

Constructing Motivation Through Choice, Interest, and Interestingness

Erika A. Patall
The University of Texas at Austin

Psychological research and theory have traditionally suggested that opportunities for choosing will lead to motivation and performance benefits. However, evidence on choice effects has not been ubiquitously positive, and recent investigations have revealed factors that diminish or reverse the effects of choosing. This investigation sought to extend this line of inquiry by examining whether interest factors may influence preferences for choosing and the effects of choice on motivation and performance. In Study 1, participants read a series of scenarios and reported a greater preference for choosing aspects of a task when the task was more, compared to less, personally interesting. Similarly, Study 2 revealed that choosing aspects of a trivia game enhanced post-task interest for the game only for individuals high in initial individual interest for trivia games in general. In contrast, Study 3 revealed that choosing enhanced post-task interest, perceived competence, value, and relative liking for a reading comprehension task when the reading passage was boring. When the passage was interesting, choosing resulted in less adaptive motivation outcomes. Going further, exploratory analyses revealed a 3-way interaction, suggesting that choosing enhanced willingness to engage in the task again only for those high in initial individual interest for reading and when the particular version of the task was boring. Interactions between choice and interest were not revealed for task performance in either Study 2 or Study 3. Rather, performance was higher among individuals who chose compared to individuals who did not. Implications of these findings are discussed.

Keywords: choice, autonomy, interest, motivation, self-determination

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Decades of psychological research suggest that all kinds of people (e.g., workers, the elderly, children), but students in particular, may feel more competent, more in control, more motivated, and perform better when they are able to express their preferences and make choices (e.g., Cordova & Lepper, 1996; Patall, Cooper, & Robinson, 2008; Patall, Cooper, & Wynn, 2010; Ryan & Deci, 2000). Further, the provision of choice is a common strategy used to motivate others in a variety of contexts (e.g., work, therapeutic, and educational). Teachers report that providing opportunities for choosing and decision making within the classroom or for school tasks is a popular method by which they attempt to enhance their students' motivation and learning (Flowerday & Schraw, 2000).

However, despite teachers' intuitive beliefs and the vast literature that exists, the controversy regarding the benefits versus detriments of choosing has yet to be put to rest. In fact, some studies find that choice may have no or even a negative effect on motivation and performance outcomes (Overskeid & Svartdal, 1996; Parker & Lepper, 1992; Reeve, Nix, & Hamm, 2003). A look at the literature on choice effects across a variety of outcomes suggests that there are likely both benefits and costs associated with making choices and that not all choices are equal for all

people or across all circumstances (Iyengar & Lepper, 1999, 2000; Moller, Deci, & Ryan, 2006; Patall et al., 2008; Reeve et al., 2003).

Prior research has suggested a number of factors (e.g., the type and nature of the choice, number of options given and choices made, or culture) that may influence the motivational benefits of choices (Iyengar & Lepper, 1999, 2000; Moller et al., 2006; Patall et al., 2008; Reeve et al., 2003). However, the motivational characteristics of the person and the task have yet to receive adequate attention as potentially important moderators of choice effects. That is, it seems reasonable to expect that the initial level of interest that an individual brings to a task is likely to influence how choice is experienced. By the same token, characteristics of the task such as its interestingness may also influence the effects of choosing on subsequent motivation and performance. It is a given circumstance that classrooms will often contain a heterogeneous population of students in terms of their motivational characteristics for various school tasks and that school tasks will necessarily vary in level of interestingness across students. Consequently, in order for choice provision to be most profitably used in educational settings, it seems imperative to assess the extent to which these factors influence the effectiveness of providing choice for enhancing students' motivation and learning outcomes.

The purpose of this investigation was to explore how interest influences preferences for making choices and the effect of providing choice on motivation and performance. The role of interest was explored in two ways. First, interest was investigated as a characteristic of the person approaching a task, as when an individual comes to a task with existing beliefs about how interesting

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Correspondence concerning this article should be addressed to Erika A. Patall, Department of Educational Psychology, The University of Texas at Austin, 1 University Station D5800, Austin, TX 78712. E-mail: patall@utexas.edu

and enjoyable he or she finds it based on a personal history of engagement and experience with the task. The role of interest as a characteristic of the environment was also examined, as when the task itself varies normatively across individuals in its ability to support a state of interest.

The Benefits and Detriments of Choice

According to self-determination theory (SDT), autonomy, competence, and relatedness are three fundamental needs that underlie people's intrinsic motivation, or the propensity to engage in a task for the inherent satisfaction it provides, and social contexts that satisfy these needs will enhance intrinsic motivation (Deci & Ryan, 1985; Ryan & Deci, 2000). Therefore, motivation is enhanced when contextual conditions allow people to feel that their actions are freely emanating from the self, afford people with the possibility of developing or demonstrating competence, and support a sense of belongingness with others in their environment. In contrast, when the environment is experienced as controlling, chaotic, and/or uncaring, psychological needs and intrinsic motivation are thwarted.

A great deal of research has supported the proposed positive effects of choosing, particularly in educational environments, demonstrating that the provision of choice leads to enhanced interest, enjoyment, effort, and persistence on a task (e.g., Cordova & Lepper, 1996; Iyengar & Lepper, 1999; Patall et al., 2008, 2010), as well as enhanced perceived competence, task performance, subsequent learning, preference for challenge, and creativity (e.g., Amabile, 1983; Cordova & Lepper, 1996; Iyengar & Lepper, 1999; Patall et al., 2008, 2010). Even neurological evidence has highlighted the inherent motivational quality of choosing, showing that people's anticipation of having choices is related to increased activity in the corticostriatal regions of the brain associated with reward processing (Leotti & Delgado, 2011).

Despite a great deal of theory and research suggesting that choice is a powerful motivator of behavior, not all studies have found choice to be a ubiquitously beneficial and some suggest it may even have a negative effect on adaptive motivation and performance outcomes (e.g., Flowerday & Schraw, 2003; Flowerday, Schraw, & Stevens, 2004; Overskeid & Svartdal, 1996; Parker & Lepper, 1992; Reeve et al., 2003). This complex pattern of previous findings beg the question, under what conditions does choosing lead to motivational benefits or detriments?

The Role of Interest in Choice Effects

Clearly, the effects of providing choices are complex and mixed findings suggest that there may be different effects of choice depending on the type of choice, the circumstances under which choices are provided, or the people making decisions. Past research has suggested a number of factors that are important to understanding these complex effects. The autonomy-supportive nature of the choice opportunity, the regulatory or cognitive demands of choosing, the number of options or opportunities for choosing, and the cultural background of the participant have all been found to be important moderators of the effects of choice on motivation and performance outcomes, among other factors (e.g., Iyengar & Lepper, 1999, 2000; Katz & Assor, 2007; Moller et al., 2006; Patall et al., 2008; Reeve et al., 2003).

