

What do you think? Psychological Determinants of Online Course Evaluation Response Rates

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Abstract

Students' feedback is a key source of information to improve the quality of the educational system, but few students commonly fill out course evaluations, potentially biasing the feedback. Thus, this study tested an intervention to increase students' response rates using a novel approach in the response rate context: The psychological variables influencing students' decision to fill out course evaluations were identified with the use of the Theory of Planned Behavior (TPB), organized in a process model, and targeted with behavior change strategies. Three emails requesting 463 college students to fill out a total of 2,163 evaluations were crafted with the use of selected behavior change strategies and sent during the evaluation period. Students were randomized to receive either the intervention emails or control emails. The Chi-square analysis indicated that the intervention group did not fill out more responses than the control group. The applied behavior change strategies may have not been effective, but the presence of a confounding variable obscured the interpretation of the results. While the strategies may not have been effective, the psychological variables could have been still correctly identified. Hence, a questionnaire was administered to 135 first-year students to validate the process model. The results of the regression analyses confirmed the identification of importance, usefulness, prosocial attitude, responsibility, forgetting, and questionnaire fatigue as the key variables influencing students' decision to fill out course evaluations, making this validated process model a strong basis for future interventions. Additionally, the intention-behavior gap with forgetting and questionnaire fatigue as moderators explained 61% of the variability in the behavior of filling out course evaluations. A discussion about this large percentage contributes to the theoretical literature supporting the predictive ability of the TPB being contingent upon the identification of the moderating variables of the relationship between intention and behavior.

Keywords: response rates, course evaluation, behavior change strategies, process model, intention-behavior gap, Theory of Planned Behavior, forgetting, questionnaire fatigue

Students' feedback is a useful source of information about the quality of the format and content of courses, teachers' effectiveness in the classroom, and the extent to which exams reflect what has been taught in class (Singh-Ackbarali et al., 2016). This input can be used to improve courses and curricula to boost the quality of the educational system (Ouahada, 2019). To gather students' feedback, online course evaluations are often administered at the end of course periods (Agrawal, 2004). However, the response rates are historically below 20% on average (Guder & Malliaris, 2013), and the few students who choose to fill out these evaluations are likely not representative of the student population (Adams & Umbach, 2012; Avery et al., 2006; Heerwegh et al., 2007; Porter & Umbach, 2006; Porter & Whitcomb, 2005), making their feedback biased and thus, not sufficiently informative (Nulty, 2008). Hence, it is important to gather a sufficient amount of students' feedback to guarantee high quality standards of our educational system.

Literature is rich with attempts to get students to complete course evaluations, often focusing on enticing participants with lotteries (Laguilles et al., 2011) or course credits (Dommeyer et al., 2004; Sundstrom et al., 2016). These strategies have achieved some success, but the response rate increase has often been marginal or not sustainable over time. A more comprehensive approach to tackle students' response rates would be to identify the key psychological variables influencing students' decision to fill out course evaluations and target them with research-supported behavior change strategies. Identifying key psychological variables can be done using corroborated models of behavior change, an approach already used in other fields such as weight loss management (Palmeira et al., 2007), but it has not yet been applied to the students' response rate problem. Thus, the present research project had four main goals: 1) to identify the key psychological variables influencing students' decision to fill out course evaluations, resulting in a process model describing the interactions among the variables, 2) to select effective research-supported behavior change strategies to alter the variables of this process model, 3) to create and test an intervention to increase students' course evaluation response rates by using these strategies, and finally, 4) to validate the process model.

Process Model

Goal 1 was about identifying the key psychological variables resulting in a coherent process model. To identify the psychological variables of students' decision to fill out course evaluations, one can apply the Theory of Planned Behavior (TPB), an extensively used and validated model of behavior change in psychology (Ajzen, 1991). This theory states that the primary predictor of people's behavior is their intention to perform that behavior. Further, the TPB indicates that in the context of course evaluations, this intention may be determined by three underlying mechanisms: one's attitude towards course evaluations, the fear of negative consequences from evaluating courses, and the intention-behavior gap. These mechanisms will be discussed next, starting with the attitude towards course evaluations, which is the evaluative judgment (Schwarz, 2007), or perception of importance (Krosnick & Schuman, 1988) that students have of the course evaluations.

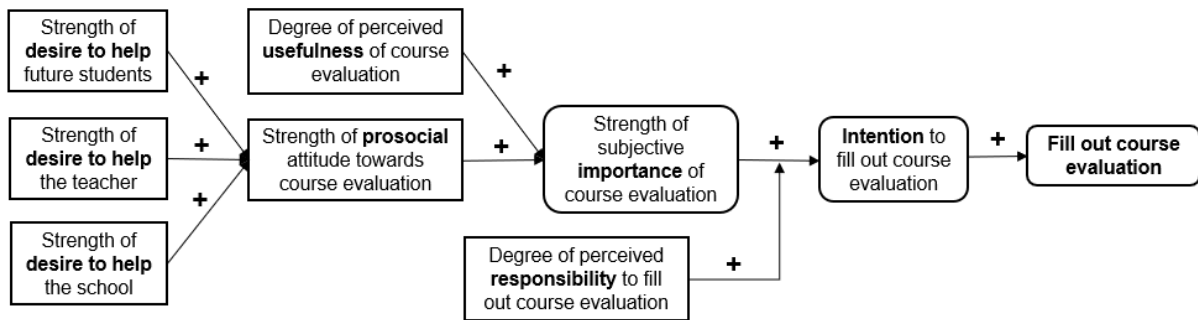
Attitude/importance of course evaluations. Students' subjective importance of the course evaluations is influenced by the students' perception of usefulness of the course evaluations, as a study investigating end-of-semester questionnaire response rates demonstrated when it found a large effect ($d = 1.05$; Cohen, 1992) that nonrespondent students possessed stronger beliefs that the data was not going to be used in a meaningful way (Rogelberg et al., 2000). Hence, when students perceive that their responses are not useful or put to good use, they consider course evaluations less important and are less likely to fill them out.

Prosocial attitude is another key determinant of students' subjective importance of course evaluations because people with higher altruistic motives place more importance on helping behavior and help more (Choi & Moon, 2016). Completing a course evaluation is often a form of prosocial behavior, given that students' feedback is used to improve the courses offered at a future date and will benefit other students, but not those providing the feedback (Cuadrado et al., 2021). Hence, students that score higher in prosocial attitude are more likely to give more importance to course evaluations. Prosocial attitude can be displayed toward unknown future students, but a study showed that it can be strengthened by increasing feelings of affiliation with the university when it found that response rates to a survey were three times higher for alumni than for students from another university (Porter & Whitcomb, 2007). Additionally, prosocial attitude can be strengthened by increasing feelings of affiliation with the teacher, as a study showed that a survey sent by a faculty member received about 30% more responses than a survey sent by a student (Guéguen & Jacob, 2002). Hence, students' prosocial behavior can be directed by the desire to help future students as well as the university or their teachers.

A third psychological variable interacting with one's subjective importance of a behavior is their perception of responsibility toward that behavior (Allen & Smith, 2008), in such a way that a student's feeling of responsibility for evaluating a course can strengthen the effect of importance of filling out the evaluation. Research shows that requests made to a large group of people, such as all the students in a class, decrease helping behavior (Darley & Latané, 1968; Kozlov & Johansen, 2010). Similarly, a study about survey response rates found that emails addressed to one person received almost 30% more responses than emails addressed to five individuals (Barron & Yechiam, 2002). This is supported by the diffusion of responsibility theory, which suggests that when more people are involved, the sense of agency for an outcome is reduced for each individual (Beyer et al., 2017). And lack of control over an outcome results in perceiving it as less important (Norgaard, 2006). Hence, perceived responsibility for evaluating a course appears to act as a moderator in the relationship between importance and intention because it strengthens the effect of importance when a student feels responsible for the evaluation. Figure 1 reports the process model illustrating how these variables involved in the decision to fill our course evaluations are related to each other.

