


Mistaking an Intention for a Behavior: The Case of Enacting Behavioral Decisions Versus Simply Intending to Enact Them

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Abstract

Five experiments investigated a previously unrecognized phenomenon—remembering that one enacted a mundane behavioral decision when one only intended to do so—and its psychological mechanisms. The theoretical conceptualization advanced in this research proposes that this error stems from a misattribution when an intention and a behavior are similar. Intentions and behaviors are similar when the physical aspects of the behavior resemble the intention (e.g., both require similar keystrokes) and when the behavior and the intention share mental contents (e.g., both rely on the same criterion). Experiments 1 and 2 introduced a paradigm with similar intentions and enactments and showed misreports and subsequent performance errors even when controlling for guessing. Experiments 3 and 4 demonstrated greater confusion when the physical involvement and mental criteria for intention and behavior were similar. Finally, Experiment 5 indicated that monitoring enactment is highly effective at reducing this error and more effective than monitoring intention.

Keywords

mindfulness, memory for behavior, behavior, intentions, attribution

Some behaviors resemble mere intentions. Imagine that you receive an e-mail asking you for your availability to serve on a university committee. You ponder and decide that you will politely decline this service opportunity to dedicate time to a long-neglected manuscript. However, the intention alone may be sufficient to make you think that you already declined the invitation, only to get further e-mails requesting a response you thought you sent. Or, imagine that you receive a call for nominations and decide to nominate your colleague for an award. Again, the intention alone may lead you to think you actually nominated them even though you did not. As we frequently experience, intending to enact a behavior and actually enacting it are often confused, which results in misremembering that one enacted a decision that one only *intended* to enact. The consequences of this confusion are likely significant. However, to the best of our knowledge, this error and its attributional mechanisms have not been investigated in the past.

As many readers would recognize, *Did I actually do it, or did I only intend to?* represents a source-monitoring dilemma (Clore et al., 2001; Cotton, 1981; Frye et al., 2012; Johnson, 1988, 2006; Payne et al., 2010) in a domain that greatly affects the self: our own behaviors. We are the subjects of both our intentions and our actions, and the intentions and

actions often share physical and mental commonalities such as deciding whom to nominate and later using that mental checklist to make the nomination. The present research thus concerns inappropriate monitoring of our own intentions and behaviors, which may lead to confusions as to whether we *did or did not* perform those behaviors. Did I send the e-mail I intended to, or do I just think I did because I confused an unfulfilled intention with a fulfilled one? We examine the possibility of intention-based errors in the typical case of preparing to enact a behavior but never formalizing it.

Our theorizing is important and novel in the area of the intention–behavior relation. Across various psychological domains, including social psychology (e.g., Ajzen & Fishbein, 1980; Fishbein & Ajzen, 2010), consumer psychology (e.g., Follows & Jobber, 2000), and health psychology (e.g., Gibbons et al., 2003; Prochaska & DiClemente, 1984; Prochaska & Norcross, 2006), behavioral intentions play a

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critical theoretical role as antecedents of behavior. Primarily, the literature on behavioral intentions has described when, and to what extent, behavioral intentions predict behaviors (for reviews, see Albarracín et al., 2001; Webb & Sheeran, 2006). Despite cumulative knowledge about the intention-behavior relation and its moderators, researchers have neglected to understand when intentions may have the ironic effect of undermining behavior. The present research helps to fill this gap.

Intention-Based Errors Concerning Enactments

We are interested in mundane, repeated behaviors that occur in the context of many other similar behaviors (Förster et al., 2007; Marsh et al., 1998). From goal theory (Shah et al., 2002; Shah & Kruglanski, 2000), frequent, mundane behaviors can be understood as involving similar means to goals. In the case of making a decision, selecting many job candidates on a daily basis may involve determining who we will hire and reject, and then logging directions for actually mailing letters of offer or regret to the candidates. In this case, both the means of forming and enacting the decision involve selecting the candidates first, which makes the process leading to the intention and the behavior similar and prone to confusion (e.g., for the principle of equifinality; see Shah et al., 2002; Shah & Kruglanski, 2000).

Other prominent theoretical frameworks might appear to have implications for the effects of intentions on memory for past behavior. First, from a motivational point of view, forming an intention should increase pressure to enact the behavior. The Zeigarnik effect describes changes in the accessibility of representations (e.g., objects and words) associated with unfulfilled or interrupted intentions or goals (Zeigarnik, 1927; see also Förster et al., 2007; Goschke & Kuhl, 1993; Marsh et al., 1998; McCulloch et al., 2011; Sparrow & Wegner, 2006). The goal typically creates a tension that persists until goal completion. This tension causes increased thoughts about the intention before satiation, followed by faded or inhibited thoughts postsatiation (Förster et al., 2007; Marsh et al., 1998). However, the Zeigarnik effect has not been demonstrated as having implications for confusions about *past* behavior.

A more promising psychological perspective is source monitoring and misattribution. Source monitoring involves a distortion wherein people confuse what they might have only inferred with what actually happened (Johnson, 1997). Mundane behavioral decisions are likely to challenge source monitoring and increase errors. When behaviors are mundane or frequent, the greater similarity among the encoded contents should be likely to increase memory errors (Robinson & Roediger, 1997). *Mental process similarity* (i.e., the degree to which the criterion leading to the intention and the behavior share features) should affect the degree to which intention and behavior can be confused. For example,

managers may more frequently misremember an intention as a behavior when the intention and the behavior concern hiring for the same position. The intention to hire a particular telemarketer is more likely to be confused with the behavior of hiring a telemarketer than is the intention to hire information technology personnel. In addition, *physical similarity* (i.e., the degree to which physical actions are shared at the time of forming the intention and enacting a behavior) should also affect the degree to which intention and behavior can be confused. That is, errors may increase when the physical behavior at the time of forming the intention to enact a decision is the same as when enacting it. We turn to the implications of this problem next.