Nevertheless, to this point, little attention has been given to the role of motivational characteristics of the person or the task in understanding when the provision of choice may be more or less beneficial. Of particular importance, "interest as a motivational variable refers to the psychological state of engaging or the predisposition to reengage with particular classes of objects, events, or ideas over time" (Hidi & Renninger, 2006, p. 112). Interest is often broadly conceptualized to include affective components (i.e., positive emotionality such as enjoyment) and cognitive components (i.e., evaluations related to continued engagement or reengagement; e.g., Hidi & Renninger, 2006; Krapp, 2002). In general, two forms of interest, individual and situational, have been identified in psychological and educational research to distinguish the momentary psychological state of interest from an enduring predisposition (e.g., Hidi & Renninger, 2006; Schraw, Flowerday, & Lehman, 2001). More specifically, *individual interest* (also referred to as personal interest) is a relatively stable disposition to reengage with particular content over time (cf. Hidi & Renninger, 2006; Schiefele, 2001). Individual interest primarily resides within the individual and refers to a general tendency to experience a psychological state of interest in reference to a particular content domain or class of activities. In contrast, *situational interest* refers to interest that primarily emerges from and is supported by the environment (Hidi & Renninger, 2006; Krapp, 2002). Situational interest is a momentary psychological state triggered by the environment (i.e., by the interestingness of the current content or activity) that may or may not last over time or re-occur when similar stimuli are presented. Indeed, years of research on interest as both a fleeting psychological state and an enduring disposition have suggested that interest supports an array of positive cognitive and behavioral outcomes (e.g., attention, persistence, engagement, and learning, among other outcomes; e.g., Ainley, Hidi, & Berndorff, 2002; Harackiewicz, Durik, Barron, Linnenbrink-Garcia, & Tauer, 2008; Köller, Baumert, & Schnable, 2001; Renninger, Ewen, & Lasher, 2002; Schiefele & Krapp, 1996). Further, both forms of interest may influence the relations between choice provision and subsequent motivation and learning outcomes. However, the extent to which interest, either as an existing disposition or a state-like reaction to characteristics of the current environment, facilitates or diminishes the motivational qualities of choosing remains unclear.

Some theory and research has suggested that providing choices may buffer against the negative outcomes that poorly motivated students display and thus, providing choices may be particularly beneficial for those individuals who lack personal interest for the task at hand (Flowerday & Schraw, 2000; Schraw et al., 2001). While direct evidence on the role of interest in explaining choice effects is lacking, some support for this notion can be garnered from a phenomenological study of teachers' beliefs about instructional choice (Flowerday & Schraw, 2000), which found that teachers perceived choice to be especially beneficial for students who had low interest and little motivation for the task at hand. A complementary pattern was found in a study of German middle school students looking at class-to-class variation in perceived autonomy support and interest, where Tsai, Kunter, Ludtke, Trautwein, and Ryan (2008) found a stronger relation between perceived autonomy-support and daily interest for students with lower initial (individual) interest for the course subject.

Alternatively, some research has suggested a sensitization model in which optimally motivated students may benefit more than poorly motivated students from having the opportunity to make choices. Mouratidis, Vansteenkiste, Lens, and Sideridis (2011) found that elementary-age Greek physical education students with higher, compared to lower, relative autonomous motivation (i.e., motivation based to a great extent on interest, enjoyment, and value for course tasks) benefited significantly more from a need-supportive class in which teachers provided opportunities for making choices and working with other students.

Further and as previously alluded to, the role of interest in choice effects not only comes into play when considering individual differences in existing interest for a content area or activity (i.e., individual interest), but also when considering task interestingness. That is, the effects of choosing may be influenced by the extent to which situational interest is anticipated or experienced as a function of characteristics of the environment (i.e., the interestingness of the stimuli with which the individual is interacting with). On one hand, choice may be particularly powerful when a task is perceived as boring, as choosing provides an opportunity to build interest, enjoyment, and other forms of motivation during the task when little previously existed. Alternatively, choice may be more beneficial when the task at hand is perceived as interesting because people might be most receptive to factors that further influence their interest, enjoyment, or other aspects of motivation under this circumstance.

Accordingly, some motivation scholars have suggested that choice may be particularly motivating when it involves a task that is not interesting to begin with (e.g., Tafarodi, Milne, & Smith, 1999), although there is little evidence to examine this supposition. In line with this notion, it is worth noting that many demonstrations of improved motivation and performance due to choice have involved neutral or lackluster activities, such as solving anagram puzzles and paired-associate word learning (e.g., Iyengar & Lepper, 1999; Monty, Rosenberger, & Perlmutter, 1973; Perlmutter & Monty, 1973) or homework in a classroom context (Patall et al., 2010). Also providing some support for this possibility, Sansone, Weir, Harpster, and Morgan (1992) found that students who choose to make boring tasks more complex reported greater interest in those tasks.

Finally, it is worth pointing out that task interestingness and initial individual interest may not yield a parallel pattern of moderation and may interact in complex ways. That is, while the beneficial effects of choice seem likely to be most evident when an individual is interacting with a typically boring task (regardless of one's level of individual interest for the domain or class of activities), it does not necessarily follow that the benefits of choosing will be most pronounced among individuals with the parallel level of individual interest, that is, individuals with lower individual interest (e.g., see Mouratidis et al., 2011, as an example of research that would conflict with this hypothesis). In other words, there may be very different implications for the effects of choice depending on whether one considers on one hand, an individual's initial interest as an existing predisposition based on prior experiences with related tasks or on another hand, the experience or anticipation of situational (state) interest triggered by the interestingness of the task.

The Present Investigation

Providing students with choices appears to be a good strategy to support motivation and performance. However, there appears to be circumstances under which choosing may be more or less beneficial. Prior research has pointed to a number of factors that may influence the effects of choice. Nevertheless, limited attention has been paid to interest as a potential moderator of choice effects. To address this omission, a series of three experimental studies was conducted in which interest was either measured and/or manipulated in the context of the provision of choice.

First, to examine whether individuals would differ in their preference for having choice depending on their initial levels of individual interest, participants were asked to indicate the extent to which they would prefer to have task choices in response to a series of scenarios in which they imagined being asked to engage in a task under various conditions. Next, the effect of provision of choice on the motivation of individuals under various interest conditions was examined. In Study 2, participants' individual interest for the activity was measured prior to beginning it. In Study 3, the interestingness of the task was manipulated in addition to measuring participants' initial level of individual interest for the activity.

It was hypothesized that individuals would show a greater preference for making choices when their individual interest for the activity was higher. Likewise, it was expected that subsequent feelings of interest and enjoyment, competence, and other psychological benefits would be most enhanced by choosing among those who reported greater initial individual interest for the activity, but when the specific task was perceived as boring. Further, it was expected that individual interest, task interestingness, and the provision of choice might interact such that the benefits of choosing might be most dramatic when individuals came to a particular task perceived as boring with a high level of individual interest for the class of activity related to the one at hand.

Study 1

The investigation of whether interest influences the experience of choosing began by first examining whether people vary in their explicit preference to have the opportunity to make task-related choices under conditions of higher compared to lower interest. In Study 1, working adults and college students were asked to respond to two scenarios describing a situation in which they are asked to work on a task by either their boss or instructor. In one scenario, it was indicated that the actor had a high level of individual interest for the task at hand, while in the other it was indicated that the actor had a low level of individual interest. Participants' reports of their preference to make task-related choices served as the dependent measure.

