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Abstract

People do not always behave the way they intend to – in many decision-making contexts there is an intention-behavior gap. This problem is addressed by behavioral economics by applying interventions that take into account psychological concepts of decision making. The EAST framework summarizes behavioral interventions in four principles that aim to make behavior simple, attractive, social and timely. The present randomized controlled field study has investigated whether it is fruitful to apply the EAST framework to increase survey participation, which is argued to be a behavior suitable to be addressed by behavioral interventions. For this purpose, interventions were implemented in the cover letter of a questionnaire, that was sent out to 1128 parents of 3rd graders in Vienna and Upper Austria. In experimental group 1 all four principles were applied: an action plan (simple), an identity prime (attractive), a social norm (social) and a salient deadline (timely). In experimental group 2 only two of these interventions (action plan, salient deadline) were applied. The effect of these interventions on response rate and time was compared to a control group. There is a tendency that the questionnaire was returned about one day earlier by experimental group 2 compared to the remaining groups. However, the results did not show a statistically significant effect of the interventions neither on response rate nor on time. Thus, increasing survey participation does not seem to be a promising field for applying the EAST framework. These results highlight the importance of thorough analyses of the context of decision-making and behavior before applying behavioral interventions.

Keywords: behavioral economics, EAST framework, intention-behavior gap, interventions, survey participation, questionnaires, response rate, response time

Introduction

As the scientific community more and more acknowledges, human beings are not one hundred percent rational in their decision-making. Even if people want and genuinely intend to do something, their behavior often differs quite remarkably. Indeed, the so-called *intention-behavior gap* is large – intentions get translated into action only about one-half of the time (Sheeran & Webb, 2016). A fact that most people can relate to, thinking of their new year's resolutions to do more sports or eat healthier, which they eventually never do.

Behavioral economics¹ try to bridge this *intention-behavior gap* by taking into account biases and barriers of intended behavior. The main idea behind this approach is to make a desired behavior as simple, convenient and visible as possible. Behavioral interventions build on psychological concepts of decision-making and implement a deeper understanding of human behavior. These interventions or *nudges* – as introduced by Thaler and Sunstein (2008) – have shown to be effective when trying to make people adopt a certain behavior in many areas like health (e.g., help people to quit smoking), sustainability (e.g., make people printing double-sided), finance (e.g., make people pay their taxes) and many more (for an overview see Hummel & Maedche, 2019). Ever since the nudging approach was specified, so-called *nudge-units* have progressively arisen. Probably the biggest and most influential *nudge-unit* is the Behavioural Insights Team (BIT). In 2014, the BIT established the EAST framework which tries to summarize important findings of behavioral science, yet does not claim to be complete. EAST is an acronym, referring to make actions easy, attractive, social and timely. These four principles possibly bridge the *intention-behavior gap* by enhancing the likelihood for a certain behavior to be conducted.

This work aims to apply the EAST framework to an already extensively investigated area, that is the increase of survey participation. Research in many scientific areas depends on surveys and questionnaires² to generate empirical knowledge. Survey research is one of the most frequently used tools in social science research and its importance has been recognized in all kind of fields (Baruch, 1999; Duncan, 1979). Questionnaires serve as a relatively low-cost, efficient and simple method to collect numerous people's perceptions, attitudes and circumstances in comparison to other methods (Sahlqvist et al., 2011). A lot of work, time and money is spent on the conduction of questionnaires. Since research is almost always conducted under budget constraints, cost-effectiveness is an important aspect. Clearly, with a low response

¹ The terms 'behavioral economics', 'behavioral insights' and '*nudging*' are used interchangeably in this work.

² The terms 'questionnaire' and 'survey' are used interchangeably in this work.

rate the costs of conducting surveys increase relatively to the benefit. Yet, in a lot of cases people do not take part in surveys. People are confronted with a huge amount of emails, paperwork, bills and advertisement every day. The request of participating in yet another survey can simply overwhelm or annoy them. They either do not see their personal advantage of taking part or they actually do want to take part but postpone it until they eventually forget about it.

Theories of survey participation (see Porter, 2004) indicate that it is a behavior that can be well approached with behavioral interventions. Consequently, behavioral insights have been successfully applied to encourage greater survey completion: On the one hand, in optimizing the cover letter or procedure (Behavioural Economics Team of the Australian Government [BETA], 2018; Johnson, Callahan, Chandler, & Markesich, 2017; Pemberton, 2018; OECD, 2017). On the other hand, in the questionnaire itself, i.e., the layout and the questions (Better Care Victoria, 2016). Many aspects have been investigated separately or even combined, yet never in the combination recommended by the EAST approach. There is still a lack of knowledge about which combination of measures possibly yields the best outcome in the response rate. This leads to the assumption that an elaborated framework, which recommends using several interventions, could help to increase response rates. For this reason, this study introduces the EAST framework to put single effective interventions into a conceptual framework. Until now, no published study has explicitly applied the EAST framework to increase response rates.

Aside and beyond the content of response rates, a particular interest of the present study lies in the systematic testing of the EAST approach. The EAST framework is a hands-on application tool for practitioners who implement the parts suitable for them. And even though it has been successfully applied across countries and sectors (for examples see BIT, 2015), there are not yet sufficient scientific tests of its effectiveness. It actually lacks an empirical basis when it comes to demonstrating the effects of the interventions developed. Thus, there is a need for evaluation studies (Eichhorn & Ott, 2019).

The aim of the present study is to examine the effectiveness of applying the EAST framework on interventions to increase the response rates of questionnaires. The effects are investigated in a field study using a randomized controlled trial. The sample consisted in parents of third graders who received and returned questionnaires through their children and their teachers. Thus, the practicability of this approach in daily routine of a school context is of particular interest. This study addresses the research gap in two ways: First, by systematically and empirically testing the EAST framework by applying it to a new area. Second, by adding to extensive research on increasing response rates by using an integrative framework of

behavioral insights. Besides, survey research is not yet advanced at all when it comes to the school context. Two main questions lead this study: First, does applying interventions according to the EAST framework in the cover letter of postal questionnaires increase response rates? Second, do these interventions even shorten the response time? Additionally – due to the practicability requirements of the school context – does a cover letter containing a reduced amount of EAST interventions increase the response rate to a satisfying level?

Theoretical background

Survey participation

Science demands for a high survey participation because of the larger amount of data and statistical power (Baruch & Holtom, 2008). Beyond that, a low response rate will most likely violate the representativeness of the sample, which is needed to be able to make predictions and conclusions about the population (Baruch & Holtom, 2008; Stoop, Billiet, Koch, & Fitzgerald, 2010). With a nonrepresentative sample, the likelihood of the non-response bias increases, which may occur when non-response is not random, thus leads to a biased interpretation of results (Groves, 1989; Porter, 2004; Shih & Fan, 2009). By minimizing non-response, this bias can be tackled. Consequently, high response rates are crucial to generate valid and reliable results and to ensure high quality research – although there is no agreed norm on how high the response rate should be to be acceptable (Edwards et al., 2002; Hox & DeLeeuw, 1994; Stoop, et al. 2010). Even the existing average response rate is hard to define because numbers differ throughout contexts and industries as well as meta-analyses possibly overestimate the response rate, since they only analyze published studies. Certainly, studies with low response rates might not be published or even submitted (Cook, Heath, & Thompson, 2000).

Scholars usually depend on the willingness of people to take part. Unfortunately, in most cases people do not respond to questionnaires for many different reasons. Numerous studies have been conducted to investigate possible influences on the decision to participate. According to Porter (2004), there are two different but at times overlapping theoretical approaches to study survey participation, that both have to be considered when designing a survey. First, the approach that acts on the assumption that the decision whether to respond to a questionnaire is reasoned and rational and is based on an active cost-benefit calculation. The costs could be considerations of time that has to be spent or the cost of privacy by answering personal questions (Stoop, et al., 2010). Benefits could be a good feeling by proclaiming one's opinion,

having done a civic duty or having helped someone out (Kropf & Blair, 2005). This approach often relies on the social exchange theory (Homans, 1958), that has been advanced by Dillmann (2000, as cited in Porter, 2004) in order to explain survey participation. Dillmann states that three factors need to be taken into account when designing questionnaires: increasing rewards (e.g., pre-paid incentives), reducing perceived costs (e.g., short and easy questionnaires) and establishing trust (e.g., notifying the authoritative sponsorship) that promised rewards will outweigh the costs.

The second approach emphasizes that the decision to participate in a survey is driven beyond rational processes. Psychological considerations like the use of heuristics (rules of thumb) when deciding whether to respond or not, appear to play a crucial role (Bednar & Westphal, 2006; Groves, Cialdini & Couper, 1992). The decision of survey participation appears to often follow a heuristic approach, because personal interest and relevance is low and therefore recipients are not willed to invest a lot of time or cognitive energy in this decision by making complex cost-benefit analyses (Groves, Cialdini & Couper, 1992). As a result, recipients will most likely base their decision on *peripheral cues*³ rather than rational information (Fan & Yan, 2010). A *peripheral cue* is a factor that lies outside the merits of an argument and that can be used to determine with relatively little effort whether a something should be evaluated positively or negatively (American Psychological Association [APA], 2020). Therefore, addressing heuristic processing seems to be effective when designing a questionnaire. Both approaches have been successfully applied to questionnaires (Fan & Yan, 2010).