Monitoring Enactment

Given similar mental contents between intention and enactment, what are people to do to reduce these errors? To begin, if mental contents are similar, people should turn to the physical, embodied aspects of behavior as a corrective cue (Hornstein & Mulligan, 2004; for reviews, see Engelkamp, 1998; Steffens, 1999; Zimmer & Cohen, 2001). That is, people should be less likely to confuse intention with behavior when they turn their attention to unique details of the object and context of the action (Steffens et al., 2007). At a fairly elementary level, phrases such as “knock on the table” are better remembered when people execute the action while learning the sentences. Likewise, descriptions of actions learned under the ecologically valid conditions, in which encoding is multimodal and rich, lead to a better recall for the actions (for a review, see Nilsson, 2000). Therefore, we examined whether attention to one’s behaviors or intentions led to more misreport of intentions as did attention to enacted behaviors. Specifically, we tested whether monitoring enactment was more beneficial than monitoring intention or not making a particular effort to monitor either.

Methodological Requirements and Overview of Experiments

Our aim was to develop a lab analog procedure entailing relatively simple, repetitive, and similar behavioral decisions to create the conditions hypothesized to produce high levels of error: our dependent variable. Participants chose candidates and either enacted the decision to hire them (enactment condition), generated an intention to hire them later (intention condition), or made a judgment that was irrelevant to behavior (control condition). There were a large number of candidates and the conditions were randomized at the trial level. Following a delay, participants were asked to report whether they had enacted the decision or simply intended to enact it for each person they had seen. This methodology was carefully crafted to produce the necessary high level of errors we were studying, keep irrelevant characteristics constant across conditions, and systematically manipulate enactment

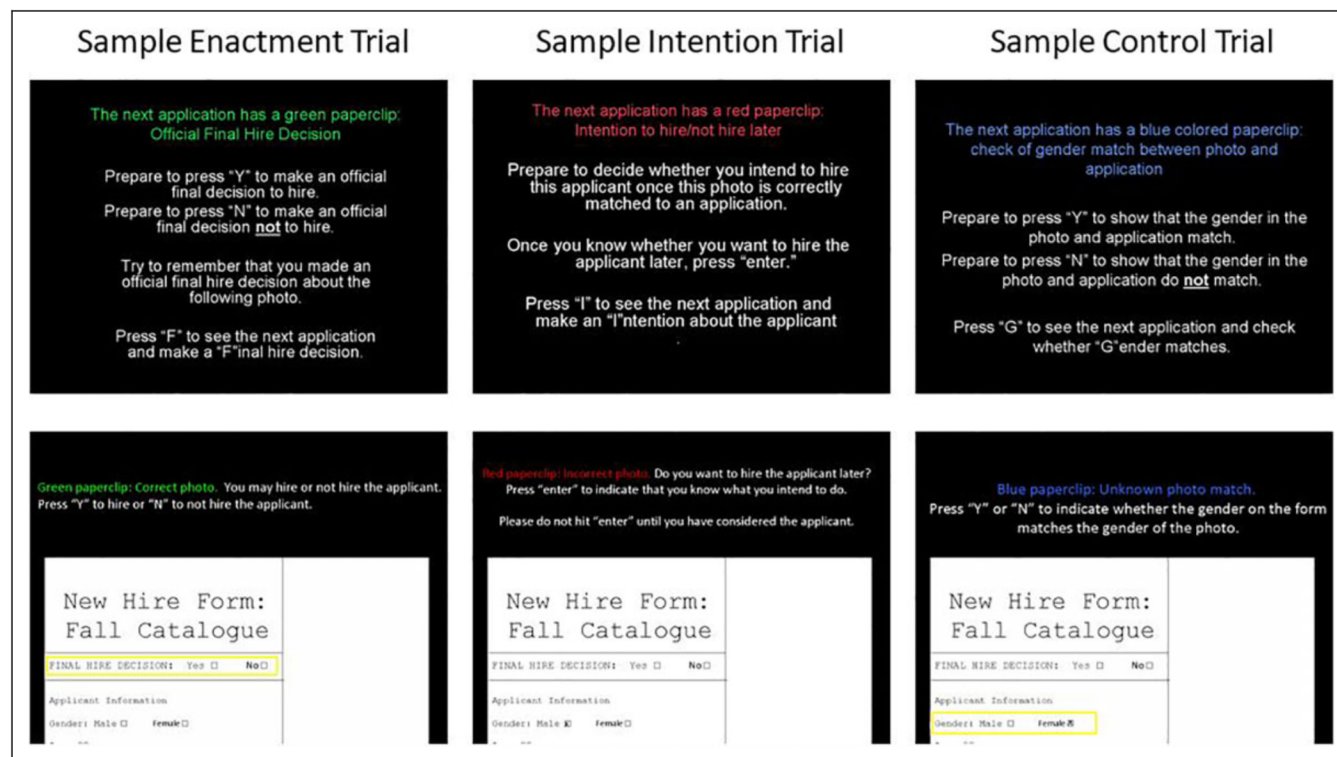


Figure 1. Sample stimuli used during enactment, intention, and control trials. Variations of these stimuli were used across all five experiments, with differences described within the text.

versus intention. We thus developed a method to create a meaningful but subtle distinction between intention and enactment. If intentions play a causal role in producing misreports of behavior, misreports should be more common in the intention than the control condition.

A high proportion of misreports of behavior was a necessary precondition to study our predictions, emulating other paradigms that produce error rates of around 40% (e.g., Deese, 1959). In Experiment 1, we were simply interested in determining whether intentions would produce misreports of past behavior relative to a control. Experiment 2 addressed potential alternative explanations for the findings with respect to guessing. Experiments 3 and 4 tested the hypothesis that intention-driven errors are especially likely for situations of high similarity, whether at the level of the physical response (Experiment 3) or the mental process (Experiment 4). Experiment 5 examined the role of monitoring enactment versus monitoring intention. A sample of the design and material appears in Figure 1 and summaries of all data appear in Table 1. A copy of the materials and data files can be found at https://osf.io/b4kzp/?view_only=dc31e75e182644e983f48495cea60cba

Experiment 1: Proof of Concept

The purpose of Experiment 1 was to test a procedure entailing a repetitive action that involved forming intentions and

enacting behaviors that were similar in nature, and to observe if the procedure led to confusing intentions with behaviors. Support for this error would derive from the observation that forming intentions increases reports of having performed a behavior more so than making a control judgment.