Figure 1

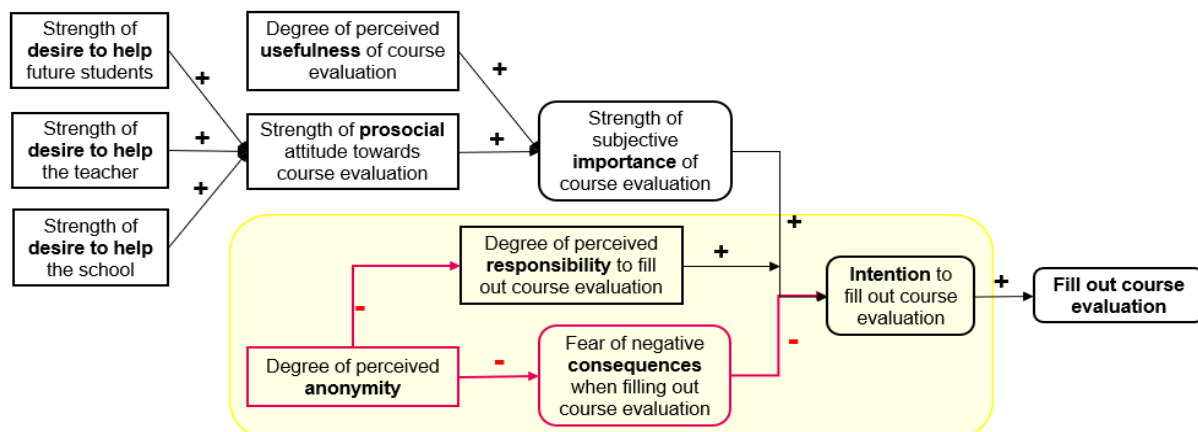
Process model describing the types and directions of the interactions among the variables influencing students' decision to fill out a course evaluation



Fear of negative consequences. While students' perception of course evaluation importance is likely to increase their intention to evaluate a course, this intention can be decreased by students' fear of negative consequences of this action, especially if they believe to be exposed to retaliation from their teachers if their responses were not anonymous. That low response rates of online surveys are at least partially caused by perceived lack of anonymity is a widespread suggestion in literature (Ardalan et al., 2019; Moss & Hendry, 2002). Students often indicate that having confidence in the anonymity of the evaluation process is important to them (Donovan, et al., 2007), and a recent study among American graduate students reported that more than 75% of participants requested assurance of anonymity and confidentiality when completing surveys (Saleh & Bista, 2017). However, research also indicates that in some cases anonymity can reduce response rates by decreasing participants' sense of responsibility (Joinson & Reips, 2007). Hence, perception of anonymity can decrease the fear of negative consequences when filling out the online questionnaire, but its effects can be partially offset by the increase in diffusion of responsibility. Figure 2 illustrates the process model including the variables involved in the fear of negative consequences-intention relationship.

Figure 2

Expanded process model describing the interactions among the variables influencing students' decision to fill out a course evaluation to include fear of negative consequences and anonymity

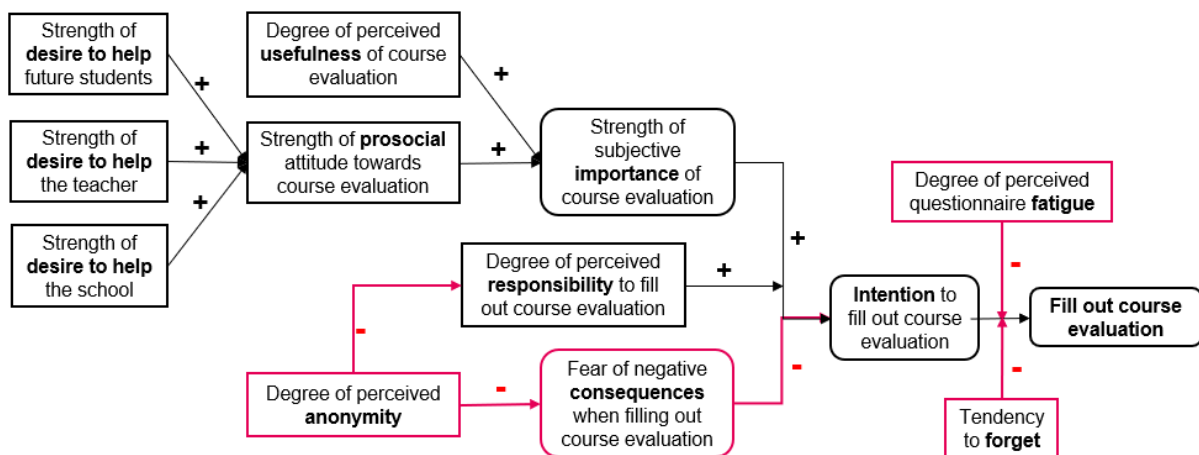


Intention-behavior gap. When applying the TPB to identify the key psychological variables influencing students' decision to fill out course evaluations, one needs also to consider the intention-behavior gap, which describes the situation when students intend to evaluate a course but they fail to translate their intention into action (Sheeran & Webb, 2016; Webb & Sheeran, 2006). A likely cause for this situation is the degree of perceived questionnaire fatigue, the demand overload experienced by survey respondents shown to hinder survey response rates (Barr et al., 2008). Higher education students perceive significant time constraints for work, school, and family responsibilities (Pelletier & Laska, 2012), and are among the most surveyed population groups in society (Sax et al., 2003). Hence, even when students intend to fill out course evaluations, their busy life schedules capped by school demands often cause lower-priority activities such as completing course evaluations to be ignored.

The intention-behavior gap can also occur because of forgetting, one of the most frequent reasons for not completing surveys found in research (Gliksman et al., 1992). Rogelberg and colleagues (2003) shoed in two experiments involving college students that most participants were not opposed to the survey effort and that most nonresponse (66%) were best explained as being passive in nature compared to deliberately choosing not to respond (15%). Hence, positive intentions to evaluate courses are predominant, but the presence of the intention is often not sufficient for the task execution to occur because students that decide not to fill out the evaluations immediately, subsequently forget. Figure 3 depicts the finalized process model including the intention-behavior gap variables.

Figure 3

Complete process model describing the types and directions of the interactions among the variables influencing students' decision to fill out a course evaluation



With the aid of this completed process model, an intervention to increase students' response rates could be developed. Thus, a study was conducted consisting of selecting behavior change strategies that influence the psychological variables of this process model and implementing these strategies in an intervention.

Study 1: Intervention

Study 1 aimed to increase the response rates of course evaluations with an intervention based on behavior change strategies selected to strengthen students' prosocial attitude towards course evaluations and the degree of perceived usefulness of these evaluations, while reducing questionnaire fatigue and forgetting. Therefore, an investigation to identify research-supported behavior change strategies to alter these variables was firstly conducted.

Prosocial Attitude Behavior Change Strategies

In-group effect. Research shows that prosocial behavior can be boosted by activating in-group feelings with those who need help (Foddy et al., 2009; Park & Schaller, 2005). This is supported by field experiments showing that helping behavior was greater when the person asking for help was identified as belonging to the same university as the potential helper (Aune & Basil, 1994; Howard et al., 1995). The in-group effect occurs because help is more likely given when it is perceived as more necessary (Lee & Farrell, 2003), and volunteers perceive a higher need for the people in their community (Unger, 1991). Hence, prosocial behavior can be boosted by increasing an in-group mindset. One way to activate this mindset is by using the altercasting technique, which involves putting people in a social role so that social pressures drive them to behave according to that role (Pratkanis, 1999), and shown to be effective in promoting prosocial behaviors (Kraut, 1973). The altercasting technique can increase feelings of belonging to the same group as the requester, such as addressing a student as 'HAN student' when the request is to benefit the HAN university. Thus, by using the altercasting technique to increase in-group feelings with the requester, prosocial behavior can be increased.

Positive mood, gratitude, and reciprocity. Prosocial behavior can also be stimulated by positive thoughts, such as thinking about things for which they are grateful (Soetevent, 2005) or feelings of accomplishment (Sargeant et al., 2000). This occurs because people are motivated to maintain a positive affect, and helping others in many cases produces a positive mood (Telle & Pfister, 2014). This is also supported by neuropsychological studies showing that donations and altruistic choices stimulate the reward processing areas of the brain (Harbaugh et al., 2007; Moll et al., 2006). Hence, activating feelings of accomplishment by reminding students of all the study achievements they have accomplished thus far can increase their prosocial attitude. Additionally, gratitude increases prosocial attitude by making the reciprocity norm salient (Bartlett & DeSteno, 2006), and highlighting the fact that someone has done them a favor leads to a "pay it forward" mindset (Reno et al., 1993). Accordingly in the course evaluation context, highlighting that previous students have provided feedback to improve the courses that one is taking could activate a reciprocity mindset. Hence, both activating feelings of accomplishment and gratitude can increase students' prosocial attitude.