Previous research has revealed the primary reasons for not responding to postal questionnaires. These are first, the questionnaire had got lost in paperwork, second, recipients were too busy and third, questionnaires had been routinely binned. Being confronted with many demands, individuals need to manage their time and prioritize activities, which naturally leads to not taking part in a questionnaire (Kaner, Haighton, & Mcavoy, 1998). Factors that can be used to enhance response rates have been studied extensively. Several meta-analyses have revealed effects of questionnaire length, personalization, pre-paid incentives, mentioning scarcity (i.e., highlighting an approaching deadline for participation or being a small selected group) and the personal relevance of the topic (for an overview see i.e., Edwards et al., 2002, 2007; Fan & Yan, 2010, Misra, Stokols, & Marino, 2012; Sheehan & McMillan, 1999).

³ Also see elaboration likelihood model (Petty & Cacioppo, 1986).

Behavioral economics

Behavioral economics is a discipline located at the intersection between economics and psychology and has evolved as a critique to the traditional paradigm of the *homo oeconomicus*, that reflected the predominantly assumption that human beings are fully rational in their decision-making. According to this view, humans act as if they hold all relevant information they need to make decisions that perfectly reflect their preferences, thus are accurately predictable (Rice, Hanoch, & Barnes, 2017). The relatively new discipline tries to introduce a more realistic picture of human decision-making, building on the assumption that individuals not always behave ideally in the sense that their behavior does not always reflect their intentions and attitudes, but rather is influenced by cognitive biases (Bicchieri & Dimant, 2019).

Behavioral economics builds on several decision-making theories. In the following the most important one will be introduced briefly. The dual process theory as introduced by Kahneman (2003) posits that human information processing and decision-making is based on two co-operating systems working together. System 1 is assumed to be the automatic system – fast, unconscious and associative. System 2 is the reflective system – slow, conscious and analytic. This theory – even though it has been criticized for its oversimplification (e.g., Grayot, 2020) – is one of the basis theories of the approach, as these systems are assumed to influence decision-making.

In 2008, Thaler and Sunstein introduced the nudging approach that specified the already existing and more or less explicitly and systematically used interventions of behavioral science: “A nudge, as we will use the term, is any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives.” (Thaler & Sunstein, 2008, p.6). By *choice architecture* the authors mean the environment and context of a person's decision-making that affects the choices people make. Choices can be presented in different ways, for instance the number or position of options can be relevant, as illustrated in the popular example of displaying food in cafeterias. In this example, healthy food that is placed in convenient places, i.e., in the beginning of the line, is picked significantly more often compared to when it is placed without reason (Thaler & Sunstein, 2008). In their approach Thaler and Sunstein elaborate on many more possibilities of designing the *choice architecture* in order to promote or inhibit a certain target behavior. These *nudges*⁴ are relatively easy to implement and low-cost alternatives to standard-economic interventions and most importantly, preserve the individual's freedom of choice at all times.

⁴ In this study referred to as ‘interventions’ following the EAST terminology, but both terms can be used interchangeable.

Nudges either try to address the automatic system (System 1) without individuals actively noticing the influence, or they try to activate the reflective system (System 2) in certain important decision contexts to elicit better decisions (iNudgeyou, n.d.).

Important aspects of designing behavioral interventions are: defining the outcome (preferably a quantifiable change of behavior), understanding and analyzing the decision context, identifying barriers and developing interventions that possibly overcome these by taking the individual's biases into account. Since it is a highly empirically driven approach it is crucial to evaluate the effectiveness of the interventions taken (preferably tested in a randomized controlled trial), and if necessary, adapt future interventions (BIT, 2014).

The EAST framework

The EAST framework ('Four simple ways to apply behavioural insights') was introduced in 2014 by the *nudge-unit* BIT. This unit was originally set up in the Cabinet Office of the United Kingdom in 2010, now it is organized as a company with offices in many countries around the world (Behavioural Insights Team [BIT], 2020). The purpose of this organization is to "[...] apply behavioural insights to inform policy, improve public services and deliver results for citizens and society." (BIT, 2020). EAST is a more simplified version of their former framework MINDSPACE and it is developed for policy makers to provide an intuitive, hands-on and easy tool for efficient policy making. The framework has evolved from years of experience of applying behavioral insights. The authors admit that, even though there is a lot of evidence that the recommended interventions are effective, users need to consider the context. Interventions do not work in all kind of areas to the same extent and can even – if misapplied – lead to unintended effects.

The EAST framework comprises four principles: making behavior as easy, attractive, social and timely as possible. Each of these principles in turn includes several possible interventions. According to the authors, any of the recommended principles can be combined, either all or only some aspects can be applied to one issue. The framework has been applied in its entirety to some areas to promote a desired behavior. Examples are health (National Health Service [NHS], 2016), marketing (Somerville, 2018) and professional training (Gloster et al., 2017). Still, there are many fields of possible application. Due to its orientation on practice, previous applications mostly were less explicitly, systematically and scientifically guided. The BIT does not specifically provide a theoretical basis for the principles and recommended interventions and each principle comprises several conceivable interventions. Therefore, the

four EAST principles and four possible interventions will be introduced and integrated into existing research in behavioral science.

Make it easy.

The first principle to encourage a behavior is making it as easy as possible. Interventions following this advice range from the well-known example of placing healthy food in a more reachable position to examples like simplifying tax letters. Another possible way to apply simplification of a behavior is to implement an *action plan*, a concrete plan about what needs to be done in order to actually perform a behavior, unpacking exactly what is required to do and putting it into a list of easy steps. Planning prompts nudge people to think about how and when they will conduct a certain behavior. In the best case, people make concrete plans themselves and then follow through on their intentions (Rogers, Milkman, John, & Norton, 2015). By providing individuals with a list of easy steps they are asked to complete, the desired behavior is presented as simple because a higher goal is divided into smaller manageable tasks thus focusing on one thing at a time is possible (BIT, 2019; Stretch, 2016; Teodorescu, 2016). Additionally, committing to a specific plan can reduce cognitive load and the burden on mental resources (Gollwitzer, 1999). People's mental resources are limited and can impair – when overburdened – decision-making. Cognitive load is associated with paying attention to, understanding and remembering necessary information which is relevant when being asked to show a certain behavior like survey participation (Paas & van Merriënboer, 1994).

Related to the *action plan* is the *endowed progress effect*, which means that people are more likely to follow a behavioral plan when it seems that they have already started the process. This can be accomplished by checking off the first step of a list of multiple steps, artificially indicating advancement towards the goal thus enhancing motivation to complete the goal (Nunes & Drèze, 2006). Artificial advancement means that the distance towards the goal is decreased while moving the goal away, consequently the task requirements remain the same. Research indicates that not only task completion gets more likely, but also completion time decreases (Nunes & Drèze, 2006; Farrell, Anzelone, Cullinan, & Wille, 2014). Additionally, reframing the task as one that has been started, but incomplete, rather than not yet begun, increases individuals' commitment to finishing the task (Nunes & Drèze, 2006).

Generally, action planning has been found to be very effective to make people follow-through their intentions on a wide range of beneficial behaviors, for example dieting, recycling and test preparation (for an overview see Rogers, Milkman, John, & Norton, 2015). Studies that applied behavioral insights on designing letters found that clear action steps that should be taken

in a certain time frame, yielded the highest percentages of the desired behavior compared to other interventions (Halpern & Gallagher, 2017; Johnson, Callahan, Chandler, & Markesich, 2017). Other research applied this behavioral intervention among other interventions and found that the desired behavior was conducted more often as well as faster (Farrell, Anzelone, Cullinan, & Wille, 2014). However, effects of only this specific intervention cannot be disentangled.

Originally, the *endowed progress effect* was found in consumer research. In a field experiment, consumers endowed with progress (two of 10 purchases already stamped) were more likely to buy the required eight car washes in order to get a free car wash than those required to buy eight (without any stamps). Moreover, they bought them sooner even though both groups technically needed to invest the same amount of effort (Nunes & Drèze, 2006). Another work that used a list of easy steps combined with endowed progress tried to increase program participation with behavioral interventions (Dechausay, Anzelone, & Reardon, 2015). Tested in a field study, the behavioral condition yielded in an overall 7.1% program uptake increase. Again, authors of this study used this intervention among others, thus the effect of only the endowed progress effect cannot be calculated separately.

Make it attractive.

The second principle evolving from the EAST framework is to make a behavior attractive. Questions that can be asked are: how can it be made visible, fun and appealing? Who is the recipient, who is the messenger and how can it be personalized? (Halpern & Gallagher, 2017). One way to effectively address attractiveness is emphasizing people's identity by implementing an *identity prime* (Sunstein, 2014). Priming is the effect where recent experience with a stimulus facilitates or inhibits the subsequent processing of the same or similar stimuli (APA, 2020a). Priming an identity can be achieved by mentioning or highlighting it, thus enhancing its salience (Klar, Madonia, & Schneider, 2014).

Salience is an important factor in behavioral economics. It means that something is particularly noticeable and eye-catching and that stimuli that have certain characteristics (such as color prominence or prominent positioning), attract more attention and are therefore better perceived and easier to process, which in turn influences decision-making processes (BETA, 2018; Higgins, 1996; Le Nestour, 2016).

