Journal of Experimental Social Psychology 85 (2019) 103852

Contents lists available at ScienceDirect

Journal of Experimental Social Psychology

journal homepage: www.elsevier.com/locate/jesp

Acting by a deadline: The interplay between deadline distance and movement induced goals

Duo Jiang[a], Dolores Albarracín[b,*]

[a] Analysis Group, Inc., 800 17th St NW, Washington, DC 20006, United States of America
[b] Department of Psychology, University of Illinois at Urbana-Champaign, 603 E Daniel St, Champaign, IL 61820, United States of America

ARTICLE INFO

Keywords:
Goals
Deadlines
Activity
Predicting behavior
Time

ABSTRACT

Human awareness of the passing of time leads to psychological processes designed to handle these inherent temporal limitations. Deadlines serve to energize desired courses of action and are likely to exert effects by leveraging general goals. Movement (e.g., walking, running) and stasis (e.g., standing, sitting), for example, may elicit general action and inaction goals that affect unrelated, time-constrained decisions. Across one field experiment and three lab experiments, prior movement or control conditions (vs. stasis) were associated with general action goals, which in turn had the perceived motivational fit with a behavior with a close deadline. As a result, movement or control conditions (vs. stasis) produced a higher probability of enacting behaviors (e.g., redemption of a coupon, intention to receive a vaccine) by a close deadline.

1. Introduction

We plan our lives to circumvent time limitations and make difficult choices concerning our actions and the deadlines for those actions. Deadlines can promote action by increasing timely efforts towards a goal (Aggarwal, Jun, & Huh, 2011; Ariely et al., 2005; Ariely & Wertenbroch, 2002; Brannon & Brock, 2001a,b; Brock & Mazzocco, 2004; Cialdini & Goldstein, 2004; Inman, Peter, & Raghubir, 1997; Lynn, 1991). In fact, deadlines have been shown to promote enrolling in a health plan (Shu & Gneezy, 2010), purchasing a product (Aggarwal et al., 2011; Brannon & Brock, 2001a; Inman et al., 1997), bidding for an auction (Ariely et al., 2005; Roth & Ockenfels, 2002), and making difficult, previously postponed decisions (Dhar & Nowlis, 1999). But how does our response to a deadline relate to our goals of action and inaction?

Perhaps surprisingly, even though deadlines foster goal-directed behavior, the relation between deadlines and action-inaction goals is not well understood. We propose that the effect of a deadline may be the result of a synergy with general goals that in turn guide the behavioral response to the deadline. For example, general action and inaction goals (e.g., effortful vs. restful endstates) can drive a variety of specific behaviors (Albarracín et al., 2008; Albarracín & Handley, 2011; Gendolla & Silvestrini, 2010; Laran, 2010; Noguchi, Handley, & Albarracín, 2011) and may be elicited by ordinary movements (Cacioppo, Priester, & Berntson, 1993; Krishna & Schwarz, 2014; Williams & Bargh, 2008). Actual or imagined movement (e.g., walking, running) may instill general action goals, whereas actual or imagined stasis (e.g., standing, sitting) may instill general inaction goals. In fact, the development of gross motor skills, including sitting, standing, walking, and running accompany the pursuit of active and inactive behavioral goals from infancy, when finer motor skills are still undeveloped (Kopp, 1982; Thelen, 1995). Therefore, general action and inaction goals may be easily activated by gross movement, as another example of the embodiment of motivation (e.g., Cacioppo et al., 1993; Centerbar & Clore, 2006; Hung & Labroo, 2010; Yap, Wazlawek, Lucas, Cuddy, & Carney, 2013). Once these general goals are set on the basis of representations connected to movement, a general action goal may facilitate meeting a rapidly approaching deadline to a greater extent than a general inaction goal.

Consider two people, one who is walking and the other who is sitting, each facing the decision of whether or not to enter a pharmacy to receive the flu vaccine. Walking involves activating action representations (e.g., “go”, “move”, “hurry”) that may promote actions outside of the context of walking. Likewise, sitting involves activating inaction representations (e.g., “rest”, “relax”) that may promote inactions outside of the context of sitting. These general goals of action and inaction are likely to be broad enough to guide decisions about the flu shot. In this case, the decision to obtain the vaccine may feel more natural when people have a general action goal than when people have a general inaction goal. Therefore, walkers may be more willing to get the shot

* Corresponding author.
E-mail addresses: duo.jiang@analysisgroup.com (D. Jiang), dalbarra@illinois.edu (D. Albarracín).

https://doi.org/10.1016/j.jesp.2019.103852
Received 6 November 2018; Received in revised form 9 June 2019; Accepted 19 July 2019
Available online 20 August 2019
0022-1031/

than people who are sitting, particularly if the pharmacy is about to close and a decision must be made. That is, general goals may influence specific behaviors that are relevant in the moment rather than those for a distant future.

1.1. Conceptualizing the interplay between deadlines and goals

Time deadlines are temporal limits to completing a behavior and are introduced to increase attention to and pressure towards potential action. Journal reviewers, for example, take an average of 36 days when given four weeks to review a manuscript but 58 days when given six weeks (Chetty, Saez, & Sándor, 2014). These time deadlines act as *nudges* that bring a behavior to the top of actors' minds with little cost on the part of the policy maker, which is consistent with a large literature in behavioral economics (Chetty et al., 2014; Thaler & Sunstein, 2008). In conditions of close deadlines in the workplace, for example, perceived time crunch increases completion and work speed (Ohly & Fritz, 2010). Although time deadlines and organizational contexts with time pressure can induce stress and negative outcomes (Ballard & Seibold, 2006; Bono, Glomb, Shen, Kim, & Koch, 2013; Fiabane, Giorgi, Sguazzin, & Argentero, 2013), time pressure can also improve performance and goal fulfillment (Ohly & Fritz, 2010).

As deadlines introduce action pressure, general goals related to action are particularly relevant to consider. Goals are desired states of affairs, and may involve experiencing specific emotions (e.g., being happy), a particular cognitive state (e.g., removing doubt from one's mind), specific behaviors (e.g., attending a medical appointment), or broader patterns of behavior, including general goals of action and inaction. General action or inaction goals, once activated, motivate individuals to attain respectively higher and lower effort end states through a variety of behavioral means. In contrast to specific goals (e.g., Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001; Kruglanski et al., 2002), general goals affect behaviors regardless of the type of behavior being considered. Albarracín and colleagues exposed participants to either action-related words (e.g., *active, go, move*) or inaction-related words (e.g., *sleep, stop, stand*) to elicit general action and inaction goals. Participants exposed to action-related words put forth more effort and showed a higher level of activity in various situations than did those exposed to inaction-related words. As examples, participants in action conditions selected drawing over sleeping, ate more snacks, solved more intellectual problems, and exercised longer than did participants in inaction conditions (Albarracín et al., 2008; Albarracín, Hepler, & Tannenbaum, 2011). All in all, there is evidence that general action and inaction goals affect various types of behaviors.

1.2. Deadline distance and perceived motivational fit

Despite knowledge about the effects of deadlines and knowledge about the effects of general action and inaction goals, our understanding of the connection between the two is limited. Our conceptualization assumes that when a behavior has a close deadline, people with a general action goal may be more likely to perform the behavior than those with a general inaction goal. However, a distant deadline is unlikely to have this effect because it deems current motivational states irrelevant. In general, people's beliefs influence behavior only when the beliefs are relevant (Glasman & Albarracín, 2006) and humans are cognitive misers that only process information when they must (Chaiken, 1980; Eagly & Chaiken, 2007). Likewise, behavioral goals are elicited based on the principle of effort conservation (Silvestrini & Gendolla, 2013), implying that decisions are made when necessary and timely. For example, in Silvestrini and Gendolla's (2013) research, priming action and inaction words led to more or less effort mobilization only when the task was feasible, a situation that is more likely when a deadline is close.

