = -.13, p = .03$); school ($\beta = .08, p = .15$); days of school per week ($\beta = .00, p = .96$)

Snacks from the school canteen: BMI ($\beta = -.10, p = .04$); sex ($\beta = -.10, p = .02$); age ($\beta = -.07, p = .22$); school ($\beta = -.08, p = .10$); days of school per week ($\beta = .02, p = .67$). Snacks from the

grocery store/snackbar: BMI ($\beta = -.06, p = .23$); sex ($\beta = -.01, p = .83$); age ($\beta = .13, p = .04$); school ($\beta = .03, p = .57$); days of school per week ($\beta = .02, p = .70$). Daily snack consumption:

BMI ($\beta = -.18, p < .001$); sex ($\beta = -.04, p = .34$); age ($\beta = .02, p = .79$); school ($\beta = .05, p = .38$); days of school per week ($\beta = .01, p = .87$)

R². R square value of the model

[^]. Model fit (R²) was not significant

*. $p < .05$.

**. $p < .01$

***. $p < .001$

Sugar-sweetened drink consumption at school

Results of the regression analyses on sugar-sweetened drink consumption are presented in Table 6. Perceived norm was a significant predictor and stronger than actual norm. Perceived norm predicted sugar-sweetened drink consumption brought from home ($\beta = .14, p < .01$), even when actual norm was included as a predictor. Perceived norm and actual norm were comparable related to sugar-sweetened drink consumption from the school canteen. Perceived norm showed to be a highly significant related ($\beta = .30, p < .001$) to sugar-sweetened drink consumption derived from the grocery store/snackbar, while actual norm was not related to this behaviour. The addition of perceived norm to the model produced an R square change of 9 per cent. Perceived norm was strongly related to (and the only predictor of) daily sugar-sweetened drink consumption at school. The relationship between perceived peer norms and sugar-sweetened drink consumption did not differ across different levels of age and identity.

Table 6. Multiple regression analyses of perceived norm and actual norm on school sugar-sweetened drink (SSD) consumption

	SSD brought from home (β)	R ²	SSD from the school canteen (β)	R ²	SSD from the grocery store/snackbar (β)	R ²	Daily SSD consumption (β)	R ²
Step 1¹		0.05		0.04		0.03		0.06
Step 2a		0.06		0.05		0.03		0.07
- Actual norm	.10*		.10*		.06		.08	
Step 2b		0.07		0.06		0.12		0.11
- Perceived norm	.14**		.14**		.30***		.23***	
Step 3		0.08		0.07		0.12		0.11
- Actual norm	.10		.10*		.04		.07	
- Perceived norm	.14**		.14**		.30***		.22***	
Step 4a								
- Age as moderator	-.74		.27		.13		-.06	
Step 4b								
- Identity as moderator	-.00		-.29		.12		.08	

¹. Background variables entered in step 1: BMI, sex (first category = 'boys'), age, school (first category = CSV), days of school per week. β values from step 1:

SSD brought from home: BMI ($\beta = -.09, p = .06$); sex ($\beta = -.12, p < .01$); age ($\beta = -.15, p = .01$); school ($\beta = .08, p = .11$); days of school per week ($\beta = .05, p = .38$)

SSD from the school canteen: BMI ($\beta = -.08, p = .08$); sex ($\beta = -.16, p < .001$); age ($\beta = -.04, p = .49$); school ($\beta = .03, p = .58$); days of school per week ($\beta = .01, p = .83$). SSD from the grocery store/snackbar: BMI ($\beta = -.08, p = .09$); sex ($\beta = -.09, p = .05$); age ($\beta = .10, p = .10$); school ($\beta = .08, p = .14$); days of school per week ($\beta = .04, p = .40$). Daily SSD consumption: BMI ($\beta = -.15, p < .01$); sex ($\beta = -.14, p < .01$); age ($\beta = -.11, p = .07$); school ($\beta = .10, p = .04$); days of school per week ($\beta = -.01, p = .91$)

R². R square value of the model

^ . Model fit (R²) was not significant

*. $p < .05$.

** . $p < .01$

*** . $p < .001$

4. Discussion and conclusion

Previous research investigated the existence of misperceptions regarding peer eating norms (Lally *et al.*, 2011; Perkins *et al.*, 2010) and the role of social norms in eating behaviour (Higgs, 2015; Martens *et al.*, 2005; Robinson *et al.*, 2014; Stok *et al.*, 2014b). The current research aimed to contribute to this literature by focusing on lower educated students specifically, and by examining the role of (mis)perceived norms across a variety of settings and product groups, merely during school-time. Furthermore the potential role of age and identity as moderators between perceived peer norm and own behaviour was examined. Lastly, the current study investigated the hypothesis that perceived norm would be stronger related to own eating behaviour than the actual norm across different product groups and settings.

The current study revealed some important things. Overestimations were seen for almost all peer eating norms. Largest misperceptions (overestimations) were seen regarding consumption from the school canteen. Peer daily unhealthy product consumption was overestimated more than peer daily healthy product consumption. Perceived peer norms showed to be related to each of the different behaviours and most consistently to eating behaviour derived from the grocery store/snackbar and daily consumption of the different products. Age and identity were generally not revealed as moderators in the relationship between perceived peer norms and own eating behaviour. Perceived norm was always a stronger predictor of own eating behaviour than actual norm, except of the frequency of bringing bread products from home to eat at school. In that situation both perceived norm and actual norm were related to the eating behaviour, but actual norm was somewhat more related. Further, both actual norm and perceived norm were related to consumption from the school canteen.

4.1 Misperceptions

Overestimations were observed for almost all different peer norms, for both healthy and unhealthy product groups. Since the process of getting to know others' behaviours is always subjective and is likely to be different from what other people actually do (Rimal & Real, 2003), misperceptions were expected. In agreement with earlier research of Conway *et al.* (2002), the consumption of bread products brought from home was seen to be high. Strikingly, students almost did not report to consume foods derived from the grocery store (the overall actual norm median of these behaviours was 0). This could be due to the fact that students are officially not allowed to go to the grocery store during school-time. Qualitative research has been indecisive till now about whether students often go to the grocery store during school-time or not (Reinders *et al.*, 2012; Tacken *et al.*, 2010), so it is not clear whether this might be due to underreporting. Underreporting for these eating behaviours may have caused the current study to find somewhat higher discrepancies between perceived peer norms and actual peer norms than in reality exist. In that case perceived norms regarding this behaviour might be important to tackle in health interventions. On the other hand, it is also possible that the supposed misperceptions do exist. In that case it does not make too much sense to tackle these misperceptions, since students only rarely go to the grocery store. Overestimations in the current study were largest for consumption from the school canteen. This might be due to both underreporting of this eating behaviour and due to high perceived peer eating norms for this behaviour. These high perceived norms might be explained by the fact that school canteen purchases might be visible in an evident way. This visibility might be triggered by very long queues in front of the canteen desk during school breaks, seen during the observations. Among the items assessing quantity of food eaten, the largest overestimation was seen for daily snack consumption. In contrast, Lally *et al.* (2011), who examined snacks,

sugar-sweetened drinks and fruit and vegetables as product groups, found the largest overestimation for sugar-sweetened drinks and the lowest misperception for snack foods.