According to the social identity approach (Tajfel & Turner, 1986; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987) individuals' self-concepts are based on their perceived group membership. One person can have many different identities depending on the social context

and groups. These social identities vary in their salience and have an important influence on individuals' self-esteem, preferences, attitudes, beliefs and actions (Fielding & Hornsey, 2016). Priming an identity will activate a self-image in recipients. If this self-image is consistent with the desired behavior, this behavior is more likely conducted because individuals aim to achieve self-image congruence (Heath & Scott, 1998; Hosany & Martin, 2012). Moreover, when attention is drawn to a positive self-image, individuals tend to behave in a way that maintains this positive self-image thus makes them feel or look good (BIT, 2014). Priming a certain identity, thereby enhancing its accessibility, can influence individuals' behavior in the direction of a behavior consistent with the concepts, interests or even stereotypes associated with the identity ingroup (Benjamin, Choi, & Strickland, 2010; Stryker, 1968 & Tajfel, 1981, as cited in Klar, Madonia, & Schneider, 2014). According to the identity-based motivation theory (Oyserman, Fryberg, & Yoder, 2007; Oyserman, 2009) *identity primes* may lead to readiness to action even if the action is not beneficial or liked.

There are several studies that primed a certain identity to measure effects on attitude or behavior. Those studies mostly recognized shifts in a stereotypical direction. For example, effects of racial identity on speech (Gaither, Cohen-Goldberg, Gidney & Maddox, 2015) and social interaction (Gaither, Sommers & Ambady, 2013); gender identity on math performance (Neuville & Croizet, 2007) and attitude towards math (Steele & Ambady, 2006) or scholar-athlete identity on verbal-reasoning performance (Stone, Harrison & Mottley, 2012). Empirical literature suggests that salient parental identity is generally linked to higher engagement in civic and political life like voting, participation of local meetings and signing petitions (for an overview see Klar, Madonia, & Schneider, 2014).

Make it social.

The third principle is about embedding a behavior in a social context. Humans are social beings, therefore they largely orientate their behavior on what those around them do, although these social influences often are implicit and without awareness (Greenwald & Banaji, 1995; Loschelder, Siepelmeier, Fischer, & Rubel, 2019). They tend to align their behavior to what is approved and popular (Cialdini, 2003). Accordingly, one can use the power of social influence by addressing certain factors like networks, norms or commitment (BIT, 2014). A frequently applied intervention is the communication of *social norms*. *Social norm* interventions are defined as interventions that elicit social expectations with the aim of inducing a certain behavior. They inform about the behavior of relevant others, thus lead to behavioral adaptation (Richter, Thøgersen, & Klöckner, 2018).

The theoretical basis for the application of *social norms* is the focus theory of normative conduct (Cialdini, Reno, & Kallgren, 1990). In this theory, Cialdini and colleagues differentiate between injunctive and descriptive norms. The descriptive norm is referred to as “the is“, namely what is actually done while the injunctive norm as “the ought“, i.e., what is approved or disapproved and possibly sanctioned (Cialdini, Reno, & Kallgren, 1990). This work will focus on descriptive norms, which describe how most people behave in a certain situation and therefore constitute what is typical or normal (Cialdini, Reno, & Kallgren, 1990; Misra, Stokols, & Marino, 2012).

More specifically, norms lead to expectations about what is right and what is wrong, thus help evaluating the appropriateness of an action (Bicchieri, 2016, Cialdini & Trost, 1998; Coleman, 1987, as cited in Kropf & Blair, 2005)⁵. Descriptive norms serve as a standard that guide behavior and that individuals like to conform to and from which they do not want to deviate (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). Individuals draw an internal value from performing an action according to a norm (Coleman, 1990, as cited in Kropf & Blair, 2005) and these valuations are added to cost-benefit calculations of performing a behavior like participating in a survey (Crawford & Ostrom 1995). The desire to imitate the behavior of relevant others and the preference for conformity thus influences decision-making (Bicchieri & Dimant, 2019; Halpern & Gallagher, 2017). Relevant others are people with seemingly similar characteristics who can serve as reference groups (Silva & John, 2017). Possible reference groups should be chosen deliberately and be specific and clear; these could be for instance same ethnic groups, gender, religious or political communities (Bicchieri & Dimant, 2019). Additionally, descriptive norms show which behavior usually is effective for other people, thus serve as a decisional shortcut for conducting good, right or reasonable behavior. Therefore, following *social norms* can be seen as an efficient heuristic, that allows to save some information processing energy in a decision-making context (Cialdini, Reno, & Kallgren, 1990).

Social norms and their effect on behavior is an extensively researched phenomenon and they have been found to be effective for all kinds of behavior, i.e sustainable behavior (e.g. Reno, Cialdini & Kallgren, 1993), health-related behavior (e.g. Ridout & Campbell, 2014; Robinson, Fleming, & Higgs, 2014) or civic behavior (e.g. Hallsworth, List, Metcalfe, & Vlaev, 2014; Gerber & Rogers, 2009; BIT, 2014). Few studies successfully used *social norms* to increase participation in questionnaires. Misra, Stokols and Marino (2012) showed that

⁵ Also see theory of social comparison processes (Festinger, 1954, as cited in Misra, Stokols & Marino, 2012).

participants of an online survey that asks about experiences at a congress are more likely to fill in the questionnaire when confronted with a descriptive *social norm* compared to those receiving a generic message without *social norms*. The group that received the following statement “Most years, over 75% of conference participants complete the survey. Please join your fellow participants in improving the quality of future conferences by filling out the survey.” had an around 13% higher response rate. A German study (Strauss-Ewerhardy, 2018) used a similar wording⁶ as Misra and colleagues (2012) and found a strong effect on response rates of a student satisfaction study. Lastly, a study tested the effects of *social norms* on the participation in questionnaires of top executives and found that the odds of response increased by 40% compared to when there was no *social norm* present (Bednar & Westphal, 2006).⁷

Make it timely.

The last principle coming from the EAST framework is to include an element of time to the behavior. Actually, it is proposed to make a behavior timely in the sense of trying to reach people in situations and times they are most likely to conduct the desired behavior. In other words, prompting people at times when they are most receptive is apparently most promising (Halpern & Gallagher, 2017; BIT, 2014). For example, it is effective to engage people in moments of transition like moving to a new home when e.g., a change of the energy supplier is requested, because they have not yet established a routine (Halpern & Gallagher, 2017). If it is not possible to determine the moment of engagement, it appears to be effective to generally add an element of time. This can be achieved by implementing a *salient deadline* which specifies until when the desired behavior should be shown (Fox, Crask, & Kim, 1988; Porter, 2004; Strauss-Ewerhardy, 2018). By keeping a deadline in mind, commitment can be increased; this helps participants to follow through a plan by suggesting an urgency of action (Dechausay, Anzelone & Reardon, 2015). Hence, clear instructions and goals combined with a *salient deadline* for completion can lead to higher response rates and shorter response time by avoiding misunderstanding about the expected behavior (Fox, Crask, & Kim, 1988).

Moreover, if plans and goals include a salient element of time, this might help to tackle procrastination (NHS, 2016). Procrastination means counterproductively delaying tasks to a point of feeling pressure and discomfort (Solomon & Rothblum, 1984). More specifically, tasks that are less urgent or more pleasurable are conducted in preference to more urgent or less

⁶ „Bei vergleichbaren Zufriedenheitsstudien nimmt regelmäßig ein hoher Prozentsatz der Studierenden unserer Universität an den Befragungen teil. Bitte schließen auch Sie sich Ihren Kommilitonen an und füllen Sie den Online-Fragebogen aus.“ (Strauss-Ewerhardy, 2018, p. 169).

⁷ “Over 5000 top managers and directors have responded to our prior surveys [on corporate governance and strategy].” (Bednar & Westphal, 2006, p. 46).

pleasurable tasks – leading to tasks being pending until last-minute with the risk of being not accomplished at all (Farrell, Smith, Reardon, & Obara, 2016).

Additionally, a deadline represents scarcity which in turn influences behavior. Its persuasion works through the perception that things that are rare or hard to get, are valuable (Cialdini, 2007). Moreover, if individuals are being limited in their ability to get something, they feel as being limited in their freedom which makes them want it even more. It is possible to suggest scarcity by limited quantity or limited time (Cialdini, 2009, as cited in Strauss-Ewerhardy, 2018). Hence, people should be more likely to participate in a questionnaire when the opportunity to do so is limited, for instance by limiting the time frame in which participation is possible. Presenting a *salient deadline* therefore could make participation appear more valuable (Groves, Cialdini, & Couper, 1992; Porter, 2004). However, not only indicating a deadline is crucial, but to do it in a way that recipients will notice it, by increasing its salience.

Previous research shows mixed results concerning the use of deadlines to promote a desired behavior (see Porter, 2004). One meta-analysis shows an overall positive effect for using deadlines or a cut-off date on response rates (see Fox, Crask, & Kim, 1988). Some studies suggest a strong positive effect of *salient deadlines* on response rates (Martin, 2009; Strauss-Ewerhardy, 2018) and of self-imposed deadlines on task completion (Brunnermeier, Papakonstantinou, & Parker, 2013). Moreover, there are studies that used a deadline among other behavioral interventions which in total led to positive outcomes, however effects cannot be disentangled (Dechausay, Anzelone, & Reardon, 2015; NHS, 2016). For instance, one study used a scarcity statement (that participants had been selected as part of a small group) and combined it with a scarcity element of time (a deadline), which raised the response rate around 8% (Porter & Whitcomb, 2003). Previous work shows that initial response rates can be increased but in the long run (when the deadline expired), convergence occurs since the control group still keeps returning and the deadline group's return comes to a halt (Ferris, 1951; Henley, 1976; Roberts, McCrory, & Forthofer, 1978). Other studies and a review that investigated 12 techniques for increasing response rates assert that the specification of a deadline does not influence response rates at all (Duncan, 1979; Fox, Crask, & Kim, 1988; Pressley, 1978). Altogether, results are not consistent, thus further investigation is needed.