Psychologically, people with general action goals may also perceive better fit with a close deadline than do those with general inaction goals. According to the regulatory fit theory, a match between orientation to a goal and the means used to approach that goal yields a state of regulatory fit that both creates a feeling of rightness about engagement and increases task engagement (Higgins, 2000). In fact, people's engagement depends on how intense their motivational force is, and the motivational force depends on whether the form of pursuing a goal matches the goal (Avnet & Higgins, 2006; Cesario, Grant, & Higgins, 2004; Lee, Keller, & Sternthal, 2010). In the case of prevention and promotion, for example, promotion-oriented people respond better to gain frames whereas prevention-oriented people respond better to loss frames (Lee & Aaker, 2004). For example, the following messages are respectively more persuasive to people who are promotion- and prevention-oriented.

> Promotion: "Further, preliminary medical research suggests that drinking purple grape juice may contribute to the creation of greater energy! Growing evidence suggests that diets rich in Vitamin C and iron lead to higher energy levels. According to research by the United States Department of Agriculture, Welch's Purple 100% Grape Juice has more than three times the naturally-occurring Vitamin C and iron than other juices. Our Concord grapes and Niagara grapes are harvested only at the peak of flavor so that Welch's Grape Juice is great tasting as well as energizing. Plus, it is simply fun to drink!"
>
> (Lee & Aaker, 2004, p. 207)

> Prevention: "Further, preliminary medical research suggests that drinking purple grape juice may contribute to healthy cardiovascular function. Growing evidence suggests that diets rich in antioxidants may reduce the risk of some cancers and heart disease. According to research by the United States Department of Agriculture, Welch's Purple 100% Grape Juice has more than three times the naturally-occurring antioxidant capacity of other juices. Purple grape juice's antioxidants are commonly attributed to the flavonoids contained in the juice that help keep arteries clear so that blood can flow freely. Therefore, it is healthy to drink!"
>
> (Lee & Aaker, 2004, p. 207)

Similar to the fit between these frames and participants goals, close deadlines may provide a better fit for people with general action than inaction goals. For example, Avnet and Higgins (2006) showed that fit generalized to assessment and locomotion orientations. Participants were willing to pay over more for the same book-light when the strategy to arrive at the choice allowed for either a full evaluation (for assessors) or a more practical progressive elimination (for locomotors). Likewise, people may perceive that the close deadline is more natural and easier when they have general action goals as opposed to general inaction goals.

1.3. Overview of the present research

One field experiment and three lab experiments tested the hypothesis that close deadlines lead to greater enactment of the recommended behavior when general action goals are in place. In Study 1, we distributed coupons with various deadlines to participants who were walking or sitting inside the student union. Study 1 was important in measuring behavioral decisions in a naturalistic context and was followed by three subsequent experiments manipulating action and inaction goals. In Study 2, we asked participants to indicate their intentions for upcoming behavioral decisions with different deadlines. In Study 3, we manipulated participants' general action or inaction goals by having them imagine running or standing, thus replicating the effects of movement with a mental manipulation. The experiments observed experimental effects on behavioral intentions and measured subjectively-experienced action goals induced by the manipulations. Furthermore, the experiments allowed us to rule out effects of movement on positive or negative affect (Miller & Krizan, 2016), and thus isolate psychological processes more precisely. They specifically allowed us to compare whether the effects of movement were likely mediated by action vs. inaction goals as opposed to affective consequences of goals on arousal levels (e.g., experienced fatigue or boredom). Furthermore, Study 4

tested whether a greater sense of fit was involved in the interplay between time deadlines and goals.

Importantly, Studies 2 and 4 included a control condition. In Study 2, control participants commenced the study without being instructed to walk or stand within the lab for 3 min. In Study 4, control participants commenced the study without being instructed to imagine themselves running or standing. These controls were introduced to interpret any differences between action and inaction conditions as being localized on the action side, the inaction side, or both. Past experiments have shown that laboratory controls typically have moderate to high levels of activation of action goals (Albarracín et al., 2008), which led us to expect the effect to be localized on inaction goals.

2. Study 1

In Study 1, we carried out a field experiment to test the effect of the general action-inaction goals instilled by physical activities on redemption of real coupons by various deadlines. Participants who were either walking or sitting in a student union received coupons for use at a local café within the union by either a close or distant deadline. We then analyzed redemption rates as a function of the naturally occurring action (walking), or inaction (sitting), and by the manipulated deadlines.

2.1. Method

2.1.1. Control

We pretested the baseline likelihood of making purchases in the café among people who were either walking or sitting in the lounges of the student union. Two research assistants who were blind to the hypotheses approached different groups of 60 individuals (45% female) who were either walking ($n = 30$) or sitting (n = 30) in the lounges of the union. Walking respondents were interviewed while they stood during a brief pause in their trajectory, under the assumption that their interrupted action goal would persist (Liberman, Förster, & Higgins, 2007; Masicampo & Baumeister, 2011; Zeigarnik, 1927/1938). Sitting respondents were interviewed when they were sitting. To exclude any unwanted effects from social influence and past behavior, the research assistants only approached people who were alone and did not have any visible beverage or food item at the time. Each participant was asked five questions with response options of *yes* or *no*. These questions and the corresponding percentages of participants who responded *yes* were: (1) *Are you likely to purchase any food or beverage items from the Espresso Royale café at the Union today?* (Walking vs. Sitting: 7% vs. 27%, $\chi^2_{(1)} = 4.320$, $p = .038$); (2) *Have you purchased anything from the Espresso Royale café in the past?* (Walking vs. Sitting: 53% vs. 80%, $\chi^2_{(1)} = 4.800$, $p = .028$); (3) *Have you purchased anything from any other establishments at the Union in the past?* (Walking vs. Sitting: 83% vs. 93%, $\chi^2_{(1)} = 1.456$, $p = .228$); (4) Have you purchased anything from the Espresso Royale café today? (Walking vs. Sitting: 13% vs. 3%, $\chi^2_{(1)} = 1.964$, $p = .161$); and (5) *Are you likely to purchase any food or beverage items from any of the establishments at the Union today?* (Walking vs. Sitting: 47% vs. 27%, $\chi^2_{(1)} = 2.584$, $p = .108$).

As shown by the results to these questions, more participants sitting in the lounges of the union were more likely to make a purchase in the Espresso Royale café (Walking vs. Sitting: 7% vs. 27%, $\chi^2_{(1)} = 4.320$, $p = .038$). These results confirmed our prediction that people who sat in the union were more likely to be consumers at the café than people who walked by. As intentions predict future behaviors (Albarracín, Johnson, Fishbein, & Muellerleile, 2001; Albarracín & Wyer, 2001; Albarracín & Wyer, 2000; Fishbein & Ajzen, 2011), we used the numbers of intended consumption for each movement condition (Walking vs. Sitting: 7% vs. 27%) as the baseline likelihood of purchasing in the café in the future. In fact, baseline probabilities were a key consideration in the main experiment.

2.1.2. Main experiment

We employed 2 General Action-Inaction Goals (Action vs. Inaction, a subject variable representing people who were walking or sitting) × 2 Deadline (Close vs. Distant) between-subjects design. Two research assistants unaware of our hypotheses approached people who either walked (action goal) or sat (inaction goal) alone in the union and offered them coupons worth one dollar to be used at the café. Coupons would either expire in 1 h (close deadline) or be valid throughout the day (distant deadline) and could be used to purchase any of the café products. A G*Power analysis (Faul, Erdfelder, Buchner, & Lang, 2009) recommended a sample of 601 to observe effects of size for a logistic regression with $H_0 = 0.2$ and $H_1 = 0.25$ at a conventional alpha level of 0.05 and a desired power of 0.80. The final sample size was subject to the availability of participant volunteers.[1] The decision to stop collecting data did not depend on the obtained results. In total, five hundred and sixty-one coupons were distributed on the day of our study. One-hundred and twenty coupons (21%) were redeemed. Coupons were numbered in connection to the recording of the participant's behavior, which allowed us to observe the association between walking or sitting and redeeming the coupons, with the general goals being coded as either walking or sitting (action vs. inaction).