Method

Participants. One hundred and fifty-two individuals (66% female) were recruited through Amazon.com's Mechanical Turk (MTurk), a website that allows researchers and businesses to post tasks and studies that the general public may peruse and participate in. Research on the use of MTurk have suggested that MTurk participants are more demographically diverse than are standard

Internet samples or typical American college samples and that the data obtained from MTurk are at least as reliable as those obtained via traditional methods (Buhrmester, Kwang, & Gosling, 2011). There were no exclusion criteria, and all participants who were over 18 years of age had an equal opportunity to participate in the study. Participants ranged between 18 and 65 years of age. The ethnic diversity of the sample approximated that of the U.S. population with the majority of participants identifying themselves as Caucasian ($n = 129$; 84%), eight participants identifying as Black (5%), 11 identified as Asian (7%), four identified as Hispanic (3%), and one identified as Native American (1%). Many participants were college students, but participants reported having a variety of occupations in a variety of fields. Participants earned a nominal contribution (\$1.50) to their Amazon.com account for participating in the study.

Procedure. All tasks associated with this study were completed online. Participants were informed that they would be presented with two scenarios describing a situation in which they are asked to work on a task. Participants were told to imagine that they were asked to engage in this task by either a boss or a course instructor. One scenario described a situation in which the participant was asked to engage in a personally interesting task, and the other scenario described a situation in which the participant was asked to engage in a personally boring task.¹ Participants were asked to think about each scenario and rate the extent to which they would prefer to have task-related choices given the circumstances described on a 5-point Likert scale (1 = *I would very much prefer not to make choices*, 5 = *I would very much prefer to make choices*). The two scenarios were presented in a random order across participants. Once participants completed ratings of the extent to which they would prefer having choices, they were asked several background questions regarding their age, sex, ethnicity, and occupation.

Results and Discussion

In line with our hypotheses, results of a dependent t test indicated that participants had a greater preference for choosing in the situation in which they came to the task with high individual interest ($M = 4.26$, $SD = 1.07$) compared to the situation in which they came to the task with low initial individual interest ($M = 3.95$, $SD = 1.31$), paired samples $t(152) = .08$, $p = .33$; $t(151) = 2.92$, $p < .02$; $d = 0.32$.

The results of Study 1 suggested that overall, people reported neutral to positive attitudes toward having opportunities for making choices across both scenarios. However, results also provided initial support for the proposal that choosing would be more desirable under conditions in which the individual has greater individual interest for the task at hand. The results of this study thus inspired the question: Beyond explicit preferences for having choices, would an individual's initial interest for a task or the interestingness of a task influence the effects of choice on motivation and performance?

Study 2

Study 1 had suggested that people vary in their explicit preference for having choices depending on their individual interest, but how would this explicit attitude translate into motivation processes

and performance outcomes? To explore this question, college students completed a laboratory study in which they were asked to play a trivia and brain teaser game after having made choices or not about the topics of the puzzles. Initial individual interest for trivia games in general was assessed at the beginning of the study. Participants' performance on the trivia game and reports of their post-task interest and feelings of competence for the game served as dependent measures.

Method

Participants. Twenty-eight college students (19 females, 9 males) in several core psychology courses in a southern school were recruited to participate in the study. Students could participate in order to receive credit toward completing a research requirement for these courses. Participants ranged between 18 and 21 years of age. Participants were ethnically diverse: 18 participants were Caucasian (64.3%), one participant was African American (3.6%), eight were Asian (28.6%), and one was of mixed ethnicity (3.6%).

Procedure. Participants were run in individual experimental sessions. Aside from initial introductions and directions, all study activities were computerized. Participants were told that the purpose of the study was to investigate people's experience and impressions of a trivia and brain teaser game that the researchers had recently developed.

First, the trivia game was described to participants. Participants were told that they would be asked to complete 36 trivia and brain teaser questions of various types on all kinds of subjects. Examples were provided (e.g., Q: "What popular children's rhyme was an outgrowth of the bubonic plague?" A: "Ring around the Rosy"; Q: "What does x equal to solve the formula $(x + 1)(x - 1) = 0$?" A: "+1 or -1"; Q: "What state can be spelled by rearranging the letters in the phrase: OLD FAIR?" A: "Florida"). Participants were told that they would have up to 45 s to answer fact-based questions and 2 min and 15 s for problem-solving and puzzle questions. If time ran out before the participant selected an answer, the computer automatically continued to the next screen. At this point, participants were asked to report on how interesting and enjoyable they generally find trivia games.

Next, participants were randomly assigned to complete the study under one of two choice conditions: *choice* or *no choice*. Participants in the choice condition were told that they would have three choices. Specifically, participants were told that although the computer would randomly select 36 questions from a bank of thousands of questions, participants had the opportunity to select three categories that they were guaranteed to receive questions on and from which the computer would over-select questions. For the first choice, participants were asked which category of trivia and brain teasers they would like to receive questions on among the following categories: (a) *Food and Drink*; (b) *History and Law*; (c) *Art, Literature, Entertainment, and Recreation*; (d) *People and Places*; (e) *Math and Science/Nature*; and (f) *Language, Riddles, and Puzzles*. For the second choice, they could choose a second category among the five remaining options. For the third choice, again, they chose a third category among the four remaining options.

¹ The interested reader can find transcripts of the scenarios in Appendix A of the online supplemental materials.

Participants in the no choice condition were made aware that there were several categories of question topics and that certain categories could be selected to be oversampled among the questions they would receive during the game. No choice participants were then told which topics had been assigned to them for the game. In reality, all participants were given the same set of trivia and brain teaser questions. Most questions fit into more than one category, so it was not obvious to participants that they were receiving just as many questions from non-selected categories as questions for selected categories. In order to further create the illusion that the choices had a real impact on the questions received, the order of the questions were arranged such that the last category chosen or assigned to participants was the first question to appear once they began playing the game.

The participant then worked on the 36 question trivia game for up to 40 min. After completing the game, the participant was asked to report on their perception of having choices, experience of interest, and feelings of competence in a post-task questionnaire. The number of questions the participant answered correctly also served as a dependent measure. Finally, participants were asked several background questions, including their sex, age, and ethnicity.

Yoking. A yoked design was used in which no choice participants were assigned the same categories of questions for the game that choice participants had previously selected. This yoking procedure allows participants in the choice condition choices while still ensuring that participants across conditions have the same task features. However, as previously mentioned, despite this protocol in which participants were led to believe they had chosen or been assigned particular question categories, there was no real difference in the actual game questions received. Participants were run intermittently through the choice and no-choice conditions to create 14 yoked dyads.

Materials. Interest-enjoyment and perceived competence subscales from the Intrinsic Motivation Inventory (IMI; Ryan, 1982) were adapted for use in this study. A version of the interest-enjoyment subscale was used to measure both initial individual interest for trivia and brain teaser games in general at the beginning of the study, as well as the post-task report of their experience of interest during *Brain Twister*. The perceived competence subscale was measured just once following engagement in *Brain Twister*. For the measure of initial individual interest, items were phrased in terms of trivia and brain teaser games in general (seven items; $\alpha = .93$; e.g., “I would describe trivia questions and brain teasers as very interesting,” or “I enjoy playing trivia games like *Brain Twister* very much”). For the post-task measures of interest

and perceived competence, items were framed in reference to the game that the participant had just completed (seven items for interest-enjoyment; $\alpha = .90$; e.g., “I enjoyed playing *Brain Twister* very much,” or “I would describe the game questions as very interesting”; six items for perceived competence; $\alpha = .92$; e.g., “I think I did pretty well on the game questions, compared to other college students”). Previous research has provided strong support for the validity (McAuley, Duncan, & Tammen, 1989) and reliability of this measure (e.g., Ryan, 1982). In addition, as a manipulation check, participants were asked about their perception of having received choices regarding the categories of questions for the game using four items explicitly designed for use in this study ($\alpha = .86$; e.g., “I believe I had some choice about the game questions I was given to complete”). Participants were asked to respond to all items using a Likert-type scale ranging from 1 (*not true at all*) to 7 (*very true*).