This outline of the theoretical and empirical background illustrates that each of these four interventions was applied to encourage a certain behavior and can be integrated into the EAST framework. Some were explicitly tested for survey participation, others for comparable behaviors. Yet, to date there is no study, which systematically applied interventions on the basis

of EAST to survey participation. Given the facts that first, a high response rate is a crucial aspect to guarantee representative samples thus high-quality research, second, survey participation theories indicate that the application of behavioral interventions might be fruitful to increase response rates and third, the practical evidence shows a considerable potential of EAST interventions, this study aims at systematically applying this framework to increase response rates. Thus, this study adds to the existing research by providing empirical evidence for the effectiveness of the framework and by investigating the effects of behavioral interventions on response rates and times. Moreover, the practical application possibilities are of particular interest in this study in order to be able to provide an additional value for practitioners, like in this case teachers. Hence, an easier option to apply interventions is tested, that is, only two of four principles of EAST are applied in the cover letter. If the effect of only these two interventions was sufficient, teachers could easily use these interventions in their routine for parent communication since the practicability for these interventions appears to be higher.

Hypotheses

Drawing on the theoretical background it is expected that all four interventions increase response rates. In line with empirical evidence of previous research, especially two interventions – *action plan* and *salient deadline* – are expected to decrease response times, because an *action plan* serves as a prompt to action, whereas a *salient deadline* is expected to make the time frame of the behavior less abstract and to provide a very clear call to action in the near future. Applying all four interventions (Treatment 1) is expected to have a higher effect on response rate and time than applying only half (Treatment 2).

H1: In Treatment 1 leads the average response rate is higher than in the control group and Treatment 2; in Treatment 2 the average response rate is higher than in the control group.

H2: In Treatment 1 the average response time is lower than in the control group and Treatment 2; in Treatment 2 leads the average response time is lower than in the control group.

Method

Study context and sample

The present study was conducted within a large field study of the Institute of Advanced Studies in Vienna with the topic ‘promoting unprejudiced learning’. This field study aimed at making conclusions about third graders’ learning behavior by – among other interventions – collecting parents’ attitude and beliefs concerning the topic. Thus, a two-page questionnaire was sent out to the parents. The language of the questionnaire and cover letter was German. The sample consisted of 1128 parents of third grade children in 60 classes of 39 primary schools in Austria. One half of the schools ($n = 19$) was located in Vienna, the other half ($n = 20$) in Upper Austria, a rather rural region. For the sampling a list of all schools in Vienna and Upper Austria was used, then schools were chosen randomly. In Vienna only schools of the central districts two to nine were included, due to logistic reasons (note that these are on average higher in socio-economic characteristics). Not more than two classes per school were included. When there were more than two third grade classes in a school, classes were chosen randomly. Participation in the study was voluntary for all schools, classes and individuals. There is no demographical data like sex or age available for the parents nor their children. The highest education level in the family can be gathered from the respective questionnaire, consequently this information is only available for participants who returned the questionnaire.

Operationalization

Building on the theoretical background, the following interventions were implemented in the cover letter accompanying the postal questionnaire (for a visual impression see Appendix B).

Independent variables.

Make it easy. To apply the first principle, the intervention of an *action plan* was used to decrease cognitive load and anticipated costs by reducing the amount of perceived work. The *action plan* was operationalized by a list of four easy steps: 1. “Read the cover letter”, 2. “Fill in the questionnaire (max. 10 min)”, 3. “Put it in the attached return envelope” and 4. “Return it to your child for school”. The first step was already ticked off to demonstrate artificial advancement towards task completion to increase motivation. This *action plan* was placed in an extra box at the end of the cover letter.

Make it attractive. To apply the second principle, the intervention of an *identity prime* was used. On the one hand, the parental identity was emphasized to attract attention, to enhance

personal relevance of the questionnaire's topic (namely, their children's learning behavior) and to indicate the participation was part of their social or civic duties. On the other hand, an expert identity was subtly emphasized to make participants wanting to maintain this positive self-image of being an expert with a valuable and important opinion, thus making them conduct the expected behavior. These two identities were combined and primed by the sentence within the text: "You as parents know best about your child, thus your opinion is an important part of our study."

Make it social. To apply the third principle, the intervention of a descriptive *social norm* was used to make participants want to conform to the norm, to make them want to reduce the perceived costs of deviating from the norm, and to provide them with an heuristic that is easy to follow. As a specific and relevant reference group, the group of 'other parents' was chosen to make sure participants identify with the reference group. Following Misra and colleagues (2012), the descriptive norm was operationalized by the sentence: "In a comparable study, 81,3% of the parents filled in the questionnaire. Join the other parents and thus support us in our research on the learning behavior of children." The number is based on a study of Kosse Deckers, Pinger, Schildberg-Hörisch, and Falk (2017) who reached this response rate in a questionnaire conducted with parents in Germany. The source of information was cited below the *social norm*. The *social norm* was placed in an extra box.

Make it timely. To apply the fourth principle, the intervention of a *salient deadline* was used to make the time frame less abstract, to tackle procrastination by increasing the impression of the urgency of participating and to make participation appear more valuable by indicating temporal scarcity. The *salient deadline* was operationalized by placing the information of the last day of return in a colored, extra box, designed like a stamp, in a highly visible position near the *action plan*.

Dependent variables.

Response rate. Response was measured as a binary outcome variable (0 = not responded, 1 = responded). Building on this, the response rate was computed.

According to the American Association for Public Opinion Research, there are several ways to define the response rate, depending on how partial interviews and unknown eligibility are handled, leading to lower or higher rates. This study used the definition called *response rate 2*, in that the response rate is the number of complete and partial interviews with reporting units divided by the number of eligible reporting units in the sample (AAPOR, 2016). This measure

was used because sensitive information was being asked and partially completed questionnaires were expected.

Response time. The response time was measured in days; calculated from the date on which the questionnaire was handed to the children until the date it was returned to the teachers.

Study design

The study design is a randomized control trial with a between subject design, comprising two experimental groups (Treatment 1 and Treatment 2) and one control group. These three groups form the independent variable condition. Condition was randomized on an individual level (within classes) in an attempt to lower confounding class or teacher effects. This means that in each class there was roughly one third of pupils assigned to control group ($n = 410$), one third to Treatment 1 ($n = 368$) and one third to Treatment 2 ($n = 350$). The control group received a questionnaire with a standard cover letter that contained the aim of the study, reasons to participate, the procedure and the deadline. The first experimental group (Treatment 1) received the same questionnaire and the same standard cover letter extended by all four interventions of EAST. The second experimental group (Treatment 2) received the same questionnaire and the same standard cover letter extended by only two interventions of EAST: the first principle ‘make it easy’ (*action plan*) and the fourth principle ‘make it timely’ (*salient deadline*).

Procedure

The participants did not know that they were part of a field study. Regarding ethical concerns, no negative consequences for the participants were expected at any time. The randomization was conducted online with the tool ‘random sequence generator’⁸. Each participant was represented by a code. No link could be established between the code and the participant, so anonymity was guaranteed. The program randomly allocated these codes to the control group, Treatment 1 or Treatment 2 for each class, which then was transferred to an excel file. Questionnaires and three different versions of cover letters were printed, and each questionnaire was identified with a code (by sticking it on). According to the allocation made, each questionnaire was accompanied by the corresponding cover letter and put into envelopes.

The envelopes were handed to the children by the teachers in January 2020. In turn, children were asked to hand them to their parents. Once the parents filled in the questionnaires, the children had to give it back to their teachers. Blank envelopes were provided together with

⁸ <https://www.random.org/sequences/>

the questionnaires in order to ensure an anonymous return. Teachers then were asked to note the date of return on each envelope received. The deadline was 10 days after handing the envelopes to the children, though they were still accepted and included when they were returned later. Finally, the envelopes with the completed questionnaires were picked up from the schools to be evaluated. 664 envelopes were returned in total. Each envelope was opened and visually scanned for the following criteria: First, the code was still sticking on the questionnaire (necessary to allocate the code to the condition) and second, the questionnaire was at least partially completed (necessary because a blank questionnaire does not meet the response rate operationalization). Questionnaires that were not returned or did not meet these criteria were recorded 0 (= not returned), others were recorded 1 (= returned). This procedure led to 653 usable questionnaires that were recorded 1. If available, the date of return noted by the teachers was calculated into days. The education level was retrieved from the questionnaires and transformed to an ordinal scale with 0-5 levels, of which 0 means having no or low degree and 5 having an academic degree. The data was then exported to SPSS.

Statistical analysis

Data were analyzed using SPSS (IBM Statistics SPSS 26 for Windows, 2019). For all statistical tests an alpha level of .05 was set.

A hierarchical system was assumed, since data was acquired in classes of schools. Resulting in nested data, dependence among observations is very likely. A multilevel model was therefore indicated (Field, 2013). Since not many classes ($n = 60$) were distributed across schools ($n = 39$), a two-level model was conducted with response (Level 1) being nested in schools (Level 2).

