



Don't tell me what I should do, but what others do: The influence of descriptive and injunctive peer norms on fruit consumption in adolescents

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Objectives. While healthy eating patterns are of high importance in adolescence, most adolescents portray quite unhealthy eating behaviour. One reason for this may be that social norms among peers tend to be unsupportive of healthy eating. The current study investigates whether communicating health-promoting descriptive and injunctive norms influences adolescents' intended and actual fruit consumption.

Design. The study employed an experimental prospective design.

Methods. A norm message manipulation (descriptive vs. injunctive vs. no-norm control) was administered to high school students, after which fruit intake intention ($N = 96$) was assessed. At follow-up, actual fruit intake over 2 days ($N = 80$) was recorded.

Results. Adolescents receiving the descriptive norm did not report higher fruit intake intentions than the control group, but did consume (borderline, $p = .057$) significantly more fruit in the following 2 days (2.3 portions per day) than the control condition (1.7 portion per day). Adolescents receiving the injunctive norm reported lower fruit intake intentions than the other two groups, but actual fruit consumption (1.5 portions per day) was similar to that of the control group.

Conclusions. Health-promoting injunctive norms not only had no positive effects on fruit intake but actually caused a decrease in fruit intake intentions, indicating that injunctive norms may be vulnerable to reactance. A health-promoting descriptive norm was found to positively affect fruit intake in adolescents. No effect on fruit intake intention was found. Results show that simple single-sentence norm messages hold the potential to substantially influence health behaviour.

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Statement of contribution

What is already known on this subject? Previous research has shown that both descriptive and injunctive norms can influence behaviour. There are indications that for health behaviour specifically, descriptive norms may be more influential than injunctive norms. These previous studies have, however, been cross-sectional in nature.

What does this study add?

- The current study demonstrates that a very short and simple norm manipulation has the potential to substantially influence health behaviour.
- The current study demonstrates that injunctive norm messages have no influence on fruit intake, but a negative influence on fruit intake intentions, pointing to the potential that injunctive norms hold to induce resistance and reactance.
- The current study demonstrates that descriptive norm messages positively influence fruit intake behaviour, while intentions did not change, pointing to the possibility of descriptive norms functioning as heuristics for behaviour.

Adolescents' eating practices often do not meet nutrition guidelines (Bauer, Larson, Nelson, Story, & Neumark-Sztainer, 2009; Larson, Neumark-Sztainer, Hannan, & Story, 2007). Moreover, recent research indicates that adolescents' eating behaviour has deteriorated in recent years, indicating that the problem is steadily growing (Bauer *et al.*, 2009; Larson *et al.*, 2007). Insufficient fruit intake is one important consumption-related problem signalled in adolescents (Larson *et al.*, 2007; Sebastian, Cleveland, & Goldman, 2008; Vereecken, De Henauw, & Maes, 2005), with adolescent consumption typically falling well short of the recommended two portions of fruit per day (United States Department of Agriculture, 2010). This is worrisome given that adequate fruit consumption is considered highly beneficial to various important health issues such as weight management and the prevention of cardiovascular diseases (Alinia, Hels, & Tetens, 2009; Holt *et al.*, 2009).

In apparent contradiction to their unhealthy eating practices, research indicates that adolescents know rather well that healthy eating is important (Brown, McIlveen, & Strugnell, 2000; Stevenson, Doherty, Barnett, Muldoon, & Trew, 2007). Furthermore, adolescents seem to have sufficient knowledge of what constitutes healthy eating. Most adolescents know, for example, that a healthy diet includes the consumption of sufficient portions of fruit (Croll, Neumark-Sztainer, & Story, 2001). In an attempt to solve this apparent contradiction between knowledge and behaviour, it has been suggested that there must be factors other than a general lack of knowledge at play, which hinder adolescents' healthy eating behaviour (Croll *et al.*, 2001; Stok, De Vet, De Ridder, & De Wit, 2012a). One suggestion is that these hindering factors may include social norms that are unsupportive of healthy eating (Croll *et al.*, 2001).