2.2. Results and discussion

2.2.1. Coupon redemption behavior

A logistic regression was performed with the coupon redemption behavior as the outcome and action (effect coding: action = 1, inaction = −1), deadline (effect coding: close = 1, distant = −1), their interaction term. The omnibus test suggested that the model was significant, $\chi^2_{(3)} = 14.705$, $p = .002$. As predicted, the interaction between the action and the deadline on coupon redemption was significant, $B = 0.220$, $SE = 0.106$, $Wald_{(1)} = 4.303$, $p = .038$. Furthermore, the main effect of deadline was also significant, $B = -0.274$, $SE = 0.106$, $Wald_{(1)} = 6.662$, $p = .010$, implying that there were more people redeeming the coupons in the distant deadline condition than in the close deadline condition. No other effects were significant (the main effect of action-inaction goal: $B = -0.148$, $SE = 0.106$, $Wald_{(1)} = 1.936$, $p = .164$).

To further probe the interaction, we further analyzed purchasing behavior in each condition in comparison with the very disparate deadlines for people who were walking vs. sitting. Without considering the baselines, in the presence of a close deadline (1 h), the coupon redemption did not differ as a function of walking or sitting (Action: 18%, $n = 147$ vs. Inaction: 16%, $n = 134$) (see Fig. 1), z for difference = 0.452, $p = .651$. However, because of the differences in baselines, these values must be appropriately interpreted in relation to the baselines of 7% for participants who were walking vs. 27% for participants who were sitting. Specifically, the purchasing Odds Ratio (*OR*) among people who were walking was 2.92, z for difference with baseline = 2.10, $p = .04$, but 0.51 for people who were sitting, z for difference with baseline = −2.00, $p = .04$. The difference between the two z-scores (2.10 vs. −2.00) was significant, $Z = 44.99$, $p < .001$.

We found that in the presence of a distant deadline (throughout the day), participants who were sitting in the union lounges were more likely to redeem the coupon than participants who were walking in the student union (Action: 19%, $n = 145$ vs. Inaction: 33%, $n = 135$), $z = -2.671$, $p = .008$. However, because of the differences in baselines, these values must be interpreted in relation to the baselines of 7% for participants who were walking vs. 27% for participants who were sitting. In that context, when the deadline was distant, people who were walking had a Purchasing Odds Ratio ("OR") of 3.11, indicating a high probability of purchasing relative to their baseline, z for difference with baseline = 2.25, $p = .02$, higher than the OR for people who were sitting = 1.33, z for difference with baseline = 0.91, $p = .37$. The difference between the two z-scores (2.25 vs. 0.91) was significant, $z = 8.40$, $p < .001$. However, the differences between the z-scores

[1] Complete data and codes can be found on the Open Science Framework at https://osf.io/qt28v/. For all experiments, all participant exclusions, measures and manipulations are reported.

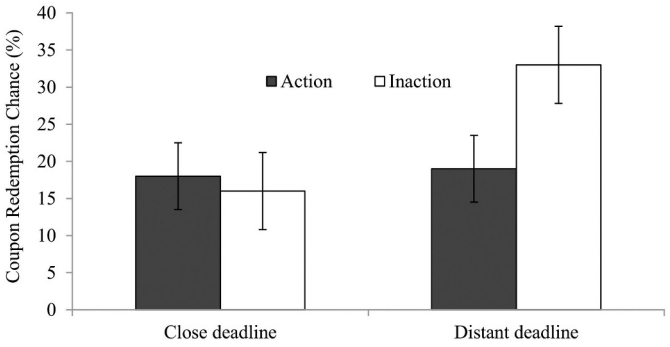

Fig. 1. Coupon redemption (Study 1). Bars represent standard errors.

for a distant deadline ($z = 8.40$) were much less pronounced that the same value for the close deadline ($z = 44.99$), $z = -475.31$, $p = .001$.

Study 1 thus confirmed our prediction in a natural setting. Controlling for the fact that people sitting in the union generally purchased in the café more than those who were walking in the union, walkers redeemed coupons by a close deadline more often than did those sitting (z scores = 2.10 vs. −2.00). Although walkers also redeemed coupons by a distant deadline more often than did those sitting (z scores = 2.25 vs. 0.91), the differences between the z-scores for a distant deadline ($Z = 8.40$) were much less pronounced that the same value for the close deadline ($Z = 44.99$), $Z = -475.31$, $p = .001$. As discussed earlier, walking and sitting may stimulate a general action and action goal respectively. A close (vs. distant) deadline that requires prompt action is more demanding and therefore encourages recruitment of general goals as a basis for a decision.

3. Study 2

In Study 2, we manipulated the general action and inaction goals by asking participants to walk or stand in the lab before indicating their behavioral intentions concerning a flu shot offered on sale with closer or more distant deadline. We also had a control group in which participants were not asked to walk or stand before indicating behavioral intentions. Furthermore, we measured participants' attitudes towards the flu shot for control purposes. We predicted that, in the face of a close (vs. a distant) deadline, participants in the action goal condition (i.e., walk) would be more likely to purchase the flu shot than participants in the inaction goal condition (i.e., stand). The control condition might resemble the action goal condition since participants have just walked to the lab to participate in the study, but it was important to know what the baseline was.

3.1. Method

3.1.1. Participants and design

We employed a 3 General Action-Inaction Goals (Action vs. Inaction vs. Control) × 2 Deadline (Close vs. Distant) between-subjects design. A G*Power analysis (Faul, Erdfelder, Lang, & Buchner, 2007) recommended a sample of 190 to observe a medium effect size of $f = 0.25$ at a conventional alpha level of 0.05 and a desired power of 0.80. The final sample size was subject to the availability of participant volunteers. The decision to stop collecting data did not depend on the obtained results. Two hundred and eighteen undergraduates (51% female; 72% native speakers of English; 48% Caucasian, 3% African American, 6% Hispanic, 41% Asian, 2% other ethnicity) participated in this experiment in exchange for course credit. Participants' age range was from 19 to 26 ($M = 20.13$, $SD = 2.22$).

3.1.2. Procedure and measures

Participants arrived in the lab in small groups. After signing the consent forms, experimental participants were told to clear their minds by imagining being in real shopping situations. To ostensibly help them to do so, participants were asked to either walk around (Action) or stand in a line (Inaction) in an open area of the lab, for 3 min. After that, participants were directed to their seats to complete the study. Participants in the control condition were not asked to do either of these activities, but began the study by reading the materials.

In the manipulation materials, participants were asked to consider what they would do if they received a coupon for a 50% discount on a flu shot at a nearby clinic. The health clinic would continue to be open either *for 5 min* (close deadline) or *for the day* (distant deadline), *at which point only customers already in the clinic would be able to receive the shot.* Participants were then asked to indicate their willingness to check out the flu shot sale (from 0 = *won't go at all* to 10 = *will definitely go*) and to purchase the vaccine (from 0 = *not at all likely* to 10 = *very likely*) using 11-point scales. The average of these two items was used as a measure of purchasing intention ($\alpha = 0.893$). After that, participants reported their attitudes about purchasing the flu shot by stated if they were *not interested in the flu shot* (reverse-scored), *liked the idea of the flu shot, getting the flu shot is a good idea*, and *getting the flu shot seemed beneficial* (from 0 = *not at all*, to 10 = *very much; α* = 0.869). Participants' attitude was not influenced by either the general action-inaction goals (F (2, 212) = 1.767, $p = .173$, $\eta^2 = 0.016$), or the deadline manipulations (F (1, 212) = 0.166, $p = .684$, $\eta^2 = 0.001$), or the interactions of the general action-inaction goals and the deadline (F (2, 212) = 1.588, $p = .207$, $\eta^2 = 0.015$): Action-close: $M = 5.58$, $SD = 2.59$, $n = 34$; Inaction-close: $M = 4.08$, $SD = 2.33$, $n = 37$; Action-distant: $M = 5.07$, $SD = 2.72$, $n = 42$; Inaction-distant: $M = 5.05$, $SD = 2.30$, $n = 34$; Control-close: $M = 5.19$, $SD = 2.93$, $n = 36$; Control-distant: $M = 5.16$, $SD = 2.39$, $n = 35$. Correlation matrices for manipulation checks and intentions for this and subsequent studies appear in the Appendix A.

