Persuasion through facts and feelings: integrating affect and cognition into behavioral decision models and health messages
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Chapter three

The interplay between affect and theory of planned behavior variables

Abstract

Objectives: To assess whether affective evaluations of health behaviors moderate or mediate the influence of theory of planned behavior (TPB) variables on intention. Methods: For each of 20 health behaviors, respondents (N = 300) completed questionnaire measures of affective evaluation, attitude, subjective norm, perceived behavioral control, and intention. Results: Analyses using path modeling revealed that affective evaluation of the behaviors did not moderate the influence of the TPB variables on intention, but it partially mediated the influence of attitude and perceived behavioral control on intention. Conclusions: These results emphasize the importance of affective evaluation as a target for health communication.

In health communication, the theory of planned behavior (TPB) is widely used both to explain and change behavior (Ajzen, 1991). The TPB assumes that decision making is based on a consideration of the costs and benefits of behavioral choices. In the past decades, theorists have challenged this rational account of decision making, proposing that affective evaluations of behaviors may influence behavior independently of social cognitive constructs, such as those specified in the TPB (Van der Pligt & De Vries, 1998; Zajonc, 1980). In fact, many studies support this claim (Kiviniemi, Voss-Humke, & Seifert, 2007; Lawton, Conner, & McEachan, 2009; Sandberg & Conner, 2008). Although it is now well established that affective evaluation impacts behavioral decision making, it is not clear how it is associated with the determinants specified in the TPB. The present study responds to this gap in the literature by exploring 2 possible relationships between affective evaluation and TPB variables. Specifically, we test whether affective
evaluation moderates or mediates the influence of TPB variables on behavioral intention, and we do so for a wide range of health behaviors.

**Affect and decision making**

An extensive body of research demonstrates that affect has a large impact on decision making (Clore, Schwarz, & Conway, 1994; Schwarz, 2002). In many studies on affect and decision making, happy or sad moods are induced in participants prior to the decision task, for example by having them read happy or sad stories. These studies investigate how decision making is influenced by preexisting feelings states. In contrast, relatively few studies are available about how one’s affective evaluation of a behavior influences the decision-making process.

In the present article, we use the term *affective evaluation* to refer to an individual’s judgment about the overall pleasantness or unpleasantness of performing a behavior. Affective evaluation is an important determinant of health behavior, as is illustrated by Rhodes, Fiala, and Conner (2009) in a recent meta-analysis on affective evaluation and physical activity. The authors found significant positive correlations between affective evaluation and physical activity, with a summary correlation of .42. As the authors point out, this effect size is larger than those found for self-efficacy, social, and personality variables in prior meta-analyses (Hagger, Chatzisarantis, & Biddle, 2002; Rhodes & Smith, 2006; Spence et al., 2006). Considerable influence of affective evaluation on behavior has also been found for a variety of other health behaviors (Lawton et al., 2009).

Considering that it is now well established that affective evaluation influences behavior, strikingly little is known about how it interacts with other behavioral determinants, such as those specified in the TPB. Such insight is needed in order to accurately integrate affective influences into models of behavioral decision making, an endeavor many have called for (Keer, Van den Putte, & Neijens, 2010; Kiviniemi et al.,
Such integration will surely improve the explanatory power of behavioral decision models and consequently improve the efficacy of persuasive communication efforts based on those models.

Some theorists consider affective evaluation as a component of attitude. For example, in the TPB, the term attitude is used to refer to “the evaluation of an object, concept, or behavior along a dimension of favor or disfavor, good or bad, like or dislike” (Fishbein & Ajzen, 2010, p. 78). In this approach, attitude is inclusive of overall evaluations (e.g., positive versus negative) and of evaluations along more cognitive (e.g., wise versus foolish) and affective (e.g., pleasant versus unpleasant) dimensions. However, there is debate about whether it is accurate to include affective evaluation in the attitude concept. Research suggests that affective evaluation is empirically distinguishable from attitude (Crites, Fabrigar, & Petty, 1994; Trafimow & Sheeran, 1998; Van den Berg, Manstead, Van der Pligt, & Wigboldus, 2005), and studies employing affective evaluation as a separate construct in the TPB show that it impacts behavior and intention over and above standard TPB variables, including attitude (Eves, Hoppé, & McLaren, 2003; Kiviniemi et al., 2007; Sandberg & Conner, 2008). To further examine the role of affective evaluation in the decision-making process, we will explore a revised version of the TPB in which we employ it as a separate construct.