Results

Preliminary analyses. First, the distribution of scores on each variable was examined for statistical outliers. Grubbs’s (1950) test was applied, and no outliers were found.

Results suggested our choice manipulation was successful. Participants in the choice condition perceived having more choice regarding the question categories for the game ($M = 4.70$, $SD = 1.09$) compared to participants in the no choice condition ($M = 2.98$, $SD = 1.12$), $t(26) = 4.11$, $p < .001$, $d = 1.56$.

Motivation. To explore the proposal that the provision of choice in combination with initial individual interest would predict one’s subsequent experience of interest and perceived competence during the trivia game (“*Brain Twister*”), two hierarchical regression analyses (one for each outcome) were conducted. For each analysis, Step 1 included a dummy-coded variable to represent the choice manipulation (no choice = 0; choice = 1) and initial individual interest for trivia and brain teaser games. The interaction between these two variables was added at Step 2. All continuous predictor variables were centered using procedures detailed by Aiken and West (1991). Table 1 presents the correlations between the relevant variables, and Table 2 presents the results of these analyses.

The first step accounted for 53% of the variance in participants’ post-task reports of their experience of interest during *Brain Twister*, $F(2, 25) = 14.02$, $p < .001$. However, only initial individual interest in trivia and brain teaser games significantly predicted the experience of interest during *Brain Twister* ($\beta = .71$, $p < .001$), there was no main effect of choosing. The second step

Table 1
Means, Standard Deviations, and Bivariate Correlations Among Variables in Study 2

Measure	<i>M</i> (<i>SD</i>)	1	2	3	4	5
1. Provision of choice	0.50 (0.51)	—				
2. Initial individual interest	4.39 (1.12)	-.01	—			
3. Post-task interest	4.49 (1.00)	.14	.71***	—		
4. Perceived competence	3.34 (1.37)	.45**	.32*	.59***	—	
5. Task performance	11.85 (3.65)	.37*	.38**	.66***	.60***	—

Note. $N = 28$.

* $p < .10$. ** $p < .05$. *** $p < .001$.

Table 2
Regression Analyses for All Outcomes in Study 2

Predictor	Post-task interest			Perceived competence			Task performance		
	<i>B</i>	<i>SE</i>	β	<i>B</i>	<i>SE</i>	β	<i>B</i>	<i>SE</i>	β
Step 1									
Provision of choice	0.29	0.27	.15	1.21	0.45	.45**	2.65	1.22	.37**
Initial individual interest	0.64	0.12	.71***	0.40	0.20	.33*	1.24	0.55	.38**
Step 2									
Provision of choice	0.29	0.25	.15	1.21	0.46	.45**	2.64	1.22	.37**
Initial individual interest	0.32	0.19	.36*	0.30	0.34	.25	0.61	0.92	.19
Choice \times Individual Interest	0.50	0.24	.44**	0.15	0.43	.10	0.99	1.15	.24

Note. Provision of choice is dummy coded (0 = no choice condition, 1 = choice condition).

* $p < .10$. ** $p < .05$. *** $p < .001$.

contributed an additional 7% of the variance, an increase that was statistically significant, $F_{\Delta}(1, 24) = 4.32, p = .049$. This final model accounted for 60% of the variance in the experience of interest during the trivia game, $F(3, 24) = 12.02, p < .001$. The significant interaction between provision of choice and initial individual interest ($\beta = .44, p = .049$) was probed using simple regression equations of post-task interest on provision of choice at two levels of initial individual interest scores (see Figure 1). There was a significant positive effect of provision of choice on participants' post-task report of interest during the trivia game at two standard deviations above the mean of initial individual interest ($\beta = .71, p = .026$). In contrast, provision of choice did not significantly predict participants' reports of the experience of interest during the game at two standard deviations below the mean ($\beta = -.45, p = .16$).

To determine if a similar conclusion could be made for perceived competence on the game, this same analysis was conducted for that outcome. A different pattern of results emerged for perceived competence. The first step accounted for 30.7% of the variance in post-task perceived competence for the trivia game, $F(2, 25) = 5.53, p < .01$. There was a significant positive main

effect of the provision of choice on post-task perceived competence ($\beta = .45, p = .01$) and a marginally significant positive main effect of initial individual interest in trivia and brain teaser games ($\beta = .33, p = .06$). The addition of the interaction did not significantly contribute to the model, $F_{\Delta}(1, 24) = 0.13, p = .72$; total model $R^2 = .31$; $F(3, 24) = 3.60, p = .028$.

Task performance. To explore whether provision of choice in combination with initial individual interest would predict one's performance on *Brain Twister*, an identical hierarchical regression analysis for task performance as those previously described was conducted (see Table 2). A pattern of results similar to that for perceived competence emerged for task performance. The first step accounted for 28% of the variance in task performance, $F(2, 25) = 4.84, p = .017$. Similar to the analyses for perceived competence, both the provision of choice ($\beta = .37, p = .04$) and the initial individual interest for trivia and brain teaser games ($\beta = .38, p = .03$) significantly predicted task performance. The addition of the interaction did not significantly contribute to the model, $F_{\Delta}(1, 24) = 0.74, p = .40$; total model $R^2 = .30$; $F(3, 24) = 3.44, p = .03$.

Discussion

The results of Study 2 suggested that choosing provides motivational and performance benefits, especially for those individuals who had high initial interest going into the task. For individuals who entered the trivia game already with high individual interest for the activity, choosing led to enhanced feelings of interest for the current game compared to not choosing. In contrast, for individuals who entered the game having little initial interest in the activity, choosing had no effect on their subsequent experience of interest for the current game (and the non-significant effect was actually negative in direction). Surprisingly, this pattern of effect was not found for participants' feelings of competence and performance on the game. Rather, both the provision of choice and initial individual interest facilitated participants' perceptions of their competence on the game and their actual performance, but the effects of choice did not vary depending on participants' initial levels of individual interest for the activity.