To test the effect of the independent variable on response rate (H1) a multilevel logistic regression analysis was conducted. For analyzing the effect on response time (H2) a multilevel linear regression analysis was conducted. Models were built stepwise following the procedure of Heck, Thomas and Tabata (2013). First, a null (unconditional) model was conducted. By adding random intercepts into the model, the intercepts of the model were allowed to vary across contexts, so that the variability of the outcome across higher levels can be estimated. Therefore, the intraclass correlation (ICC) was computed to analyze the variance of the data (Heck, Thomas, & Tabata, 2013). The ICC describes the proportion of variance between units. Consecutively, predictors were included into the model as fixed effects and analyzed in terms of significance. Lastly, differences in model fit were examined by using the Akaike Information Criterion (AIC; Akaike, 1973) and the Bayesian Information Criterion (BIC; Schwarz, 1978).

Smaller values indicate a better fit for both of the criteria. In case random effects did not indicate variance between contexts, multilevel methods were replaced by a one-way ANOVA.

Data requirements.

Several tests were conducted to test if the data meet the requirements for calculating a multilevel model. Multilevel models base on the same assumptions as regressions (Meteyard & Davies, 2019). For H1, requirements are dichotomy of the dependent variable, categorical or continuous predictors, independency of observations – in the sense that are no repeated measures or matched data because dependency of data concerning hierarchy is explicitly expected) – absence of multicollinearity and linearity of independent variables and log-odds. Present data met these requirements. For H2, requirements are linearity of independent and dependent variables, multivariate normality, homoscedasticity, absence of multicollinearity and absence of auto-correlation. Present data met these requirements to a satisfying level except for multivariate normality and homoscedasticity. Central limit theory states that if sample size is high enough ($N > 50$) this requirement can be neglected (Pek, Wong, & Wong, 2018).

Regarding sample size, a minimum of 50 units in Level 1 and 40 units in Level 2 is assumed to be sufficient when intercept variance is relatively small (Sommet & Morselli, 2017). This requirement is met by the present data. For H1 (response rate) there was no missing data ($N = 1128$). For H2 (response time) data was only available for Vienna due to procedural issues. Even of the data obtained in Vienna not all information about response time is available ($N = 250$). This accumulates in a loss of about 62% of the data. Therefore, response time assumptions can only be made for the sample in Vienna. The missing data is assumed to be completely at random, leading to the appropriateness of the listwise deletion method, which reduces the sample size instead of imputing values. Therefore, SPSS computes tests with the data available (Heck, Thomas, & Tabata, 2013a).

Additional analyses

Several additional analyses without a-priori hypotheses were conducted. First, extreme groups (classes with response rates greater than 80% and smaller than 20%) were excluded and multilevel modeling was repeated for examining the adjusted effect of the interventions on response rate. Regarding the response time with extreme values being excluded, a one-way ANOVA was conducted. Extreme values were considered as greater than 10, since the deadline of return was 10 days after handing out the questionnaire. Second, the effect of location (0 = Upper Austria, 1 = Vienna) on response rate was estimated by including the variable as a predictor into the multilevel model. Since data of response time is only available for Vienna,

this could not be analyzed for Hypothesis 2. Lastly, it was investigated whether responders across all conditions and locations differ in their education level using a Kruskal-Wallis test. The distribution of observed data and expected (census) data (Statistik Austria, 2018) was compared. This test was conducted using a chi²-test in Microsoft Excel (Version 16.40). Regarding the response time, a spearman correlation was conducted to test the relationship between response time and education level. Note that neither location nor education level were manipulated, thus assumptions are only approximate.

Results

Main hypotheses

Response rate.

As displayed in Table 1, response rates did not differ much between groups. These descriptive results were subsequently examined on the basis of inferential statistics.

Table 1

Response rate across conditions

		Control group	Treatment 1	Treatment 2	Total
Response 0/1	0	161	161	153	475
	1	249	207	197	653
Total		410	368	350	1128
Response Rate (%)		61	56	56	57.7

Note. Response: 0 = not responded, 1 = responded

To test Hypothesis 1, multilevel models were conducted (see Table 2). With the variance estimates calculated in the null model (model 0a), the ICC was computed, revealing that approximately 20% of variance exists between schools ($z = 3.2$, $p = .001$). Thus, the z-test results suggest intercept variance between Level-2 units. This result demonstrates the appropriateness of developing a multilevel model. Subsequent modeling consisted in adding the Level-1 predictor condition as a fixed effect (model 1a). The intercept is 0.64 ($t = 3.53$, $p < .001$). Fixed effects are Treatment 1 ($b = -.18$, $p = .12$) and Treatment 2 ($b = -.17$, $p = .27$) (for further details see Table 3). Results indicate that condition is not a significant predictor of response rate, $F(2, 1125) = 1.38$, $p = .25$. H1 therefore is rejected. Model fit as displayed in AIC/BIC decreases compared to the null model [$AIC(\text{Model } 0a) = 4971.84 < AIC(\text{Model } 1a) = 4978.14$].

Table 2

Overview of multilevel models (Hypothesis 1)

	Response rate	
Sampling Units	$N = 1128$; schools $n = 39$; classes $n = 60$	
Model Name	Model 0a	Model 1a
Model Specification	Null (RE ⁹ only)	FE ¹⁰ Main Effects
Fixed Effect Added	-	Condition
Random Effect		
School	Intercept	Intercept
Model Fit		
AIC	4971.84	4978.14
BIC	4976.86	4983.17
-2LL	4969.86	4976.14
df1	0	2
df2	0	1125

Table 3

Multilevel Model 1a

	Response rate			
	Estimate	SE	95% CI	<i>p</i>
Fixed effects				
Intercept	0.64	0.18	[0.29; 0.99]	<.001*
Treatment = 1	-0.18	0.12	[-0.42; 0.05]	.12
Treatment = 2	-0.17	0.16	[-0.48; 0.13]	.27
Random effects				
School (Intercept)	0.84	0.26	[0.46; 1.55]	.001*

Note. P-values marked with * represent significant values.

Response time.

The response time of Treatment 2 appears to be lower than the response time of Treatment 1 and the control group (see Table 4). This result was subsequently tested with inferential statistical tests.

⁹ RE = random effects

¹⁰ FE = fixed effects

Table 4

Response time across conditions

	<i>M</i>	<i>SD</i>
Control Group	5.27	3.68
Treatment 1	5.08	3.98
Treatment 2	4.21	3.23
Total	4.90	3.67

Note. Response time is measured in days.

When conducting a null model for response time, the z-test reveals a non-significant intercept ($z = 0.72, p = .47$), indicating that there is no significant variance between schools (for further details, see Appendix C). Consequently, as recommended by Heck et al. (2013), a one-way ANOVA was conducted to test whether response times differ across conditions. The sample size for each condition was control group ($n = 98$), Treatment 1 ($n = 80$), Treatment 2 ($n = 72$). This test yielded no significant effect of the interventions on response time $F(2, 247) = 1.86, p = .16$. Pairwise comparisons reveal that there tends to be a difference between Treatment 1 and the control group. More specifically, response time in Treatment 1 by trend is approximately one day shorter than in the control group, though this effect is not significant ($p = .06$). H2 therefore is rejected.

Additional analyses

Excluding extreme groups.

Response rate. The model 1a– (see Table 5 for an overview, see Table 6 for details) was conducted including only the middle 60% of classes ($N = 805$). This procedure was used to calculate the effects when classes with extreme response rates (greater than 80% and less than 20%) are excluded. Results indicate that condition still is not a significant predictor, $F(2, 802) = 0.73, p = .48$. Fixed effects are Treatment 1 ($b = -0.15, p = .27$) and Treatment 2 ($b = -0.13, p = .43$). Model fit increases compared to the Model 1a that included all classes [$AIC(\text{Model 1a–}) = 3443.35 < AIC(\text{Model 1a}) = 4978.14$].

Table 5

Overview of multilevel Model 1a–

	Response rate
Samplig Units	$N = 805$ schools $n = 29$ classes $n = 42$
Model Name	Model 1a–
Model Specification	FE Main Effect – Extreme groups
Fixed Effect Added	Condition
Random Effect	
School	Intercept
Model Fit	
AIC	3443.35
BIC	3448.03
-2LL	3441.34
df1	2
df2	802

Note. Model names refer to the models built for the main hypotheses (Table 2), indicating that additional models are based on them.

Table 6

Multilevel model 1a–

	Response rate			
	Estimate	SE	95% CI	<i>p</i>
Fixed effects				
Intercept	0.27	0.14	[-0.01; 0.54]	.06
Treatment = 1	-0.15	0.14	[-0.43; 0.12]	.27
Treatment = 2	-0.13	0.16	[-0.45; 0.19]	.43
Random effects				
School (Intercept)	0.21	0.11	[0.08; 0.56]	.048*

Response time. To calculate the effect of the interventions on response time when extreme values are excluded, a one-way ANOVA was conducted. Extreme values were considered as greater than 10 days. Excluding outliers out of the sample leads to a sample size of $N = 226$, with control group ($n = 86$), Treatment 1 ($n = 72$), Treatment 2 ($n = 68$). This test

leads to no substantial changes in the parameters. Condition is still not a significant predictor of response time, $F(2,223) = 1.19, p = .31$.

Location.