Finally, as manipulation checks for the action and inaction manipulation, participants reported the extent to which, during the walking/standing task, they felt they were *moving, static* (reverse-scored), *active*, and *passive* (reverse-scored) using 11-point scales (from 0 = *not at all*, to 10 = *very much, α* = 0.859). Furthermore, to directly check the general action-inaction goals, participants were also asked to fill in seven items measuring their general action-inaction goal. Specifically, they were asked to indicate the extent to which they agreed with these statements: (1) *During this study, I was feeling energetic*; (2) *If I could, I would take a nap after this session* (reverse-scored); (3) *If I could, I would go work out after this session*; (4) *During this study, I wanted to get some rest* (reverse-scored); (5) *Today I am motivated to get a lot of work done*; (6) *My goal for today is to relax as much as possible* (reverse-scored) on an 11-point scale (from 0 = *Not at all* to 10 = *Very much, α* = 0.686). Additionally, they also reported the extent to which they felt they were *tired*, and *bored* using 11-point scales (from 0 = *not at all*, to 10 = *very much*). These items were included to rule out possible influences of our manipulations on arousal level ($\alpha = 0.607$). Participants in the control condition were not asked to answer those questions since they did not complete the walking/standing task.[2] Instead, they were asked to indicate their perception of the deadline as a way to check the manipulation success of the deadline. They were asked to indicate the extent to which they perceived that *the deadline to purchase the flu shot was too tight/too loose, they had too little time/ample time, the deadline required acting right away/allowed ample time to act, the deadline was not likely feasible/likely feasible, and it was very hard to meet/very easy to meet*. Participants used 11-point scales (from 0 to 10) on which lower numbers indicated feelings of more immediacy or pressure of the deadline. The average of the items was used as a measure of deadline distance ($\alpha = 0.865$).

3.2. Results

3.2.1. Manipulation checks

As predicted, the general *action-inaction goals manipulation* significantly affected reports of action. Participants who walked reported feeling more active ($M = 6.59$, $SD = 1.85$, $n = 76$) than did

[2] In retrospect, these items could have been included. However, all other manipulation checks for both goal and the deadline were present.

participants who stood still ($M = 2.62$, $SD = 1.84$, $n = 71$), F (1, 143) = 171.283, $p < .001$, $\eta^2 = 0.545$. The main effect of the deadline (F (1, 143) = 1.305, $p = .255$, $\eta^2 = 0.009$) and the interaction between the general action-inaction goals and the deadline (F (1, 143) = 0.033, $p = .855$, $\eta^2 = 0.0002$) were not significant. More importantly, participants who walked had stronger action goals ($M = 5.29$, $SD = 1.59$, $n = 76$) than did participants who stood still ($M = 4.71$, $SD = 1.86$, $n = 71$), F (1, 143) = 4.636, $p = .033$, $\eta^2 = 0.031$. The main effect of the deadline (F (1, 143) = 1.629, $p = .204$, $\eta^2 = 0.011$) and the interaction between the general action-inaction goals and the deadline (F (1, 143) = 0.799, $p = .373$, $\eta^2 = 0.006$) were not significant. These results indicated that the general action-inaction goals were successfully primed.

We also checked effects of our goals manipulations on *arousal*. We found that participants who stood still ($M = 7.51$, $SD = 1.86$, $n = 71$) reported feeling more tired and more bored than did those who walked ($M = 5.36$, $SD = 2.11$, $n = 76$), F (1, 143) = 42.779, $p < .001$, $\eta^2 = 0.230$. The main effect of the deadline (F (1, 143) = 0.695, $p = .406$, $\eta^2 = 0.005$) and the interaction between the general action-inaction goals and the deadline (F (1, 143) = 0.496, $p = .482$, $\eta^2 = 0.003$) were not significant. However, these responses were not correlated (see Appendix A) with behavioral intentions, and thus could not account for any results in our principal outcome variable.

With respect to the *deadline manipulation*, as expected, participants in the control group indicated that the five-minute deadline ($M = 3.07$, $SD = 2.42$, $n = 36$) was tighter than the one-day deadline ($M = 4.92$, $SD = 1.70$, $n = 35$), F (1, 69) = 13.908, $p < .001$, $\eta^2 = 0.168$, suggesting success in the manipulation of deadline pressure.

3.2.2. Effects on behavioral intentions

As in Study 1, there was a significant two-way interaction between the general action-inaction goals and the deadline on behavioral intentions, F (2, 212) = 6.835, $p = .001$, $\eta^2 = 0.061$. In the presence of a close deadline, participants in the general action goals condition (e.g., walk, $M = 3.65$, $SD = 2.95$, $n = 34$) were more likely to purchase the flu shot than were participants in the general inaction goal condition (e.g., stand, $M = 1.93$, $SD = 1.93$, $n = 37$), planned contrast F (1, 212) = 7.05, $p = .009$, $\eta^2 = 0.032$, but not more than those in the control condition ($M = 3.82$, $SD = 3.31$, $n = 36$), F (1, 212) = 0.070, $p = .791$, $\eta^2 = 0.0003$. Participants in the general inaction goal condition ($M = 1.93$, $SD = 1.93$, $n = 37$) also had lower behavioral intention than those in the control condition ($M = 3.82$, $SD = 3.31$, $n = 36$), planned contrast F (1, 212) = 8.788, $p = .003$, $\eta^2 = 0.0398$.

In contrast, in the presence of a distant deadline, the behavioral intentions of participants were not influenced by the manipulated general goals (action: $M = 3.11$, $SD = 2.59$, $n = 42$; inaction: $M = 3.68$, $SD = 2.63$, $n = 34$; control: $M = 2.27$, SD = 2.77, $n = 35$), simple effect F (2, 212) = 2.339, $p = .099$, $\eta^2 = 0.0216$ (see Fig. 2). The planned contrast between the action and inaction conditions was not significant, F (1, 212) = 0.824, $p = .365$, $\eta^2 = 0.0039$. The planned contrast between the inaction and control conditions was significant, F (1, 212) = 4.605, $p = .033$, $\eta^2 = 0.0213$. For ease of visualization, Table 1 shows the *d*s representing the differences between goal conditions at each level of the deadline manipulation. Finally, the main effects of action and deadline were not significant (the main effect of the general action-inaction goals: F (2, 212) = 0.818, $p = .443$, $\eta^2 = 0.008$; the main effect of the deadline: F (1, 212) = 0.096, $p = .757$, $\eta^2 = 0.0005$).

3.3. Discussion

Study 2 successfully replicated our previous findings using real movement manipulations in the lab. When the deadline of the offer was close, participants primed with the general action goals or those in control conditions had stronger intentions to purchase the flu shot by the close deadline than did participants primed with the general inaction goals. However, as predicted, when the deadline was distant, the general goals had no impact on the intention.

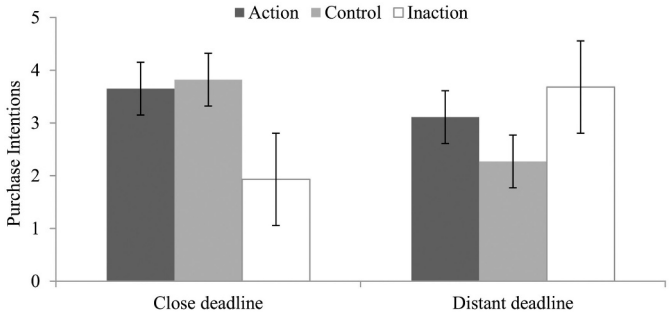

Fig. 2. Means of behavioral intentions (Study 2). Bars represent standard errors.

Table 1
Main results of all studies.