These findings are compelling in that they seem to challenge the consensus, despite mixed results, that the provision of choice will unconditionally facilitate adaptive motivational and performance outcomes. This study seems to have helped to delineate one condition under which different effects of choosing may occur. In

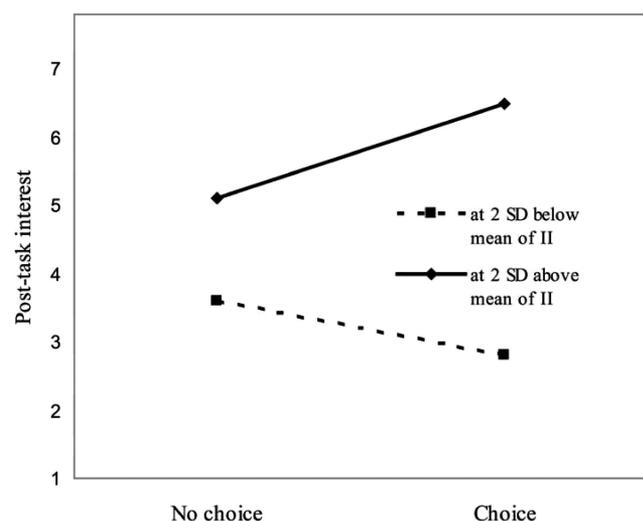


Figure 1. Regression of post-task interest on choice at 2 SDs above and below the mean of initial individual interest (II) in Study 2.

particular, this study suggests that for some motivation outcomes (the experience of interest and enjoyment), choice may only be empowering in the context of having some initial interest for the activity at hand. Providing and making choices may also be of some, but more limited value when an individual enters a task with low initial individual interest.

Study 3

Study 2 had suggested that the at least some of the motivational effects of choosing vary with people's initial individual interest. Given the findings of Study 2, one central question is whether differential effects of choice would be observed when interest was manipulated in the situation rather than measured as a characteristic of the individual. Further, given that in many cases, people will enter a task with both past experiences to inform their beliefs about how interesting they personally find an activity, as well as an understanding of how interesting the particular task at hand is, how these two factors might interact with choice to influence motivation and performance seemed to be an important question. To this end, Study 3 explored whether the effect of choice would vary when the interestingness of the task was manipulated and participants were informed of how interesting or boring most people had found the task in the past, as well as depending on people's initial individual interest for the activity at hand.

Method

Participants. One hundred and seventy-two college students (132 females, 39 males, 1 did not report) in several core educational psychology courses in a large southern school were recruited to participate in the study. Students could participate in order to receive credit toward completing a research requirement for these courses. Participants ranged between 18 and 26 years of age. Participants were ethnically diverse: 75 participants were Caucasian (44%), 18 participants were African American (10%), 23 were Asian (13%), 39 were Hispanic (23%), and 17 were another or of mixed ethnicity (10%).

Procedure. All tasks associated with this study were completed online using a commercial online survey software program, Qualtrics. Participants were informed that the purpose of the study was to investigate people's performance on a reading comprehension task under various conditions. Participants were told that they would receive a reading passage and several questions assessing their comprehension of the passage. After this description, participants were asked to report on how interesting and enjoyable they generally find reading.

Next, participants were randomly assigned to one of two task conditions: *boring task* or *interesting task*. At this point, participants were told that they would be receiving either an interesting or boring version of the reading comprehension task. Participants assigned to the boring task condition were told that they would be reading one of several articles on the scientific method from an academic text. Participants in this condition were told that most college students find the articles fairly boring. Participants assigned to the interesting task condition were told they would be reading one of several articles on employment among young professionals from a newspaper. Participants in this condition were told that most college students find these articles fairly interesting.

In essence, we varied the "interestingness" of the task by both informing participating students of how similar others have experienced the task and by selecting reading passages that we thought would be more or less personally relevant to interests of college students. Both boring and interesting articles were written at a ninth-grade reading level and were approximately the same length. At this point, a post-manipulation measure of interest for the upcoming reading comprehension task was taken to assess whether the task interestingness manipulation had influenced participants' perceptions of the task going into it (and prior to receiving any choices).

Next, participants were informed there would be several aspects of the task that could vary: the particular article and the difficulty of the questions. In the boring task condition, participants were told they could choose to read one of the following articles: "The Social Functions of Science" or "Teaching the Methods and Content of Science." In the interesting task condition, participants could choose to read one of the following articles: "Job Outlook Grim for Recent College Grads" or "Job Strategies Change in Challenging Economy." In addition, participants were told that the difficulty of the questions could vary such that all could be of medium difficulty or there could be a mix of easy, medium, and difficult questions. Participants were then randomly assigned to one of two choice conditions. In the *choice* condition, participants were then asked to make their choices for the reading comprehension task regarding the specific article they would read and the difficulty of the comprehension questions. Participants in the *no choice* condition were assigned these aspects of the task.

The participant then worked on the reading comprehension task for up to 15 min. The task consisted of a 420–450 word passage and seven reading comprehension questions. While participants had chosen or were assigned different articles and difficulty levels for the task, in reality there was no difference in the reading passages or questions within each task condition. Merely the title of the two articles differed so that choice participants could feel as if they had made a choice, without varying the task within task interestingness condition. Likewise, regardless of the difficulty level chosen or assigned to the participant, all participants received the same set of questions within each task condition.

After completing the reading comprehension task, the participant was asked to report on their perception of having choices, experience of interest and enjoyment during the task, perceived competence, the amount of effort they put into the task, their value for the task, their willingness to engage in the task again, and their relative liking of the task compared to similar ones. The number of questions the participant answered correctly also served as a dependent measure. Finally, participants were asked several background questions, including their sex, age, and ethnicity.

Yoking. As in Study 2, a yoked design was used in which participants were grouped into quads such that each member of a quad selected or received the same difficulty task option under one of the four experimental conditions and participants within each task interestingness category received the same article. In order to yoke participants across the two choice conditions (choice participants in the boring task condition and choice participants in the interesting task condition) and in turn, to participants in the no choice conditions, several participants in the choice conditions were run through the experiment first. A log of the choices each participant made was kept in order to determine when two choice

participants of varying task conditions naturally matched in the selection of difficulty assortment for the comprehension questions. Then, a matched participant in each of the no-choice conditions (one from both the easy and difficult task condition) was assigned options identical to those chosen by the participants in the choice conditions. Participants were run intermittently through the choice and no-choice conditions to create 43 yoked quads.

Materials. Measures identical to those used in Study 2 were also used in Study 3, with several additions and exceptions. Namely, in addition to the interest-enjoyment (initial: $\alpha = .93$; post-manipulation: $\alpha = .87$; post-task: $\alpha = .92$) and perceived competence ($\alpha = .92$) subscales of the IMI, subscales from the IMI measuring effort expenditure during the task (five items; $\alpha = .90$; e.g., “I put a lot of effort into this”) and value for the task (seven items; $\alpha = .94$; e.g., “I believe the reading comprehension task could be of some value to me”) were also measured in Study 3 following completion of the reading comprehension task. Consistent with Study 2, initial individual interest items were phrased to refer to reading in general and all post-manipulation and post-task items were worded to refer to the target reading comprehension task in the study. Like Study 2, participants were asked to respond to items using a Likert-type scale ranging from 1 (*not true at all*) to 7 (*very true*).

In addition, participants were asked in a single item to rate how willing they would be to work on the task again in the future using a Likert-type scale ranging from 1 (*not at all willing*) to 7 (*very willing*). Participants were also asked in a single item to indicate how much they enjoyed the reading comprehension task compared to similar tasks on a Likert-type scale ranging from 1 (*enjoyed it much less than other tasks*) to 7 (*enjoyed it much more than other tasks*). As with Study 2, participants were asked about their perception of having received choices regarding aspects of the reading comprehension task using the same four items explicitly designed for use in this investigation ($\alpha = .83$).