Separating affective evaluation from attitude, of course, raises the question of where affective evaluation should be placed in the TPB. Many studies assessing the value of affect in the TPB are now available. These studies have almost exclusively examined the direct relationship between affect and intention or behavior, thus placing affect parallel to attitude, subjective norm (SN), and perceived behavioral control (PBC) (Eves et al., 2003; French et al., 2005; McEachan, Sutton, & Myers, 2010). It is remarkable that despite the large body of research in this
field, other structural positions of affective evaluation within the TPB have rarely been explored.

One exception is a study on physical activity by Kiviniemi and his colleagues (Kiviniemi et al., 2007). These authors examined 2 ways in which affective association (a construct almost identical to affective evaluation) may interface with standard TPB variables. Based on perspectives that posit that affective inputs alter information processing, the authors argued that affective associations should moderate the influence of social cognitive variables on behavior (Ashby, Isen, & Turken, 1999; Schwarz, 2002). Alternatively, another set of theories holds that affective cues can serve as “shorthand” for expected outcomes, suggesting that the influence of TPB variables on behavior should be mediated by affective associations (Damasio, 1994; Wagar & Thagard, 2004). Kiviniemi and his colleagues tested these 2 possibilities and found that affective association acted as a mediator, but not as a moderator. It fully mediated the influence of attitude and SN on physical activity and partially mediated the influence of PBC.

This finding implies that affective association is a summary construct that encompasses influences from attitude, SN, and PBC. The results further suggest that affective association may serve as a mental shortcut in the decision-making process. That is, individuals may base their decisions about whether or not to perform a health behavior on their affective association with the behavior. This may be a very efficient way of decision making, as the monitoring of feelings provides judgmental responses that are potentially faster than weighing all the pros and cons associated with a behavior (Fiske & Pavelchak, 1986; Pham, Cohen, Pracejus, & Hughes, 2001; Slovic, Peters, Finucane, & MacGregor, 2005). In line with this view, Schwarz’s affect-as-information framework posits feelings can directly inform judgments as judges use their affective state as a shortcut to infer their evaluative
reactions to a target (Clore et al., 1994; Schwarz, 1990). Most research in this area has focused on the influence of mood on judgments (Schwarz, 2002). Moods are diffuse feelings states that may result from a series of events and typically do not have an easily identifiable cause (Frijda, 1993; Schwarz, 1990). Whether affective evaluation influences decision making in a similar manner is yet to be explored.

The interplay between affective evaluation and TPB variables has great practical relevance. If both influence decision making independently of each other, health communicators may direct their efforts at changing the determinant that has the strongest influence on decision making. However, if affective evaluation moderates the influence of TPB variables, health messages should target both, as a certain level of affective evaluation is required for TPB variables to influence decision making. In contrast, if affective evaluation mediates the influence of TPB variables, health communicators may use it as a shortcut to behavior change and target affective evaluation exclusively.

The present study

We explored how affective evaluation interacts with attitude, SN, and PBC for a wide range of health behaviors. One previous study, conducted by Kiviniemi and his colleagues, explored whether the influence of TPB variables on behavior is moderated or mediated by affective influences (Kiviniemi et al., 2007). That study found that affective associations mediated but not moderated the influence of TPB variables on behavior. However, as the study looked only at physical activity, it is unclear whether the findings are generalizable across a wide range of health behaviors. We extend the study by Kiviniemi et al. (2007) in 3 important ways. First, whereas Kiviniemi et al. analyzed the influence of attitude, SN, and PBC in separate analyses, we report results based on a full model including all 3 TPB variables. This is important as the TPB allows for these variables to covary and to
influence the decision-making process simultaneously. Second, Kiviniemi et al. (2007) studied the influence of TPB variables on past behavior. As attitude, SN, and PBC are positioned as direct determinants of intention in the TPB, we use intention as dependent variable in the present analyses. Third, we perform analyses for a wide range of health behaviors. Doing so enables us to assess whether the interplay between affective evaluation and TPB variables varies across health behaviors or whether it is consistent.