		Deadline	
Study 1: Coupon redemption and real movement in the field			
		Close	Distant
		% (*n*)	% (*n*)
Coupon redemption	Action	18%[a] (147)	19%[a] (145)
	Inaction	16%[b] (134)	33%[a] (135)
Study 2: Behavioral intentions to get a flu shot and real movement			
		Close	Distant
		M (*SD, n*)	*M* (*SD, n*)
Behavioral intentions	Action	3.65[a] (2.95, 34)	3.11[a] (2.59, 42)
	Control	3.82[a] (3.31, 36)	2.27[a] (2.77, 35)
	Inaction	1.93[b] (1.93, 37)	3.68[a] (2.63, 34)
	d (action—inaction)	0.70	−0.22
	d (action—control)	−0.05	0.31
	d (inaction—control)	−0.72	0.52
Study 3: Behavioral intentions to get a flu shot and imagined movement			
		Close	Distant
		M (*SD, n*)	*M* (*SD, n*)
Behavioral intentions	Action	4.60[a] (3.83, 54)	3.96[a] (3.75, 51)
	Inaction	0.97[b] (1.58, 46)	3.16[a] (3.40, 52)
	d (action—inaction)	1.34	0.22
Study 4: Behavioral intentions to get a flu shot and imagined movement			
		Close	Distant
		M (*SD, n*)	*M* (*SD, n*)
Behavioral intentions	Action	4.00[a] (3.03, 49)	2.79[a] (2.69, 48)
	Control	4.09[a] (2.70, 48)	3.51[a] (2.95, 48)
	Inaction	2.50[b] (2.73, 49)	3.55[a] (2.79, 47)
	d (action—inaction)	0.52	−0.28
	d (action—control)	−0.03	−0.26
	d (inaction—control)	−0.59	0.01
Perceived fit	Action	3.82[a] (2.28, 49)	2.74[a] (2.56, 48)
	Control	3.99[a] (2.48, 48)	3.14[a] (2.11, 48)
	Inaction	2.67[b] (2.38, 49)	3.33[a] (2.54, 47)
	d (action—inaction)	0.49	−0.23
	d (action—control)	−0.07	−0.17
	d (inaction—control)	−0.54	0.08

Note. Means with different superscripts ([a] vs. [b]) represent significant differences across conditions ($p < 0.05$). Higher numbers in the dependent measures represent more coupon redemption, stronger intentions, and greater perceived fit. *d*: Cohen's *d*.

4. Study 3

Studies 1 and 2 provided evidence of the hypothesized effect of the general action-inaction goals and the deadline on behavior and intention to enact a recommended behavior. In our prior studies, the general action-inaction goals were gauged by the naturally occurring movements of walking and sitting or by a manipulation of gross movement. In Study 3, we aimed to manipulate the general action-inaction goals

via imagined movement, because embodiment can also be activated by mental representations (Leung & Cohen, 2007). Specifically, participants were asked to imagine, and write about, either running or standing before indicating their behavioral intention for a sale. We predicted the general action-inaction goals primed by imagined movement would have the same effect as naturally occurring movement and manipulated real movement.

4.1. Method

4.1.1. Participants and design

We used a 2 General Action-Inaction Goals (Action vs. Inaction) × 2 Deadline (Close vs. Distant) between-subjects design. A G*Power analysis (Faul et al., 2007) recommended a sample of 190 to observe a medium effect size of $f = 0.25$ at a conventional alpha level of 0.05 and a desired power of 0.80. The final sample size was subject to the availability of participant volunteers. The decision to stop collecting data did not depend on the obtained results. Two hundred and three Amazon Mechanical Turk workers residing in the United States (52% female; 97% native speakers of English; 77% Caucasian, 7% African American, 5% Hispanic, 9% Asian, 2% other ethnicity) participated in this experiment in exchange for a small monetary reward. Participants' ages ranged from 18 to 70 years ($M = 33.39$, $SD = 11.99$).

4.1.2. Procedure and measures

To manipulate the general action-inaction goals, participants were asked to imagine a situation in which they were either running or standing. They were asked to describe the situation and the physical experience in as much detail as possible and were not given any particular context within which to imagine running or standing.

After the imagination manipulation, participants received the same flu shot sale materials as in Study 2. Participants were asked to consider what they would do if they received a coupon for a 50% discounted flu-shot at a nearby clinic. The health clinic would continue to be open either *for 5 min* (close deadline) or *for the day* (distant deadline). Participants indicated their behavioral intentions concerning the flu shot sale ($\alpha = 0.972$), using the same measures as the previous study. For control purposes, participants also indicated their attitudes towards purchasing the flu shot with the same procedures as in Study 2 ($\alpha = 0.902$). Attitude was only affected by the general action-inaction goal (F (1, 199) = 13.864, $p < .001$, $\eta^2 = 0.065$), but not affected by either the deadline (F (1, 199) = 0.079, $p = .779$, $\eta^2 = 0.0004$) or the interaction term of general action-inaction goal and deadline (F (1, 199) = 2.644, $p = .106$, $\eta^2 = 0.013$). Finally, participants completed the same manipulation checks of active feeling ($\alpha = 0.855$), the self-reported general action-inaction goal ($\alpha = 0.690$), and the arousal checks ($\alpha = 0.557$) used in Study 2. In essence, the measures in Study 3 were identical to Study 2.

4.2. Results

4.2.1. Manipulation checks

As in the previous study, the imagination task was associated with action. Participants who imagined running reported more active feelings ($M = 6.30$, $SD = 2.53$, $n = 105$) than did participants who imagined standing ($M = 3.24$, $SD = 2.14$, $n = 98$), F (1, 199) = 85.264, $p < .001$, $\eta^2 = 0.300$. The main effect of the deadline (F (1, 199) = 0.221, $p = .638$, $\eta^2 = 0.001$) and the interaction between the general action-inaction goals and the deadline (F (1, 199) = 0.270, $p = .604$, $\eta^2 = 0.001$) were not significant. Furthermore, participants who imagined running also reported a stronger general action goal ($M = 6.23$, $SD = 1.78$, $n = 105$) than did those participants who imagined standing ($M = 5.50$, $SD = 1.79$, $n = 98$), F (1, 199) = 8.509, $p = .004$, $\eta^2 = 0.041$. The main effect of the deadline (F (1, 199) = 0.045, $p = .832$, $\eta^2 = 0.0002$) and the interaction between the general action-inaction goals and the deadline (F (1, 199) = 0.094, $p = .760$, $\eta^2 = 0.0005$) were not significant. These results indicated that imagined movement successfully primed the general action-inaction goals. As in Study 2, participants who imagined standing ($M = 3.98$, $SD = 2.87$, $n = 98$) reported feeling more tired and bored than did those who imagined running ($M = 2.80$, $SD = 2.15$, $n = 105$), F (1, 199) = 11.212, $p = .001$, $\eta^2 = 0.053$. The main effect of the deadline (F (1, 199) = 0.255, $p = .614$, $\eta^2 = 0.001$) and the interaction between the general action-inaction goals and the deadline (F (1, 199) = 0.032, $p = .859$, $\eta^2 = 0.0002$) were not significant. As before, however, these items did not correlate with behavioral intentions, $p = .309$.

4.2.2. Effects on behavioral intentions

We analyzed behavioral intentions as a function of the general action-inaction goals, deadline, and their interaction term. As in the previous studies, there was a significant two-way interaction between the general action-inaction goals and the deadline, F (1, 199) = 9.283, $p = .003$, $\eta^2 = 0.045$. In the presence of a close deadline, participants in the general action goal condition ($M = 4.60$, $SD = 3.83$, $n = 54$) had stronger behavioral intentions than those in the inaction goal condition ($M = 0.97$, $SD = 1.58$, $n = 46$), simple effect F (1, 199) = 29.930, $p < .001$, $\eta^2 = 0.130$. In the presence of a distant deadline, however, behavioral intentions were unaffected by the general goal manipulation (action: $M = 3.96$, $SD = 3.75$, $n = 51$; inaction: $M = 3.16$, $SD = 3.40$, $n = 52$), simple effect F (1, 199) = 1.493, $p = .223$, $\eta^2 = 0.007$ (*see* Fig. 3). For ease of visualization, Table 1 shows the *d*s representing the differences between goal conditions at each level of the deadline manipulation. The main effect of the general action goal was significant, F (1, 199) = 22.650, $p < .001$, $\eta^2 = 0.102$, and the main effect of the deadline was marginally significant, F (1, 199) = 2.788, $p = .097$, $\eta^2 = 0.014$. Because attitude correlated with intention significantly, $r = 0.777$, $p < .001$, $N = 203$, we thus ran a separate analysis with attitude as a covariate. After controlling for attitude, all of the effects remained the same.