Results

Preliminary analyses. First, the distribution of scores on each variable was examined for statistical outliers. Grubbs’s (1950) test was applied, and no outliers were identified. Results indicated that the choice and task interestingness manipulations were successful. Participants in the choice condition perceived having more choice regarding aspects of the reading comprehension task ($M = 4.59$, $SD = 1.15$) compared to participants in the no choice condition

($M = 3.24$, $SD = 1.01$), $t(170) = 8.10$, $p < .001$, $d = 1.25$. Likewise, participants in the boring task condition reported lower interest expectations for the upcoming reading comprehension task ($M = 2.85$, $SD = 1.20$) compared to participants in the interesting task condition ($M = 3.28$, $SD = 1.21$), $t(170) = 2.36$, $p = .02$, $d = -0.36$.

The effects of choice and task interestingness on motivation.

To explore the hypothesis that the interestingness of the task would moderate the effect of the provision of choice on one’s subsequent motivation (i.e., post-task interest, perceived competence, effort, value, willingness to engage in the task again, and relative liking), a 2 (choice) \times 2 (task interestingness) between-subjects factorial multivariate analysis of variance (MANOVA) was conducted that included all six motivation outcomes (see Table 3 for means and standard deviations for each dependent variable by condition). Using Pillai’s trace, the dependent variate was not significantly affected by the main effect of choice condition (Pillai’s trace = .02), $F(6, 163) = 0.43$, $p = .86$. The multivariate main effect of task interestingness condition (Pillai’s trace = .19), $F(6, 163) = 6.29$, $p < .001$, and the multivariate interaction between choice and task interestingness conditions were both significant (Pillai’s trace = .13), $F(6, 163) = 4.09$, $p = .001$.

Univariate analyses of variance (ANOVAs) were conducted on each dependent measure separately to determine the source of the significant multivariate effects. Results suggested that individuals who received the interesting task reported feeling more interest during the task, $F(1, 168) = 25.48$, $p < .001$, $d = 0.74$; greater perceptions of competence, $F(1, 168) = 19.48$, $p < .001$, $d = 0.67$; greater value for the task, $F(1, 168) = 7.62$, $p = .006$, $d = 0.40$; greater willingness to engage in the task again, $F(1, 168) = 8.02$, $p = .005$, $d = 0.44$; and greater relative liking for the task compared to similar others, $F(1, 168) = 21.75$, $p < .001$, $d = 0.69$, compared to individuals who received the boring reading comprehension task. The main effect of task interestingness on effort was marginally significant, $F(1, 168) = 3.65$, $p = .06$, $d = 0.29$, and again, the pattern of findings indicated that individuals who received the interesting task put more effort into the task compared to individuals who had received the boring task. There was no main effect of choice condition on any motivation outcome.

More importantly, univariate analyses revealed a significant interaction between choice and task interestingness for post-task reports of interest, $F(1, 168) = 17.56$, $p < .001$; perceived competence, $F(1, 168) = 5.61$, $p = .02$; value, $F(1, 168) = 16.45$, $p < .001$.

Table 3
Means (and Standard Deviations) for Outcomes by Condition in Study 3

Dependent variable	Interesting task		Boring task	
	Choice ($N = 43$)	No choice ($N = 43$)	Choice ($N = 43$)	No choice ($N = 43$)
	M (SD)	M (SD)	M (SD)	M (SD)
Post-task interest	3.14 (1.10)	3.84 (1.14)	3.00 (1.02)	2.35 (0.97)
Perceived competence	4.51 (0.99)	4.83 (0.82)	4.20 (1.05)	3.80 (1.10)
Effort	4.27 (1.26)	4.60 (1.00)	4.25 (1.11)	3.94 (1.37)
Value	3.49 (1.24)	4.39 (1.17)	3.73 (1.19)	3.13 (1.25)
Willingness to engage	3.44 (1.52)	3.65 (1.77)	3.14 (1.44)	2.63 (1.38)
Relative liking	3.19 (1.28)	3.84 (1.29)	2.95 (1.19)	2.30 (1.21)
Task performance	3.37 (1.50)	3.12 (1.38)	3.58 (1.55)	2.93 (1.58)

.001; and relative liking, $F(1, 168) = 11.81, p < .001$. Tests of the simple effects, using the Bonferroni adjustment for multiple comparisons, revealed that among participants who had received the boring reading comprehension task, making choices significantly enhanced post-task reports of interest, $F(1, 168) = 8.30, p < .004, d = 0.65$; value, $F(1, 168) = 5.37, p = .02, d = 0.49$; and relative liking, $F(1, 168) = 5.91, p = .02, d = 0.54$, compared to individuals who did not make task choices. In contrast, among individuals who had the interesting task, making choices significantly diminished post-task reports of interest, $F(1, 168) = 9.28, p = .003, d = -0.63$; value, $F(1, 168) = 11.68, p = .001, d = -0.75$; and relative liking, $F(1, 168) = 5.91, p = .02, d = -0.51$, compared to individuals who did not make task choices. Although the pattern of effects was identical, the simple effect of choice condition on perceived competence was marginally significant among participants who had received the boring task, $F(1, 168) = 3.50, p = .06, d = 0.37$, and was not statistically significant among participants who had the interesting task, $F(1, 168) = 2.19, p = .14, d = -0.35$.

Looking at the simple effect of task interestingness for each choice condition, among individuals who had made task choices, there was no difference between those who had the interesting versus the boring task in terms of their post-task reports of interest, $F(1, 168) = 0.37, p = .54, d = 0.13$; perceived competence, $F(1, 168) = 2.09, p = .15, d = 0.30$; value for the task, $F(1, 168) = 0.84, p = .36, d = -0.20$; and relative liking of the task, $F(1, 168) = 0.75, p = .39, d = 0.19$. However, among individuals who had not made task choices, those who received the interesting task reported significantly greater interest, $F(1, 168) = 42.67, p < .001, d = 1.41$; perceived competence, $F(1, 168) = 23.00, p < .001, d = 1.06$; value for the game, $F(1, 168) = 23.24, p < .001, d = 0.64$; and relative liking of the task, $F(1, 168) = 32.81, p < .001, d = 1.23$.

The interaction effect was not statistically significant for effort, $F(1, 168) = 3.18, p = .08$, or willingness to engage in the task again, $F(1, 168) = 2.37, p = .13$. Nevertheless, the pattern of the means across conditions suggested a similar pattern of findings: Making choices enhanced effort ($d = 0.25$) and willingness to engage in the task again ($d = 0.36$) among individuals who had received a boring reading comprehension task, but diminished effort ($d = -0.29$) and willingness to engage in the task again ($d = -0.13$) among individuals who had received an interesting task.