Social norms

Social norms are defined as the rules that a group has for the acceptable behaviours, values and beliefs of its members (Aronson, Wilson, & Akert, 2005). Given that people operate in a social environment rather than as isolated individuals, the social norms that exist within this social environment exert important influence over the behaviour of group members (Cialdini, Kallgren, & Reno, 1991; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). Research has distinguished two main kinds of social norms, descriptive norms and

injunctive norms (Aronson *et al.*, 2005; Cialdini *et al.*, 1991). Descriptive norms describe the behaviour of others and as such indicate what is the normal or typical thing to do in a certain situation; injunctive norms *proscribe* behaviour and as such indicate what others consider appropriate behaviour and how others want an individual to behave in a certain situation.

While research has convincingly demonstrated that both descriptive and injunctive norms can influence behaviour (Deutsch & Gerard, 1955; Reno, Cialdini, & Kallgren, 1993), it is not the case that the two types of norms always influence behaviour in the same direction and to the same extent (Cialdini *et al.*, 1991; Schultz *et al.*, 2007). Regarding health behaviour, a meta-analysis indicated that while both types of norms are associated with health behavioural intentions, associations were stronger for descriptive norms than for injunctive norms (Rivis & Sheeran, 2003). A more recent study about eating behaviour in adolescents also demonstrated that peer descriptive norms were more strongly related to eating behaviour than peer injunctive norms (Lally, Bartle, & Wardle, 2011). Research conducted to date, however, has been cross-sectional in nature, and differences between the effects of descriptive and injunctive norms on eating behaviour have yet to be established experimentally.

Peer eating norms

Various recent studies have shown that in adolescence, peer norms may stimulate unhealthy rather than healthy eating. While good for their physical health, healthy eating may hold negative consequences for adolescents in terms of their social health. In various studies, it was found that healthy eating was perceived by adolescents to be uncool (Neumark-Sztainer, Story, Perry, & Casey, 1999), was characterized as undesirable and susceptible to peer ridicule (Croll *et al.*, 2001) and was qualified as untrendy, nerdy and geeky (Stead, McDermott, MacKintosh, & Adamson, 2011). Together, such studies seem to suggest that healthy eating may hold social risks for adolescents in terms of being laughed at or excluded from the group. As adolescence is a period in life in which the creation and maintenance of a positive social image assumes high importance (Erikson, 1968), most adolescents will try hard to be accepted by others, fit in with peer group expectations and avoid deviating from group norms (Shapiro, Baumeister, & Kessler, 1991; Wooten, 2006). Social norms are therefore likely to constitute an important source of influence on adolescents' behaviour. Support for this idea stems from the finding that the link between norms and health behavioural intentions in a meta-analysis was stronger in young samples than in adults (Rivis & Sheeran, 2003).

Given their inclination to conform to group norms, it is especially unfortunate that adolescents seem to hold incorrect views of their peers' eating norms, perceiving peers' eating behaviour to be even healthier than it already is (Lally *et al.*, 2011; Perkins, Perkins, & Craig, 2010). A recent study demonstrated that adolescents underestimated peers' fruit and vegetable intake (the *descriptive* fruit consumption norm) by more than three portions per week, constituting sixteen per cent of weekly intake (Lally *et al.*, 2011). Perhaps even more telling is that the authors showed that adolescents perceived peers' attitudes towards fruit and vegetable intake (what they call the *injunctive* fruit consumption norm) to be less positive than the actual attitudes held by the peer group: adolescents reported that they thought their average peer would find eating sufficient fruit and vegetables significantly less 'good' and less 'sensible' than was indicated by the actually reported attitudes from the peer group (Lally *et al.*, 2011). In trying to match their peers' behaviour and attitudes in order to avoid being ostracized, adolescents ironically

enough may thus adjust their eating habits to incorrectly perceived unhealthy standards, giving rise to a spiralling problem recognized in the literature as pluralistic ignorance (Katz & Allport, 1931; Prentice & Miller, 1993).