General response rate seems to be higher in Upper Austria ($n = 474$) with around 72% than in Vienna ($n = 654$) with around 47%. The distribution of conditions does not differ across locations ($\chi^2(2) = 0.08, p = .96$). After including the Level-2 predictor location as a fixed effect into the previous model 1a (yielding in model 1a+, see Table 7) results indicate that location has an effect on response rate, $F(1,1124) = 22.49, p < .001$. In Vienna the likelihood to respond is decreased compared to Upper Austria. Using the odds ratio (OR = 0.29, 95% CI: 0.18; 0.49, $p < .001$) to calculate the likelihood of responding yields in the likelihood to respond being approximately 3.5 times higher in Upper Austria (for details see Table 8). Model fit increases when adding location into the model [$AIC(\text{Model 1a+}) = 4975.66 < AIC(\text{Model 1a}) = 4978.14$].

Table 7

Overview of multilevel Model 1a+

	Response rate
	$N = 1128$
Sampling Units	schools $n = 39$ classes $n = 60$
Model Name	Model 1a+
Model Specification	FE Main Effects + Location
Fixed Effects Added	Condition, Location
Random Effect	
School	Intercept
Model Fit	
AIC	4975.66
BIC	4980.68
LL	4973.66
df1	3
df2	1124

Table 8

Multilevel Model 1a+

	Response rate			
	Estimate	SE	95% CI	<i>p</i>
Fixed effects				
Intercept	1.26	0.23	[0.81; 1.71]	<.001*
Treatment = 1	-0.20	0.12	[-0.42; 0.05]	.12
Treatment = 2	-0.17	0.16	[-0.48; 0.13]	.27
Location = 1	-1.23	0.26	[-1.74; -0.72]	<.001*
Random effects				
School (Intercept)	0.47	0.17	[0.24; 0.94]	.004*

Note. Location 0/1, 0 = Upper Austria, 1 = Vienna.

Education level.

Overall education level of responders seems to be higher in Vienna ($M = 4.05$, $SD = 1.38$) than in Upper Austria ($M = 3.37$, $SD = 1.26$). Almost no differences in the mean of education level across conditions was found (see Table 9).

Table 9

Education level across conditions

	<i>M</i>	<i>SD</i>
Control group	3.68	1.37
Treatment 1	3.69	1.38
Treatment2	3.71	1.35

Note. Education level 0-5 with 5 being the highest (academic degree).

Data is only available for responders who specifically answered the question about their education level ($N = 633$; Upper Austria $n = 330$; Vienna $n = 303$). Responders in Vienna ($M = 4.05$, $SD = 1.38$) have a higher average education level compared to responders in Upper Austria ($M = 3.37$, $SD = 1.26$). This difference in the mean of education level was tested with a Kruskal-Wallis test and found significant, $\chi^2(1) = 50.52$, $p < .001$. Census data of Statistik Austria (2018) was compared to observed data and results show that the observed data differ significantly from the expected data. In the observed data lower education levels 1 (no degree/ grammar school) and 2 (vocational school) are significantly underrepresented, whereas the highest education

level 5 (academic studies) is strongly overrepresented. This is the case for both Vienna ($\chi^2(4, N = 257) = 64.77, p < .001$) and Upper Austria ($\chi^2(4, N = 169) = 83.52, p < .001$).

To examine if there is a difference in the means of education level across conditions a Kruskal-Wallis test was conducted. Results indicate that the means do not significantly differ between conditions ($\chi^2(2) = 0.02, p = .99$). Also, (as descriptively displayed in Table 10) the distribution of education levels in the observed data does not differ between conditions ($\chi^2(10) = 3.32, p = .97$). Regarding the response time, a spearman correlation reveals a non-significant correlation between response time and education level ($r_s(246) = -.08, p = .24$).

Table 10

Distribution of education levels across conditions

Education Level	Observed			Expected
	C	T1	T2	Austrian Average
1	5	5	3	18
2	20	19	22	47
3	20	19	18	11
4	10	13	13	7
5	45	44	44	17
Total	100	100	100	100

Note. Values displayed in percentages. Education levels are: 1. no degree/grammar school, 2. vocational school, 3. vocational high school, 4. general high school, 5. academic studies

Discussion

Previous work showed that applying interventions of the EAST framework can be an effective tool to influence behavior. Nevertheless, empirical and systematic tests are still lacking. The aim of this study was to investigate whether it is fruitful to apply the EAST framework to increase survey participation. This aim arose from two reasons: First, to add to existing research of the application of the EAST framework by testing its effectiveness in a randomized controlled trial. Second, to test whether there is a simple way to increase response rates, since high survey participation is crucial to achieve representative samples which in turn is essential for high quality research. For this purpose, a field study was conducted, in which EAST interventions were implemented to the cover letter of questionnaires that were sent to parents of third graders.

This study analyzed two main questions: First, does applying interventions recommended by the EAST framework to the cover letter of a questionnaire have an effect on the response rate (H1) and second, how does it influence the response time (H2)? Previous research and theoretical analyzes corroborated the hypothesis that response rates would increase whereas response times would decrease when applying behavioral interventions. Moreover, this study aimed at analyzing the effect of the full application of EAST interventions (Treatment 1) compared to a reduced amount of interventions (Treatment 2). In short, the application of EAST was operationalized in the following interventions: *action plan* (easy), *identity prime* (attractive), *social norm* (social) and *salient deadline* (timely). Treatment 1 included all four interventions in the cover letter, whereas Treatment 2 only included the two interventions *action plan* (easy) and *salient deadline* (timely).

Summary of results

Response rate.

Results of developing several multilevel models show that there is no difference in response rates between control and experimental groups. This applies to both Treatment 1 and Treatment 2. This finding indicates that applying EAST interventions to the cover letter has no significant effect on the response rate. Therefore, Hypothesis 1 is rejected. It was noticeable that in some classes the response rate was extreme (near 1/near 0). This could lead to the interventions were not being able to take effect at all. Therefore, in an additional analysis, these extreme groups were excluded, and the effects of the EAST interventions were recalculated. A multilevel model was developed, yielding no significant effects of the interventions. These

results indicate that the effect of the EAST interventions on response rate was not distorted by extreme groups.

Response time.

The effect on response time was analyzed with a one-way ANOVA. Results show that there is no significant effect of the interventions on response time. Therefore, Hypothesis 2 is rejected. Yet, analyses indicate that by trend participants who received the Treatment 2 letter, actually did return the questionnaire about one day faster compared to the control group, even though this effect is not statistically significant. Also, a one-way ANOVA did not show a significant effect of the interventions on response time, when extreme values were excluded (response times of more than 10 days). Again, these results indicate that the effect of the interventions was not distorted by extreme groups.

Nevertheless, this can be considered a relevant finding. Taking into account the small sample size of 250 participants, which was only available for testing this hypothesis, it can be argued that with the full sample, this difference in response time would have been significant. Treatment 2 consisted in the implementation of an *action plan* and a *salient deadline*. These two interventions in particular were assumed to have an impact on response time. Surprisingly, only the reduced EAST application (Treatment 2) tends to have an effect on response time, although the full application also includes these both interventions.

Despite the finding that Treatment 2 by trend was associated with shorter response times, both main hypotheses were rejected. This study was the first to systematically apply the EAST framework to increase survey participation, hence no previous empirical evidence was given for the effectiveness of this measure. However, it was not expected that the applied interventions do not have any effect. The literature review suggests that behavioral insights in general and the EAST framework in particular have been applied successfully to encourage certain behaviors. Within the framework several interventions are conceivable, some are explicitly described by the authors, others could be added on the basis of the four principles. Since the framework does not provide a theoretical basis of the principles and interventions recommended, this study chose interventions that could be based on a theoretical foundation. Thus, all interventions that have been applied are theoretically grounded and empirically supported. Nevertheless, this study could not replicate the empirical evidence which has already been outlined of all four interventions. These results could have several explanations. First, explanations related to the application of the interventions and second, explanations related to the target behavior will be discussed.

Application of the interventions.

Several interventions were combined and tested at the same time; hence it is not possible to conclude which one was or was not effective. Potentially, one intervention backfired so much, that it cancelled out the effects of other interventions that would have been successful if tested separately. The finding that the reduced amount of EAST interventions was more effective for response time than the full amount (at least by trend), suggests that this could actually be the case. Indeed, ‘the more the better’ might not apply for using behavioral interventions: Sometimes combining multiple interventions can even lead to backfire effects and therefore worse outcomes (Hauser, Gino, & Norton, 2019). Hauser and colleagues (2019) criticize that many academics and practitioners want to tick off all the letters of the EAST framework in an attempt of getting the best possible results. This procedure, however, is argued to be the opposite of a reasoned and tailored approach of using behavioral interventions, which should address specific contexts. Nor does the BIT itself demand that all principles have to be applied for interventions to be successful.

Notwithstanding, for the specific behavior of survey participation, combining multiple interventions and using them simultaneously have found to be more effective than using single interventions (Lawlor & Dempsey, 2019). As Misra and colleagues (2012) also demand, it is necessary to do more research in the investigation of joint influences of various interventions on response rates, comparing separate, additive and interactive effects.

Target behavior.