Method

Designed and Participants

A three-trial type (enactment, intention, and control) within-subjects design was used. Sixty-nine undergraduates participated in the experiment in exchange for partial course credit: $n_{\text{female}} = 53$, $M_{\text{age}} = 19.09$, $SD_{\text{age}} = 0.90$. The sample size in this study was planned to detect a small effect, $d = 0.25$, with an $\alpha = .05$ and power = .80. Based on these parameters, we planned for an $N = 57$ and posted the study for the estimated number of days to obtain such a sample.

Procedures

All procedures were administered by a computer. Participants played the role of a manager reviewing electronic applications of models for a clothing catalog. Applications were reviewed and were associated with either the decision to hire the applicant immediately (enactment trials), the intention to hire the applicant at a later time (intention trials), or a determination of whether the gender of the applicant

Table 1. Experiment Descriptions and Summary Statistics.

Experiment and participants	Procedures and N	Photos and trials	Reported Enactments (by Trial Type and Condition)					Enact/control	F-ratio for trial differences	F-ratio for second factor	F-ratio for interaction
			Enact	Intend	Control	Enact/intend	Enact/control				
1 University participant pool	Proof of concept measured reports in behavior. Participants had an opportunity to act on their unfulfilled intentions at the end of the study. Enactment = keystroke; intention = mental. N = 69	15 trials 15 photos Assignment of stimuli was counterbalanced	.65 _a [0.60, 0.70]	.46 _b [0.39, 0.53]	.39 _c [0.33, 0.45]	—	—	28.84***	—	—	
2 Paid participants	Participants were not forced to report having acted or not, and could instead report uncertainty. Enactment = keystroke; intention = mental. N = 37	15 trials 15 photos Assignment of stimuli was counterbalanced	.70 _a [0.64, 0.76]	.37 _b [0.26, 0.48]	.17 _c [0.10, 0.24]	—	—	57.72***	—	—	
3 University participant pool	Manipulated response similarity. Enactment = keystroke; intention = keystroke. Enactment = keystroke; intention = mental. N = 111	70 trials 50 photos 10 photos assigned to each condition	.66 _a [0.61, 0.71]	.66 _a [0.61, 0.71]	.48 _c [0.43, 0.53]	.82 _c [0.78, 0.86]	.76 _c [0.72, 0.80]	26.09***	—	—	
			.62 _a [0.56, 0.68]	.52 _b [0.45, 0.59]	.38 _c [0.30, 0.46]	.78 _d [0.74, 0.82]	.74 _d [0.69, 0.79]	38.60***	—	—	
			.64 _a [0.60, 0.68]	.59 _b [0.55, 0.63]	.43 _c [0.38, 0.48]	.80 _d [0.77, 0.83]	.75 _e [0.72, 0.78]	99.45***	4.98*	3.28*	
4 _z University participant pool	Manipulated mental process similarity. N = 508	32 trials 32 photos 16 photos assigned to each condition Omitted control condition Included 7 novel photos during	.59 [0.57, 0.61]	.57 [0.55, 0.59]	—	Same hiring criterion	—	—	—	—	
			.41 [0.39, 0.43]	.43 [0.41, 0.45]	—	Different hiring criteria	—	—	—	—	
			.50 [0.49, 0.51]	.50 [0.49, 0.51]	—	Total	—	—	—	—	
			.94 _a [0.90, 0.98]	.43 _b [0.34, 0.52]	.15 _c [0.08, 0.22]	Monitor enactment	—	159.32***	—	—	
5 University participant pool	Examined the role of monitoring. Participants were randomly assigned to either monitor their enactments, their intentions, or neither. Enactment = keystroke; intention = keystroke. N = 118	15 trials 15 photos 5 photos assigned to each condition Assignment of stimuli was counterbalanced	.65 _a [0.57, 0.73]	.45 _b [0.32, 0.58]	.31 _c [0.22, 0.40]	Monitor intention	—	22.76***	—	—	
			.78 _a [0.70, 0.86]	.75 _a [0.68, 0.82]	.46 _b [0.37, 0.55]	No monitoring	—	29.48***	—	—	
			.80 _a [0.76, 0.84]	.54 _b [0.48, 0.60]	.30 _c [0.25, 0.35]	Total	—	118.82***	14.78***	16.41***	

Note. Entries represent the mean proportion of reported enactment (and their 95% confidence intervals [CIs]) by trial type and condition. This represents accuracy in the enactment trials and error in the others. The total sample size across all studies is N = 843. Some experiments did not include all five trial types. In such cases, they are marked as not applicable —. Means with differing subscripts within rows are significantly different at $p < .05$.

_z In Experiment 4, we compare the mean proportion of reported enactment (for intention trials) and the mean proportion of reported intention (for enactment trials) with each other. This comparison is made and *** $p < .001$. ** $p < .01$. * $p < .05$.

matched what was listed on the application form (control trials). Participants were told that they would first review applications and then answer questions about their behavior during the selection task. According to extensive pretesting, the task was clear and served to distinguish definite enactment from intention to enact the behavior in the future, while tightly controlling other features of the task. The requested reports of what participants had done during the applicant selection task, which happened after a delay, were also clear. Participants made a large number of decisions to increase the probability of errors and our manipulation of intention, enactment, and control judgment was at the level of the trial.

Task description. The task (see Figure 1) included 15 trials, each showing the gender and a photograph of a model. To create a rationale for the different types of trials in the task, participants were told that an intern erroneously mismatched some models' identifying information with their photos. When applications were not affected by the mismatch, participants could make an "official final hire" based on the photograph, signifying the immediate and irrevocable decision to hire or reject the applicant (enactment trial). When applications were ostensibly affected by this mismatch, participants could generate an intention to hire or reject the applicant in the future (intention trial). Completion of this intention was thus pending until the administration could correct the applicant's identifying information. For the third group of applications, it was ostensibly unknown whether the clerical error affected the applications. Seemingly as part of a check for potential error, though participants were simply asked to record whether the gender marked on the application matched the apparent gender on the photo (control trial). Participants were told that the gender determination had to be made to assist in future detection of whether the photo and identifying information were mismatched. Specifically, any identified gender mismatches would signal that the application *had* been affected by the error, thus making this control condition meaningful in the context of the cover story. This cover story describing the administrative error requiring delayed action in the intention trials was clear and believable according to pretesting and served to distinguish definite enactment from intention to enact the behavior in the future, whereas tightly controlling other features of the task and ensuring the necessary high error rate.