Current study

In the current study, we investigate the effects of providing health-promoting peer fruit consumption norms on adolescents' intended and actual fruit consumption. If incorrectly perceived unhealthy peer fruit consumption can lead to perpetuated unhealthy eating behaviour, then it is worth investigating whether providing healthier fruit consumption norms from within their own peer group can also positively influence adolescents' eating behaviour.

While the effect of social norms in adolescence and especially in adolescent health behaviour has been researched previously (Lally *et al.*, 2011; Ravis & Sheeran, 2003), the body of research on this topic is not extensive and most of the work that has been conducted has been cross-sectional. The current study aims to fill this gap in the literature, and to our knowledge, it constitutes the first study with an experimental and prospective design. We employ an experimental manipulation for investigating the direct influence of both descriptive and injunctive norms on adolescent eating behaviour as compared to each other and compared to a control condition. Because individuals' own motivation to engage in health-protective behaviour has been shown to be an important influence on the actual engagement in that behaviour (Ryan & Deci, 2000), we also take into account the extent to which participants were themselves motivated to consume sufficient portions of fruit. Moreover, as we expect there may be individual differences in the tendency to compare oneself with others, we include a measure of social comparison tendency.

We hypothesize that receiving normative information will increase participants' intended and actual fruit intake compared to a no-norm control condition. Moreover, because various previous studies indicate that descriptive norms have larger effects than injunctive norms on health behaviour (Ravis & Sheeran, 2003) and in adolescents (Lally *et al.*, 2011), we hypothesize that participants in the descriptive norm condition will report higher intended and actual fruit consumption than participants in the injunctive norm condition. A main effect of motivation was hypothesized, such that participants reporting higher motivation scores will also report higher intended and actual fruit consumption.

Methods

Participants

Participants were recruited in six classes of a Dutch high school. From an initial sample of 98 students, two participants were excluded because they had already reached the age of 18; both had twice failed a school year. The final sample thus consisted of 96 adolescents. Participants were between 14 and 17 years of age ($M = 15.5$, $SD = .75$) and had an average BMI of 20.58 ($SD = 2.90$); 61.5% were girls. Not all participants were present when the follow-up measures were administered, leaving a smaller sample for the analyses including follow-up measures ($N = 80$). A dropout analysis indicated that participants who were present at follow-up did not differ from participants who were not present at follow-up in terms of age, BMI, motivation and tendency towards social comparison (all F 's

(1, 91) < 1) nor in terms of gender (χ^2 (1, $N = 96$) = 2.54, $p = .111$) or assigned experimental condition (χ^2 (2, $N = 96$) < 1).

Procedure

High school students were asked to participate in a study on fruit consumption during class hours. Parental approval was sought with using the opt-out procedure, which none of the parents used. The experimenter explained that participants' answers would remain anonymous and that participation was voluntary. Participants read and signed an informed consent form. The data collection procedure complied with Dutch ethical guidelines. As per the guidelines of the Dutch Central Committee on Research Involving Human Subjects, it was not necessary to obtain approval from an ethics committee for this specific study.

The experimenter explained to the participants that they would receive a booklet containing questions and a short informational text. Participants were instructed to read the informational text carefully before proceeding (this informational text contained the experimental manipulation). Three types of booklets (containing either the descriptive norm text or the injunctive norm text or the control condition text) were randomly shuffled prior to distribution and were then distributed to the participants based on seating order. The booklets were completed in class, with participants being seated separately to ensure that they would fill out the booklet without input from their peers. After all participants were finished, they handed in their booklets at the same time to assure anonymity. Participants were asked not to discuss the research with each other. Three days after they had filled out the original questionnaire, participants were asked to complete a short follow-up questionnaire and debriefed.

Experimental manipulation

The experimental manipulation was induced through a short informational text about fruit consumption included within the questionnaire. All participants read the following text: 'Healthy eating can contribute to being healthy. By eating healthily, you can maintain your weight and will not become overweight. In addition, a healthy eating style reduces the risk of developing several serious diseases like diabetes and coronary diseases. An important part of healthy eating is to consume sufficient fruit. In previous studies we conducted at high schools, we asked high school students like yourself how they think about healthy eating'. For control group participants, this was the end of the text. In the descriptive and injunctive norm conditions, one additional sentence was added about the results from these supposed previous studies. Participants in the descriptive norm condition received information that a majority of high school students try to eat sufficient fruit themselves, while participants in the injunctive norm condition received information that a majority of high school students think other high school students should eat sufficient fruit.