Perceived Usefulness Behavior Change Strategy

Efficacy. Efficacy refers to the perception that one's contribution makes a difference to the cause supported, and this perception of usefulness has been found effective in increasing prosocial behavior in several experimental studies (Jackson & Mathews, 1995; Parsons, 2003, 2007). Often, students are diffident about their feedback really being used (Crews & Curtis, 2011), and research recommends instructors to ensure students that they will use their feedback to improve their teaching or their courses (Guder & Malliaris, 2013; McKone, 1999). To make this message of usefulness more effective, the emails need not just to state that students' feedback matters, but also indicate why it is useful. Research shows that priming with abstract (why) compared to concrete (how) construal categories increases prosocial behavior (Singh & Teoh, 2014). This occurs because why-styled, high-level construals correlate to greater self-control, and when high-level construals are made salient, individuals are more likely to delay their gratification and choose to behave for the benefit of others (Fujita et al., 2006). Hence, emphasizing that feedback will be used and specifying for what purposes it will be used can increase students' perception of course evaluation usefulness.

Responsibility Behavior Change Strategy

Identification. Diffusion of responsibility states that perception of agency over an outcome is reduced when more people are involved because it is unclear whose responsibility it is to take action (Beyer et al., 2017). Therefore, one strategy shown to counteract the diffusion of responsibility effect and increase one's sense of responsibility consists of removing ambiguity as to whom the message is directed and thus clarifying who needs to take action (Wogalter et al., 1994). A meta-analysis showed that removal of ambiguity by personalization of messages was positively associated with survey response rates (Anseel et al., 2010). Hence, messages should be as much as possible personally addressed to increase students' sense of responsibility.

Questionnaire Fatigue Behavior Change Strategies

Anti-reactance strategies. When a student is already experiencing questionnaire fatigue, course evaluation requests may trigger reactance, the unpleasant feeling caused by unwanted requests that threaten one's sense of freedom (Steindl et al., 2015). Multiple strategies are proven to decrease reactance (Pratkanis, 2007), such as request minimization strategy, which works by promising that little effort is needed to fulfill one's request because reactance is more likely the more effort is requested (Cialdini & Schroeder, 1976). Other strategies work by reducing one's perception of threat to their freedom, such as acknowledgment of the reactance (Werner et al., 2002) and conceding that the request is not mandatory (Cline & Fay, 1990). Therefore, by ensuring that students' sense of freedom is not violated and minimizing the demand one can decrease reactance effects. Because multiple strategies are available to counteract reactance and research suggests varying the messages/strategies to prevent message repetition, which can otherwise disengage students' attention (Kim & So, 2018), it is advisable to use more than one strategy.

Forgetting Behavior Change Strategy

Scarcity. In addition to sending reminders (Sekeres et al., 2021), the effect of forgetting can be reduced by increasing one's sense of time pressure and need to take immediate action. This can be accomplished by exploiting scarcity, the threat to one's ability to meet their needs due to a lack of a resource (Hamilton et al., 2019). Because people tend to infer that high-value resources are scarce (Dai et al., 2008), scarcity of a resource such as time has been shown to increase the perceived value of that resource (Sevilla & Redden, 2014). Hence, students' sense of urgency to immediately fill out a course evaluation can be increased when reminded that there is only limited time available.

Summarizing, targeting the key psychological variables of the process model in Figure 3 with these behavior change strategies, an intervention to increase students' response rates of course evaluations was created and tested. It was predicted that the students in the intervention group would fill out more course evaluations than the students in the control condition.

Method

Participants. The participant group consisted of 463 students of age range 16-47 ($M = 20.99$, $SD = 3.25$) studying at the International School of Business (ISB) of the HAN University of Applied Sciences in the Netherlands. The students (60% male) had a broad international background, with 54% of them being Dutch and the largest minorities being the Vietnamese (9%), Bengalese (9%), German (3%), and Indonesian (3%) students. Because the dependent variable of the intervention was the course evaluation response rate measured at the end of the third school quarter, participant inclusion criteria were that students followed courses on campus in the third school quarter. In total, 21 student groups from five clusters, or semesters, were included in the intervention. Clusters are how the school organizes students and courses, with students following first-year first-semester courses being part of cluster A, students following first-year second-semester courses being cluster B, second-year first-semester cluster C, and so on. Three clusters were not included because during these semesters students follow a study abroad program or do their internship. Appendix A provides an overview of the number of students in each group and cluster.

Procedure. At the end of the third school period, students were asked to evaluate the courses they just completed. Ninety student group-course combinations were considered, for a total of 2,163 evaluations being created. Because the amount of course credits in each cluster differed, the student groups had different amounts of courses to evaluate. For example, A-cluster students were asked to evaluate seven courses, while B-cluster students only five (see Appendix A for a complete overview).

The intervention consisted of three emails asking students to fill out the course evaluations. The emails were sent via the Evalytics online tool. Within each student group, students were randomly assigned to either the control or the intervention condition, which differed by type of message received. Because of the small number of students in two of the G-cluster groups and consequent risk of student identification and violation of anonymity and confidentiality,

randomization for this cluster was done at the group level, instead of student level. Hence, all of the students in the G01 and G04 groups were part of the control group, while all of the students in the G02 and G03 groups received the intervention emails.

On the Monday following the end of the two-week exam period, the students received the first email stating that the course evaluations were open and inviting students to fill them out. A reminder email was sent a week later, on Tuesday because that Monday was a national holiday and was assumed that students would not be checking their school emails. Finally, a warning message that the course evaluations were going to close by end of day was sent that same week on Thursday for the intervention group and Friday for the control group. Closing the evaluations on a different day was necessary due to the Evalytics system settings that would have otherwise prevented sending different messages to the two groups. Hence, the course evaluations were open for the intervention group for 11 days, and for 12 days for the control group.

Materials. The intervention emails were crafted to increase students' key psychological variable of course evaluation importance and to decrease the effects of questionnaire fatigue and forgetting, while the control group received the emails with the same wording used by the school in the past. How the abovementioned behavior change techniques were applied to the intervention group emails is discussed next.

In-group effect. In-group feelings were activated in the emails by emphasizing that the course evaluations were benefitting fellow ISB students or their ISB program, and the altercasting technique was applied by addressing students as "Dear ISB students."

Positive mood. To promote positive mood, the students' efforts and accomplishment in completing their exams were recognized in the first email.

Gratitude and reciprocity. To stimulate gratitude, the first email pointed out that previous students' feedback helped shape the courses they had just taken and asked them to reciprocate by filling out the course evaluations.

Efficacy. To increase efficacy, the emails made it clear to students that their feedback mattered and that it was needed to improve the exams and the study program's curriculum.

Identification. To counteract the diffusion of responsibility effect, the reminder and the final warning emails exploited the settings of the Evalytics system configured to send message reminders exclusively to the students who had not yet filled out a course evaluation by letting those students know that they were identified as part of the nonrespondent group ("We noticed that you did not evaluate this course yet").

Anti-reactance strategies. Each email utilized a different strategy to decrease reactance. The first email utilized the request minimization strategy by promoting the short duration necessary to evaluate a course ("It will take just two minutes"). The reminder email made use of the acknowledgment of the reactance strategy by recognizing the negative feeling evoked by the course

evaluation request (“We understand that you may not want to fill out yet another course evaluation”), and the final warning email addressed reactance by conceding that the student was free not to respond.

Scarcity. To trigger the scarcity effect, the first reminder stated that the course evaluations would close soon, and the final warning email emphasized that the time was running out (“Only possible today”) and this was their last chance to fill out the course evaluations.

The full text of the intervention and control emails can be found in Appendix B. This appendix also highlights where and how in the intervention emails the behavior change strategies were applied.

Data analysis. Descriptive analyses identifying the number of responses by condition were first conducted to provide an overview of the experiment results. For the main hypothesis, a Chi-square test of independence was performed to examine the relation between condition and response. Because this analysis does not require homoscedasticity or equality of variances among the groups, and all cells had frequencies higher than five (McHugh, 2012), no further assumption testing was planned.

Results

Descriptive statistics and confirmatory analyses. The students in the control group filled out 202 evaluations compared to the 148 evaluations filled out by the students in the intervention group. Response rates by condition are shown in Table 1. A Chi-square test of independence was performed to examine the relation between condition and course evaluation response. The relation between these variables was significant, $\chi^2 (1, N = 2163) = 10.98, p = .001$. The odds ratio was 0.68 (95% CI [0.54, 0.86]), indicating that a student from the control group was 1.47 times more likely to fill out an evaluation than a student in the intervention condition.