Enactment, intention, and control trials. Stimuli for the application phase involved the presentation of simplified mock job applications appearing truncated to show only the top of a page. The shown portion included a box labeled "FINAL HIRE DECISION" with "Yes" and "No" spaces, a box for gender with male and female spaces, and a photograph appearing in the upper right corner. Above each application, text explained the status of the match between photo and application, and a specific instruction for responding was given. The screens for each type of trial were as follows:

1. The enactment screen read *Correct photo. You may hire or not hire the applicant/Press "Y" to hire or "N" to not hire the applicant*, and the hire decision box was highlighted. Participants responded to enactment trials by pressing a key.
2. The intention screen read *Incorrect photo. Do you want to hire the applicant later?/Press "Enter" to indicate that you know what you intend to do*. Participants thus formed purely mental intentions and did not overtly express the intention or whether they intended to hire a candidate or not (i.e., the intention direction) in any way.
3. The control screen read *Unknown photo match/Press "Y" or "N" to indicate whether the gender on the form matches the gender of the photo*, and the gender box was highlighted. Participants responded to control trials by pressing a key.

To ensure that participants could properly distinguish enactment, intention, and control trials, a pretrial, stimulus-free screen included instructions for the impending trial type and required participants to press a unique key that demonstrated participants were prepared to respond to the nature of each trial. To further differentiate trial types, the initial instructions, pretrial screen, and trials, all included a color scheme in which the fonts and a paperclip appearing in the corner of the application were green (enactment), red (intention), or blue (control).

Photos presented in the trials. Each of the 15 trials entailed the pretrial screen and the application screen. The applicants were represented with 15 photos of smiling faces of men and women from the Radboud Faces Database (Langner et al., 2010). Five photos equated for attractiveness (based on the database's norms) were assigned to each of the enactment, intention, and control conditions. To further ensure that the trial-type condition, rather than particular stimuli, was responsible for our results, we included a between-subject stimulus set counterbalancing condition and randomly assigned one of two pairings of particular faces to trial-type condition.

Task training and understanding. A five-question multiple-choice quiz following the initial instructions ensured that participants understood the task, with particular emphasis on the meaning of the conditions and what constituted a completed behavior (enactment vs. intention conditions). All incorrect responses were followed by corrective information.

Reports of behavior. After participants learned that the task was complete, there was a delay, followed by a clearly labeled measurement phase that allowed participants to report enacting their decision or simply intending to enact it. An instruction screen emphasized this objective and reminded participants that this type of question referred to the green-colored trials, which were unaffected by the

clerical error and thus represented irrevocable hires or rejections. Trials with each face from the prior task (separated from the application) appeared in random order. Above each photo, the question *Did you make an official final hire?* appeared with three response options: (a) *I made an official final hire decision: Yes, hire*, (b) *I made an official final hire decision: No, do not hire*, and (c) *I did not make an official final hire decision*. Participants responded by pressing the appropriate number key. As the primary dependent measure, we calculated the proportions of responses indicating official, final hiring decisions, whether affirmative or negative. Naturally, when behavior is confused for intention, participants can report having hired an applicant when they intended to hire an applicant and not having hired an applicant when they intended not to hire an applicant. In other words, they may be more likely to confuse an intention with a behavior when both go in the same direction (i.e., both are to hire or both are to not hire). Nevertheless, our key error of interest was whether people reported an enactment irrespective of the direction of their intention, and there was no such direction in the control condition. Thus, in some of the later studies, participants simply reported whether or not they had made an enactment or simply formed an intention, without being asked to report the direction.

Measure of performance at a later time. We also measured failures to act following the behavior report phase. Participants were informed that they would have the opportunity to officially hire any desired applicants, but should avoid rehiring those previously hired, and this occasion would comprise the final opportunity to hire models. Stimuli appeared in random order and participants chose one of three responses: (a) *Applicant has not been hired: HIRE NOW*, (b) *Applicant has not been hired: DO NOT HIRE*, and (c) *Applicant has already been hired*. Thus, participants were given the opportunity to act on their unfulfilled intentions.

Results and Discussion

The five-question multiple-choice quiz indicated that participants understood the differences between the trials (accuracy: $M = 91\%$). For all subsequent experiments, accuracy was comparably high, indicating that participants had no difficulty understanding the task.

The proportion of reported enactment was subjected to a 3 (trial type: enactment, intention, and control; within) \times 2 (stimulus set counterbalancing; between) repeated-measures ANOVA. A Huynh–Feldt correction was used because the data violated the sphericity assumption. Stimulus set produced no main or interactive effects, $F(1.88, 126.22) = 0.80, p = .44$. Supporting the hypothesis of intention-driven reports of actual behavior, we found a significant main effect of trial type, $F(1.88, 126.22) = 28.84, p < .001$. Reported enactment was higher in the intention trial ($M = .46, SD = 0.29$) than the control trial ($M = .39, SD =$

0.26), $t(68) = 2.07, p = .043, d = 0.25$, but higher still in the enactment trial ($M = .65, SD = 0.21$) than the intention trial, $t(68) = 4.75, p < .001, d = 0.61$.

We next analyzed actual performance during the second hiring opportunity. As expected, we found greater failure to act (choice of the “applicant has already been hired” instead of “hire now”) in the intention than the control condition. As anticipated, participants in the intention condition were more likely to choose “This applicant has already been hired” ($M = .21, SD = 0.24$) than were participants in the control condition ($M = .11, SD = 0.14$), $t(67) = 3.20, p = .002, d = 0.51$. This effect was again unqualified by interaction with stimulus counterbalancing, $F(1, 66) = 0.08, p = .78$.