Measures

The booklet included four demographic items (age, gender, height in metres and weight in kilograms). Subsequently, participants' autonomous motivation to consume fruit and their tendency towards social comparison were assessed. The next page of the booklet consisted of the experimental manipulation described above. The final part of

the booklet assessed participants' intention to consume sufficient fruit in the coming time.

Autonomous motivation for fruit consumption was assessed with the autonomous subscale of the Treatment Self-Regulation Questionnaire (TSRQ; Williams, Grow, Freedman, Ryan, & Deci, 1996), consisting of six items (e.g., 'The reason I would eat fruits is because I feel that I want to take responsibility for my own health'; 'The reason I would eat fruits is because it is an important choice I really want to make') assessed on a 7-point scale ranging from 1 (*not at all true*) to 7 (*very true*); Cronbach's alpha = .82. A mean motivation score was computed.

Tendency towards social comparison was assessed with the Iowa-Netherlands Comparison Orientation Measure (INCOM; Gibbons & Buunk, 1999), consisting of four items (e.g., 'I often compare how I am doing socially [e.g., social skills, popularity] with other people' and 'I am not the type of person who compares often with others' [reverse-coded]) assessed on a 5-point scale ranging from 1 (*completely disagree*) to 5 (*completely agree*); Cronbach's alpha = .75. A mean social comparison tendency score was computed.

Lastly, participants rated their *intention* to eat sufficient fruit in the coming period of time. This was measured with four items ('I intend/plan/want/expect to eat sufficient fruit in the coming time') on a 5-point Likert scale ranging from 1 (*completely disagree*) to 5 (*completely agree*); Cronbach's alpha = .90. A mean intention score was computed.

In the follow-up assessment 3 days later, *fruit consumption* information was obtained by having participants indicate how much fruit they had consumed during the 2 previous days (i.e., on the 2 days following the day that they had filled in the original questionnaire) for each of the 2 days separately: 'How much fruit did you consume on [weekday, date]?' Responses for both days correlated to a high extent ($r = .76, p < .001$) and one average fruit consumption score was computed.

Results

Analyses presented here were conducted on the full sample of 96 students, *except for* the analyses including the follow-up measure of fruit consumption. These analyses were conducted on the data of the 80 students who were present during the follow-up.

Participants on average were somewhat autonomously motivated to consume fruits ($M = 4.72, SD = 1.19$) and reported a somewhat low tendency towards social comparison ($M = 2.30, SD = .91$). Overall, they reported a moderate intention to consume sufficient fruit ($M = 3.76, SD = .93$) and had eaten an average of 1.8 ($SD = 1.4$) daily pieces of fruit during the 2 days that constituted the follow-up measure. Correlations, means and standard deviations of all variables under study are reported in Table 1. Means, standard deviations and number of participants per condition are reported in Table 2.

Randomization check

A MANOVA including age, gender, BMI, motivation and tendency towards social comparison as dependent variables and condition as independent variable indicated that randomization across the conditions was successful: neither the multivariate effect ($F(10, 172) < 1$) nor any of the univariate effects (all F 's(2, 90) < 1) reached significance.

Table 1. Correlations, means and standard deviations of the variables under study

	1	2	3	4	5	6	7
1. Age							
2. Gender (1 = male, 2 = female)	-.195 ^a						
3. BMI	.073	.114 ^a					
4. Autonomous motivation	.107	.134 ^a	-.047				
5. Social comparison tendency	-.015	-.187 ^a	-.142	.124			
6. Intention	-.040	.292 ^{**a}	.049	.529 ^{**}	.102		
7. Two-day fruit consumption	.273 [*]	.168 ^a	.099	.427 ^{**}	-.028	.420 ^{**}	
Mean	15.54	n.a.	20.53	4.72	2.30	3.75	1.8
Standard deviation	0.83	n.a.	2.89	1.20	0.91	0.92	1.4

Note. * $p < .05$; ** $p < .01$.