The effects of choice and task interestingness on task performance. To explore whether provision of choice and task interestingness would predict one's performance on the reading comprehension questions, we conducted a 2 (choice) \times 2 (task interestingness) factorial analysis of variance (ANOVA) for task performance (see Table 3 for means and standard deviations by condition). The pattern of results that emerged for task performance was consistent with Study 2. Namely, there was a main effect of choice condition, $F(1, 168) = 3.91, p = .05, d = 0.31$, such that individuals who had made choices outperformed individuals who had not made choices. The main effect of task interestingness condition, $F(1, 168) = 0.003, p = .96, d = 0.01$, and the interaction between choice and feedback, $F(1, 168) = 0.74, p = .39$, were not significant. That said, the pattern of the means suggested that choice had a stronger positive effect on task

performance when participants worked on the boring ($d = 0.42$) compared to the interesting task ($d = 0.17$).

The interactive effects of choice, task interestingness, individual interest. To explore how the provision of choice in combination with task interestingness and initial individual interest would predict one's motivation and performance during and following the reading comprehension task, a series of hierarchical regression analyses (one for each outcome) was conducted that included provision of choice, task interestingness, initial individual interest, as well as all two- and three-way interactions.² The main interest of these analyses was the three-way interaction between choice, task interestingness, and initial individual interest for reading.

The three-way interaction between choice, task interestingness, and initial individual interest for reading was significant for only one of the seven variables examined, willingness to engage in the task again. The significant interaction between provision of choice, task interestingness, and initial individual interest ($\beta = -.28, p < .05$) was probed using simple regression equations of willingness to engage on provision of choice at two levels of initial individual interest scores and the two levels of task interestingness (see Figure 2). There was a significant positive effect of provision of choice on willingness to engage in the reading comprehension task again for participants who completed the boring task at two standard deviations above the mean of initial individual interest ($\beta = .51, p = .03$). Provision of choice did not significantly predict willingness to engage for participants who completed the boring task at two standard deviations below the mean ($\beta = -.27, p = .30$). Likewise, provision of choice did not significantly predict willingness to engage for participants who completed the interesting task at either two standard deviations above the mean ($\beta = -.31, p = .19$) or two standard deviations below the mean ($\beta = .13, p = .58$) of initial individual interest.

Discussion

The results of Study 3 suggested that choosing provides motivational and performance benefits particularly when the task is perceived as boring. For college students who were asked to engage in a boring reading task, choosing led to higher feelings of interest, value, and relative liking for the task compared to not choosing. In contrast, for college students who were asked to engage in a reading task perceived to be interesting for most college students, choosing had a negative effect on their motivation during and following the task. Looked at a different way, there was no difference in participants reports of their interest, perceived competence, value, or relative liking for boring and interesting versions of the reading task when choices were given. But, when choices were not given, participants reported significantly greater motivation when the reading task was interesting compared to when it was boring. In other words, choice seemed to create motivation where it did not exist such that boring and interesting versions of a task were experienced similarly. But, when choice was not present, the interesting task supported motivation far better than the boring task, not surprisingly.

² The interested reader can find tables presenting correlations between the relevant variables and results of these regression analyses for Study 3 in the online supplemental materials.

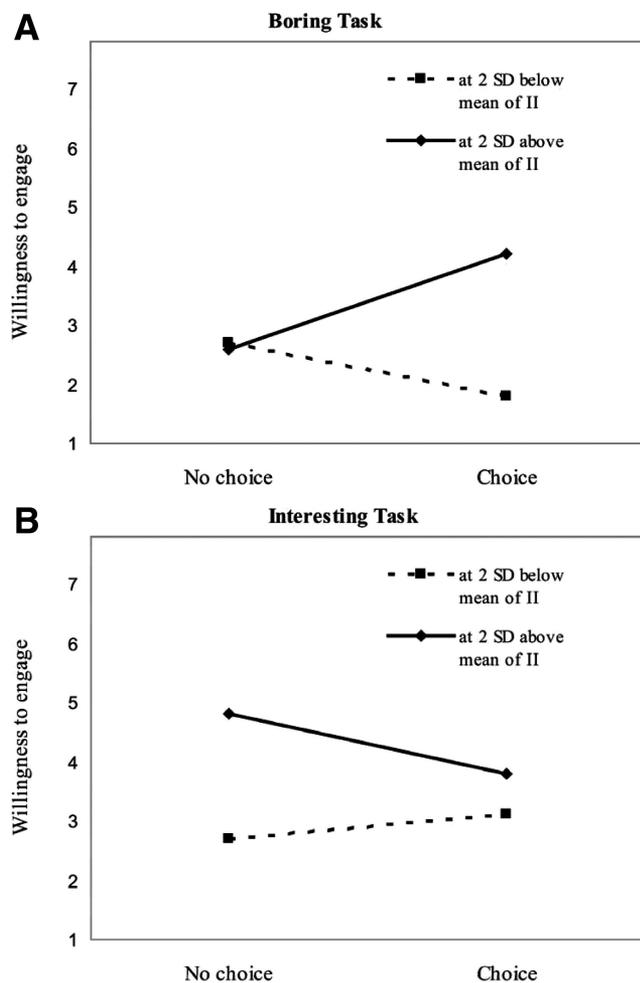


Figure 2. Regression of willingness to engage in the task again on choice at 2 SDs above and below the mean of initial individual interest (II) for boring and interesting tasks in Study 3.

Like Study 2, this pattern of effect was not found for participants' performance on the game. Rather, the provision of choice facilitated participants' actual performance on the reading comprehension questions, but the effect of choice did not vary depending on the interestingness of the reading task or participants' level of individual interest for the activity.

Exploratory analyses examining the three-way interaction between choice, task interestingness, and initial individual interest suggested that these three factors may interact in complex ways to affect motivation. In particular, the results of Study 3 suggest that choice is most facilitative of participants' willingness to engage in the task again in the future when an individual has high initial individual interest for the general activity, though the particular task is perceived to be boring. In fact, high initial individual interest in the context of a boring task was the only circumstance under which choice had a statistically significant effect on willingness to engage in the task again.

In sum, these findings help illustrate that choice will have different consequences for motivation depending on the conditions under which it is offered. This study suggests that choice may be

especially empowering in the context of a task that is perceived as uninteresting, and possibly, in combination with having high initial individual interest for the general activity at hand. Providing and making choices seems to be of more limited value when the task is perceived as typically interesting to most people.

General Discussion

While decades of psychological research have suggested that choice may generally lead to enhanced motivation and performance, especially among students in educational contexts, more recent investigations into the effects of choosing have challenged this assumption. Recent research on the effects of choosing has been fraught with mixed findings regarding the overall effect of choosing and has suggested that there are conditions under which and people for whom choosing may be more or less beneficial (e.g., Iyengar & Lepper, 1999, 2000; Moller et al., 2006; Patall et al., 2008; Reeve et al., 2003). The current findings help to provide a nuanced understanding of the conditions under which choice may be more and less beneficial. These are the first studies to demonstrate that offering an individual the opportunity to choose aspects of a task may be most beneficial when the individual feels some initial interest for the activity at hand or when the task is such that it can benefit from opportunities to build interest.