Experiment 2: Replication Excluding Guessing

The aim of Experiment 2 was to address whether incorrect reports of behavior may actually have been a function of mere guessing or random responding. Although the high proportion of mistaken reports of behavior in our experimental conditions makes this implausible, reports may have been made without subjective certainty. Therefore, in Experiment 2, participants were given the option of reporting uncertainty. Finding that intentions increase misreports of behavior when “aren’t sure/don’t know” was an option would demonstrate that these mistakes are experienced with certainty.

Method

Design and Participants

A three-trial type (enactment, intention, and control) within-subjects design was used. Thirty-seven volunteers participated in half-hour sessions in exchange for US\$5: $n_{\text{female}} = 23$, $M_{\text{age}} = 21.5, SD_{\text{age}} = 4.77$. The sample size in this study was planned to detect a small effect, $d = 0.30$, with an alpha = .05 and power = .80. This effect took into account the estimated $d = 0.25$ we had in the first experiment but factoring in the use of a paid participant pool which in our experience had less random variability. Based on these parameters, we planned for an $N = 39$ and posted the study for the estimated number of days to obtain such a sample.

Procedures

The procedures used in this experiment were similar to those used in Experiment 1 with two differences. First, responses were altered such that participants were not forced to report having or not having acted and could instead report uncertainty. Participants could thus (a) *Press “1” to indicate that you completed the application by making an official final hire or rejection*, (b) *Press “2” if the application is incomplete (you generated an intention or did a gender check)*, or (c) *Press “3” if you aren’t sure/don’t know*. Second, the

study ended with the participants' report of their behavior without presenting another opportunity to hire the applicants.

Results and Discussion

Across the board, participants chose the third option to indicate uncertainty on 10% of the trials. A 3 (trial type: enactment, intention, and control; within) \times 2 (stimulus set counterbalancing; between) repeated-measures ANOVA was conducted on the proportion of recognition trials for which that option was chosen. Stimulus set counterbalancing produced no main or interactive effect, $F(2, 70) = 1.41, p = .25$. A main effect of trial type was observed, $F(2, 70) = 5.37, p = .007$. Uncertain responses were unevenly distributed between enactment trials ($M = .06, SD = 0.10$), intention trials ($M = .10, SD = 0.17$), and control trials ($M = .17, SD = 0.19$). However, only enactment and control trials differed significantly from each other, $t(36) = 3.53, p = .001, d = 0.59$. This finding implies that reports in 90% of the intention trials and 94% of the enactment trials were made with high certainty.

We also examined whether intentions continued to lead to mistaken reports of behavior by conducting a 3 (trial type: enactment, intention, and control; within) \times 2 (stimulus set counterbalancing; between) repeated-measures ANOVA on the proportion of reported enactments. The stimulus set factor again produced no main or interactive effect, $F(2, 70) = 1.00, p = .37$. A main effect of trial type was observed, $F(2, 70) = 57.72, p < .001$. Reported enactment was higher in the intention trials ($M = .37, SD = 0.33$) than the control trials ($M = .17, SD = 0.21$), $t(36) = 3.76, p = .001, d = 0.64$, but higher still in the enactment trials ($M = .70, SD = 0.20$) than the intention trials, $t(36) = 6.44, p < .001, d = 1.1$. Thus, introducing a response option to indicate uncertainty did not eliminate misreports of behavior.

Overall, the error rate in this experiment, probably because of the use of paid participants, was lower than in Experiment 1. Still, the error in the intention conditions was high. Critical to our analysis, the rate of reporting enacting a decision in the intention trials was higher than the same rate in the control trials.

Experiment 3: Physical Similarity

The purpose of Experiment 3 was to provide evidence for physical similarity. If the formation of intentions and behavioral enactments has similar contents, this similarity may lead to confusing an intention with a behavior. To test this hypothesis, we randomized participants into one of two similarity conditions: high similarity and low similarity. The high similarity condition involved a similar physical response for both enactment and intention formation (e.g., press Y/N to hire/not hire or intend to hire/intend to not hire). The low similarity condition involved a physical response for enactment but only the mental formation of one's intention. We

anticipated that misreports would be more frequent in the high similarity condition due to the greater overlap in response type. As part of exploratory work, we also presented the same photos during some of the intention and enactment trials to understand the role of additivity in these effects.

Method

Participants

A 5 (trial type: enactment, intention, control, enactment/intention, and enactment/control) within-subjects \times 2 (high and low physical similarity) between-subjects design was used. Fifty-eight undergraduates participated in the experiment in exchange for partial course credit. Three were excluded from analyses due to invariant responding in one of the two primary measures: $N = 55, n_{\text{female}} = 36, M_{\text{age}} = 18.91, SD_{\text{age}} = 1.06$. The sample size in this study was planned to detect a small effect, $d = 0.25$, with an alpha = .05 and power = .80. Based on these parameters, we planned for an $N = 57$ and posted the study for the estimated number of days to obtain such a sample.

Procedures

The procedures used in this experiment were similar to those used in the prior experiments, with the exception that we also manipulated the physical similarity of intentions and behavior by manipulating how intentions were expressed. Participants assigned to the high similarity condition expressed both the enacted behavior and intention with a keystroke. For intention trials in the high similarity condition, participants were thus presented with *Incorrect photo. Do you want to hire the applicant later?/Press "Y" or "N" to indicate whether you want to hire the applicant later.* In contrast, participants assigned to the low similarity condition expressed enacted behavior with a keystroke but considered their intention only mentally. For these intention trials, then, participants were presented with *Incorrect photo. Do you want to hire the applicant later?/Press "Enter" to indicate that you know what you intend to do.*

This experiment also included two new types of trials: enactment/intention and enactment/control trials. In the *enactment/intention trial*, 10 photos each appeared twice, once in the enactment and once in the intention trial. In the *enactment/control trial*, 10 photos each appeared twice, once in the enactment and once in the control trial. That is, each photo in these conditions appeared twice in separate randomly ordered trials such that one appearance required an enacted hire/rejection and another required either the generation of an intention or a control judgment. This design feature permitted the examination of whether intentions increased the likelihood of reporting enactment even when an enactment response is made on another occasion (i.e., whether the effects of intention and enactment on the