^aSpearman's coefficient.

Table 2. Number of participants and means and standard deviations of the variables under study per condition

	Descriptive norm condition (N = 31)	Injunctive norm condition (N = 34)	Control condition (no norm) (N = 31)
1. Age	15.55 ^a (0.85)	15.53 ^a (0.71)	15.39 ^a (0.72)
2. Gender (% males)	36% ^a	41% ^a	39% ^a
3. BMI	21.02 ^a (3.98)	20.20 ^a (1.85)	20.54 ^a (2.57)
4. Autonomous motivation	4.80 ^a (1.25)	4.56 ^a (1.04)	4.62 ^a (1.30)
5. Social comparison tendency	2.40 ^a (0.88)	2.21 ^a (0.90)	2.30 ^a (0.96)
6. Intention	3.94 ^a (0.88)	3.40 ^b (0.81)	3.97 ^a (1.01)
7. Two-day fruit consumption	2.3 ^a (1.6)	1.5 ^b (0.9)	1.7 ^{b†} (1.0)

Note. Values with different subscripts within the same row indicate significant differences.

[†]Marginally significant difference ($p = .057$). Values for row 7 are based on the follow-up sample of $N = 80$.

Intention to consume sufficient fruit

A first ANOVA investigated whether the experimental manipulation influenced participants' intention to consume sufficient fruit in the coming time. Because gender and autonomous motivation were correlated with intention, these variables were controlled for in the analysis. The results indicated that gender significantly influenced intention, $F(1, 90) = 4.72, p = .033, \eta^2 = .050$ with girls ($M = 3.90, SD = .76$) reporting higher levels of intention than boys ($M = 3.55, SD = .76$). Autonomous motivation also was significantly positively associated with intention, $F(1, 90) = 31.31, p < .001, \eta^2 = .258$. Even when controlling for these two variables, the norm that participants received exerted significant influence over their fruit intake intentions, $F(2, 90) = 3.88, p = .024, \eta^2 = .079$. Post-hoc comparisons (see also Figure 1)¹ indicated that this difference was due to participants in the injunctive norm condition ($M = 3.43, SD = .76$) reporting significantly lower levels of intention than participants in both the descriptive norm condition ($M = 3.87, SD = .77, p = .021, d = .58$) and the control condition ($M = 3.88, SD = .76, p = .017, d = .59$). Participants in the descriptive norm condition and

¹ These numbers are based on an ANCOVA, corrected for covariates, and therefore differ slightly from the descriptives in Table 2.

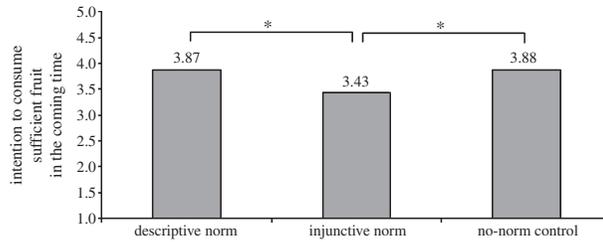


Figure 1. Participants' intention to consume sufficient fruit in the descriptive norm, injunctive norm and control condition.

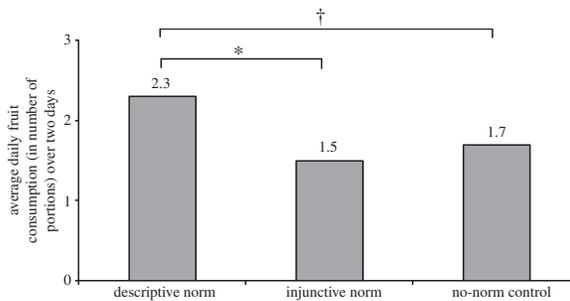


Figure 2. Participants' daily fruit consumption (in number of portions) in the descriptive norm, injunctive norm and control condition.

participants in the control condition did not differ significantly from each other on intention ($p = .938$).