The present findings suggest that when individuals feel high compared to low individual interest for an impending task, they may have a greater preference for choosing and making choices further enhances their motivation for the task compared to not choosing. In fact, the enhanced benefits of choice in the context of high individual interest were found across three studies, despite the different methods of examining the questions. Thus overall, the results of this investigation seemed to support a sensitization model in which optimally motivated students, those with higher individual interest for the activity, seemed to benefit more than poorly motivated students from having the opportunity to make choices. These results suggest that for the individual with high individual interest, choosing may be experienced as desirable because it is an opportunity to maximize their potential to develop their skills, tailor the task to their particular preferences or goals, and perform successfully, while a lack choice may be seen as an unwarranted restriction of their ability to act autonomously, express their individuality, and maximize their skills. In contrast, for students who lack individual interest, choosing may be experienced as unnecessary, or even overwhelming. Rather than providing an opportunity to tailor the task to their personal preferences and goals, making task-related decisions may be an additional self-regulatory demand in the context of a task they already dislike.

That said, in some contradiction, results also support the notion that choice may lead to the greatest benefits for tasks that can stand to benefit from attempts to increase motivation outcomes (e.g., boring tasks). When considering the interestingness of the particular task rather than the individual's personal level of interest for the general activity, choosing seems to be especially beneficial in the context of a task that is perceived as uninteresting and potentially detrimental in the context of a task perceived to be interesting. This finding makes intuitive sense. Drawing on the notion of a ceiling effect, for a task that is already highly engaging, it may be more difficult to further increase one's motivation for that task. Further, an exploratory three-way interaction between choice, task

interestingness, and individual interest on participants' willingness to engage in the task again seemed to make the most sense of this apparent contradiction in the findings. Namely, Study 3 revealed that choice lead to significant enhancement in participants' willingness to engage in a boring task again when they started out with high initial individual interest for the general category of activity. But, choice had little benefit when the task was perceived to be typically interesting to most people or when people had low individual interest for the general activity.

In line with years of psychological research noting the motivational and performance benefits of intrinsic motivation, individual interest, and situational interest both in and outside of educational contexts and across various levels of schooling (e.g., Ainley et al., 2002; Harackiewicz et al., 2008; Krapp, 2002; Lepper, Corpus, & Iyengar, 2005; Ryan & Deci, 2000; Schiefele, 2001), initial individual interest and task interestingness were found in this investigation to have many benefits. In Study 2, individual interest for an activity predicted experiencing greater interest and enjoyment during task engagement, as well as heightened task performance. Likewise, in Study 3, interesting compared to uninteresting tasks led to the experience of greater subsequent interest and enjoyment during the target activity, as well as greater perceived competence, value for the task, willingness to engage in the task again, and liking of the task relative to similar ones. Given the highly engaging nature of the interesting compared to uninteresting task (as operationally defined in this investigation by the relevance of the information to the samples' personal goals and life concerns), it is little wonder that decision-making opportunities failed to further enhance motivational outcomes during an interesting task. Indeed, in the context of an interesting task, providing choices had negative motivational consequences. Perhaps in the context of an already interesting task, choice is experienced as a self-regulatory demand that has costs (decision-making effort) but few benefits.

While the two patterns of findings across Study 2 and 3 may appear in some contradiction to one other, two points might help to make sense of these findings. One resolution to this contradiction that has already been mentioned can be seen in the three-way interaction that was found in Study 3 between choice, interestingness, and individual interest for willingness to engage in the target task again. This interaction highlights that the three factors likely interact in complex ways and suggest that choosing may yield the greatest motivational benefits in particular contexts (e.g., when people both have some interest in the activity at the start and are given a particular version of that activity that is not naturally engaging). The fact that this three-way interaction was not found for other motivation outcomes is likely a result of the lack of power to detect such a complex interaction, given the relatively small to moderate effects (Cohen, 1988; Cohen, Cohen, West, & Aiken, 2003).

Second, this apparent contradiction highlights that all facets of interest do not operate equally. In these studies, individual interest was assessed by asking participants to think about how interesting and enjoyable they have generally found a category of activity in the past (i.e., trivia games in general or reading in general). Alternatively, instead of focusing on individual interest, anticipated situational interest (also a characteristic of the person) could have been assessed by asking participants to reflect on how interesting and enjoyable they expected the particular upcoming task to be after being given information about the task in order to make

such an assessment. This strategy may have led to different conclusions about how one's interest might moderate the effects of choice, conclusions that might be more in line to those which were drawn when task interestingness was manipulated. To further highlight this distinction, in contrast to how individual interest was measured, when manipulating the interestingness of the task, information about interestingness was provided in reference to the particular task (i.e., the particular articles to be read), rather than the category of activity in general (i.e., reading articles and answering comprehension questions in general). In other words, the specificity of the interest target may contribute to this apparent contradiction in the findings.

Somewhat surprising was the finding that the interactive effect of choice and interest factors was never revealed for task performance, and was only revealed for perceived competence in Study 3 in the context of the task interestingness manipulation. In both of the studies that tested the effects of choice on task performance (Studies 2 and 3), participants who made choices outperformed those who did not make choices about the tasks. Further, choosing had an impact on task performance even though there were no real differences in the task as a result of choosing. In Study 2, there was no difference in the trivia game questions that participants received even though they believed they had chosen categories of questions. Likewise, in Study 3, there was no difference in the reading passage or comprehension questions (within task interestingness condition) that participants received, even though participants thought they selected between two articles based on different titles and selected to receive questions of a particular difficulty assortment. Results suggest that there may be advantages of choosing that translate into differences in performance (and perhaps perceptions of competence) aside from its impact on motivation and emotion. Receiving one's preferences for aspects of a task, even when such preference matching is illusory or trivial, seems to yield cognitive processing benefits that result in enhanced performance.

Given the practical implications of choice-making effects in and outside the classroom, it seems imperative that future research replicate these findings and investigate whether the differential effects of choice observed in this set studies conducted primarily with college students and working adults applies equally to real life settings with various types of samples, especially pre-college students. Along these same lines, it remains unknown as to whether the conclusions of this set of studies might be generalizable to other tasks or other choice-making situations. It is possible that the relations between choice, task interestingness, and individual interest function differently when alternative tasks (tasks other than a trivia game or reading comprehension) are used or in the context of tasks that are not skill-dependent. A fruitful avenue of future research may be to investigate the effects of choosing and interest factors in other choice-making contexts, using other tasks and contrasting various targets of interest. Finally, in this research we have defined interest in line with how it is most commonly conceived of in educational psychology as including both an affective component (i.e., enjoyment) and cognitive components (i.e., perceptions of the activity having value and evaluations related to engagement or re-engagement; e.g., Hidi & Harackiewicz, 2000; Hidi & Renninger, 2006; Krapp, 2002). That is, our definition of individual interest and the situational experience of interest are hinged partially on the experience of enjoyment. It is important to note that this perspective is not unanimously agreed

on. While some emotion scholars agree that pleasantness needs to accompany interest (e.g., Ellsworth & Smith, 1988a, 1988b), others differentiate the positive emotions of interest and enjoyment, noting that they need not co-occur (e.g., Izard, 2007; Silvia, 2005; Turner & Silvia, 2007). In light of this controversy, future research could explore the roles of interest and enjoyment separately in explaining the effects of choice.

This research adds to the growing body of research demonstrating both the limits of choosing and the conditions under which choosing may be most valuable. Clearly, choice is to be valued for its ability to support some of the most important facilitators of learning. However, the provision of choice may need to be used judiciously, and in this case, used only after considering the level of individual interest of the person doing the choosing and the characteristics of the task the person is choosing about.

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