Table 1

Percentage of responses by condition

		Response		
		No	Yes	Total
Condition	Control	81.2%	18.8%	100.0%
	Intervention	86.4%	13.6%	100.0%
Total		1,813	350	2,163
		83.8%	16.2%	100.0%

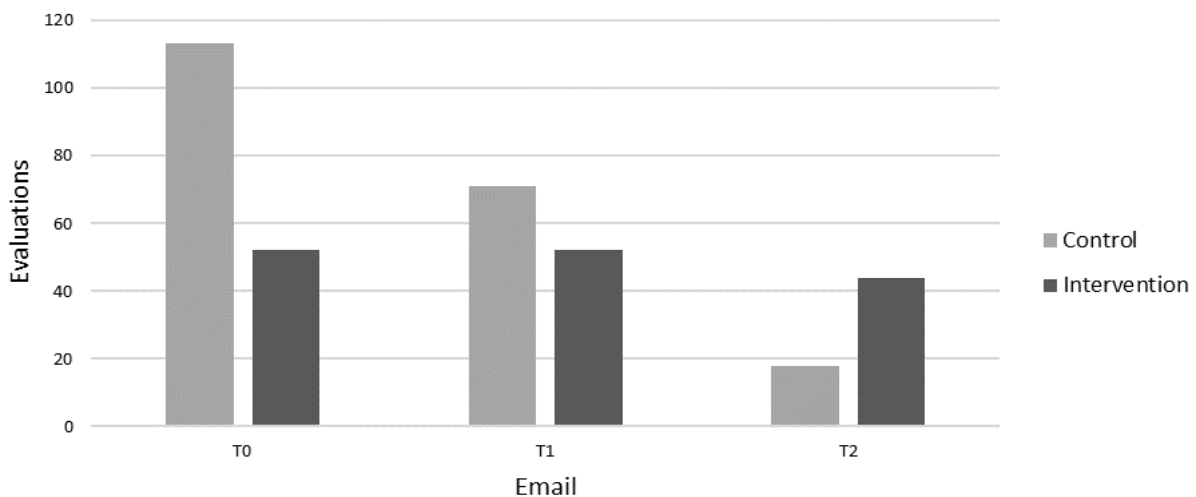
Exploratory analyses. Because it was not expected that the control group filled out more evaluations than the intervention group, an exploratory analysis was performed to verify if key differences in response rate were present by student cluster (semester). A logistic regression with response (yes, no) as dependent variable and cluster (A, B, C, D, G) and condition (control, intervention) as independent variables was performed to determine if cluster had an interaction effect

on the condition. Cluster was significant, $\chi^2(4, N = 2163) = 19.92, p = .001$, but the interaction Cluster x Condition was not significant, indicating a selection bias for which some of the student groups acted (evaluate course evaluations) differently than others, but regardless of the condition. Hence, cluster did not appear to be a possible explanation for the unexpected results.

However, it was noticed that when the evaluation period started, the Evalytics system sent one email to the intervention group students asking them to evaluate multiple courses, while it sent multiple emails to the control group students, each asking them to evaluate one course. The reason for this different output is not known, but it could be the case that this difference in number of emails was a significant confounding variable influencing students' response rates. Therefore, a set of exploratory Chi-square tests of independence were performed to examine the relation between condition and email (time) on response rates (RR). In chronological order, each message received fewer and fewer responses ($RR_0 = 165, RR_1 = 123, RR_2 = 62$), and condition had a significant effect on all three emails, although the number of evaluations filled out by the control group students was significantly larger than for the intervention group students after the first two emails, but smaller after the final warning message. Figure 4 provides the number of evaluations filled out by the control and intervention groups after each email. The detailed description of these analyses and contingency tables are reported in Appendix C.

Figure 4

Number of evaluations filled out by the control and intervention groups after each email



Because of the inconsistent effect of condition on the three emails, the possible effect of the number of emails a student received was investigated with an exploratory logistic regression with response (no, yes) as dependent variable and number of emails received (range 2 – 7) as independent variable for the students in the control group. Also this analysis resulted nonsignificant, $\chi^2(1, N = 1073) = 0.196, p = .658$. The number of emails received was not associated with the response rates of the control group students.

Discussion

An intervention to increase students' course evaluation response rates was carried out by implementing behavior control strategies aimed at strengthening students' prosocial attitude and the degree of perceived usefulness of the evaluations, while reducing questionnaire fatigue and forgetting. The data showed that the intervention had significant results, but in the opposite direction as predicted: The students in the control group filled out more course evaluations than the students in the intervention group. It is possible that the applied behavior change strategies were not effective or not effectively applied.

Because this surprising result was in contrast with the supporting literature, an attempt was made to determine if causes other than the intervention itself may have influenced the results. The effect of cluster was exploratorily tested but resulted nonsignificant. Instead, it was noticed that the two condition groups received a different number of emails at the start of the course evaluation period: Students in the intervention group received one email asking them to evaluate multiple courses, while students in the control group received multiple, each email asking students to evaluate one course. Exploratory analyses indicated that the effect of condition differed among emails, but that the number of emails did not appear to be a factor in these differences. Rather, this difference plausibly triggered reactance in the intervention group students, hindering their intention to fill out the evaluations: Given that students already report questionnaire fatigue when receiving a request to fill out one course evaluation (Barr et al., 2008) and that reactance is more likely to emerge when a request demands much effort (Cialdini & Schroeder, 1976), it could be the case that an email asking students to fill out multiple course evaluations triggered excessive reactance. Hence, while the main explanation for the surprising results of study 1 remains that the applied behavior change strategies were not effective, a replication of the present study controlling for the number of evaluations requested in a single email is warranted.

Although the selected behavior change strategies may not have been effective and the differing number of evaluations constituted a potential confounding variable that undermined the testing of the present intervention, the underlying process model of study 1 could still be valid and the basis for future interventions. Thus, a second study was conducted to verify the validity of the process model.

Study 2: Process Model Validation

Study 2 aimed at validating the research-supported process model identifying the psychological variables that influence students' decision to fill out course evaluations. Five broad hypotheses were formulated to test the relationships of the variables in the model. The first hypothesis (H1) aimed at confirming the intention-behavior gap, which predicted that questionnaire fatigue and forgetting would negatively moderate the intention-behavior relationship. The second hypothesis (H2) focused on the determinants of intention: It predicted that importance would increase intention to fill out evaluations, while fear of negative consequences would decrease it, and that responsibility would

moderate the importance-intention relationship. The third hypothesis (H3) predicted a positive main effect of prosocial attitude and usefulness of course evaluations on the evaluations' perceived importance. The fourth hypothesis (H4) was a validation of the prosocial attitude variable, predicting that the desire to help future students, the teacher, and the school would create a valid prosocial attitude scale. The final hypothesis (H5) focused on the effect of anonymity on fear of negative consequences of filling out course evaluations and responsibility, predicting a negative correlation with both variables.

Method

Participants and procedure. Using Qualtrics, a questionnaire was created that could be reached via an anonymous link or a QR code. The week after the course evaluations closed, all the first-year student groups were approached and asked to fill out a short online questionnaire during their regular classroom hours. This use of purposive sampling (Etikan et al., 2016) was meant to ensure an accurate representation of the first-year students, and it was reflected in the survey answers indicating that 42% of the 135 respondents were from the A-cluster student groups. Fifty-three percent of the questionnaire answers came from the control group students.

Materials. Each psychological variable was measured on a quantitative scale. Except for behavior and forgetting, the variables were measured by asking students to what extent they agreed with one or more statements. Students responded on a 5-point Likert scale ranging from 1 (Very much disagree) to 5 (Very much agree). When more than one item was used to measure a variable, the final score was computed by averaging the items in the scale.

Behavior (*Fill out course evaluations*). Students reported how many courses they had evaluated. The range 0 – 7 was used for A-cluster students and 0 – 5 for the B-cluster students to reflect the amount of course evaluation requests they had received.

Intention. Intention to fill out course evaluations was measured with one item asking students to indicate to what extent they agreed with the statement “Whenever I receive a course evaluation, I have the intention to fill it out.” Higher scores indicated higher levels of intention.

Forgetting. Students reported how many courses they meant to evaluate but forgot to evaluate. The range 0 – 7 was used for the A-cluster and 0 – 5 for the B-cluster to reflect the amount of course evaluation requests they had received.

Questionnaire fatigue. Two items were created for the present study to assess questionnaire fatigue, and consisted of the statements “I am tired of survey requests” and “I do not feel like completing yet another task for school such as course evaluations.” The 2-tailed correlation between the items was significantly moderate at the $p < .01$ level ($r = .39$; Cohen, 1992). Higher scores indicated higher levels of questionnaire fatigue.

Importance. Perceived importance of course evaluations was measured with one item asking students to indicate to what extent they agreed with the statement “Filling out course evaluations is important.” Higher scores indicated higher levels of perceived importance.