For each of 20 health behaviors, we test whether affective evaluation moderates or mediates the influence of attitude, SN, and PBC on intention (Figure 1). As both moderation and mediation seem theoretically plausible, we choose not to formulate specific hypotheses. Instead, we pose the following research questions:

RQ1: Is the influence of attitude, SN, and PBC on intention moderated by affective evaluation?

RQ2: Is the influence of attitude, SN, and PBC on intention mediated by affective evaluation?

Method

Participants and procedure

Participants were 300 students at a Dutch university (70% women, 30% men). All participants visited a computer laboratory to complete a computer-assisted questionnaire assessing affective evaluation, attitude, subjective norm, perceived behavioral control, and intention with regard to 20 health behaviors (see Table 1 for a short description of these behaviors). The behaviors were selected from various recommendations communicated to the public by Dutch health organizations. From the recommended behaviors, those with the highest
expected variance in and relevance to a student population were selected. The questionnaire consisted of several pages, each covering one of the behaviors. The order of these pages, and thus of the behaviors, was randomized for each respondent. Each behavior was described at the top of its page in terms of an action, a frequency, and a time span. For example, “The following questions all concern the behavior ‘Brushing your teeth at least twice a day during the coming month’.” Each of the subsequent questions then referred to the behavior in question as “the behavior specified above.” Participants received a small financial compensation (€8) for completing this questionnaire. This study is part of a larger project on health behaviors. Ethical approval for this project was granted by the Ethics Committee of the Amsterdam School of Communication Research. Here, only variables relevant to the current research questions will be mentioned.

Measures

**Attitude and affective evaluation.** Participants responded to the stem “For me to perform the behavior specified above would be...” followed by 3 seven-point semantic differential scales for both attitude
and affective evaluation. The order of the items was randomized. The word pairs used to represent attitude were negative/positive, bad/good, and undesirable/desirable. Those for affective evaluation were unpleasant/pleasant, not enjoyable/enjoyable, and nasty/nice. The items for attitude and affective evaluation have been employed successfully in previous research (Crites et al., 1994; Trafimow & Sheeran, 1998). We subjected the 6 attitude and affective evaluation items to principal components analyses with forced 2-factor solutions. The outcome of these analyses reflected the attitude-affective evaluation distinction for each of the behaviors perfectly. Both the attitude and affective evaluation scales also had high internal reliability (mean α values were .84 and .90 respectively). As this was the case, a single scale was computed for each measure.

**Subjective norm, perceived behavioral control, and intention.**
Each of these constructs was measured using 2 seven-point bipolar items that were combined into a single scale for each measure. The subjective norm items were “Most people who are important to me want me to perform the behavior specified above (unlikely/likely),” and “If I would perform the behavior specified above, most people who are important to me would… (disapprove/approve)” (mean r = .52). In line with Ajzen (2002), the measurement of perceived behavioral control included both a controllability and a self-efficacy item: “How much control do you have over performing the behavior specified above? (no control/complete control),” and “For me to perform the behavior specified above would be… (very difficult/very easy).” (mean r = .57). Finally, intention was measured with the items “I intend to perform the behavior specified above (definitely do not/definitely do),” and “I will try to perform the behavior specified above (definitely will not/definitely will)” (mean r = .92).
Analyses

The analyses were separately conducted for each behavior. First, the affective evaluation, attitude, SN, and PBC measures were checked for multicollinearity. None of the VIF scores exceeded 5, indicating no multicollinearity existed between the measures. Second, moderation and mediation were tested simultaneously in a regression model using AMOS 19.0 (see Figure 1). In this model, intention was regressed on affective evaluation, attitude, SN, and PBC (each mean centered). To test whether the influence of the TPB variables on intention was moderated by affective evaluation, we included 3 interaction terms in the model: attitude*afffective evaluation, SN*afffective evaluation, and PBC*afffective evaluation. To test whether the influence of the TPB variables on intention was mediated by affective evaluation, we included causal paths from attitude, SN, and PBC to affective evaluation. The analyses were conducted using the bootstrapping approach described by Shrout and Bolger (2002). The model was tested for each of the 20 behaviors. To reduce the risk of type I error, Bonferroni correction was applied, yielding an α-level of .05 / 20 = .0025.