Perkins *et al.* (2010) found higher misperceptions regarding daily intake of sugar-sweetened drinks (mean overall perceived peer intake of 2.64 and a median actual norm of the whole population of 1) than the current study (mean overall perceived peer intake of 2.37 and a median actual norm of the whole population of 2). This difference in misperceptions might be due to the lower self-reported actual norm in the study of Perkins and colleagues (2010). As earlier research found that lower educated students consume more sugar-sweetened drinks than other educational level students (Wouters *et al.*, 2010), part of this gap may be caused by the eating behaviour of lower educational level of students in the current study. Given that the current study only assessed eating behaviour during school-time while in the study of Perkins *et al.* (2010) also eating behaviour at home was assessed, the difference in eating behaviour is even more striking. However, part of the difference in misperception may also be explained by students reporting own behaviour more accurately than students in the study by Perkins *et al.* (2010).

In agreement with earlier research of Lally *et al.* (2011), in the current study students also thought that peers usually ate more than peers reported to do for unhealthy products. The earlier explained theory of pluralistic ignorance for the existence of misperceptions (Miller & McFarland, 1991) can be related to this. As students might have seen themselves as being in the minority group of behaving healthily, they were more likely to overestimate unhealthy peer consumption. This implicates that in health interventions it might be important to alter misperceived eating norms regarding snack and sugar-sweetened drink consumption.

The daily unhealthy product consumption norm was misperceived (overestimated) more than the daily actual peer healthy product consumption norm (which was also overestimated), which is in line with the hypothesis. However, the current results show overestimations of daily peer consumption of healthy products (fruit and bread products) instead of an earlier demonstrated underestimation of peer fruit and vegetables consumption (Lally *et al.*, 2011). Overestimations of peer fruit consumption might be (partly) due to the fact that students reported to eat very little fruit at school (overall actual norm median of 0). It might be easier for students themselves to report to never eat fruit (as it is about one person), while for a group norm that might be less easy (which is about the average class mate). Because of the low fruit consumption at school, overestimations regarding this behaviour were more apparent to find in the current study and no underestimations could be observed. Whatever the explanation, this low consumption norm in combination with overestimations of this healthy eating behaviour suggest that it does not make too much sense tackling perceived peer norms regarding this behaviour.

What does coincide with the hypothesis, is the observed underestimation of bread product consumption brought from home. However, bread products consumption from the school canteen and grocery store might be misinterpreted, as students could also have perceived it to mean sausage-roll or something similarly 'unhealthy'. This supposed misinterpretation was confirmed by a consulted vocational education student. This might explain why bread products consumption from the school canteen and bread products consumption from the grocery store were overestimated in contrast to the underestimated bread products consumption brought from home. This means that when altering misperceptions of perceived peer bread products consumption norms, focus should be on perceptions of products consumption from home and not on daily bread products consumption, bread products consumption derived from the grocery store or the school canteen.

4.2 Perceived norm in relation to eating behaviour

Even though Dutch adolescents themselves reported that friends' eating behaviour is not important for their own eating behaviour (Reinders *et al.*, 2012), perceived norm showed to be consistently, strongly related to own eating behaviour, which is in line with previous research (Higgs, 2015; Lally *et al.*, 2011; Perkins *et al.*, 2010; Stok *et al.*, 2014b). Although stronger relationships were found in the current study than in the study by Woodward *et al.* (1996), perceived norm was found to be less strongly related to own behaviour than in earlier, more recent and relevant, studies (Lally *et al.*, 2011; Perkins *et al.*, 2010). Possible explanations for this might be the difference in type of education (lower educational level students in the current study compared to different types of educational level students in other studies) and differences in countries where the study was done. It could be that students from the USA or the UK are more influenced by the perception of peers' behaviour than students in the Netherlands. It has to be noted also that the items assessing consumption, as well as answering scales and other predictors included in the model, are not totally comparable between previous research and the current study.

As mentioned before, identity has previously been shown to be an important moderator between perceived norms and own eating behaviour (Higgs, 2015; Robinson *et al.*, 2014; Stok *et al.*, 2014d). Strikingly, in the current study identity only showed to be a significant moderator in the relationship between perceived and own fruit consumption brought from home, where a higher identity was associated with perceived norm being stronger related to fruit consumption, brought from home. This is in accordance with its hypothesis. Also, this is comparable to earlier research that found identity to be a moderator in the relationship between perceived peer norm and vegetable consumption (Stok *et al.*, 2014d). However, in general relationships with perceived norms did not differ across social identity levels. This could be due to the fact that the current study used a more proximal referent group (class mates) than earlier studies, that for example used peers from the same university as referent group (Robinson *et al.*, 2014; Stok *et al.*, 2014d). Together with the fact that perceived norm was a less strong predictor for own behaviour than earlier studies showed (Lally *et al.*, 2011; Perkins *et al.*, 2010), while the earlier studies looked at peers from the same school year, this could implicate that (Dutch lower educated) adolescents might be more influenced by perceptions of peers who are less proximal to us (with whom we might still identify).

It was in accordance with the hypothesis that stronger relationships between perceived norms and own eating behaviour were found for younger aged students than for older students. However, age was solely a significant moderator between perceived - and own daily bread products consumption. For eating behaviours regarding all other product groups and settings, the relationship between perceived norm and own eating behaviour did not differ across age. This might implicate that earlier observed higher peer influences for younger adolescents (Steinberg & Monahan, 2007), might for example be more the consequence of peer modeling. It might also be that self-control, which is thought to be a moderator between perceived peer norm and behaviour (Stok *et al.*, 2014b), did not differ across age levels among lower educated students. Further, the parameter estimates from the analyses might have been somewhat less trustworthy since the interactions correlated highly with perceived norm and with age and with identity.

Differences between product groups

Perceived norm was the most important predictor of fruit, snack and sugar-sweetened drink consumption at school in the current study. This is in congruence with prior research (Lally *et al.*, 2011; Perkins *et al.*, 2010). Both perceived norm and actual norm were important predictors of bread products consumption at school. Woodward *et al.* (1996) also showed that perceived friend bread product consumption was related to own bread product consumption. Stok *et al.* (2014c) showed that injunctive subjective norms were stronger related to healthy products consumption than to unhealthy products

consumption. However, the current study, which looked at descriptive perceived norms, did not support these findings of social norms being more related to healthy products than unhealthy products.

Differences between settings

Perceived norm was the strongest predictor of fruit, snacks and sugar-sweetened drinks brought from home. Perceived norm was less strongly related to bread products consumption brought from home. Several background variables also predicted this behaviour. Perceived norm was also related to the consumption of products from the school canteen and perceived norm was the most consistent, strongest predictor of daily consumption of each of the food products and consumption of food products derived from the grocery store or snackbar. These high predicting capabilities of perceived peer norms in the grocery store/snackbar context might be due to the ambiguous nature of this behaviour, since this behaviour is actually not allowed on these schools. In familiar situations there is no need to look at other's behaviour to inform decisions, while when a situation or a behaviour is characterized by ambiguity, people look for other's guidance and social comparison processes occur (Lapinski & Rimal, 2005). So when uncertainty or ambiguity about behaving (in a certain situation) exists, social norms are deemed to exert strong influence on own behaviour (Cialdini & Trost, 1998; Higgs, 2015; Lapinski & Rimal, 2005).