Fruit consumption at follow-up

A second ANOVA then investigated whether the experimental manipulation also influenced actual fruit consumption as measured at follow-up. Because age and autonomous motivation were correlated with intention, these variables were controlled for in the analysis. The results indicated that age positively influenced fruit consumption, $F(1, 75) = 6.84$, $p = .011$, $p\eta^2 = .084$. Autonomous motivation also was significantly positively associated with intention, $F(1, 75) = 17.40$, $p < .001$, $p\eta^2 = .188$. Even when controlling for these two variables, the norm that participants received exerted significant influence over fruit consumption, $F(2, 75) = 3.21$, $p = .046$, $p\eta^2 = .079$. Post-hoc comparisons (see also Figure 2) indicated that this difference stemmed from a larger fruit consumption in participants who received the descriptive norm ($M = 2.3$ daily pieces of fruit, $SD = 1.6$) than in participants who received either the injunctive norm ($M = 1.5$, $SD = .9$, $p = .020$, $d = .65$) or in control condition participants ($M = 1.7$, $SD = 1.0$, $p = .057$, $d = .47$), albeit that the latter difference was only marginally significant. There was no difference in fruit intake between participants in the injunctive norm condition and participants in the control condition ($p = .681$).

Discussion

The results from this study indicate that descriptive and injunctive norms exert influence over either adolescents' intention to consume sufficient fruit or their actual fruit

consumption. More specifically, and confirming our hypothesis, it was found that a message containing an injunctive norm to consume sufficient portions of fruit did not positively influence fruit consumption. What is more, we in fact found a short-term negative effect of the injunctive norm message as shown by a decrease in adolescents' intention to consume sufficient fruits. A descriptive norm message, on the contrary, positively influenced adolescents' actual fruit consumption, as we hypothesized. We did not find an effect of the descriptive norm message on fruit intake intentions. As expected, motivation positively influenced both fruit intake intentions and actual consumption. In our opinion, these findings point to two main issues warranting further discussion. The first issue is the negative influence of the injunctive norm message on fruit intake intentions. The second issue is the lack of influence of the descriptive norm message on intentions, while there was an effect on actual behaviour. We will address each of these below, beginning with the former.

Reactance

An injunctive norm may lead people to feel like they are being pushed in a certain direction by the source delivering the norm, especially when that norm is not in line with their personal goals (Jacobson, Mortensen, & Cialdini, 2011; Melnyk, Van Herpen, Fischer, & Van Trijp, 2011). This may be perceived as an attempt to limit one's freedom of thinking and acting (Silvia, 2006) and therefore evoke resistance to the proposed behaviour. Resistance, in turn, may lead people to focus mostly on counterarguments, to suppress thoughts in favour of the proposed behaviour and to think negatively about the credibility of the norm message source (Silvia, 2006; Tormala & Petty, 2004). When this happens, there is the potential for the injunctive norm to backfire (Melnyk *et al.*, 2011) and lead to psychological reactance (Brehm, 1966).

In the current study, this was likely also the case. As previous studies indicate that healthy eating typically is not very high on adolescents' list of personal goals (Croll *et al.*, 2001; Stead *et al.*, 2011), an injunctive norm to eat more fruit may thus be received as inconsistent with personal standards and therefore induce resistance and reactance, reflected in lower self-reported fruit intake intentions as compared to the other conditions. In the current study, this effect seems to have faded away rather quickly as it did not carry over to actual consumption, which was similar to that of participants in the control condition. It is important to note, however, that the norm message in the current study consisted of just one single sentence contained within a short informational text. If injunctive norm messages are communicated more frequently or more extensively, their (potentially negative, reactance-inducing) effects on behaviour may also become larger and more persistent. This is something that should be addressed in future research.

Descriptive norms as heuristics

In the current study, descriptive norms were found to influence actual behaviour, but not behavioural intentions. We believe that this may be due to the nature of descriptive norms and the way that descriptive norms exert their influence. Descriptive norms motivate by indicating what would be effective and adaptive behaviour in a certain situation. As such, a descriptive norm can function as a *heuristic* (Shah & Oppenheimer, 2008) or decisional shortcut for behaviour, which should offer an information-processing advantage (Cialdini, 2008). It is not necessary for an individual to exert much effort to reach a behavioural decision: the descriptive norm provides a quick and efficient behavioural guideline.