Prosocial attitude. Three items were created for the present study to assess prosocial attitude, and consisted of the statements “I want to help my teacher”, “I care about helping ISB students,” and “I want to help improve the ISB program.” Scale reliability was acceptable for the three prosocial items (Cronbach's alpha = .69; George & Mallery, 2003) and minimally better (Cronbach's alpha = .73) if the item ‘Help the teacher’ was deleted. Hence, all three items in the scale were used. Higher scores indicated higher levels of prosocial attitude.

Usefulness. Perceived usefulness of course evaluations was measured with a 5-item scale created for the present study. The statements specified that the evaluations were useful to improve the courses, the ISB program, the exams, or the ISB curriculum. One item (“My feedback will have no impact on future students’ education”) was reversed to reduce acquiescence bias (Schriesheim & Hill, 1981), and thus re-coded before calculating the participants’ scores on this scale. Cronbach’s alpha for these items was .76, indicating good internal consistency (George & Mallery, 2003). Higher scores indicated higher levels of perceived usefulness.

Responsibility. Initially, three items were created for the present study to measure responsibility to fill out course evaluations. However, the scale reliability was unacceptable (Cronbach’s alpha = .42; George & Mallery, 2003). Hence, the most representative item “I feel responsible to fill out the course evaluations” was used instead. Higher scores indicated higher levels of responsibility.

Fear of negative consequences. Fear of negative consequences of filling out course evaluations was measured with one item asking students to indicate to what extent they agreed with the statement “When I fill out a course evaluation, I fear negative consequences.” Higher scores indicated higher levels of fear.

Anonymity. Three items were created for the present study to measure perceived anonymity of course evaluation answers, and consisted of the statements “I believe my answers are anonymous,” “I feel comfortable providing feedback in the course evaluations,” and the reversed item “I worry that the teacher can recognize my answer as mine,” which was re-coded before calculating the participants’ scores on this scale. The scale reliability was questionable (Cronbach’s alpha = .61; George & Mallery, 2003). Higher scores indicated higher levels of perceived anonymity.

Condition. The questionnaire listed the control group students and asked participants to indicate if their name was on the list. To maintain students’ response anonymity, the reason was not provided for some of the students’ names being present but others not. The answer “yes” indicated that the student had been part of the control group.

Data analysis. The data analysis plan included preliminary analyses to detect the presence of outliers and test the assumptions of normality and homogeneity of variance. Additionally, bivariate correlations and descriptive statistics were reviewed to summarize the variables’ key characteristics. To answer the main hypotheses, it was assumed that the process model would hold regardless of condition, and the following analyses were performed.

Intention-Behavior gap (H1). A standard multiple regression analysis with behavior (filling out course evaluations) as dependent variable and intention to fill out course evaluations, forgetting, questionnaire fatigue, as well as the interaction Intention x Forgetting and Intention x Questionnaire Fatigue as predictors was performed to validate the main effect of intention on behavior and the moderating factors of forgetting and questionnaire fatigue. Intention, forgetting, and questionnaire fatigue were centered before calculating the moderating variables to prevent multicollinearity (Frazier et al., 2004).

Determinants of intention (H2). A standard multiple regression analysis with intention to fill out course evaluations as dependent variable and importance, fear of negative consequences, responsibility, as well as the interaction Importance x Responsibility as predictors was performed to validate the main effect of importance and fear of negative consequences on intention and the moderating factor responsibility. Importance and responsibility were centered before calculating the moderating variable (Frazier et al., 2004).

Determinants of importance (H3). A standard multiple regression analysis with importance of filling out course evaluations as dependent variable and prosocial attitude and usefulness as predictors was performed to confirm the main effect of prosocial attitude and usefulness on importance.

Prosocial attitude scale (H4). A reliability analysis was performed to validate that the desire to help future students, the teacher, and the school constituted a robust prosocial attitude scale.

Effect of anonymity (H5). A correlation analysis was performed to determine the association between anonymity and fear of negative consequences, and between anonymity and responsibility.

Results

Preliminary analyses, descriptive statistics, and correlation analyses. Assumptions of normality, homoscedasticity, and multicollinearity were checked and validated before conducting the main analyses. The details can be found in Appendix D, together with the descriptive statistics and bivariate correlations.

Confirmatory analyses. The 135 participants exceeded the a priori power analyses minimum requirements for all of the confirmatory analyses when considering a medium-size effect (Cohen, 1992), an alpha level of $p < .05$, power of .80, and the relevant number of predictors.

Intention-Behavior gap (H1). The standard multiple regression analysis to validate the main effect of intention on behavior and the moderating factors of forgetting and questionnaire fatigue showed that R^2 was significantly larger than 0 ($F(5,129) = 15.41, p < .001$). Its value ($R^2 = .61$) indicated that all predictors combined accounted for 61% of the variability in the behavior of filling out course evaluations. The standardized regression coefficient of intention was 0.42 ($t = 4.99, p < .001$) and of forgetting was -0.23 ($t = -3.16, p = .002$), meaning that the increase in intention correlated with more evaluations being filled out but increase in forgetting was associated with less evaluations. These main effects were qualified by the expected significant interaction of intention and

forgetting ($\beta = -0.21, t = -2.74, p = .007$). The interaction between intention and questionnaire fatigue was also significant according to expectations ($\beta = -0.17, t = -2.25, p = .026$). A simple slope analysis (Aiken et al., 1991) showed that there was a negative effect of forgetting for high and medium scores of intention, but no effect for low scores of intention. Hence, forgetting was associated with behavior when students intended to fill out course evaluations, but it was no longer relevant when students did not intend to evaluate a course to start with. Similarly, the simple slope analysis for questionnaire fatigue shows that this variable was associated with behavior only when students strongly intended to fill out course evaluations. The simple slope analyses are reported in detail in Appendix E.

Determinants of intention (H2). The standard multiple regression analysis to validate the main effect of importance and fear of negative consequences on intention and the moderating factor responsibility showed that R^2 was significantly larger than 0 ($F(4,130) = 8.57, p < .001$). Its value ($R^2 = .46$) indicated a large effect size (Cohen, 1992): All predictors combined accounted for 46 % of the variability in the intention to fill out course evaluations. The standardized regression coefficients of importance ($\beta = 0.24, t = 2.67, p = .008$) and responsibility ($\beta = 0.30, t = 3.36, p = .001$) were significant, indicating that that higher scores on these variables were associated with higher scores on intention to fill out course evaluations. The coefficients of fear of negative consequences and for the interaction Importance x Responsibility resulted nonsignificant, suggesting that the scores of fear of negative consequences were not associated with the scores on intention to fill out course evaluations, and that responsibility did not moderate the relationship between importance and intention.

Determinants of importance (H3). The standard multiple regression analysis to validate the main effect of prosocial attitude and usefulness on importance showed that R^2 was significantly larger than 0 ($F(2,132) = 50.39, p < .001$). Its value ($R^2 = .66$) indicated that the two predictors combined accounted for 66% of the variability in the scores of importance. The standardized regression coefficients of prosocial attitude ($\beta = 0.41, t = 5.89, p < .001$) and usefulness ($\beta = 0.40, t = 5.68, p < .001$) were significant, meaning that higher scores on these variables were associated with higher scores on perception of course evaluations importance.

Prosocial attitude scale (H4). A reliability analysis was performed to validate the prosocial attitude scale. Cronbach's alpha was .69. Deleting the item 'Help the teacher' increased only minimally the Cronbach's alpha to .73. These values indicated acceptable scale reliability for the three prosocial items (George & Mallery, 2003).

Effect of anonymity (H5). A correlation analysis indicated that perception of anonymity was significantly negatively correlated at the $p < .01$ level with the fear of negative consequences when filling out course evaluations. The correlation was strong ($r = -.49$; Cohen, 1992). Conversely, anonymity was not significantly correlated with the perception of responsibility.