Results

Table 1 reveals the results of the analyses for all 20 behaviors. All figures shown here are unstandardized regression coefficients. The first 3 columns depict the coefficients of the interaction terms of attitude, SN, and PBC with affective evaluation. These indicate to what extent affective evaluation moderated the influence of the TPB variables on intention. The following 9 columns specify the degree affective evaluation mediated the influence of the TPB variables on intention. These columns show the total effects of attitude, SN, and PBC on intention, and which part of these total effects was direct, and which part was
indirect (i.e., mediated by affective evaluation). The last column of Table 1 indicates the total effect of affective evaluation on intention.

**Moderation**

Our first research question asked whether affective evaluation moderates the influence of TPB variables on intention. All except one of the coefficients of the interaction terms were not significant, indicating that affective evaluation does not moderate the influence of attitude, SN, and PBC on intention. This is further illustrated by the mean coefficients across the 20 behaviors. These were very small: -.03, -.05, and .02 for the attitude, SN, and PBC interaction terms, respectively.

**Mediation**

The relative influence of the TPB variables on intention varied somewhat across the behaviors. However, overall, attitude was the strongest determinant of intention (mean $b = .51$), followed by PBC (mean $b = .50$), affective evaluation (mean $b = .27$), and SN (mean $b = .21$). Table 1 shows which part of the total effects of attitude, SN and PBC on intention was direct and which part was mediated by affective evaluation.

Averaged across the behaviors, the total effect of attitude on intention (mean $b = .51$) comprised a large direct effect (mean $b = .33$) and a smaller indirect effect (mean $b = .19$). Although the indirect effects were smaller, they were substantial and statistically significant for 11 behaviors. Thus, for many behaviors, the influence of attitude on intention was at least partially mediated by affective evaluation.

The total effect of SN on intention (mean $b = .21$) was made up of a large direct effect (mean $b = .19$) and a very small indirect effect (mean $b = .02$). None of the indirect effects reached statistical significance. Therefore, these results provide no support for the idea that affective evaluation mediates the influence of SN on intention.
Table 1. Tests of moderation and mediation by affective evaluation: Total, direct, indirect, and moderated effects of TPB variables on intention.