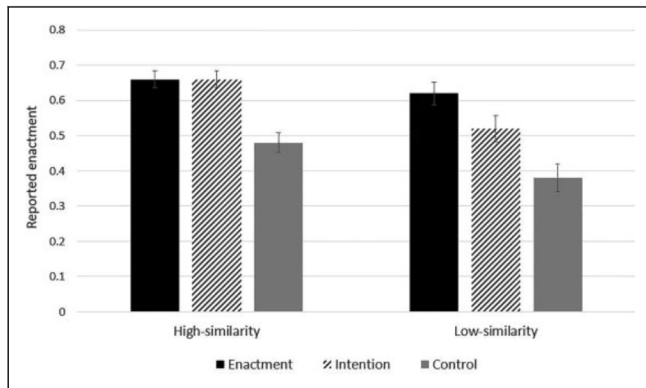


Figure 2. The proportion of reported enactment for enactment, intention, and control trials for both the high similarity and low similarity conditions in Experiment 3. Error bars represent standard errors.

likelihood of reporting enactment are additive). Participants received no explanation about the repeat trials, which we expected to “fly under the radar” given the large number of trials we introduced. In funnel debriefing procedures, no participant mentioned this issue. We thus used 50 unique photos for 70 trials.

Results and Discussion

A 5 (trial type: enactment, intention, control, enactment/intention, and enactment/control; within) \times 2 (similarity factor: high and low; between) repeated-measures ANOVA was conducted to analyze the proportion of reported enactments. A Huynh–Feldt correction was used because the data violated the sphericity assumption. The key prediction in this experiment was that greater physical similarity between intention and behavior would yield greater misreport of behavior. A main effect of trial type was observed, $F(3.71, 403.83) = 99.45, p < .001$. Reported enactment was higher in the intention trial ($M = .59, SD = 0.24$) than the control trial ($M = .43, SD = 0.26$), $t(110) = 8.12, p < .001, d = 0.77$, but higher still in the enactment trial ($M = .64, SD = 0.21$) than the intention trial, $t(110) = 2.34, p = .02, d = 0.22$. Interestingly, an examination of the two exploratory trials added showed reported enactment was higher in the enactment/intention trial ($M = 0.80, SD = 0.16$) than the enactment/control trial ($M = 0.75, SD = 0.17$), $t(110) = 2.74, p = .007, d = 0.30$. This pattern of results suggests that intention can add to the certainty that one has performed a behavior even in cases in which the behavior was in fact performed.

The interaction between similarity and trial type was also statistically significant, $F(3.71, 403.83) = 3.28, p = .01$ (see Figure 2). The difference between the enactment and intention trials was smaller when similarity was high ($M = 0, SD = 0.20$) than when it was low ($M = 0.10, SD = 0.23$), $t(109) = -2.45, p = .02, d = 0.46$, implying that intention was confused with behavior more when the intention and the

behavior were similar. One could also expect a smaller difference in report of behavior in intention trials than control trials when the similarity between the intention and enactment trials was low. Although this intention–control difference was smaller when the similarity between intention and enactment trials was low ($M = 0.03, SD = 0.20$) than when it was high ($M = 0.06, SD = 0.16$), the difference was not significant, $t(109) = 0.84, p = .40$. All in all, Experiment 3 demonstrates that the similarity of the response for intention and behavior is a critical contributor to mistaken reports of behavior as shown by reports of behavior in intention conditions approximating reports of behavior in enactment conditions.

Experiment 4: Similarity in Mental Process

The primary aim of Experiment 4 was to provide further evidence for the influence of similarity by zoning in on the role of mental process similarity. We hypothesized that because intentions entail similar cognitive processes that occur during the preparation of behavior, this similarity would lead individuals to confuse an intention with a behavior. To test this hypothesis, we had two criteria on which to base decisions, attractiveness and competency, anticipating that misreports would be more frequent within the same versus different criteria due to the greater overlap in mental contents. Experiment 4 also introduced procedural variations to further ensure that participants had paid attention to the task. Specifically, we included novel faces (not corresponding to models from the hiring task) that participants should report as not seen if they paid attention to the task.

Method

Design and Participants

A 2 (trial type: enactment and intention) \times 2 (same vs. different mental criteria) within-subjects design was used. Five hundred and sixteen undergraduates participated for partial course credit: $n_{\text{female}} = 308, n_{\text{other}} = 8; M_{\text{age}} = 19.59, SD_{\text{age}} = 1.38$. Fourteen participants were excluded due to problems saving their data. Based on a pilot, the sample size in this study was planned to detect a small effect, $d = 0.07$ (according to Cohen, 1992 effect size convention), with an alpha = .05 and power = .80. Based on these parameters, we planned for an $N = 564$ and posted the study for the estimated number of days to obtain such a sample.

Procedures

The cover story for the previous experiments was modified by telling participants that the hiring process involved two catalogs. Participants first learned about the selection criteria for each catalog. The first, *American Clothiers* featured leisurewear and required models selected based on attractiveness. The second, *Modern Professional*, featured business

wear and required models selected based on perceived competence. Intention and enactment were manipulated as in Experiment 1, with the exception that participants were instructed to *use competence* or *attractiveness* for each enactment and intention judgment. The selection criterion manipulation was further made salient by inserting the relevant catalog title prominently on the application sheet. In both the enactment and intention trials, 8 applicants appeared for each catalog for a total of 32 applicants. Because our primary hypothesis concerned comparing rates of misreport of behavior to one another (and because we anticipated that recalling both the criteria and enactment status would be very difficult in and of itself), we omitted the control trial to reduce the number of trials.

As mentioned, the measurement phase included those reports but also reports as to whether or not the face appeared. In addition to the 32 applicants from the hiring phase, we showed 7 novel faces. The number of novel faces was the maximum possible due to the number of appropriate stimuli available in the database from which the faces were selected. After each photo was presented, participants were asked: *Did you see an application from this candidate? Press "Y" for Yes/"N" for No.* If participants reported having seen the applicant, they chose among the following responses: (a) *Acted: Hired or rejected using attractiveness for American Clothiers*, (b) *Acted: Hired or rejected using competence for Modern Professional*, (c) *Intended: Intended to hire or reject using attractiveness for American Clothiers*, and (d) *Intended: Intended to hire or reject using competence for Modern Professional*. These measures were used to calculate the reports of enactment and intention within each criterion (i.e., each catalog).