Exploratory analysis. Because the process model validation was done after the intervention of study 1, an exploratory analysis was performed to test on which psychological variables the intervention (condition) had an effect. Hence, an exploratory MANOVA with each of the individual

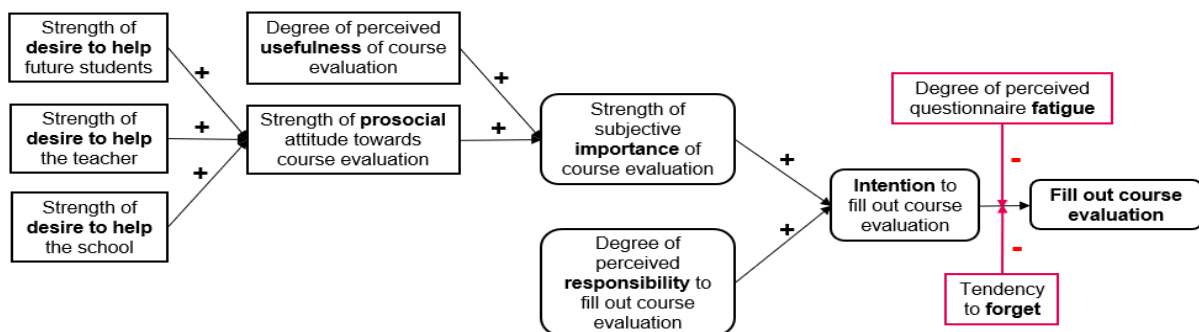
psychological constructs of the process model as dependent variable and condition (control, intervention) as independent variables was performed. However, the 135 participants did not reach the a priori power analysis minimum requirements of 298 participants for a MANOVA analysis with two groups, 13 dependent variables, a medium-size effect ($f^2 = .06$; Cohen, 1992), an alpha level of $p < .05$, and power of .80. Thus, the results will have to be interpreted with extreme caution. The MANOVA multivariate test resulted significant ($F(12, 122) = 2.31$ $p = .011$, $\eta^2_{\text{partial}} = .19$), but condition had only a significant effect on behavior (number of evaluations filled out) and the item “desire to help future students.” The control group submitted more evaluations ($M = 3.21$) but indicated less desire to help future students ($M = 4.00$) than the students in the intervention group ($M = 2.31$, $M = 4.33$, respectively). The univariate analyses are found in Appendix F.

Discussion

Study 2 aimed to validate the process model identifying the psychological variables influencing students’ decision to fill out course evaluations. The results confirmed the hypotheses for all the variables with three exceptions: 1) responsibility had an unexpected direct effect on intention, instead of mediating the importance-intention relationship, 2) fear of negative consequences did not predict intention to fill out course evaluations, and 3) responsibility was not significantly correlated with the perception of anonymity. Hence, students in the present sample did not appear to fear retaliation from their teachers for their negative feedback. This may be the case because the evaluations were done after the results of most exams were available, and it has been previously noted that more retaliatory potential is perceived when feedback is given before the grades of an exam are finalized (Stone et al., 1977). Students also reported feeling responsible regardless of their perception of anonymity. Despite what the literature suggests (Joinson & Reips, 2007), anonymity may not hinder students’ sense of responsibility to fill out the course evaluations. However, it is important to remark that anonymity remains an essential psychological variable to consider when administering course evaluations to prevent socially desirable answers because it ensures the meaningfulness of the survey’s results (Tourangeau et al., 2013). The validated process model on which future interventions may be based is illustrated in Figure 5.

Figure 5

Validated process model describing the types and directions of the interactions among the variables influencing students’ decision to fill out a course evaluation



Additionally, the exploratory results of the effect of condition on the process model variables reflected the higher response rate of the control group compared to the intervention group found in study 1. However, the results also suggested that the intervention was effective in promoting prosocial attitude toward future students. These findings provide encouraging evidence for the use of the behavior change strategies to increase prosocial attitude that were applied in the present intervention, although replication studies are needed to confirm the conclusions of these exploratory analyses.

General Discussion

The present study provides a novel approach to solving the low course evaluation response rate problem. It tested an intervention to increase response rates by identifying the psychological variables influencing students' decision to fill out course evaluations and targeting them with behavior change strategies. The intervention was not successful. It could be the case that the selected behavior change strategies were not effective or most effectively applied in this context. However, the intervention group mistakenly received an email listing multiple course evaluations at once, and this request may have been perceived as burdensome and triggered reactance in the students. Because reactance is known to hinder students' motivation to fill out the evaluations, this multiple-evaluations request may have obscured the intervention's effect.

Nevertheless even if effective, the present intervention was not strong enough to overcome the effect of receiving a multiple-evaluations request. However, the intervention did not utilize all the variables in the process model, such as students' desire to help their teachers. Involving teachers in an intervention and having them ask students to fill out the course evaluations is likely to have a strong effect on response rates because people are more willing to help those they know (Unger, 1991). Thus, teachers' involvement in the course evaluation process may be a necessary factor in a response rate intervention, and it is recommended to test its effect in future research.

Another reason for the intervention's ineffectiveness could be that the process model was not sufficiently comprehensive. The model was developed by applying the Theory of Planned Behavior (TPB), but other validated models of behavior change could have been selected, which may have led to additional psychological variables. For example the value-based choice model (Berkman, 2018), which focuses on the value of the target action, would have likely promoted the relevance of benefits and use of rewards to motivate students to give feedback. However, the present process model already explained 61% of the variability in behavior. Hence, while additional variables could be considered, the present process model already includes the main determinants of the decision to fill out course evaluations, establishing it as a reliable base for future interventions.

The present study is not without limitations, one being that the student sample largely consisted of international business students. A study found that students of different disciplines displayed differing levels of prosocial behavior (Muñoz-Izquierdo et al., 2019), and it could be the case that the findings of the present study do not replicate when conducted among students of other study streams. Similarly, the international composition of the students in our sample may have biased

the results. Research shows that cultural background influences the degree of altruistic behavior that is displayed (Munroe, 2018), and a validation of the present process model may produce different results when conducted among students from different countries. Therefore, it is advisable to replicate the present study with students from different cultural backgrounds and study fields of interest, and to consider these factors when applying the present process model in future interventions.

Finally, this study contributes to the theoretical literature on the relationship between intention and behavior, the cornerstone of the TPB. Multiple meta-analyses report that intention accounts on average for less than 30% of the variance in behavior (Sheeran, 2002), whereas intention could explain 61% of the behavior in this study when forgetting and questionnaire fatigue were included as moderators. These results highlight the central role of moderating variables on the relationship between intention and behavior, corroborating similar remarks made in previous studies (Hassan et al., 2016; Vasiljevic et al., 2016). Hence, this study provides support for the predictive ability of the TPB being contingent upon the identification of the moderating variables of the relationship between intention and behavior. In conclusion, the contributions of the present study are both practical and theoretical: The validated process model provides the basis for future interventions in the field, while the findings about the role of the moderators in the intention-behavior relationship enrich the theoretical literature on the TPB.

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Appendix A

Number of students and evaluations by cluster and student group

Number of students per group, organized by year and semester

Year	Semester	Cluster	Group	Number of students	Number of evaluations per group	Total evaluations
1	1	A	A01	28	7	196
1	1	A	A02	31	7	217
1	1	A	A03	26	7	182
1	1	A	A04	27	7	189
1	2	B	B01	28	5	140
1	2	B	B02	25	5	125
1	2	B	B03	27	5	135
1	2	B	B04	27	5	135
1	2	B	B05	29	5	145
2	1	C	C01	26	3	78
2	1	C	C02	18	3	54
2	2	D	D01	25	2	50
2	2	D	D02	21	3	63
2	2	D	D03	32	3	96
2	2	D	D04	18	2	36
2	2	D	D05	18	2	36
2	2	D	D06	17	3	51
4	1	G	G01	11	4	44
4	1	G	G02	7	4	28
4	1	G	G03	15	4	60
4	1	G	G04	7	4	28
Total				463	90	2,163

Note. Students in clusters E, F, and H were not included because students in these clusters do their internship or follow a semester of study abroad.

Appendix B

First email

Initial message sent to the intervention group and the behavioral change techniques applied

The image shows an email invitation for course evaluations. The email is from the ISB Quality Assurance Team and is addressed to ISB students. The main heading is "New course evaluations available" with a sub-heading "Help us improve your ISB program by filling them in today". The body of the email includes a greeting "Dear ISB student," followed by a congratulatory message "Today, all of you ISB students are done with your exams. Congratulations to you on completing all of your exams this period!". It then asks the student to help improve the course by filling out an evaluation, emphasizing that their opinion matters. The email includes a call to action "EVALUATE NOW" and a footer with the course name "Evaluation Accounting & Finance 1" and the evaluation period "08-04-2022 – 22-04-2022".

Behavioral change techniques identified in the email:

- Similarity/ in-group
- Altercasting
- Similarity/ in-group
- Positive mood
- Gratitude/reciprocity
- Efficacy
- Reactance

Initial message sent to the control group

The image shows an email invitation for course evaluations sent to the control group. The email is from the ISB Quality Assurance Team and is addressed to ISB students. The main heading is "Dear students, new evaluations are ready for you." with a sub-heading "Please fill them in today.". The body of the email includes a greeting "Dear students, would you be so kind to fill in this short survey? The survey is strictly anonymous. The results will be shared with the teacher(s) so please formulate your answers respectfully. Thank you in advance.". The email includes a call to action "Start survey now" and a footer with the course name "Evaluation Accounting & Finance 1" and the evaluation period "Evaluatie periode: 08-04-2022 – 22-04-2022".