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Effect of Aff on I</th>
<th>Moderation</th>
<th>Modera tion</th>
<th>Mediation</th>
<th>Mediation</th>
<th>Moderation</th>
<th>Mediation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do sports</td>
<td></td>
<td>.01</td>
<td>-.06</td>
<td>.07</td>
<td>.66*</td>
<td>.23</td>
<td>.43*</td>
</tr>
<tr>
<td>Engage in moderate exercise</td>
<td>-.16</td>
<td>.04</td>
<td>.05</td>
<td></td>
<td>.50*</td>
<td>.14</td>
<td>.36*</td>
</tr>
<tr>
<td>Take stairs</td>
<td>-.02</td>
<td>-.06</td>
<td>.05</td>
<td></td>
<td>.52*</td>
<td>.30*</td>
<td>.22*</td>
</tr>
<tr>
<td>Dental check-ups</td>
<td>.11</td>
<td>-.10</td>
<td>.03</td>
<td></td>
<td>.71*</td>
<td>.71*</td>
<td>.00</td>
</tr>
<tr>
<td>Brush teeth twice</td>
<td>-.20</td>
<td>-.06</td>
<td>-.03</td>
<td></td>
<td>.28</td>
<td>.21</td>
<td>.07</td>
</tr>
<tr>
<td>Brush teeth 2 min</td>
<td>-.16</td>
<td>-.07</td>
<td>-.01</td>
<td></td>
<td>.37*</td>
<td>.28</td>
<td>.09*</td>
</tr>
<tr>
<td>Use toothpicks</td>
<td>.10</td>
<td>-.08</td>
<td>.01</td>
<td></td>
<td>.59*</td>
<td>.49*</td>
<td>.09</td>
</tr>
<tr>
<td>Eat 2 pieces of fruit</td>
<td>.05</td>
<td>-.16</td>
<td>.02</td>
<td></td>
<td>.47*</td>
<td>.18</td>
<td>.30*</td>
</tr>
<tr>
<td>Eat 200g vegetables</td>
<td>-.06</td>
<td>-.07</td>
<td>-.02</td>
<td></td>
<td>.54*</td>
<td>.32</td>
<td>.22*</td>
</tr>
<tr>
<td>Eat breakfast</td>
<td>-.05</td>
<td>-.10</td>
<td>-.03</td>
<td></td>
<td>.47*</td>
<td>.34</td>
<td>.13</td>
</tr>
<tr>
<td>Decline cake</td>
<td>.02</td>
<td>.03</td>
<td>.05</td>
<td></td>
<td>.60*</td>
<td>.52*</td>
<td>.08</td>
</tr>
<tr>
<td>Drink 1.5 l of non-alcoholic drinks</td>
<td>.02</td>
<td>-.13</td>
<td>-.03</td>
<td></td>
<td>.54*</td>
<td>.42*</td>
<td>.12*</td>
</tr>
</tbody>
</table>

Table continues on next page
<table>
<thead>
<tr>
<th>Behavior</th>
<th>Moderation</th>
<th>Mediation</th>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Att*</td>
<td>SN*</td>
<td>PBC*</td>
<td>Att</td>
<td>SN</td>
<td>PBC</td>
<td>Att</td>
<td>SN</td>
<td>PBC</td>
<td>Att</td>
<td>SN</td>
</tr>
<tr>
<td>Do not engage in binge drinking</td>
<td>-.07</td>
<td>-.01</td>
<td>.12*</td>
<td>.56*</td>
<td>.28</td>
<td>.28*</td>
<td>.16</td>
<td>.09</td>
<td>.07</td>
<td>.55*</td>
<td>.33*</td>
</tr>
<tr>
<td>Do not use drugs</td>
<td>-.01</td>
<td>-.06</td>
<td>.04</td>
<td>.30</td>
<td>.10</td>
<td>.20</td>
<td>.23*</td>
<td>.19*</td>
<td>.04</td>
<td>.66*</td>
<td>.54*</td>
</tr>
<tr>
<td>Air out house</td>
<td>-.01</td>
<td>-.13</td>
<td>.05</td>
<td>.59*</td>
<td>.36*</td>
<td>.23*</td>
<td>.19</td>
<td>.17</td>
<td>.02</td>
<td>.53*</td>
<td>.49*</td>
</tr>
<tr>
<td>Wear seat belt</td>
<td>-.09</td>
<td>-.07</td>
<td>-.06</td>
<td>.18</td>
<td>.05</td>
<td>.13*</td>
<td>.21</td>
<td>.22</td>
<td>-.01</td>
<td>.62*</td>
<td>.58*</td>
</tr>
<tr>
<td>Limit alcohol intake</td>
<td>-.08</td>
<td>.08</td>
<td>.05</td>
<td>.41*</td>
<td>.24</td>
<td>.17</td>
<td>.29*</td>
<td>.26*</td>
<td>.04</td>
<td>.56*</td>
<td>.44*</td>
</tr>
<tr>
<td>Use condom</td>
<td>.07</td>
<td>.02</td>
<td>.02</td>
<td>.88*</td>
<td>.87*</td>
<td>.01</td>
<td>.33*</td>
<td>.33*</td>
<td>.00</td>
<td>.17</td>
<td>.16</td>
</tr>
<tr>
<td>Get enough sleep</td>
<td>.02</td>
<td>-.03</td>
<td>.00</td>
<td>.52*</td>
<td>.27</td>
<td>.25</td>
<td>.24*</td>
<td>.22</td>
<td>.03</td>
<td>.25*</td>
<td>.23*</td>
</tr>
<tr>
<td>Take computer break</td>
<td>-.12</td>
<td>-.01</td>
<td>.07</td>
<td>.58*</td>
<td>.21</td>
<td>.38*</td>
<td>.24*</td>
<td>.22*</td>
<td>.02</td>
<td>.40*</td>
<td>.32*</td>
</tr>
<tr>
<td>Mean</td>
<td>-.03</td>
<td>-.05</td>
<td>.02</td>
<td>.51</td>
<td>.33</td>
<td>.19</td>
<td>.21</td>
<td>.19</td>
<td>.02</td>
<td>.50</td>
<td>.41</td>
</tr>
</tbody>
</table>