Results and Discussion

Accuracy for recognizing novel faces was 98%, indicating adequate attention to the task. Regarding faces that *did* appear, intentions were misreported as enactments (reported behaviors, $M = 0.45$, $SD = 0.20$) more frequently than enactments were misreported as intentions ($M = 0.41$, $SD = 0.19$), $t(496) = 2.82$, $p = .005$, $d = 0.13$. Furthermore, consistent with our prediction, a greater proportion of misreports of behavior was observed within the same hiring criterion ($M = 0.57$, $SD = 0.28$) than in different hiring criterion ($M = 0.43$, $SD = 0.28$), $t(482) = 5.88$, $p < .001$, $d = 0.80$. This finding implies that intentions made based on the same hiring criterion were more likely to be mistaken as enactments than were intentions based on a different hiring criterion. This result, therefore, suggests that the similarity in the cognitive processes involved in forming an enactment and an intention is important to produce misreports of behavior. Experiment 4 further extends our understanding of the intention-based error by examining the extent to which enactments were confused with intentions. Specifically, although naturally both errors exist, we found support for

the notion that the misattribution is more localized around intention-based misreports of behavior.

Experiment 5: Effects of Detailed Monitoring

The purpose of Experiment 5 was to explore the effect of detailed monitoring. We asked participants to keep track of and observe details about either their intentions or their behaviors to hire or not hire an applicant. We hypothesized that participants who monitor would report fewer misreports of behavior, compared with a control condition. We also expected that detailed monitoring of enactment might be more effective because it would provide physical information to distinguish enactment from intention. Although both the enactment and intention trial responses involved keystrokes, only the enactment screen involved a key that represented hiring.

Method

Design and Participants

A 3 (trial type: enactment, intention, and control) within-subjects \times 3 detailed monitoring (monitor enactment, monitor intention, and no monitoring instructions) between-subjects design was used. Hundred and eighteen undergraduates participated in exchange for partial course credit: $n_{\text{female}} = 86$, $M_{\text{age}} = 19.66$, $SD_{\text{age}} = 1.61$. Based on a pilot, the sample size in this study was planned to detect a small effect, $d = 0.20$, with an alpha = .05 and power = .80. Based on these parameters, we planned for an $N = 124$ and posted the study for the estimated number of days to obtain such a sample.

Procedures

Participants were randomly assigned to one of three detailed monitoring conditions (monitor enactment, monitor intention, and no monitoring instructions). In the two monitoring conditions, participants were asked to write down, on a form, the alphanumeric code associated with each applicant and either their actual hiring decision (monitor enactment) or their intention to hire or not hire (monitor intention; see Supplemental Appendix). Participants were also asked to elaborate on their reasons for their enactment or intention, including characteristics of the applicant that may have influenced their decision (e.g., age, gender, physical features) as well as other thoughts about them (e.g., whether the applicant resembled someone they know). The third condition was a control condition without monitoring directions, thus similar to all of our prior experiments.

Results and Discussion

A 3 (trial type: enactment, intention, and control; within) \times 3 (detailed monitoring: monitor enactment, monitor intention,

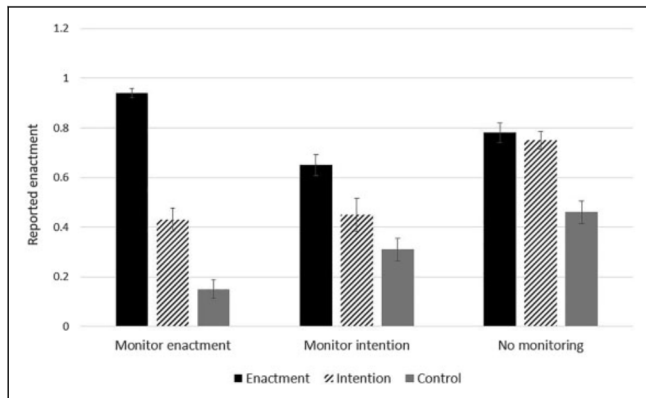


Figure 3. The proportion of reported enactment for enactment, intention, and control trials for the monitoring enactment, monitor intention, and no monitoring conditions in Experiment 5. Error bars represent standard errors.

and no monitoring instructions; between) repeated-measures ANOVA was conducted on the proportion of reported enactments. A Huynh–Feldt correction was used because the data violated the sphericity assumption. A main effect of trial type was observed, $F(1.92, 220.86) = 118.82, p < .001$. Reported enactment was higher in the intention trial ($M = .54, SD = 0.34$) than the control trial ($M = .30, SD = 0.29$), $t(117) = 7.82, p < .001, d = 1.28$, but higher still in the enactment trial ($M = .80, SD = 0.24$) than the intention trial, $t(117) = 6.56, p < .001, d = 1.07$.

Most importantly, as predicted, there was a significant interaction between the trial types and the detailed monitoring conditions, $F(3.84, 220.86) = 16.41, p < .001$ (see Figure 3). Monitoring intention reduced intention-based misreports of behavior ($M = 0.45, SD = 0.39$) relative to not monitoring ($M = 0.75, SD = 0.22$), $t(71) = -4.13, p < .001, d = 0.98$, but also worsened the report of enactment on the enactment trials ($M_{\text{monitoring intention}} = 0.65, SD_{\text{monitoring intention}} = 0.25$; $M_{\text{no monitoring}} = 0.78, SD_{\text{no monitoring}} = 0.24$), $t(71) = -2.31, p = .02, d = 0.55$. In contrast, monitoring enactment led to the most discrimination. Particularly, monitoring enactment reduced intention-based misreports of behavior ($M = 0.43, SD = 0.31$) relative to not monitoring, $t(82) = -5.40, p < .001, d = 1.19$, but also improved the report of enactment for the enactment trials ($M_{\text{monitoring enactment}} = 0.94, SD_{\text{monitoring enactment}} = 0.13$), $t(82) = 3.83, p < .001, d = 0.83$. In summary, detailed monitoring of enactments had the dual benefit of reducing misreports of enactment and improving accuracy for completed behaviors.