4.3. Discussion

Study 3 replicated earlier findings but with imagined instead of real movement. The results suggested that the general action-inaction goal might be primed through imagined movement. Supposedly, imagining movement brought up past memories of running and imagining standing brought up memories of stasis, which then activated general action and inaction goals, respectively. The general action (vs. inaction) goal in turn affected participants' behavioral intention by the close deadline. However, in the absence of a close deadline, the general action and inaction goals were irrelevant and thus did not affect decisions.

5. Study 4

In Study 4, we measured the proposed mechanism of perceived fit between the goal and the deadline. We used imagined movement as the way to manipulate the general action-inaction goals. Because Study 3 did not include a control, such a condition was introduced in Study 4.

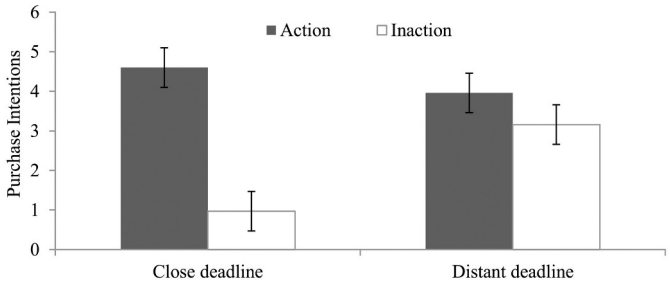

Fig. 3. Means of behavioral intentions (Study 3). Bars represent mean errors.

5.1. Method

5.1.1. Participants and design

We employed a 3 General Action-Inaction Goals (Action vs. Inaction vs. Control) × 2 Deadline (Close vs. Distant) between-subjects design. A G*Power analysis (Faul et al., 2007) recommended a sample of 190 to observe a medium effect size of $f = 0.25$ at a conventional alpha level of 0.05 and a desired power of 0.80. The final sample size was subject to the availability of participant volunteers. The decision to stop collecting data did not depend on the obtained results. Two hundred and eighty-nine undergraduates (59% female; 60% native speakers of English; 39% Caucasian, 5% African American, 5% Hispanic, 50% Asian, 2% other ethnicity) participated in this experiment in exchange for course credit. Participants' age range was from 18 to 32 ($M = 20.18$, $SD = 1.40$).

5.1.2. Procedure and measures

Participants were randomly assigned to imagining moving or standing, using the same mental-imagining task used in Study 3. Participants in the control condition were not asked to do either of these imagination activities and moved directly into the sale introduction, which contained the experimental manipulation of the deadline.

As part of the sale materials, participants read the same flu shot sale scenario as in Studies 2 and 3. The close deadline was *5 min* and the distant deadline was *throughout the day*. This study included two new measures of perceived fit and deadline relevance, and a different number of items for the measure of attitudes and arousal. That is, participants indicated their behavioral intentions concerning the flu shot sale using the same items as in Studies 2 and 3 ($\alpha = 0.917$). After that, and new to this study, participants were asked to indicate the extent to which they perceived fit on two items: (1) *I felt like attending the flu shot sale would just flow from how I was feeling*; (2) *Attending the flu shot sale just felt natural* ($\alpha = 0.788$). Furthermore, also new to this study, participants also indicated the relevance of the deadline on two items: (1) *The deadline of the flu shot sale was relevant to my decision to get the shot*; (2) *I paid a lot of attention to the deadline* ($\alpha = 0.756$). In addition, participants reported their attitudes towards getting the flu shot on three items, instead of the four items as in Studies 2 and 3: (1) *I liked the idea of the flu shot*; (2) *Getting the flu shot was a good idea*; (3) *Getting the flu shot seemed beneficial* ($\alpha = 0.872$). Finally, experimental participants completed the same manipulation checks of active feelings ($\alpha = 0.704$) used in previous studies, and four items (as opposed to two items in Studies 2 and 3) measuring arousal with statements about the extent to which they felt they were *tired, bored, jittery*, and *anxious* using 11-point scales (from 0 = not at all, to 10 = very much, $\alpha = 0.513$). All of the participants also completed the manipulation checks of the general action-inaction goal ($\alpha = 0.606$) and the deadline perception ($\alpha = 0.733$) using the same procedures used in Studies 2 and 3.

5.2. Results

5.2.1. Manipulation checks

As in the previous study, the imagination task produced the expected action report. Participants who imagined running reported more active feelings ($M = 5.10$, $SD = 2.00$, $n = 97$) than did those participants who imagined standing ($M = 3.92$, $SD = 1.89$), F (1, 189) = 17.803, $p < .001$, $\eta^2 = 0.086$. The main effect of the deadline (F (1, 189) = 0.366, $p = .546$, $\eta^2 = 0.002$) and the interaction between the general action-inaction goals and the deadline (F (1, 189) = 0.018, $p = .892$, $\eta^2 = 0.0001$) were not significant.

Furthermore, the general action-inaction goal manipulation had a significant impact on perceived general action goal (F (2, 283) = 3.253, $p = .040$, $\eta^2 = 0.022$). Participants in the general action goal condition ($M = 4.55$, $SD = 1.57$, $n = 97$) indicated that they had a higher general action goal than those in the general inaction goal condition ($M = 4.08$, $SD = 1.75$, $n = 96$), planned contrast F (1, 283) = 3.879, $p = .049$, $\eta^2 = 0.014$. Participants in the control condition ($M = 4.65$, $SD = 1.61$, $n = 96$) also had a higher general action goal than those in the general inaction condition, planned contrast F (1, 283) = 5.710, $p = .018$, $\eta^2 = 0.020$, but did not differ from those in the general action condition, planned contrast F (1, 283) = 0.182, $p = .670$. $\eta^2 = 0.0006$. The main effect of the deadline (F (1, 283) = 0.663, $p = .416$, $\eta^2 = 0.002$) and the interaction between the general action-inaction goals and the deadline (F (2, 283) = 1.352, $p = .260$, $\eta^2 = 0.009$) were not significant. These results suggested that the general action-inaction goal manipulation was successful and participants in the control condition had similar extent of action goals as did those in the general action goal condition. In addition, participants who received a close deadline perceived to have less time ($M = 3.35$, $SD = 2.09$, $n = 146$) than did those who received a distant deadline ($M = 4.91$, $SD = 1.43$, $n = 143$), F (1, 283) = 54.368, $p < .001$, $\eta^2 = 0.161$. The main effect of the general action-inaction goals (F (2, 283) = 0.996, $p = .371$, $\eta^2 = 0.007$) and the interaction between the general action-inaction goals and the deadline (F (2, 283) = 0.227, $p = .797$, $\eta^2 = 0.002$) were not significant. Finally, participants had no differences in any arousal measures across the action and inaction conditions: the main effect of the deadline (F (1, 189) = 0.197, $p = .658$, $\eta^2 = 0.001$), the main effect of the general action-inaction goals (F (1, 189) = 0.842, $p = .360$, $\eta^2 = 0.004$), and the interaction between the general action-inaction goals and the deadline (F (1, 189) = 0.218, $p = .641$, $\eta^2 = 0.001$) were not significant. Similarly, as expected, participants perceived the deadline to be more relevant to their decision when the deadline was close ($M = 4.21$, $SD = 2.70$, $n = 146$) than when it was distant ($M = 2.91$, $SD = 2.63$, $n = 143$), F (1, 283) = 17.036, $p < .001$, $\eta^2 = 0.057$. The main effect of the general action-inaction goals (F (2, 283) = 0.042, $p = .959$, $\eta^2 = 0.0003$) and the interaction between the general action-inaction goals and the deadline (F (2, 283) = 0.091, $p = .913$, $\eta^2 = 0.001$) were not significant.