Note. Aff = affective evaluation; SN = subjective norm; PBC = perceived behavioral control; I = intention; *p < .0025.
Finally, the total effect of PBC on intention (mean $b = .51$) was mostly direct (mean $b = .41$). Nevertheless, the indirect effects (mean $b = .09$) were quite large for some behaviors and statistically significant for 10 behaviors, indicating that, for many behaviors, affective evaluation partially mediates the influence of PBC on intention.

Thus, overall, the impact of SN on intention was not mediated by affective evaluation, but the impact of attitude and PBC on intention was at least partially mediated by affective evaluation for about half the behaviors.

**Discussion**

Previous research has demonstrated that one's affective evaluation of a health behavior is an important determinant of actual performance of that behavior (Kiviniemi et al., 2007; Lawton et al., 2009; Rhodes et al., 2009). However, little is known about how affective evaluation may interact with other behavioral determinants. The present study responded to this gap in the literature by exploring the interplay between affective evaluation and the behavioral determinants specified in the TPB. Specifically, we analyzed whether the influence of TPB variables on intention was moderated or mediated by affective evaluation.

Our first research question asked whether affective evaluation moderates the influence of attitude, SN, or PBC on intention. The results revealed that this was not the case. This is in line with Kiviniemi et al. (2007), who reported that affect does not moderate the influence of TPB variables on physical activity. The present study shows that this finding applies to a wide range of health behaviors or, to be more precise, to the intentions to perform those behaviors.

Our second research question asked whether affective evaluation mediates the influence of attitude, SN, and PBC on intention. Our findings indicated that affective evaluation did not mediate the in-
fluence of SN on intention, but it partially mediated the influences of 
attitude and PBC on intention for about half of the behaviors studied. 
These findings are partly in contrast with Kiviniemi et al. (2007), who 
found that affect fully mediated the influence of attitude and SN and 
partially mediated the influence of PBC on physical activity. Two dif-
fferences between that study and the present one can account for these 
discrepant findings. First, Kiviniemi et al. (2007) used past behavior as 
dependent variable whereas we looked at intention. There is evidence 
suggesting that intention simply is a more rational construct than 
behavior. For example, Lawton et al. (2009) found that cognitive 
considerations play a larger role in forming intentions than in actually 
performing behavior whereas affective considerations influence in-
tention and behavior equally. If intention relies more on rational 
considerations, this would explain why attitude, SN, and PBC have a 
large direct (i.e., not mediated by affect) influence on it. Another 
explanation for the discrepancy between the size of the mediated effects 
between our study and the one by Kiviniemi et al. (2007) is that we 
analyzed all 3 TPB variables simultaneously. As the variance explained 
by attitude, SN, and PBC may overlap, larger effects are found when 
they are analyzed separately. This is especially true for SN. The mean 
total, direct and mediated effects for SN when analyzed separately from 
attitude and PBC are .40, .26, and .15 respectively, compared to .21, .19, 
and .02 when analyzed in a full model. The large differences between 
these figures – most notably in the indirect effect, which is almost 
reduced to zero in the full model – clearly illustrate the necessity of 
analyzing a full model.