Originally, the *nudge approach* was established for target behaviors, which individuals themselves genuinely want to do, but for many different reasons and barriers do not. Hence, it addresses behaviors for which an *intention-behavior gap* exists. Ideally, the target behavior is something that is beneficial for the individual and/or beneficial for the society (Bicchieri & Dimant, 2019) – even though the private sector increasingly (mis)uses this approach for its own purposes, i.e., in marketing. Considering this, it is legitimate to discuss whether survey participation really is a behavior which is affected by the *intention-behavior gap* and therefore is fruitful to be addressed with behavioral interventions. As compared to behaviors with an obvious and direct benefit to the individual – for instance healthy nutrition or physical activity – survey participation itself rarely provides direct benefits to the responder. Thus, it seems to be a rather untypical target behavior to be addressed with behavioral interventions. Nevertheless, considering the main reasons for not responding, to some point an *intention-behavior gap* indeed can be assumed. The reasons of being too busy, routinely binning

questionnaires and forgetting and eventually losing the questionnaire give the impression that an intention to participate exists in the first place (Kaner, Haighton, & Mcavoy, 1998).

Furthermore, as outlined before, theories of survey participation (see Porter, 2004) do indicate that it is a behavior that can be well approached with behavioral interventions by addressing the two processing systems that underly decision-making processes (dual process theory, Kahneman, 2003). Considering social exchange theory, participants seem to make cost-benefit calculations to some extent when deciding about survey participation. Costs can be effort or time spent on filling the questionnaire in, whereas benefits may not be directly, but could consist of the good feeling of doing someone a favor or of having made a contribution to science (Kropf & Blair, 2005; Stoop et al., 2010). Some of the interventions applied in this study addressed these calculations that are assumed to be conducted by the reflective system. The *action plan* for instance, could reduce perceived costs by transforming the behavior of survey participation into easily conductible steps.

Then again, survey participation theories indicate that the decision to participate appears not to be completely rational but is rather a behavior that is not actively reflected, which makes it a primary application area for behavioral interventions (Mont, Lehner, & Heiskanen, 2017). In this study, some interventions served as *peripheral cues* that addressed the automatic system that relies on heuristics. *Social norms* for example can serve as a heuristic by showing which behavior is usually effective for other people (Cialdini, Reno, & Kallgren, 1990).

Additional findings

Location.

Some exploratory analyses were conducted, which means that no a priori hypotheses were raised before the study was conducted, thus the conditions were not actively manipulated, and effects can only be estimated approximately. Due to the sample being divided into schools in Vienna and Upper Austria, it was evident to test whether location is associated with differences in response rates. Apparently, participants in Upper Austria had a 3.4 times higher likelihood to respond than participants in Vienna. Unfortunately, response times were only available for Vienna, this analysis could not be examined on this outcome.

One possible explanation for this finding is that there might be differences in participants' attitudes, interests, occupation/time or commitment due to the rather rural (Upper Austria) as compared to the urban environment (Vienna). For instance, civic participation and particularly unpaid volunteer work – which would include survey participation – tends to be higher in rural regions (Turcotte, 2005).

Moreover, class size was lower in Upper Austria, which might lead to differences in teacher-pupil and teacher-parent relationships. Some research indicates that the interaction between teachers and pupils enhances with reduced class size (Blatchford, Moriarty, Edmonds, & Martin, 2002; Finn, Pannozzo, & Achilles, 2003). This could yield in teachers being more eager to demand for questionnaire returns. Concerning the effects of class size on parent involvement, it is conceivable, that teachers in small classes have more time to make effort in involving parents. Yet, previous research shows mixed results: Some indicate that smaller class size correlates with higher parental involvement (Bonesrønning, 2004), others do not find this effect (Hoover-Dempsey, Bassler, & Brissie, 1987). Future research therefore is needed to further investigate on this finding.

Education level.

Another exploratory analysis was conducted with the data of education levels which was only known for responders, and more specifically, only for those responders who actually stated their education level. To be able to approximately estimate how education is related to response rates, census data were consulted to estimate the general distribution of education levels in the population. Responders in Vienna have a significantly higher average education level compared to responders in Upper Austria, which adequately reflects the real distribution within the Austrian population. Moreover, results revealed that the education levels of responders significantly differ from the expected data of the population, both in Vienna and Upper Austria. Low education levels (no degree/ grammar or vocational school) were underrepresented and high education levels (academic degree) were strongly overrepresented in the observed data. The analysis whether the responders of different conditions differ in terms of their average education level yielded no significant differences between means. Moreover, the distribution of the education level across conditions did not differ substantially. Regarding the response time, there was not found a significant correlation between response time and education level.

There are different possible reasons for the overrepresentation of high education levels in the sample of responders. First, participants with lower education levels simply might have not stated their education level due to social desirability associated reasons, therefore the answers were distorted. However, this was tried to avoid by ensuring anonymity of the responses. Second, the entire sample (responders and non-responders) might have had a higher education level than the average. At least for Vienna, this could actually be the case, because the schools recruited for this study were only located in the districts second to nine. These

districts are located more centrally, and the residents have higher education levels on average than in other districts (Die Presse, 2016). However, this does not apply for the schools in Upper Austria. Another possible explanation could be that responders in general tend to have higher education levels than non-responders. For instance, because participants with higher education levels might tend to value scientific research more, which has made them fill in the questionnaire in order to contribute to research. This could be investigated by future research.

Limitations

Structural limitations.

Although the overall sample size, including more than one thousand participants, was considerably high, Hypothesis 2 (response time) could only be measured with 250 participants – that is not even a quarter of the entire sample – because there were difficulties in getting the information on the return dates from the teachers. More specifically, these data were only available for participants located in Vienna. As stated before, this might have caused the insignificance of the effect on response time.

Field studies are real life settings, thus always bring a risk that unexpected, uncontrollable variables may distort the results. Confounding influences could have emanated from the children, as they were in charge of handing over the questionnaires to their parents and returning them to their teachers afterwards. Bear in mind, that they were only third graders of primary school. This means that it is not clear when and if at all the parents actually received the questionnaires, nor when they filled them in and returned them.

Besides, there were no data about possible confounding variables concerning the classes or schools, that would have been helpful to include into the multilevel models. For example, there was no information, let alone control about what teachers told their pupils. The data shows, that there were at parts strong differences between classes, these could be explained by how the teachers communicated the importance or the obligation of participating. Some teachers might even have had direct interaction with the parents. Moreover, it was not possible to conduct a manipulation check, which would have been controlled for if the cover letter was properly read and understood or if the *identity prime* worked.

Lastly, language barriers could have taken place since the questionnaire and cover letter were only handed out in German. This might have led to a distorted sample of responders, because some individuals with low language proficiency could not be influenced by the language-based interventions in the first place. Indeed, to adapt behavioral interventions for groups with low language proficiency it is important to develop communication strategies that

address language barriers and are sensitive to language use (Netto, Bhopal, Lederle, Khatoon, & Jackson, 2010). It could be a fruitful field for future research of how to overcome language barriers with behavioral interventions, in order to better reach and involve individuals with low language proficiency, thus preventing non-response bias and enhancing representativeness.

Content-related limitations.

First of all, it must be stated that several interventions are not fully and only representing one principle of the framework. For example, the intervention of providing an *action plan* could also be considered as a timely intervention, because according to the framework, helping people to plan their response to events is a possible intervention to address timing and procrastination issues. Or providing a *salient deadline* thus expressing temporal scarcity also can be allocated to the principle of attractiveness, as it highlights the value of this scarce opportunity of action (BIT, 2014). As it becomes clear, it is not trivial to separate all principles properly from each other and to assign the interventions clearly to single principles.

Beyond that, countless interventions could have been selected for each principle. Although the interventions applied were chosen deliberately on the basis of empirical evidence, some do have limitations. For instance, the *action plan* usually works best, when individuals themselves create the plan; in this study it was already provided (Rogers et al., 2015). Although there is no indication in existing literature that this could be the case, the parents might have felt patronized or even infantilized by giving them a list of easy steps to conduct the behavior of filling in a questionnaire, which in fact is already a simple behavior. Indeed, the target behavior for which *action plans* have found to be effective in previous studies was rather complex, like dieting or test preparation (see Rogers et al. 2015).

The *identity prime* might have been too weak in its salience, so that the parents may have simply overlooked this sentence and not even noticed it. Nevertheless, according to the active-self framework (Wheeler & DeMarree, 2007), primed constructs affect behavior by temporarily altering the active thus accessible self-concept that guides behavior through motivational and behavioral representations. More importantly, these effects occur automatically even if priming happens unconscious, suggesting that behavioral responses can be triggered without cognitive mediation by cues in the environment (Bargh, Chen & Burrows, 1996; Chen, Li, Liu, & Shih, 2014; Gaither, Cohen-Goldberg, Gidney, & Maddox, 2015; Kawakami, Young, & Dovidio, 2002).

The *social norm* in essence was the same as used by Misra and colleagues (2012), who found it to be effective in increasing response rates. Yet, there are a lot of factors that need to

be considered when using *social norms* to influence behavior. For instance, an intervention that works in the US might not work in Europe due to a different culture or different baseline behavior (Bohner & Schlüter, 2014). Even boomerang effects – suggesting psychological reactance – appear to occur in some countries, but not in others (Richter, Thøgersen, & Klöckner, 2018). Additionally, participants could simply not believe the *social norm* to be true, which made it ineffective, because people have the tendency to reject information that is not consistent with what they believe (Bicchieri & Dimant, 2019). This was tried to be countered by naming the source of the information. Aside from that, a strong motivation to not conduct the desired behavior can most likely not be overcome with *social norms*; for example, those who strongly identify as non-recyclers are unlikely to start recycling when the norm of recycling is presented to them (Thomas & Sharp, 2013). Correspondingly, those who are active non-responders – individuals who actively decide not to respond and refuse participation in principle – cannot be expected to follow the norm. This applies for all interventions; indeed, response enhancement interventions are expected to work only for passive non-responders (Stoop et al., 2010; Strauss-Ewerhardy, 2018). In turn, these concepts of active and passive non-responders reflect the *intention-behavior gap* either existing or not existing in responders.