Second email

First reminder sent to the intervention group and the behavioral change techniques applied

The image shows an email reminder for course evaluations. The email content is as follows:

Don't forget to fill out the course evaluations!
The course evaluations will close soon

Dear ISB student,

We noticed that you did not evaluate this course yet. We understand that you may not want to fill out yet another course evaluation, but it will take just two minutes and your fellow ISB students could benefit from your input.

To share your feedback, please click the EVALUATE NOW button below. Thanks in advance!

Sincerely,
ISB Quality Assurance Team
quality.assurance-isb@han.nl

Evaluation Accounting & Finance 1
08-04-2022 – 22-04-2022

[EVALUATE NOW](#)

Annotations on the right side of the email content:

- Scarcity (points to "will close soon")
- Altercasting (points to "Dear ISB student,")
- Identification (points to "We understand that you")
- Reactance (points to "may not want to fill out yet another course evaluation, but it will take just two minutes and")
- Efficacy / in-group (points to "your fellow ISB students could benefit from your input.")
- In-group (points to "To share your feedback, please click the EVALUATE NOW button below. Thanks in advance!")

First reminder sent to the control group

The image shows an email reminder for course evaluations for the control group. The email content is as follows:

Reminder: please fill in the evaluation
This evaluation expires soon

The following evaluation will expire within short notice and you have not filled it in yet. Would you please do this by using the "EVALUATE NOW" button?

Evaluation Accounting & Finance 1
Evaluatie periode: 08-04-2022 – 22-04-2022

[Evaluate now \(click here\)](#)

Third email

Final warning sent to the intervention group and the behavioral change techniques applied

The image shows an email interface with several text elements highlighted by boxes, with arrows pointing to labels for behavioral change techniques:

- Scarcity:** Points to the blue header box containing "Last chance to fill out the course evaluations!" and "Only possible today".
- Altercasting:** Points to the salutation "Dear ISB student,".
- Identification:** Points to the sentence "We noticed that you did not evaluate this course yet."
- Reactance:** Points to the phrase "You are free not to complete it,".
- Efficacy/ in-group:** Points to the phrase "but your input will help shape the curriculum for your fellow ISB students."
- Scarcity:** Points to the sentence "The evaluation will end tomorrow, so this is your last chance to fill it in!".
- In-group:** Points to the sentence "To share your feedback, please click the EVALUATE NOW button below. Thanks in advance!".

The email footer includes: "Sincerely, ISB Quality Assurance Team, quality.assurance-isb@han.nl", "Evaluation Accounting & Finance 1", "08-04-2022 – 22-04-2022", and an "EVALUATE NOW" button.

Final warning sent to the control group

The image shows an email interface for the control group with the following content:

- Header: "Laatste kans om de evaluaties in te vullen!" and "Morgen kan het namelijk niet meer".
- Body: "These evaluations expire tomorrow, so please fill it in by using the 'EVALUATE NOW' button."
- Footer: "Evaluation Accounting & Finance 1", "Evaluatie periode: 08-04-2022 – 22-04-2022", and an "Evalueer nu" button.

Appendix C

Exploratory analyses of Study 1: Intervention

An exploratory Chi-square test of independence was performed to examine the relation between condition and time on response rates (RR) for each email. The relation between these variables was significant, $\chi^2(2, N = 350) = 28.74, p < .001$. In chronological order, each message received fewer and fewer responses ($RR_0 = 165, RR_1 = 123, RR_2 = 62$), although the drop in response rates between the first and second emails did not occur in the intervention condition. Table 2 provides the contingency table for this analysis.

Table 2

Contingency table showing the percentage of responses by time (email) and condition

		Condition		
		Control	Intervention	Total
Time	T ₀	68.5%	31.5%	100.0%
	T ₁	57.7%	42.3%	100.0%
	T ₂	29.0%	71.0%	100.0%
Total		202	148	350
		57.7%	42.3%	100.0%

The relation between condition and response at T₀ (the evaluations filled out between the first and the second email) was significant, $\chi^2(1, N = 2163) = 25.34, p < .001$. The control condition obtained more responses (10.5%) than the intervention group (4.8%). The odds ratio was 0.43 (95% CI [0.30, 0.60]), indicating that a student from the control group was 2.33 times more likely to fill out an evaluation than a student in the intervention condition. Table 3 provides the contingency table for this analysis.

Table 3

Contingency table showing the percentage of responses by condition obtained after the first email (T₀)

		Response		
		No	Yes	Total
Condition	Control	89.5%	10.5%	100.0%
	Intervention	95.2%	4.8%	100.0%
Total		1,998	165	2,163
		92.4%	7.6%	100.0%

The relation between condition and response at T₁ (evaluations received between the second and the third messages) was also significant, $\chi^2(1, N = 1998) = 4.86, p = .027$. The control condition obtained more responses (7.4%) than the intervention group (5.0%). The odds ratio was 0.66 (95% CI [0.46, 0.96]), indicating that a student from the control group was 1.51 times more likely to fill out an

evaluation than a student in the intervention condition. Table 4 provides the contingency table for this analysis.

Table 4

Contingency table showing the percentage of responses by condition obtained after the first email (first reminder; T₁)

		Response		
		No	Yes	Total
Condition	Control	92.6%	7.4%	100.0%
	Intervention	95.0%	5.0%	100.0%
Total		1,875	123	1,998
		93.8%	6.2%	100.0%

Finally, the relation between condition and response T₂ (evaluations received after the third message) was also found significant, $\chi^2(1, N = 1875) = 8.74, p = .003$, but this time the control condition obtained less responses (2.0%) than the intervention group (4.5%). The odds ratio was 2.27 (95% CI [1.30, 3.95]), indicating that a student from the intervention group was 2.27 times more likely to fill out an evaluation than a student in the control condition. The contingency tables displaying the percentage of responses for these three Chi-square analyses are provided in Tables 3, 4, and 5 respectively. Table 5 provides the contingency table for this analysis.

Table 5

Contingency table showing the percentage of responses by condition obtained after the third email (final warning; T₂)

		Response		
		No	Yes	Total
Condition	Control	98.0%	2.0%	100.0%
	Intervention	95.5%	4.5%	100.0%
Total		1,813	62	1,875
		96.7%	3.3%	100.0%

Appendix D

Assumption checking, descriptive statistics, and bivariate correlations of Study 2: Process Model Validation

Shapiro-Wilk tests and Q-Q plots indicated that the assumption of normality was violated to some degree for all the variables. The presence of outliers was verified by checking that none of the standardized values of the psychological variables were outside the 3.29 to -3.29 range (Tabachnick & Fidell, 2007). This operation confirmed that a few outliers were present, but almost all came from one participant who scored very low on prosocial attitude, the three items in the prosocial attitude scale, and usefulness. Additionally, one unusually low value for anonymity and one similarly low value for the ‘desire to help teacher’ item in the prosocial attitude scale were detected from two separate participants. Because there was no reason to believe that these were not valid responses, the values were kept. Despite these findings, the analysis was conducted as planned since the group size widely exceeded thirty participants (Allen & Bennett, 2010).

The assumption of homoscedasticity was checked by residual scatter plots visual examination (Tabachnick & Fidell, 2007). The scatter plots of the predicted and residual values had an (approximate) oval shape. Combined with the use of centered values used to prevent multicollinearity, these results provided indication that the assumption of homoscedasticity was sufficiently met (Tabachnick & Fidell, 2007).

Descriptive statistics and bivariate correlations are provided in Table 6.

Table 6

Descriptive statistics and bivariate correlations for the psychological variables of the process model for the decision to fill out course evaluations

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Behavior													
2. Intention	.50**												
3. Forgetting	-.25**	-.03											
4. Questionnaire fatigue	-.26**	-.41**	.10										
5. Importance	.26**	.36**	.01	-.23**									
6. Prosocial attitude	.29**	.32**	.02	-.25**	.54**								
7. Desire to help teacher	.18*	.20*	-.08	-.18*	.25**	.71**							
8. Desire to help students	.29**	.29**	.11	-.20*	.55**	.83**	.34**						
9. Desire to help school	.22**	.27**	.02	-.21*	.46**	.82**	.34**	.57**					
10. Usefulness	.03	.19*	.15	-.22*	.53**	.34**	.23**	.31**	.25**				
11. Responsibility	.36**	.40**	-.03	-.29**	.48**	.32**	.25**	.31**	.20*	.47**			
12. Fear of negative consequences	.05	.04	.06	.11	-.09	-.02	-.02	.01	-.04	-.17*	.04		
13. Anonymity	-.02	.06	.09	-.23**	.20*	.15	.12	.09	.14	.29**	.04	-.49**	
Mean	2.79	3.01	2.78	3.34	3.54	4.16	4.10	4.16	4.21	3.58	3.15	2.10	3.79
SD	2.30	1.12	1.95	0.91	0.93	0.66	0.81	0.88	0.84	0.67	1.11	1.15	0.82
Internal consistency (α)	-	-	-	-	-	.69	-	-	-	.76	-	-	.61

SD = Standard Deviation. Behavior and forgetting ranged from 0 to 7. All other variables ranged from 1 to 5.