Various studies have demonstrated that conscious and effortful processing and elaboration of descriptive norm information indeed is not necessary for the norm to influence behaviour (e.g., through demonstrating that descriptive norm information still influences behaviour under conditions of low self-regulatory resources; Jacobson *et al.*, 2011; Salmon, Fennis, De Ridder, Adriaanse, & De Vet, 2012).

Our results are consistent with the idea of descriptive norms working as a heuristic, helping people to reach behavioural decisions without conscious effort or awareness: we found no influence of the descriptive norm on intention, a cognitive measure which asked participants to report on a process that thus very well may have taken place outside awareness, and we did find an effect of the descriptive norm heuristic on actual fruit consumption. The increase in fruit consumption at follow-up indicates how powerful descriptive norms can be: a one-time, single-sentence norm message was strong enough to positively influence fruit consumptions for up to 48 hr and potentially longer.

Limitations and suggestions for future research

Fruit consumption at follow-up was self-reported and had to be recalled over 48 hr. Previous research (McPherson, Hoelscher, Alexander, Scanlon, & Serdula, 2000) has indicated that self-reported food intake is not always accurate, especially when some time has already passed, which means that the conclusions we can draw from this finding may be somewhat limited. However, this research is already a step up from previous other studies where no attempt was made to measure actual consumption following an experimental norm manipulation at all. In future research, alternative methods for assessing food intake (e.g., a food diary) could be employed.

In the current study, the descriptive and injunctive norm messages were formulated such that they came from within the participants' own group (it was their peers' behaviour or opinion that was described in the norm). It remains to be determined what the effects would be, if the norm messages come from other sources. With regard to the descriptive norm message, previous research has demonstrated that descriptive norms are most influential when the referent group is one with which participants can identify (Stok, De Vet, De Ridder, & De Wit, 2012b; Turner, 1991), and such a norm would therefore likely have less influence on behaviour if it describes the behaviour of a more distant group. With regard to the injunctive norm message, however, it may be the case that adolescents would respond differently to an injunctive norm when this norm comes from a source of authority (e.g., parents or health experts). This issue should be further explored in future research.

There was a 2-day interval between the first and the second measurement. While participants were asked not to discuss the research with each other, we can of course not be sure that everybody complied with this request and there is thus a potential of contamination between conditions. Given that the difference between conditions consisted of only one varying sentence within a six-page booklet, however, we believe that the likelihood of such contamination is rather low. During the debriefing, we received no indication that participants had realized that there were different versions of the booklet or that the information they had received varied across students.

Implications and conclusion

The current study investigated the influence of descriptive norms and injunctive norms on adolescents' fruit intake intentions and actual fruit consumption. Descriptive

norms were found to positively influence consumption, but not intention, pointing to the possibility that descriptive norms function as a heuristic: descriptive norms need not be processed and cognitively elaborated upon in order for them to influence behaviour. Injunctive norms, on the other hand, seem to be less influential for behaviour. In the current study, a negative effect on fruit intake intentions was even found, which may point to the possibility of injunctive norms causing feelings of resistance and reactance.

The current study was among the first to directly and experimentally compare the influence of descriptive and injunctive norms on both intended and actual health behaviour in adolescents. Our results point to the potentially large effects of a very small and quick manipulation: a simple one-line descriptive norm message was found to be capable of positively influencing fruit intake behaviour for up to 2 days, indicating the potential of health-promoting descriptive norms to improve adolescents' eating behaviour. As has been suggested previously (Lally *et al.*, 2011; Perkins *et al.*, 2010), improving adolescents' perceptions of their peers' eating habits by communicating health-promoting descriptive norms from within their peer group thus holds great promise for health interventions in this age group. Moreover, the current results also indicate that injunctive norms may be less useful in this regard and should even be communicated with great care, given that, in this study, a similarly simple one-line injunctive norm message may activate resistance processes and could as such create behavioural boomerang effects.

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