5.2.2. Effects on behavioral intentions

We analyzed behavioral intentions as a function of action and deadline. As in the previous studies, there was a significant two-way interaction between the general action-inaction goal condition and deadline on intentions, F (2, 283) = 4.126, $p = .017$, $\eta^2 = 0.028$. In the presence of a close deadline, participants in the general action goal condition ($M = 4.00$, $SD = 3.03$, $n = 49$) had stronger behavioral intentions than those in the general inaction goal condition ($M = 2.50$, $SD = 2.73$, $n = 49$), planned contrast F (1, 283) = 6.925, $p = .009$, $\eta^2 = 0.024$, who also differed from those participants in the control condition ($M = 4.09$, $SD = 2.70$, $n = 48$), planned contrast F (1, 283) = 7.737, $p = .006$, $\eta^2 = 0.0266$. In this close-deadline condition, the behavioral intentions in the general action goal and control conditions did not differ, planned contrast F (1, 283) = 0.027, $p = .870$, $\eta^2 = 0.00009$.

In the presence of a distant deadline, however, behavioral intentions were unaffected by the general action-inaction goal manipulation (Action: $M = 2.79$, $SD = 2.69$, $n = 48$; Inaction: $M = 3.55$, $SD = 2.79$, $n = 47$; Control: $M = 3.51$, $SD = 2.95$, $n = 48$), simple effect F (2, 283) = 1.099, $p = .335$, $\eta^2 = 0.0077$. The planned contrast between the action and inaction conditions was not significant, F (1, 283) = 1.730, $p = .189$, $\eta^2 = 0.0061$. The planned contrast between the inaction and control conditions was also not significant, F (1, 283) = 0.0054, $p = .941$, $\eta^2 = 1.90886E-05$. As before, for ease of visualization, Table 1 shows the *d*s representing the differences between goal conditions at each level of the deadline manipulation. Neither the main effect of action condition (F (2, 283) = 1.814, $p = .165$, $\eta^2 = 0.013$) nor the main effect of deadline were significant (F (1, 283) = 0.55, $p = .459$, $\eta^2 = 0.002$). Again, attitude was not influenced by the manipulations (for the main effect of general action-inaction goals: F (2, 283) = 1.381, $p = .253$, $\eta^2 = 0.01$; for the main effect of deadlines: F (1, 283) = 1.512, $p = .220$, $\eta^2 = 0.005$; for the interaction of general action-inaction goals and deadlines: F (2, 283) = 1.625, $p = .199$, $\eta^2 = 0.011$), but correlated with intention ($r = 0.719$,

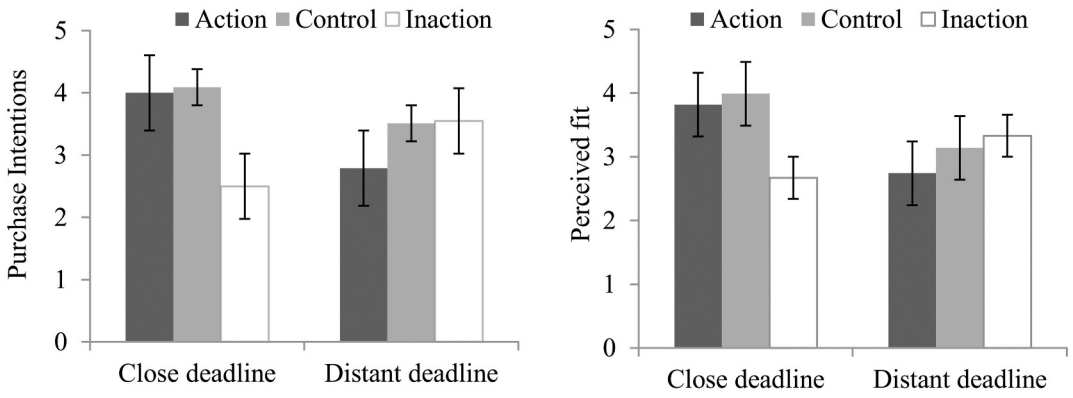

Fig. 4. Means of behavioral intentions and perceived fit (Study 4). Bars represent standard errors.

$p < .001$, $N = 289$). However, results remained the same after controlling for attitude.

5.2.3. Effects on perceived fit

We found a significant two-way interaction between the general action-inaction goal and the deadline on perceived fit, F (2, 283) = 3.725, $p = .025$, $\eta^2 = 0.026$. When there was a close deadline, participants in the general action goal condition ($M = 3.82$, $SD = 2.28$, $n = 49$) and in the control condition ($M = 3.99$, $SD = 2.48$, $n = 48$) felt greater fit than those in the general inaction goal condition ($M = 2.67$, $SD = 2.38$, $n = 49$); for the planned contrast with the action condition: F (1, 283) = 5.573, $p = .019$, $\eta^2 = 0.019$; for the planned contrast with the control condition: ($M = 3.99$, $SD = 2.48$, $n = 48$), F (1, 283) = 7.315, $p = .007$, $\eta^2 = 0.025$. When there was a distant deadline, however, perceived fit was unrelated to the general inaction-goal manipulation (action: $M = 2.74$, $SD = 2.56$, $n = 48$; inaction: $M = 3.33$, $SD = 2.54$, $n = 47$; control: $M = 3.14$, $SD = 2.11$, $n = 48$), simple effect F (2, 283) = 0.750, $p = .473$, $\eta^2 = 0.005$; for the planned contrast between the action and inaction conditions: F (1, 283) = 1.441, $p = .231$, $\eta^2 = 0.005$; for the planned contrast between the control and inaction conditions: F (1, 283) = 0.156, $p = .693$, $\eta^2 = 0.0006$ (see Fig. 4).

5.2.4. Mediated moderation analysis

We used a bootstrap analysis with 5000 samples (Model 8, Preacher, Rucker, & Hayes, 2007; PROCESS Procedure for SPSS Version 3.3, Hayes & Preacher, 2014) to test the mediated-moderation model with perceived fit as the mediator. Analyses were conducted with Dummy Variable 1(Action = 1, Inaction = 0, Control = 0), Dummy Variable 2 (Control = 1, Inaction = 0, Action = 0), deadline (Close = 1, Distant = 0), and the interactions between the dummy variables and the deadline. Because both dummy variables are entered simultaneously, Dummy Variable 1 represents the difference between the action and inaction conditions and Dummy Variable 2 represents the difference between the control and inaction conditions (see Hayes & Preacher, 2014). Behavioral intention was the outcome variable and perceived fit was the mediator. This analysis appears in Fig. 5 and, as suggested by the significant interactions between deadline and each dummy variable, shows significant mediated moderation for Dummy Variable 1 and Dummy Variable 2. This mediated moderation was also decomposed into simple mediations for each deadline level. In close-deadline conditions, perceived fit mediated the effect of Dummy Variable 1 on intention, relative conditional indirect effect = 0.9037, $SE_{(Boot)} = 0.3687$, 95% CI (0.1739, 1.6202). Perceived fit mediated the effect of Dummy Variable 2 on intention, relative conditional indirect effect = 1.0407, $SE_{(Boot)} = 0.3871$, 95% CI (0.3039, 1.8077). In contrast, in distant deadline conditions, neither the conditional indirect effect of the Dummy variable 1 = −0.4667, $SE_{(Boot)} = 0.4097$, 95% CI (−1.2486, 0.3523); nor the conditional indirect effect of the Dummy Variable 2 = −0.1537, $SE_{(Boot)} = 0.3724$, 95% CI (−0.8723, 0.5837), was significant[3] This mediated moderation model appears in Fig. 5.