4.3 Perceived norm and actual norm in relation to eating behaviour

Perceived norm was the most important predictor of fruit, snack and sugar-sweetened drink consumption at school and more important than actual norm. This is in congruence with previous research (Lally *et al.*, 2011; Perkins *et al.*, 2010). Actual norm was not found to be related to consumption derived from the grocery store, at all. Actual norm was only more strongly related to daily bread products consumption and home-brought bread products consumption than perceived norm. Also bread products consumption from the school canteen could be predicted significantly by actual norm, although perceived norm was related more strongly.

How actual norms might play a role (together with perceived norms) in adolescents' eating behaviour

The observed relationships between actual norm and consumption from the school canteen might suggest actual norm playing a bigger role in visible behaviour than in behaviour that is less visible (e.g. consumption of products derived from the grocery store). Higher consumption visibility (such as consumption from the school canteen) makes behaviour more normative and quicker available for later retrieval (Han & Hirshleifer, 2013). This might implicate that decisions about consumption from the school canteen are more led by heuristic decision-making. Actual norm might play a larger role in well-known behaviour, which is bread products consumption at school in the Netherlands (Rijpstra & Bernaards, 2011), than in less well-known behaviour. When people decide what to eat frequently and routinely, it is more likely that these decisions are based on more cognitive processing, without elaboration (Cohen & Babey, 2012). It was already suggested that perceived norms work in a heuristic, non-cognitive processing, manner (Stok *et al.*, 2014a), but actual norm also being related to common (bread products consumption at school) and visible behaviour (consumption from the school canteen) in the current study might suggest that it plays a role in eating behaviour even more heuristically.

Further, it is suggested that actual norms might even almost work as a kind of modeling, which can be explained as copying the behaviour of others (Bandura & McClelland, 1977), especially for eating behaviour from the school canteen, since this behaviour is evidently visible. This was also suggested by Robinson *et al.* (2014), who explained that informational social influence (showing what others do) might inform decisions about how much or what to eat without thinking too much about (emotional)

consequences.

Besides, it is suggested that actual norms (combined with perceived norms) might influence behaviour of proximal peers more than behaviour of less proximal peers, since the current study used class mates as a peer group, who are more proximal than peers (students in the same school year) used by earlier studies (Lally *et al.*, 2011; Perkins *et al.*, 2010). This idea is supported by another study where actual friendship group norms were related to own eating behaviour (Wouters *et al.*, 2010).

Thus, it is suggested that actual norm might play a heuristic role in adolescents' eating behaviour, maybe even more than perceived norm and that actual norm might play a role specifically in proximal peers and well-known and visible behaviours. This might shed light on how actual norms might also play a role in adolescents' own eating behaviour.

4.4 Methodological considerations

The cross-sectional design of the study does not allow to make causal inferences. Therefore the question remains whether perceived peer norm influences own behaviour or whether one's perceived norm reflects someone's own behaviour (social projection). However, many social norm experiments (although carried out with different samples) showed that perceived eating norm can influence own eating behaviour (Higgs, 2015; Robinson *et al.*, 2014; Stok *et al.*, 2014b).

Relying on self-reports poses a potential limitation, since it may have caused students to misreport own eating behaviour. Especially self-reported soft drink consumption is known to be often underreported (Millen *et al.*, 2009). In the current study however, the daily sugar-sweetened drink consumption was somewhat higher than reported in the study of Perkins *et al.* (2010), who conducted their study among similarly aged participants. Moreover, substantial misperceptions were observed in the current study, which indicates that a small difference between actual consumption and reported consumption cannot close the gap between perceived peer norm and actual peer norm. Another potential limitation might have been that tutors themselves gave the instructions regarding the questionnaires, that might have differed somewhat from each other. However, clear instructions for the tutors were given beforehand. Furthermore, the current study was conducted in a field setting, comprising two schools in the same building, which might pose constraints in generalizability. Also tutors could choose to join the research or not. Nevertheless, a large sample ($N = 598$) was used, comprising 46 different school classes. Lastly, a constraint was that 76 students did not report their length or their weight (or both) in the current study, so their data were not used in the multiple regression analyses.

The validity of the questionnaire might be supported by certain observed correlations. Moderate to strong relationships were observed between variables concerning frequency of bringing a certain product group from home to eat at school and the quantity variable of that product group (consumption per day at school). For example, frequency of own fruit consumption at school, brought from home, was related to own daily fruit consumption at school ($r = .639, p < .01$). The same pattern was seen for the perceived eating behaviour variables. For example, perceived fruit consumption at school, brought from home, was related to perceived daily fruit consumption at school. Even though different scales for these variables were used, the correlation was moderate ($r = 0.442, p < 0.01$). Another strength of the current study is the use of four different product groups and three settings, which is also unique in social norm research.

4.5 Future research and implications for practice

The current study constituted the first step towards a more holistic approach of adolescent's eating behaviour at school, by assessing the influence of (mis)perceived norms and actual norms across different product groups and settings in a school setting.

More research is needed on reasons behind the existence of misperceptions. Discrepancies between perceived peer - and actual peer consumption might be due to underreporting of own eating behaviour, which was referred to by Higgs (2015) and (Millen *et al.*, 2009). Although part of this discrepancy might be due to underreporting, these misperceptions are likely to be largely caused by a too high perceived norm. As discussed earlier, the false consensus effect, pluralistic ignorance and the false uniqueness effect are examples of possible reasons for this high perceived norm. By investigating these further, for example in qualitative studies, and by investigating also possible other theories, the cause of the misperceptions might be unraveled more and more. In this way the cause can be tackled instead of the symptoms. Also it should be further researched how actual norms might play a role in adolescents' eating behaviour.

The model of social norms in health promotion (Perkins, 2003) suggests that exposure to actual norm messages might lead to less exaggerated misperceptions of perceived norms, which in turn may lead to a reduction in unhealthy behaviour and an increase in healthy behaviour. This is supported by research stating that altering perceptions can help changing own behaviour (Haines, Barker, & Rice, 2003) and by a study by Robinson *et al.* (2014), which showed different implications of descriptive informational peer norms, in both reducing unhealthy eating behaviour and increasing healthy eating behaviour. Research on the influence of minority peer smoking and substance abuse norms in the school setting proved to be effective in reducing these risk-associated behaviours (Haines *et al.*, 2003; Haines, Perkins, Rice, & Barker, 2005). It shows to be a promising field for promotion of healthy eating (and reducing the risk-associated behaviour of unhealthy eating) to alter perceived norms, as was shown in the review of Robinson *et al.* (2014) and in research by (Stok *et al.*, 2014a). It was shown that even single-sentence descriptive fruit norm message interventions can substantially influence behaviour (Stok *et al.*, 2014a). However, more research is needed on the influence of exposure to norm messages (about unhealthy eating behaviour and healthy behaviour) on eating behaviour of different products in different (secondary) school settings. This can be done for example by exposing students to descriptive peer norm messages (also including a certain setting and differing in product groups) or by exposing students to an environmental cue, e.g. by changing something in the environment of the school canteen. Thereby it is suggested to use salient referents that are older than students themselves (Tarrant, Khan, & Qin, 2015).