* $p < .05$, ** $p < .01$.

Appendix E

Study 2: Process Model Validation simple slope analyses

Simple slope analysis of forgetting on behavior at differing levels of intention

A standard multiple regression analysis with behavior (filling out course evaluations) as dependent variable and intention to fill out course evaluations, forgetting, and the interaction Intention x Forgetting was performed. Intention and forgetting were centered before calculating the moderating variables to prevent multicollinearity (Frazier et al., 2004). The analysis showed that R^2 was significantly larger than 0 ($F(3,131) = 23.35, p < .001$). Its value ($R^2 = .59$) indicated that all predictors combined accounted for 59% of the variability in the behavior of filling out course evaluations. The standardized regression coefficient of forgetting was -0.26 ($t = -3.60, p < .001$), meaning that the increase in forgetting was associated with fewer submitted evaluations. Because the intention variable was standardized, the regression analysis can be interpreted as the conditional effect of forgetting on behavior at the mean value of intention. Thus, a simple slope analysis was performed according to the method by Aiken and colleagues (1991) to verify the significance of the forgetting effect on behavior at two additional levels of intention: a high and a low level.

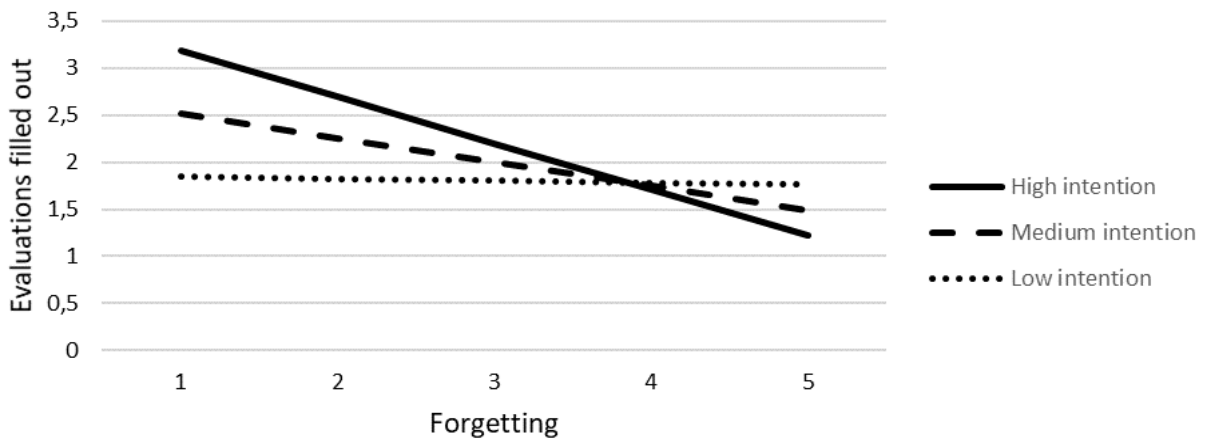
A coefficient for high intention was computed by removing 1 standard deviation (SD) from the original regression coefficient of intention. Subsequently, the interaction High Intention x Forgetting was calculated. With these two new values, a regression analysis with behavior as dependent variable and high intention, forgetting, and the interaction High Intention x Forgetting as predictors was performed. The analysis showed that the standardized regression coefficient of forgetting at high scores of intention was significant ($\beta = -0.49, t = -4.48, p < .001$).

This operation was repeated for low intention by adding 1 SD to the original regression coefficient of intention, calculating the interaction Low Intention x Forgetting, and performing the regression analysis with behavior as dependent variable and low intention, forgetting, and the interaction Low Intention x Forgetting as predictors. This analysis showed that the standardized regression coefficient of forgetting at low scores of intention was no longer significant ($\beta = -0.02, t = -0.19, p = .849$).

Summarizing, this procedure showed that the effect of forgetting on behavior is present for only high and medium levels of intention. Forgetting does not appear to have an effect on behavior when intention level is low. Hence, forgetting influences behavior when students intend to fill out course evaluations, but it is no longer relevant when students do not intend to evaluate a course to start with. A graph displaying the results of these three linear regressions is shown in Figure 6. The horizontal direction of the dotted line visually indicates the nonsignificance of forgetting on behavior when intention is low.

Figure 6

Relationship of number of evaluations filled out and forgetting at three values of intention



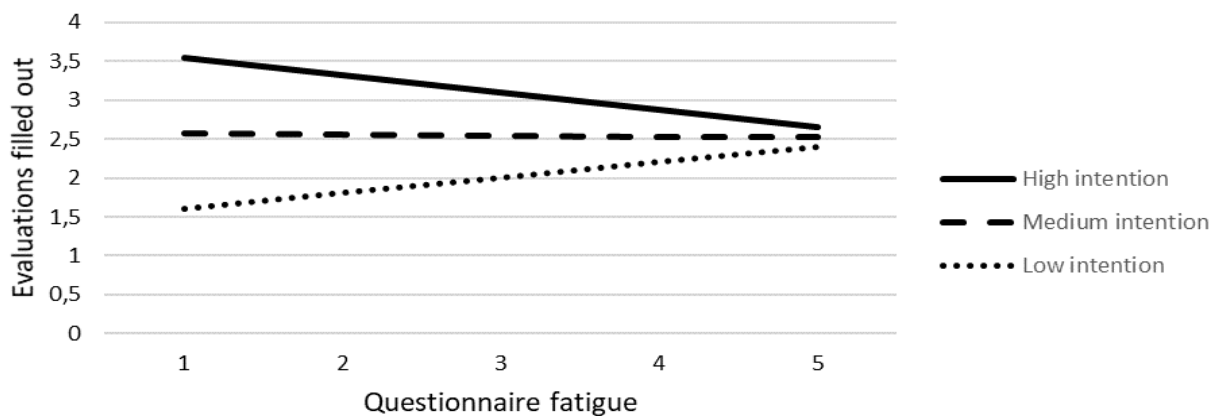
Simple slope analysis of questionnaire fatigue on behavior at differing levels of intention

A similar procedure as for forgetting was done for the questionnaire fatigue variable. The multiple regression analysis showed that R^2 was significantly larger than 0 ($F(3,131) = 18.51, p < .001$). Its value ($R^2 = .55$) indicated that all predictors combined accounted for 55% of the variability in the behavior of filling out course evaluations. The standardized regression coefficient of questionnaire fatigue was nonsignificant ($t = -0.138, p = .890$), unlike that one of the interaction between intention and questionnaire fatigue ($\beta = -0.224, t = -2.973, p = .004$). Next, the interactions High Intention x Questionnaire Fatigue and Low Intention x Questionnaire Fatigue were calculated. The regression analyses showed that the standardized regression coefficient of questionnaire fatigue at high scores of intention was significant ($\beta = -0.222, t = -2.300, p = .023$), while at low scores of intention was again no longer significant ($t = -1.666, p = .098$). Hence, the effect of questionnaire fatigue on behavior is present only for high levels of intention: questionnaire fatigue influences behavior when students strongly intend to fill out course evaluations.

A graph displaying the results of these three linear regressions is shown in Figure 7.

Figure 7

Relationship of number of evaluations filled out and questionnaire fatigue at three values of intention



Appendix F

Exploratory analyses of Study 2: Process Model Validation

Summary of univariate analyses of the effect of condition on the individual variables

Predictor	Dependent variable	<i>F</i>	<i>p</i>	Partial η^2
Condition	Behavior (fill out evaluations)	5.29	.023	.038
	Intention	0.01	.942	.000
	Forgetting	0.41	.525	.003
	Questionnaire fatigue	0.09	.767	.001
	Importance	3.09	.081	.023
	Usefulness	0.13	.715	.001
	Prosocial attitude	0.63	.430	.005
	Desire to help teacher	0.97	.327	.007
	Desire to help future students	4.82	.030	.035
	Desire to help school	0.31	.577	.002
	Responsibility	1.35	.247	.010
	Fear of negative consequences	2.55	.113	.019
	Anonymity	0.00	.957	.000