General Discussion

Five experiments employing a novel procedure examined the potential for behavioral intentions to produce misreports of behaviors. In all experiments, intentions produced more reports of enactment than a control condition. Misreports

of behavior occurred regardless of the operationalization of intention but were more likely when behavior was similar to intention because of similar physical responses (Experiment 3), similar mental processes (Experiment 4), and inadequate monitoring (Experiments 5). Furthermore, the overall effect size for misreport of behaviors was $d = 0.41$ (95% CI = [.30, .53] using a fixed-effects model), and the error was shown to lead to the consequence of failing to act when the opportunity arises (Experiment 1).

This research adds to the understanding of the intention–behavior relation. Although intentions are widely considered a crucial determinant of behavior, the correlations vary in size. Sometimes the low correlations may be due to counterintuitive effects of intention on behavior. For example, publicly expressing an intention can make the associated behavior *less* likely when that expression bolsters one’s social image in the same way that behavior itself would (Gollwitzer et al., 2009). The increase in misreports of behavior provoked by behavioral intentions is also an ironic effect. It is important to understand exceptions that may explain the complexities of the intention–behavior relation without dismissing the undeniable role of intentions as facilitators of behavior (for how overgeneralizing a null result given a commonsense hypothesis is a mistake, see Kluger & Tikhonchinsky, 2001).

We demonstrated that the inherent similarity of intentions and behaviors in many circumstances explains misreports of behavior based on intentions. For recurring behaviors, individuals are unlikely to encode and store much information about either the intention or the enactment itself, and this lack of detailed monitoring gives way to intention-driven misreports. When intention or behavior monitoring occurs, misreports of behavior decrease. Moreover, intentions and most behaviors share a mental process, which in this paradigm is evaluating the adequacy of a candidate for a job. When the criterion for this evaluation is artificially differentiated, as done in Experiment 4, then the degree of confusion is less, and misreports are less common. In contrast, shared mental processes and similar expressions of intention and behavior serve to conflate intentions and behaviors and create misreports.

Interestingly, spending a long-time imagining an action, relative to spending a minute thinking about one, also leads to the greater probability of falsely reporting having actually executed the action (e.g., Garry et al., 1996; Hyman & Pentland, 1996; Libby, 2003; Loftus & Pickrell, 1995; Rajagopal & Montgomery, 2011). Relative to such intense imagining, however, the formation of an intention, particularly one that is easy and inconsequential, is unlikely to involve imagining the details of the action. Nonetheless, monitoring details of the applicant during intention trials reduced the error from .75 in no monitoring conditions to .45 in conditions with detailed monitoring of intention. Therefore, the confusion between intention and behavior is more reasonably interpreted as related to the lack of embodiment of the action

than the excessive embodiment of the intention. Relatedly, it is unlikely that any monitoring of enactment will have the same effects. Instead, we believe that the detailed monitoring we induced is essential to link the representation of enactment to unique details of the behavioral context.

An important question concerns the generalizability of this phenomenon. In the current series of experiments, our paradigm involved simulated decisions that have no consequences for participants. However, many of the intentions we develop are consequential and may not produce the same error. As Experiment 5 indicates, detailed forms of processing of behavior reduce confusion between intentions and behavior, and consequential actions typically attract greater attention and more effortful thinking (e.g., Albarracín & Wyer, 2000, 2001; Petty & Cacioppo, 1986). In contrast, seemingly inconsequential actions may be associated with less monitoring of behavior, and thus create confusion between intention and behavior. However, many seemingly inconsequential behaviors such as taking a pill can have large toxicity effects if people fail to remember that they have already taken their daily medication dose.

This work raises a potential methodological issue for research on behavioral intentions. Although it is common to measure behavior via self-report, our work suggests that the misreport we identified may reduce the validity of self-reports of enactment and may artificially increase intention-behavior correspondence as shown for past behavior (Glasman & Albarracín, 2006). In cases where participants are likely to conflate intention and behavior, researchers should consider obtaining objective measures to get a more accurate, albeit lower, correlation between intention and behavior. In some domains, misreports of behavior may contribute to the lack of correspondence due to their capability of causing individuals to neglect carrying out their intentions.

The role that implementation intentions might play in avoiding or contributing to misreports of behavior is also an open question. Implementation intentions are specific plans for how an intention will be implemented in the future (“when *x* happens, then I will do *y*”), and have been observed to typically strengthen intention-behavior correspondence (Gollwitzer, 1999). Interestingly, the generation of implementation intentions can eliminate the hyperaccessibility of unfulfilled intentions and reduce cognitive load associated with goal maintenance (Masicampo & Baumeister, 2011), as if implementation intentions allow an individual to consider the matter settled until they enter a context appropriate for the behavior. However, implementation intentions may produce response rigidity and thus reduce intention-behavior correspondence in the presence of alternative means of behavioral completion (Masicampo & Baumeister, 2012). Such effects concern the likelihood of spontaneous use of intentions and recognition of the opportunity to act, rather than reports in past behavioral enactment.

We have taken it for granted that the boundaries of behavioral misreports are circumscribed, and in general believe that misreports of behaviors are not the norm. Regardless, some relevant circumstances are likely to be practically significant. The fulfillment of routine, repeated behaviors can have meaningful consequences, and are part of, if not central to, many practical contexts. The procedure introduced here is brief, quite flexible, and could be adapted in various ways to test hypotheses for medical, safety, and work-related contexts to address problems existing in everyday life (cf. Banaji & Crowder, 1989). More generally, understanding the complexity of the intention-behavior link and possible unexpected effects of intention formation is essential to promote beneficial behaviors in many domains, ranging from financial decisions to health. Better understanding the role of reports about behavior completion is valuable and likely to contribute to the overarching goal of explicating the complexities of self-regulation.

Authors' Note

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Author Contributions

First two authors share the first authorship.



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Supplemental Material

Supplemental material for this article is available online.

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