Besides, research is needed on whether the influence of social norm differs for boys and girls (Higgs, 2015). For example it was found that male students were twice as likely to retrieve their school lunch from a food retailer (Seliske *et al.*, 2013) and more lunch from home was eaten at school by girls than boys. This is important to consider, since interventions might be more effective when altered for boys and girls. For example, in research reviewing education about descriptive drinking norms it was found that for women sex-specific feedback about norms should be used (Lewis & Neighbors, 2006). Apart from sex as a moderator, more potentially important moderators have yet to be identified in order to build on the understanding of how social norms can affect eating behaviour (Higgs, 2015). Examples of moderators to investigate could be habitual intake, level of ambiguity, liking and self-regulation strategies.

Perceived peer norm was related to the consumption of both healthy and unhealthy products in the current study. Higher overestimations were seen for unhealthy products. Little consumption of fruit products was seen in the current study, which suggests that altering perceived norms regarding this behaviour does not make too much sense. Misperceptions regarding bread consumption were small or non-problematic (when peer norms regarding this behaviour were overestimated). Thus, focus should be on

executing promotional healthy eating interventions targeting perceptions of peer norms regarding snacks and sugar-sweetened drinks. Although earlier research showed that peer encouragement of healthy products works better for changing eating behaviour than peer discouragement of unhealthy eating (Stok *et al.*, 2014c), the current study suggests that (pre)vocational students should be made aware that peers consume less unhealthy products than they think peers do. Since perceived norm was most predictive of, and relevant for consumption from the school canteen and for daily consumption (and consumption at school derived from these settings is relevant, interventions promoting healthy eating should take these also into account. Besides, more research should be done on perceived peer norms and consumption from the grocery store, since it is unclear whether consumption from the grocery store was low or underreported.

In these interventions it might also be important to emphasise the responsibility adolescents have themselves to change their own behaviour, as it appeared that this feeling of responsibility often lacks (Ridder *et al.*, 2010) Also it is suggested to help students developing strategies for obtaining a healthier diet through appropriate interaction patterns with peers (Contento *et al.*, 2006).

4.6 Conclusion

In sum, lower educated students' unhealthy eating behaviour in the school context poses potential health problems. When targeting lower educated students in for example social norm exposure interventions, focus should be on the adaptation of misperceptions regarding peer snack consumption norms mostly and also on sugar-sweetened drink consumption norms. It is important that health promoters consider adapting their social norm exposures to different settings (focus on altering misperceptions regarding peer daily consumption norms and peer consumption norms at school derived from the school canteen), type of food and type of norm. Although earlier research showed that actual norms were not related to eating behaviour, the current study suggests that actual peer eating norms might play a role in the eating behaviour of lower educated students. It is suggested that actual norms might work in a heuristic way and that they are in particular relevant for social proximal peers. More research is needed to unravel the (combined) influence actual norms and perceived norms might have on eating behaviour.

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6. Appendices

Appendix I – Research information to parents, teachers and tutors

Nieuwsbrief naar de ouders CSV

Onderzoek eetgedrag op de CSV + ROCa12

De school vindt gezonde voeding een belangrijk thema en heeft daarom haar medewerking verleend aan een onderzoek van de Wageningen Universiteit. De universiteit voert In januari een onderzoek uit naar eetgewoonten van jongeren tijdens schooltijd. Er wordt gekeken in hoeverre er een relatie is tussen de eigen eetgewoonten van de scholieren en wat scholieren denken over de eetgewoonten van medescholieren. Hiervoor vullen scholieren tijdens een mentorles een korte vragenlijst in. De vragenlijst wordt anoniem ingevuld en de gegevens worden niet aan derden verstrekt. Mocht u desondanks liever niet willen dat uw kind de vragenlijst invult, dan kunt u dit laten weten door een e-mail te sturen naar karen.vanengelshoven@wur.nl. Vermeld daarbij de naam van uw kind en in welke mentorklas uw kind zit. Ook kunt u hier terecht voor meer informatie betreffende het onderzoek.

Nieuwsbrief leraren CSV + ROCa12

Onderzoek eetgedrag op de CSV + ROCa12

De school vindt gezonde voeding een belangrijk thema en heeft daarom haar medewerking verleend aan een onderzoek van de Wageningen Universiteit. De universiteit voert In januari een onderzoek uit naar eetgewoonten van jongeren tijdens schooltijd. Er wordt gekeken in hoeverre er een relatie is tussen de eigen eetgewoonten van de scholieren en wat scholieren denken over de eetgewoonten van medescholieren. Hiervoor vullen scholieren tijdens een mentorles anoniem een korte vragenlijst in. De mentoren zullen hier nog apart voor benaderd worden. Voor meer informatie kunt u contact opnemen via karen.vanengelshoven@wur.nl.

Informatie mentoren CSV + ROCa12

Onderzoek eetgedrag op de CSV + ROCa12

U heeft het misschien al gelezen in de nieuwsbrief; De school vindt gezonde voeding een belangrijk thema en heeft daarom haar medewerking verleend aan een onderzoek van de Wageningen Universiteit. Er wordt gekeken in hoeverre er een relatie is tussen eigen eetgewoonten van de scholieren en wat scholieren denken over eetgewoonten van medescholieren. Hiervoor willen we graag vragenlijsten uitdelen aan zo veel mogelijk scholieren van de CSV en ROCa12. Het is belangrijk dat deze vragenlijst wordt ingevuld op het moment dat alle leerlingen van een klas aanwezig zijn. Daarom is er voor gekozen dit tijdens een mentorles te doen. We hopen dat u, als mentor, uw medewerking wilt verlenen en de vragenlijsten wilt laten invullen tijdens een mentorles tussen 19 en 23 januari. Mocht het in deze week niet uitkomen, dan kunt u de vragenlijsten ook nog de week erop uitdelen, van 26 t/m 30 januari. Het afnemen van de vragenlijsten neemt ongeveer 15 minuten in beslag, inclusief korte uitleg. De leerlingen maken de vragenlijsten voor zichzelf en mogen niet overleggen. Als leerlingen niet mee willen doen, dan kunnen ze dit aangeven en leveren ze de vragenlijst weer in. De vragenlijsten zullen uiterlijk 19 januari in uw postvakje liggen en u kunt de ingevulde vragenlijsten naderhand op het kantoor van Jeanet Beck leggen. Mocht u bezwaar hebben om mee te doen aan dit onderzoek, geeft u dit dan alstublieft vòòr 14 januari door aan Karen van Engelshoven: karen.vanengelshoven@wur.nl. Geef hierbij dan ook aan van welke klas u mentor bent. Voor vragen of meer informatie over dit onderzoek kunt u ook bij dit e-mailadres terecht.