The only intervention that did not completely derive from the EAST framework is the *salient deadline*. Actually, the principle of ‘timely’ recommends to making behavior timely in the sense of reaching out to people when they are most receptive or most likely to adapt to new routines. Yet in this study it was not possible to control that aspect. However, this intervention was used following the example of the National Health Service (2016), who explicitly recommended this intervention as part of the principle ‘timely’.

Notwithstanding, there were several theoretical grounded reasons why all of these interventions were chosen, though above all was the given restricted possibilities of only being able to modify the cover letter, thus the chosen interventions had to be realizable in the first place.

Strengths and practical implications

Most importantly, this study fills the existing research gap of systematically applying the EAST framework to survey participation and adds to the growing research of behavioral interventions. Moreover, it contributes to the lack of survey research investigating school settings and parents as a target group of behavioral interventions.

One major strength of this study is its design: a randomized controlled trial – which is considered as the gold standard of study designs – within a field study. Despite some

disadvantages of field studies, there are also crucial advantages. Field studies offer a study setting in a natural environment, which gives them a high external validity. Field studies measure real behavior in natural situations and conditions which makes results more relevant for practical implementation. Participants did not know that their response behavior has been recorded, which guaranteed natural behavior without confounding factors e.g., social desirability.

In addition, the sample size (at least for measuring the response rate) is considerably high. Although the sample only consisted of parents of third graders, which implies a certain age group, it is assumed that the overall sample is broadly diverse in terms of socioeconomics and general characteristics. This is a direct contribution to previous research, as more diverse and larger samples were explicitly demanded to enhance external validity (Misra et al., 2012).

Lastly, the interventions are straightforward and low-cost strategies, which – if found effective – would have had great potential to have an impact on survey design, because they are easily and effortlessly applicable. Therefore, future research could explore in detail the applicability of these and similar interventions.

Future research

In addition to the aspects mentioned before, some proposals for future research are discussed. First, subsequent studies could try to replicate the findings on response time with a larger sample size in order to search for significant effects. Moreover, it would be interesting to untangle the effects of the combined interventions, so that single interventions can be measured in their effectiveness. In addition, the same interventions could be transferred to another target group and setting, where children were not involved in the process of handing out and returning questionnaires, in order to control for this possibly confounding variable. Also, further research could be conducted in investigating the effects of education level and location. Finally, it would be a great contribution to research, if future studies would thoroughly analyze the context of the decision of participating before deriving appropriate interventions and afterwards test them in the field.

Conclusion

In other studies, the EAST framework has been found to successfully change behavior. This study, however, could not find that it is applicable to increase survey participation – at least not for the target group of parents in a school context. These surprising findings highlight the importance of evaluating interventions before implementing them on a broader scale. More importantly, they support the rationale of the EAST framework and of behavioral economics in general: context matters. Even already successfully applied interventions can have unintended outcomes when applied to another field or group of people. Consequently, behavioral interventions in general and the EAST framework in particular are not universally applicable. It can be helpful when used as a guide, but it should not be treated like a reliable procedure which will yield the desired results without further considerations concerning the target behavior and its context.

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Appendix A: Zusammenfassung

Menschen handeln nicht immer so wie sie es beabsichtigen – in vielen Entscheidungskontexten gibt es eine Intentions-Verhaltens-Lücke. Dieses Problem wird von der Verhaltensökonomie mit Interventionen adressiert, die psychologische Konzepte der Entscheidungsfindung berücksichtigen. Das EAST Modell fasst verhaltensökonomische Interventionen in vier Prinzipien zusammen, die darauf abzielen Verhalten einfach, attraktiv, sozial und zeitgerecht zu machen. Die vorliegende randomisiert-kontrollierte Feldstudie hat untersucht, wie das EAST Modell zur Steigerung der Umfragebeteiligung bei Fragebögen angewendet werden kann. Umfragebeteiligung wird aus verschiedenen Gründen als ein Verhalten betrachtet, das durch verhaltensökonomische Interventionen beeinflusst werden kann. Zu diesem Zweck wurden Interventionen im Anschreiben eines Fragebogens implementiert, der an 1128 Eltern von DrittklässlerInnen in Wien und Oberösterreich verschickt wurde. In der Experimentalgruppe 1 wurden alle vier Prinzipien angewendet: ein Aktionsplan (einfach), ein Identitäts-Prime (attraktiv), eine soziale Norm (sozial) und eine saliente Deadline (zeitgerecht). In der Experimentalgruppe 2 wurden nur zwei dieser Interventionen (Aktionsplan, saliente Deadline) angewendet. Der Effekt dieser Interventionen auf die Rückgabequote und -zeit wurde jeweils mit einer Kontrollgruppe verglichen. Tendenziell deutet sich an, dass der Fragebogen von der Versuchsgruppe 2 im Vergleich zu den übrigen Gruppen etwa einen Tag früher zurückgesandt wurde. Die Ergebnisse zeigten allerdings keinen statistisch signifikanten Effekt der Interventionen weder auf Rücklaufquote noch -zeit. Daher scheint die Steigerung von Umfragebeteiligungen kein vielversprechendes Anwendungsgebiet des EAST Modells zu sein. Diese Ergebnisse unterstreichen die Wichtigkeit von sorgfältigen Analysen des Entscheidungs- und Verhaltenskontexts, bevor verhaltensökonomische Interventionen angewendet werden.

Schlüsselbegriffe: Verhaltensökonomie, EAST Modell, Intentions-Verhaltens-Lücke, Interventionen, Umfragebeteiligung, Fragebögen, Rückgabequote, Rückgabezeit

Appendix B: Material

Cover letter: Control group



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Elternfragebogen

Wien, am 7. Jänner 2020

Liebe Eltern, liebe Erziehungsberechtigte,

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Die Teilnahme Ihrer Schule an der Studie hilft uns, zu verstehen, welche Faktoren wichtig sind, um Kinder von früh an **vorurteilsfrei für das Lernen von neuen Dingen** zu begeistern. Um detailliertere Erkenntnisse zu gewinnen, bitten wir Sie, den beigelegten Fragebogen auszufüllen.

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Wenn Sie den Fragebogen ausgefüllt haben, nutzen Sie bitte den beigefügten Rückumschlag, kleben Sie diesen zu und geben Sie den Umschlag Ihrem Kind **bis zum 24. Jänner** in die Schule mit. Die/der KlassenlehrerIn wird uns die Elternfragebögen zukommen lassen. Auf der letzten Seite des Fragebogens haben Sie die Möglichkeit, **an unserem Gewinnspiel teilzunehmen** – lassen Sie sich die Chance nicht entgehen.

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Mit freundlichen Grüßen

Dr. Kerstin Grosch

Cover letter: Treatment 1

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Elternfragebogen

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In einer vergleichbaren Studie* füllten 81,3% der Eltern den Fragebogen aus. Schließen Sie sich den anderen Eltern an und unterstützen uns somit bei der Erforschung des Lernverhaltens von Kindern.

*Kosse, F., Deckers, T., Pinger, P., Schildberg-Hörsch, H., & Falk, A. (2017). The formation of prosociality: causal evidence on the role of

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- ☒ Anschreiben lesen
- ☐ Fragebogen ausfüllen (max. 10 min)
- ☐ In beigelegten Rückumschlag geben
- ☐ Ihrem Kind wieder mit in die Schule geben

Abgabe
bis 24.01

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Cover letter: Treatment 2

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Elternfragebogen

Wien, am 7. Jänner 2020

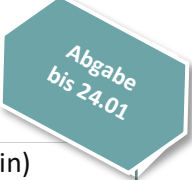
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☒ Anschreiben lesen	 Abgabe bis 24.01
☐ Fragebogen ausfüllen (max. 10 min)	
☐ In beigelegten Rückumschlag geben	
☐ Ihrem Kind wieder mit in die Schule geben	

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Mit freundlichen Grüßen

Dr. Kerstin Grosch

Appendix C: Further results

Table 11

Overview of multilevel models (Hypothesis 2)

	Response time	
Samplig Units	N = 250; schools n = 17; classes n = 29	
Model Name	Model 0b	Model 1b
Model Specification	Null (RE only)	FE Main Effects
Fixed Effect Added	-	Condition
Random Effect		
School	Intercept	Intercept
Model Fit		
AIC	1363.41	1358.70
BIC	1370.39	1365.67
-2LL	1359.36	1354.65
df1	0	2
df2	0	247

Table 12

Multilevel Model 0b

	Estimate	SE	95% CI	z	p
Random effect					
School (Intercept)	0.32	0.45	[0.02; 4.87]	0.72	0.47

Table 13

Multilevel Model 1b

	Response time			
	Estimate	SE	95% CI	p
Fixed effects				
Intercept	5.20	.35	[4.47; 5.85]	<.001*
Treatment = 1	-0.17	.50	[-1.16; 0.81]	.73
Treatment = 2	-1.03	.34	[-1.70; -0.36]	.003*
Random effects				
School (Intercept)	0.28	0.43	[0.01; 5.56]	0.51

Note. This model is only displayed for the sake of completeness and was not interpreted.