The finding that affective evaluation mediated the influence of 
attitude and PBC on intention for many behaviors supports the idea 
that affective evaluation may serve as a mental shortcut in the decision-
making process. Cognitions, such as those reflected in TPB variables,
may help create feelings towards behaviors, which in turn may serve as
the basis for behavioral intentions. As pointed out earlier, compared to
reason-based assessments of a target, the monitoring of feelings pro-
vides judgmental responses that are potentially faster and more
efficient then weighing all the pros and cons associated with the
behavior (Fiske & Pavelchak, 1986; Pham et al., 2001; Slovic et al.,
2005). However, it should be noted that only a small part of the in-
fluence of the TPB variables on intentions was mediated by affective
evaluations. Thus, although affective evaluation may function as a
mental shortcut, intentions are still mostly based on rational thought.
Therefore, health campaigns may benefit from addressing affective
evaluations of health behaviors, but they should not target this
determinant exclusively.

Previous studies testing whether affect mediates the influence of
social cognitive variables on behavior have looked only at physical
activity and fruit and vegetable consumption (Kiviniemi et al., 2007;
Kiviniemi & Duangdao, 2009). In line with these studies, we found that
affective evaluation mediated a relatively large part of the influence of
attitude and PBC for similar behaviors in our study (do sports, moderate
exercise, take stairs, eat 2 pieces of fruit, and eat 200 grams of vege-
tables). However, inspection of Table 1 reveals that affective evaluation
does not act as a mediator for all health behaviors. For example, all 4
dental behaviors (have dental checkups, brush teeth twice a day, take 2
minutes to brush teeth, and use toothpicks) showed relatively strong
direct paths, indicating that the impact of TPB variables on intention is
largely direct. This suggests that health campaigns promoting exercise
or fruit and vegetable consumption may benefit more from addressing
affective evaluation than would campaigns promoting healthy dental
behaviors.
Several limitations of the present study need to be considered. The cross-sectional design limits inferences about causal relationships between the study variables. Although our results suggest mediational effects, future studies employing a longitudinal or experimental design are required to substantiate this claim. It should also be noted that by assessing affective evaluation separately from attitude, we have deviated from the original definition of attitude in the TPB, which encompasses overall evaluations as well as cognitive and affective evaluations (Fishbein & Ajzen, 2010). There are 2 reasons that we think it is justified to assess affective evaluation separately from attitude. First, previous studies have shown that affective evaluation influences intention and behavior over and above the TPB variables including attitude, demonstrating its large and independent influence (Eves et al., 2003; Kiviniemi et al., 2007; Sandberg & Conner, 2008). Second, health campaign developers are often faced with the choice between presenting either informational or emotional content in their health messages. Therefore, assessing the influence of affective evaluation separately from attitude has great practical relevance. Nevertheless, as we have deviated from the original model and definition of attitude, inferences about the relative influences of the original TPB variables should be made with caution.

The present study suggests that affective evaluation acts as a mental shortcut for some behaviors, but not for others. An interesting avenue for future research is to investigate which factors facilitate the use of this mental shortcut. For example, by including measures of behavioral characteristics (such as addictiveness, short-term and long-term consequences, etc), future studies may be able to predict which types of behavior are particularly influenced through this route of decision making. Such information will help health campaign
developers decide whether or not to target affective evaluation in their campaigns.

Our results provide additional evidence for the importance of affective evaluation in the formation of health behavioral intentions. Whereas other researchers have investigated whether there is a direct pathway from affect to intention or behavior, we have studied how it may relate to other behavioral determinants. Specifically, we have shown that affective evaluation does not moderate the influence of TPB variables on intention, but it does partially mediate the influence of attitude and PBC for many behaviors. As affective evaluation is a proximal determinant of behavioral intention, health campaign developers may usefully target it in their persuasive messages. Our findings are also important for researchers aiming to integrate affective evaluation in the TPB or other social cognitive models, suggesting that it should be positioned as a partial mediator of cognitive influences. Furthermore, our findings provide evidence for the idea that affective evaluation acts as a mental shortcut in the decision-making process. In conclusion, the current work indicates that we should not think of affective evaluation and TPB variables as being simply separate determinants. Affective evaluation is a bridge between TPB variables and intention and therefore a key factor in the decision-making process.