Appendix II – Instruction form tutors

Mentoreninstructie vragenlijst – CSV/ROC A12

Beste mentor,

Zoals u al heeft gelezen doen wij namens Wageningen Universiteit een onderzoek in samenwerking met het CSV en de ROC A12. Hierin wordt er gekeken in hoeverre er een relatie is tussen eigen eetgedrag van de scholieren en wat scholieren denken over eetgedrag van medescholieren. Voor u vindt u de vragenlijsten die we hiervoor graag willen afnemen bij de leerlingen uit uw klas. We stellen het erg op prijs als u hieraan mee wilt werken.

Het invullen van de vragenlijsten duurt ongeveer 10 minuten. Hierbij is het van belang dat de leerlingen onderling niet overleggen of afkijken. Mochten leerlingen niet mee willen doen, dan kunnen ze dit aangeven en leveren ze de vragenlijst weer in. De ingevulde vragenlijsten kunt u naderhand neerleggen bij de rode balie van Het Perron. We zouden u willen vragen de vragenlijst af te nemen tijdens een mentorles tussen 21 januari en 30 januari. Mocht het u binnen deze weken niet lukken, laat u het dan aub even weten via onderstaand e-mailadres.

Naam mentor: _____

Klas: _____

Tot slot wil ik u graag één vraag stellen over de leerlingen in uw klas:

Hoe vindt u de onderlinge band tussen de leerlingen in uw klas?

- Ze hebben een erg slechte onderlinge band
- Ze hebben een slechte onderlinge band
- Ze hebben een redelijke onderlinge band
- Ze hebben een goede onderlinge band
- Ze hebben een erg goede onderlinge band

Bij vragen over dit onderzoek of de uitvoering daarvan kunt u contact opnemen met Karen van Engelshoven via karen.vanengelshoven@wur.nl.

Hartelijk dank voor uw medewerking!

Het onderzoeksteam van de Wageningen Universiteit en Jeanet Beck

VRAGENLIJST ETEN TIJDENS SCHOOLTijd – CSV

Namens Wageningen Universiteit doen wij onderzoek naar wat jij eet tijdens schooltijd en wat jij denkt dat je klasgenoten (van je mentorklas) eten. Het kost ongeveer 10 minuten om deze vragenlijst in te vullen. Vul deze vragenlijst alsjeblieft helemaal zelf in, zonder hulp van klasgenoten. Als je een vraag niet begrijpt, dan kun je dit natuurlijk wel aan de leraar vragen. Als de vragenlijst ingevuld is, kun je hem inleveren bij de leraar.

Meedoen aan dit onderzoek is vrijwillig. De gegevens van dit onderzoek worden anoniem verwerkt en zullen niet voor andere doeleinden gebruikt worden. Niemand komt te weten wat jij hebt geantwoord.

Alvast bedankt voor het meedoen!

- 1) Wat is je geslacht? Jongen Meisje
- 2) In welke klas van het CSV zit je? _____
- 3) Hoe oud ben je? _____ jaar
- 4) Hoe lang ben je? _____ centimeter (*als je het niet weet, kun je het schatten*)
- 5) Hoe zwaar ben je? _____ kilogram (*als je het niet weet, kun je het schatten*)
- 6) Hoeveel dagen per week ga je naar school? _____ dagen
- 7) Hoe goed is je band met je klasgenoten? *Kruis één antwoord aan.*
 - Ik heb een erg slechte band
 - Ik heb een slechte band
 - Ik heb een redelijke band
 - Ik heb een goede band
 - Ik heb een erg goede band

WAT EET EN DRINK JIJ OP SCHOOL?

Hieronder staan vragen die gaan over **wat jij eet en drinkt tijdens schooltijd**, inclusief pauzes en tussenuren. Alles wat je na schooltijd eet of drinkt telt dus **niet** mee. Denk aan een normale schoolweek in de afgelopen 4 weken. Kruis eerlijk jouw antwoord aan (1 antwoord per vraag). Alle antwoorden die je geeft zijn goed.

Eten van thuis

- 1) Hoe vaak neem jij **fruit** van thuis mee om op school op te eten?

Voorbeelden: Een appel, banaan, mandarijn.

- Nooit
- Minder dan 1x per week
- 1x per week
- 2x per week
- 3x per week
- 4x per week
- 5x per week of meer

- 2) Hoe vaak neem jij **brood** van thuis mee om op school op te eten?

Voorbeelden: Boterhammen, bolletjes, krentenbollen.

- Nooit
- Minder dan 1x per week
- 1x per week
- 2x per week
- 3x per week
- 4x per week
- 5x per week of meer

- 3) Hoe vaak neem jij **snacks** van thuis mee om op school op te eten?

Voorbeelden: Snickers, chips, saucijzenbroodje, kaassoufflé en koekjes.

- Nooit
- Minder dan 1x per week
- 1x per week
- 2x per week
- 3x per week
- 4x per week
- 5x per week of meer

- 4) Hoe vaak neem jij **drinken waar suiker in zit** mee van thuis naar school om te drinken?

Voorbeelden: Wicky, cola, chocomel, sap en energy drink. (niet meetellen: light dranken)

- Nooit
- Minder dan 1x per week

- 1x per week
- 2x per week
- 3x per week
- 4x per week
- 5x per week of meer

Eten van de schoolkantine - De automaten op school tellen ook mee.

5) Hoe vaak haal jij **brood** in de schoolkantine?

Voorbeelden: Broodje gezond, boterhammen, bolletjes, krentenbollen.

- Nooit
- Minder dan 1x per week
- 1x per week
- 2x per week
- 3x per week
- 4x per week
- 5x per week
- Meer dan 1x per dag

6) Hoe vaak haal jij **snacks** in de schoolkantine?

Voorbeelden: Snickers, pizza, saucijzenbroodje, kaassoufflé, chips en koekjes.

- Nooit
- Minder dan 1x per week
- 1x per week
- 2x per week
- 3x per week
- 4x per week
- 5x per week
- Meer dan 1x per dag

7) Hoe vaak haal jij **drinken waar suiker in zit** in de schoolkantine?

Voorbeelden: Wicky, cola, chocomel, sap, energy drink. (niet meetellen: light dranken)

- Nooit
- Minder dan 1x per week
- 1x per week
- 2x per week
- 3x per week
- 4x per week
- 5x per week
- Meer dan 1x per dag

Eten van de supermarkt/snackbar

8) Hoe vaak haal jij **fruit** in de supermarkt tijdens schooltijd?

Voorbeelden: Een appel, banaan, mandarijn.

- Nooit
- Minder dan 1x per week
- 1x per week
- 2x per week
- 3x per week
- 4x per week
- 5x per week
- Meer dan 1x per dag

9) Hoe vaak haal jij **brood** in de supermarkt/snackbar tijdens schooltijd?

Voorbeelden: Broodje gezond, boterhammen, bolletjes, krentenbollen.

- Nooit

- Minder dan 1x per week
- 1x per week
- 2x per week
- 3x per week
- 4x per week
- 5x per week
- Meer dan 1x per dag

10) Hoe vaak haal jij **snacks** in de supermarkt/snackbar tijdens schooltijd?

Voorbeelden: Snickers, chips, saucijzenbroodje, kaassoufflé, pizza en koekjes.

- Nooit
- Minder dan 1x per week
- 1x per week
- 2x per week
- 3x per week
- 4x per week
- 5x per week
- Meer dan 1x per dag

11) Hoe vaak haal jij **drinken waar suiker in zit** in de supermarkt/snackbar tijdens schooltijd?

Voorbeelden: Wicky, cola, chocomel, sap, energy drink. (niet meetellen: light dranken)

- Nooit
- Minder dan 1x per week
- 1x per week
- 2x per week
- 3x per week
- 4x per week
- 5x per week
- Meer dan 1x per dag

HOEVEEL EET JIJ OP SCHOOL?

12) Hoeveel stuks **fruit** eet jij gemiddeld **per dag** tijdens schooltijd

Als 1 stuk fruit mag je rekenen: 1 appel, 2 mandarijnen, 1 handvol druiven enz.

- Minder dan 1
- 1
- 2
- 3
- 4
- Meer dan 4

13) Hoeveel sneetjes **brood** eet jij gemiddeld **per dag** tijdens schooltijd?

Als 1 snee brood mag je rekenen: 1 boterham. Een bolletje/broodje is 2 sneetjes.

- Minder dan 1
- 1
- 2
- 3
- 4
- Meer dan 4

14) Hoeveel **snacks** eet jij gemiddeld **per dag** tijdens schooltijd?

Als 1 snack mag je rekenen: 1 snicker, 1 saucijzenbroodje, 1 handvol chips, 1 stuk pizza enz.

- Minder dan 1
- 1
- 2
- 3

- 4
- Meer dan 4

15) Hoeveel **drankjes waar suiker in zit** drink jij gemiddeld **per dag** tijdens schooltijd?

Als 1 drankje mag je rekenen: 1 pakje wicky, 1 glas drinken. Een blikje is 2 drankjes. Een flesje (0,5 liter) is 3 drankjes. (niet meetellen: light dranken)

- Minder dan 1
- 1
- 2
- 3
- 4
- Meer dan 4

WAT DENK JE DAT KLASGENOTEN OP SCHOOL ETEN?

Hieronder staan vragen die gaan over wat je denkt dat je klasgenoten (je mentorklas) eten **tijdens schooltijd** in een normale schoolweek van de afgelopen 4 weken. Alles wat je denkt dat klasgenoten na schooltijd eten of drinken telt dus **niet** mee. Kruis jouw antwoord aan (1 antwoord per vraag) en vul eerlijk in **wat jij denkt over je klasgenoten**. Alle antwoorden die je geeft zijn goed. Kruis eerlijk jouw antwoord aan (1 antwoord per vraag).

Eten van thuis

16) Hoe vaak denk je dat **klasgenoten fruit** van thuis meenemen om op school op te eten?

Voorbeelden: Een appel, banaan, mandarijn.

- Nooit
- Minder dan 1x per week
- 1x per week
- 2x per week
- 3x per week
- 4x per week
- 5x per week of meer

17) Hoe vaak denk je dat **klasgenoten brood** van thuis meenemen om op school op te eten?

Voorbeelden: Boterhammen, bolletjes, krentenbollen.

- Nooit
- Minder dan 1x per week
- 1x per week
- 2x per week
- 3x per week
- 4x per week
- 5x per week of meer

18) Hoe vaak denk je dat **klasgenoten snacks** van thuis meenemen om op school op te eten?

Voorbeelden: Snickers, chips, saucijzenbroodje, kaassoufflé en koekjes.

- Nooit
- Minder dan 1x per week
- 1x per week
- 2x per week
- 3x per week
- 4x per week
- 5x per week of meer

19) Hoe vaak denk je dat **klasgenoten drinken waar suiker in zit** meenemen van thuis naar school om op te drinken?

Voorbeelden: Wicky, cola, chocomel, sap, energy drink. (niet meetellen: light dranken)

- Nooit
- Minder dan 1x per week

- 1x per week
- 2x per week
- 3x per week
- 4x per week
- 5x per week of meer

Eten van de schoolkantine - De automaten op school tellen ook mee.

20) Hoe vaak denk je dat **klasgenoten brood** in de schoolkantine halen?

Voorbeelden: Broodje gezond, bolletjes, krentenbollen.

- Nooit
- Minder dan 1x per week
- 1x per week
- 2x per week
- 3x per week
- 4x per week
- 5x per week
- Meer dan 1x per dag

21) Hoe vaak denk je dat **klasgenoten snacks** in de schoolkantine halen?

Voorbeelden: Snickers, pizza, chips, saucijzenbroodje, kaassoufflé en koekjes.

- Nooit
- Minder dan 1x per week
- 1x per week
- 2x per week
- 3x per week
- 4x per week
- 5x per week
- Meer dan 1x per dag

22) Hoe vaak denk je dat **klasgenoten drinken waar suiker in zit** in de schoolkantine halen?

Voorbeelden: Wicky, cola, chocomel, sap. (niet meetellen: light dranken)

- Nooit
- Minder dan 1x per week
- 1x per week
- 2x per week
- 3x per week
- 4x per week
- 5x per week
- Meer dan 1x per dag

Eten van de supermarkt/snackbar

23) Hoe vaak denk je dat **klasgenoten fruit** in de supermarkt halen tijdens schooltijd?

Voorbeelden: Een appel, banaan, mandarijn.

- Nooit
- Minder dan 1x per week
- 1x per week
- 2x per week
- 3x per week
- 4x per week
- 5x per week
- Meer dan 1x per dag

24) Hoe vaak denk je dat **klasgenoten brood** in de supermarkt/snackbar halen tijdens schooltijd?

Voorbeelden: Broodje gezond, boterhammen, bolletjes, krentenbollen.

- 0 Nooit
- 0 Minder dan 1x per week
- 0 1x per week
- 0 2x per week
- 0 3x per week
- 0 4x per week
- 0 5x per week
- 0 Meer dan 1x per dag

25) Hoe vaak denk je dat **klasgenoten snacks** in de supermarkt/snackbar halen tijdens schooltijd?

Voorbeelden: Snickers, chips, pizza, saucijzenbroodje, kaassoufflé en koekjes.

- 0 Nooit
- 0 Minder dan 1x per week
- 0 1x per week
- 0 2x per week
- 0 3x per week
- 0 4x per week
- 0 5x per week
- 0 Meer dan 1x per dag

26) Hoe vaak denk je dat **klasgenoten drinken waar suiker in zit** in de supermarkt/snackbar halen tijdens schooltijd?

Voorbeelden: Wicky, cola, chocomel, energy drink. (niet meetellen: light dranken)

- 0 Nooit
- 0 Minder dan 1x per week
- 0 1x per week
- 0 2x per week
- 0 3x per week
- 0 4x per week
- 0 5x per week
- 0 Meer dan 1x per dag

Zie achterkant voor vervolg

HOEVEEL DENK JE DAT KLASGENOTEN OP SCHOOL ETEN?

27) Hoeveel stuks **fruit** denk jij dat **klasgenoten** gemiddeld **per dag** tijdens schooltijd eten?

Als 1 stuk fruit mag je rekenen: 1 appel, 2 mandarijnen, 1 handvol druiven

- Minder dan 1
- 1
- 2
- 3
- 4
- Meer dan 4

28) Hoeveel sneetjes **brood** denk jij dat **klasgenoten** gemiddeld **per dag** tijdens schooltijd eten?

Als 1 snee brood mag je rekenen: 1 boterham. Een bolletje/broodje is 2 sneetjes.

- Minder dan 1
- 1
- 2
- 3
- 4
- Meer dan 4

29) Hoeveel **snacks** denk jij dat **klasgenoten** gemiddeld **per dag** tijdens schooltijd eten?

Als 1 snack mag je rekenen: 1 snicker, 1 saucijzenbroodje, 1 handvol chips, 1 stuk pizza enz.

- Minder dan 1
- 1
- 2
- 3
- 4
- Meer dan 4

30) Hoeveel **drankjes waar suiker in zit** denk jij dat **klasgenoten** gemiddeld **per dag** tijdens schooltijd drinken?

Als 1 drankje mag je rekenen: 1 pakje wicky, 1 glas drinken. Een blikje is 2 drankjes. Een flesje (0,5 liter) is 3 drankjes. (niet meetellen: light dranken)

- Minder dan 1
- 1
- 2
- 3
- 4
- Meer dan 4

Bedankt voor het meedoen! Je kunt nu de vragenlijst weer inleveren.

Appendix IV - Correlation matrix

Descriptives, perceived peer norms and own eating behaviour

Correlations	Sex	School	Age	BMI	Days school	Identity	1	2	3	4	5	6	7	8	9	10	11
Descriptives																	
Sex		.004	.014	.036	.127**	-.032	.053	-.097*	.097*	-.091*	-.054	-.091*	-.154**	-.009	.004	.003	-.073
School			.445**	.210**	-.260**	-.012	.011	-.125**	-.016	-.076	-.012	-.099*	.025	.050	.137**	.122**	.102*
Age				.367**	-.534**	-.028	-.030	-.326**	-.155**	-.226**	-.030	-.165**	-.061	.034	.206**	.156**	.115**
BMI					-.232**	-.008	.104*	-.131**	-.177**	-.173**	-.010	-.129**	-.077	.019	-.097*	-.018	-.006
Days school						-.111**	.043	.334**	.081	.191**	.089*	.094*	.053	.024	-.051	-.049	-.003
Identity							-.003	.039	.071	.077	-.003	.003	-.005	.064	.083*	.088*	.128**
Own eating behaviour																	
1.Fruit from home								.205**	.011	-.112**	.122**	.026	.065	.234**	.114**	.031	.059
2.Bread products from home									.161**	.221**	-.099*	-.039	-.044	.019	-.134**	-.194**	-.144**
3.Snacks from home										.227**	.059	.183**	.007	-.042	.000	.186**	.075
4.Sugar-sweetened drinks from home											.048	.129**	.129**	-.078	.021	.060	.096*
5.Bread products from school canteen												.522**	.452**	.178**	.285**	.301**	.280**
6.Snacks from school canteen													.487**	.066	.120**	.323**	.253**
7.Sugar-sweetened drinks from school canteen														.150**	.207**	.257**	.323**
8.Fruit from grocery store/snackbar															.350**	.225**	.251**
9.Bread products from grocery store/snackbar																.548**	.538**
10.Snacks from grocery store/snackbar																	.680**
11.Sugar-sweetened drinks from grocery store/snackbar																	
12.Daily fruit consumption	.044	-.011	-.027	.041	.120**	.026	.639**	.140**	-.015	-.035	.089*	.047	.091*	.351**	.200**	.108**	.127**
13.Daily bread product consumption	-.244	.058	-.024	-.013	-.062	.079	.215**	.462**	.054	.095*	.016	-.048	.076	.093*	.074	-.043	.001
14.Daily snack consumption	-.063	.018	-.029	-.165**	.031	.022	-.071	-.016	.385**	.188**	.164**	.322**	.242**	.135**	.214**	.333**	.288**
15.Daily sugar-sweetened drinks consumption	-.120**	.014	-.102*	-.153**	.033	.056	-.074	.052	.172**	.483**	.144**	.188**	.187**	-.008	.133**	.191**	.298**
Perceived peer eating norms																	
16.Fruit from home	.094*	.064	-.038	.002	.057	-.021	.225**	.038	.052	.033	.049	.117**	.065	.172**	.124**	.096*	.113**
17.Bread products from home	-.013	-.160**	-.218**	-.074	.283**	.090*	.01	.286**	.108**	.088*	-.042	-.042	-.119**	-.087*	-.126**	-.125**	-.116**
18.Snacks from home	.070	-.067	-.123**	-.019	.176**	-.019	.012	.124**	.280**	.079	-.062	.015	-.052	-.077	-.162**	-.068	-.114**
19.Sugar-sweetened drinks from home	.011	-.127**	-.136**	-.075	.206**	.025	-.024	.163**	.159**	.224**	-.026	-.021	-.057	-.111**	-.091*	-.054	-.087*
20.Bread products from school canteen	.035	-.027	-.036	-.101*	.099*	.014	.086*	.071	.101*	.079	.095*	.143**	.070	0.041	-.019	.048	.049
21.Snacks from school canteen	.036	-.007	-.077	-.07	.177**	-.062	.109**	.060	.093*	.092*	.061	.155**	.051	.010	-.003	.080	.037
22.Sugar-sweetened drinks from school canteen	.001	.001	-.081	-.054	.142**	-.008	.115**	.094*	.067	.083*	.067	.114**	.150**	.002	.013	.060	.087*
23.Fruit from grocery store/snackbar	-.025	.148**	.102*	.068	-.010	-.002	.102*	-.003	.045	.065	.136**	.117**	.161**	.188**	.195**	.203**	.193**
24.Bread products from grocery store/snackbar	.049	.161**	.177**	.134**	-.080	.066	.062	-.030	.040	.031	.061	.036	.069	.155**	.323**	.284**	.313**
25.Snacks from grocery store/snackbar	-.044	.141**	.111**	.043	-.031	.030	.061	-.070	.093*	.059	.046	.055	.081*	.081	.207**	.330**	.266**
26.Sugar-sweetened drinks from grocery store/snackbar	-.011	.144**	.117**	.082	-.007	.034	.113**	-.059	.015	.053	.096*	.104*	.173**	.099*	.214**	.292**	.322**
27.Daily fruit consumption	.007	.034	-.131**	.017	.055	.036	.208**	.047	.003	.023	.107**	.125**	.094*	.160**	.152**	.118**	.114**
28.Daily bread product consumption	-.091*	-.004	-.04	-.049	.012	.095*	.058	.096*	.022	.078	.019	-.020	.010	.037	.142**	-.001	.006
29.Daily snack consumption	.012	.010	-.028	-.044	.071	-.068	.035	.054	.161**	.099*	.038	.108**	.139**	.082*	.060	.143**	.088*
30.Daily sugar-sweetened drinks consumption	.040	-.009	-.027	-.062	.030	-.011	.028	.039	.119**	.154**	.016	.041	.028	-.044	.030	.067	.078

Correlations	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Own eating behaviour																		
12.Daily fruit consumption	.217**	.102*	.014	.213**	-.028	.001	-.058	.106*	.119**	.096*	.207**	.111**	.110**	.177**	.280**	.100*	.093*	.004
13.Daily bread product consumption		.092*	.171**	.007	.123**	-.006	.077	-.010	.005	.077	.021	.070	.018	.076	.068	.243**	.076	.105*
14.Daily snack consumption			.295**	.096*	-.092*	.085*	-.015	.178**	.108**	.111**	.227**	.151**	.082*	.123**	.193**	.057	.301**	.044
15.Daily sugar-sweetened drinks consumption				.018	-.025	.035	.161**	.047	.066	.062	.055	.095*	.084*	.099*	.034	.109**	.133**	.224**
Perceived peer eating norm																		
16.Fruit from home					.148**	.011	-.010	.127**	.095*	.084*	.186**	.120**	.050	.114**	.442**	.085*	-.007	.007
17.Bread products from home						.319**	.432**	.115**	.101*	.121**	-.132**	-.014	.014	-.005	.097*	.319**	.006	.215**
18.Snacks from home							.449**	.344**	.381**	.262**	.029	.071	.159**	.124**	-.005	.104*	.340**	.293**
19.Sugar-sweetened drinks from home								.259**	.290**	.273**	-.113**	.038	.137**	.096*	-.088*	.182**	.161**	.300**
20.Bread products from the school canteen									.547**	.451**	.235**	.214**	.299**	.254**	.117**	.129**	.280**	.153**
21.Snacks from the school canteen										.544**	.200**	.240**	.356**	.366**	.140**	.085*	.389**	.288**
22.Sugar-sweetened drinks from the school canteen											.173**	.286**	.319**	.391**	.092*	.158**	.334**	.269**
23.Fruit from the grocery store/snackbar												.431**	.299**	.371**	.372**	.120**	.277**	.029
24.Bread products from the grocery store/snackbar													.379**	.445**	.249**	.167**	.280**	.171**
25.Snacks from the grocery store/snackbar														.567**	.087*	.084*	.339**	.250**
26.Sugar-sweetened drinks from the grocery store/snackbar															.196**	.180**	.304**	.324**
27.Daily fruit consumption																.215**	.123**	.063
28.Daily bread product consumption																	.149**	.283**
29.Daily snack consumption																		.384**
30.Daily sugar-sweetened drinks consumption																		

*. Correlation with a significance at the $p < 0.05$ level (2-tailed).

** Correlation with a significance at the $p < 0.01$ level (2-tailed).

Variables that were assessed with the Pearson correlation: Age, BMI, 3, 13, 14, 15, 17,18,19,20,21,22,24,25,26,27,28,29,30.

Appendix V – Correlation matrix

Descriptives, own eating behaviour and actual peer norms

Correlations	Actual peer norm 1	Actual peer norm 2	Actual peer norm 3	Actual peer norm 4	Actual peer norm 5	Actual peer norm 6	Actual peer norm 7	Actual peer norm 8	Actual peer norm 9	Actual peer norm 10	Actual peer norm 11	Actual peer norm 12	Actual peer norm 13	Actual peer norm 14	Actual peer norm 15
Descriptives															
Sex	.156**	-.050	.124**	-.150**	.026	-.096*	-.034	-.006	.008	-.016	-.071	.178**	-.260**	-.019	-.126**
School	-.289**	-.183**	-.062	-.170**	.038	-.209**	.075	.005	.262**	.212**	.239**	-.110**	.109**	.057	.047
Age	-.466**	-.488**	-.302**	-.482**	-.071	-.370**	-.200**	-.177**	.135**	.213**	.021	-.268**	-.026	-.154**	-.200**
BMI	-.168**	-.192**	-.098*	-.265**	.007	-.203**	-.119**	-.001	.012	.128**	.039	-.070	.021	-.007	-.112*
Days school	.415**	.417**	.338**	.408**	.100*	.280**	.216**	.164**	.021	-.206**	.016	.267**	-.027	.125**	.090*
Identity	.033	.045	.057	-.005	.034	.041	-.044	-.032	.007	-.043	.030	.055	.111**	.085*	.078
Own eating behaviour															
1.Fruit from home	.061	.086*	-.005	-.009	-.041	-.070	-.054	.027	-.010	.006	-.007	.087*	.039	-.009	-.041
2.Bread products from home	.268**	.258**	.119**	.150**	-.025	.091*	.050	.137**	-.080	-.060	-.028	.165**	.144**	.050	.011
3.Snacks from home	.062	.112**	.197**	.108**	.041	.088**	.004	.041	-.003	-.048	.023	.018	-.009	.031	.048
4.Sugar-sweetened drinks from home	.094*	.118**	.105*	.183**	.074	.220**	.191**	.026	.040	-.060	.116**	.045	.039	.104*	.149**
5.Bread products from the school canteen	-.039	-.015	.057	.050	.107**	.141**	.105*	.032	.120**	-.051	.143**	-.014	-.010	.067	.023
6.Snacks from the school canteen	.027	.081*	.113**	.172**	.136**	.189**	.109**	-.019	.056	-.114**	.074	-.003	.009	.131**	.077
7.Sugar-sweetened drinks from the school canteen	-.044	.023	.001	.111**	.116**	.125**	.090*	.081*	.118**	-.094*	.100*	.053	.034	.086*	.072
8.Fruit from the grocery store/snackbar	-.064	-.016	-.027	-.025	-.021	-.062	.005	.025	.013	.068	.051	-.017	.045	.014	-.015
9.Bread products from the grocery store/snackbar	-.148**	-.132**	-.001	-.081*	.084*	.009	.044	.015	.077	-.024	.113**	-.080*	-.013	.007	-.042
10.Snacks from the grocery store/snackbar	-.117**	-.154**	.052	.002	.118**	.071	.048	.023	.121**	.013	.162**	-.049	-.020	.055	-.011
11.Sugar-sweetened drinks from the grocery store/snackbar	-.096*	-.075	.008	-.001	.113**	.057	.046	.065	.123**	-.024	.119**	-.068	.010	.025	.001
12.Daily fruit consumption	.114**	.084*	-.001	.006	-.015	-.007	.018	.022	-.025	.019	-.028	.046	.033	.057	.017
13.Daily bread product consumption	.052	.160**	-.010	.063	-.022	-.019	-.015	.124**	-.007	-.007	.049	.032	.250**	-.022	.077
14.Daily snack consumption	.007	.020	.027	.076	.081*	.072	.064	.025	.033	-.029	.020	.036	-.020	.042	.028
15.Daily sugar-sweetened drinks consumption	.014	.032	.041	.148**	.045	.100*	.065	.029	.037	-.071	.118**	.023	.067	.030	.136**

*. Correlation with a significance at the $p < 0.05$ level (2-tailed).

** Correlation with a significance at the $p < 0.01$ level (2-tailed).

Variables that were assessed with the Pearson correlation: Age, BMI, 3, 13, 14, 15, actual peer norms 1, 2, 3, 4, 5, 6, 7, 13, 14 and 15.