5.3. Discussion

As with previous studies, in the presence of a close deadline, participants in the general action goal condition were more likely to purchase the flu shot than were participants in the general inaction goal conditions. Participants in the control condition reported to have similarly high general action goals to those in the general action goal condition, and thus their behavioral intention was influenced by the deadline in the similar way as those in the general action goal condition. This finding may be in part due to participants usually walking to the lab, and thus possessing similar levels of action goals relative to the action primed ones. Furthermore, Study 4 supported our proposed mechanism that perceived fit mediated the combined effect of the general action-inaction goal and deadline on behavioral intentions. Participants in the general action goal condition perceived more fit with the close action cue (e.g., close deadline) and thus had higher behavioral intentions than those in the general inaction goal condition. In addition, the results also suggested that the deadline became more relevant to the behavioral decision when it was close rather than when it was distant.

6. General discussion

Dealing with time is a particularly important aspect of human existence, as reflected by extensive research on the planning fallacy (Buehler, Griffin, & Ross, 1994; for a review, see Buehler, Griffin, & Peetz, 2010), counterfactuals (Epstude & Roese, 2008), time orientation

[3] We used a bootstrap analysis with 5000 samples (Model 8) to test the mediated-moderation model with the manipulation check of general action-inaction goal as the mediator. Results showed that the interaction of the general action-inaction goal and the deadline on behavioral intentions was *not* significantly mediated by the manipulation check of general action-inaction goal. In close-deadline conditions, the manipulation check measuring general action-inaction goals did not mediate the effect of the action condition (vs. the inaction and control conditions; Dummy variable 1) on intention (relative conditional indirect effect = −0.0275, $SE_{(Boot)} = 0.0825$, 95% CI (−0.2055, 0.1347)). The manipulation check measuring general action-inaction goals also did not mediate the effect of the control condition (vs. action and inaction; Dummy variable 2) on intention (relative conditional indirect effect = −0.0168, $SE_{(Boot)} = 0.0565$, 95% CI (−0.1378, 0.1022)). Similarly, in distant deadline conditions, the conditional indirect effect for the action condition (vs. the inaction and control conditions; Dummy variable 1) on intention was not significant (relative conditional indirect effect = −0.0080, $SE_{(Boot)} = 0.0465$, 95% CI (−0.1298, 0.0692)). The relative conditional indirect effect of the control condition (vs. the action and inaction conditions; Dummy variable 2) was −0.0264, $SE_{(Boot)} = 0.0813$, 95% CI (−0.2182, 0.1253). However, the degree to which people are aware of goals that are produced with priming varies (Weingarten et al., 2016a,b), and the study was not powered to test this mediation.

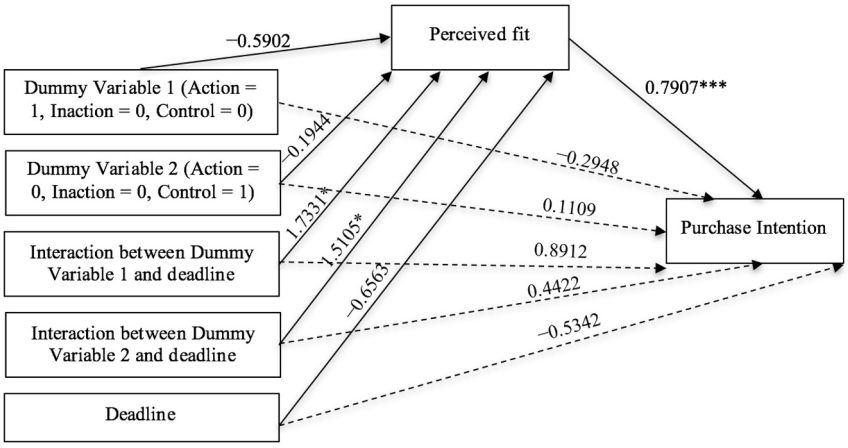

Fig. 5. Mediated Moderation model.
Note.—All of the β_s are standardized. Dummy variable 1: 1 = action, 0 = control; 0 = inaction. Dummy variable 2: 0 = action, 1 = control; 0 = inaction. Deadline codes: 1 = close, 0 = distant $^*p < .05$, $^{**}p < .01$, $^{***}p < .001$.

(Jonas & Huguet, 2008; Jonas & Woltin, 2005), time allocation (Schmidt, Dolis, & Tolli, 2009), clock versus event time (Avnet & Sellier, 2011), and thinking about goals over time (Chetty & Szeidl, 2007; Jonas & Woltin, 2005). Some of this work suggests that people's thoughts about deadlines are guided by chronic goals of promotion and prevention (Woltin & Jonas, 2012).

Across four experiments (see summary in Table 1), we investigated the interplay of deadlines and general goals and its implications for behavior and behavioral intentions. We found that when the deadline for a behavior was close, people with action goals had stronger behavioral intentions than those with inaction goals, regardless of the type of behavior or context being considered. However, when the deadline was distant and thus less relevant, the general goals were not influential. We manipulated the general goals by either measuring naturally occurring physical movement or having participants enact or recall physical movement. Study 1 showed that walking participants were more likely to redeem coupons with a close (vs. distant) deadline than those who were seated. Study 2 included a manipulation of general goals by asking participants to walk or stand in the lab, thus avoiding any confounding effects of naturally occurring movement. Study 3's manipulation of general goals involved having participants imagine running or standing, and replicated the earlier effects. Finally, Study 4 found support for the proposed fit mechanism underlying the effect.

Importantly, Studies 2 and 4 included a control condition. In Study 2, control participants began the study without walking or standing within the lab for a prespecified period of 3 min. In Study 4, control participants began the study without being instructed to imagine and write about themselves running or standing. Despite consistent differences between action and inaction goal conditions across four studies when the deadline was close, these two studies indicated that the goal effect was driven by inaction being different from control. This finding is common with laboratory controls who typically have moderate to high levels of activation of action goals (Albarracín et al., 2008). Thus, even though there is no clear neutral case for general action and inaction goals, these findings still suggest that close deadlines are likely to lead to failure for people with inaction goals.

This research provides a new perspective on how general action and inaction goals can exert an impact on future behaviors and intentions. Past research has suggested that general action-inaction concepts and goals influence specific behaviors in a variety of contexts (e.g., Albarracín et al., 2008; Albarracín & Hart, 2011; McCulloch, Li, Hong, & Albarracín, 2012). As examples, people incidentally exposed to action-related words, such as *active* and *go* preferred drawing over sleeping, exercised for a longer time, ate more, and solved more anagrams than did those in conditions where they were exposed to inaction-related words, such as *sleep* and *stop* (Albarracín et al., 2008). The present research contributes to this past literature not only by highlighting important behavioral consequences, but also by identifying temporal urgency as a factor that prompts the use of general action and inaction goals in the specific behavioral situation.

Our studies revealed that close deadlines are more effective for increasing compliance with a recommendation when people engage in or imagine movement, such as walking and running, than when they engage in or imagine stasis, such as sitting and standing. In prior studies on deadlines (e.g., Brannon & Brock, 2001a), participants were actually moving or engaged in a neutral state before receiving the deadline. Participants in Brannon and Brock's (2001a) research were driving through a local Mexican fast-food restaurant when they were asked to buy Cinnamon Twists as a limited-time offer. In other research showing beneficial effects of deadlines on compliance, participants likely had spontaneous general action goals as well (e.g., Aggarwal et al., 2011; Janakiraman & Ordóñez, 2012; Vermeir & Van Kenhove, 2005). Contrary to past research on the effects of deadlines, our studies suggest that imminent deadlines can decrease compliance with a recommendation when people engage in or imagine stasis. This finding may be useful to marketers if they target relatively inactive consumers such as those who frequently sit in front of a TV or a computer. In these cases, marketers are probably better off using distant deadlines rather than close deadlines in their marketing communications. Alternatively, they may craft marketing strategies that utilize imagined movement to thus generate movement towards a deadline.

Our results have broad implications beyond the marketing communication context and can shed light on *any* persuasive communication recommending close action. For example, encouraging close action may be better for people with chronic action goals (e.g., those who like to exercise) than those with a disposition towards inaction (e.g., those who like to watch TV). Alternatively, persuaders may want to deliver communications requiring close action in places where people are more likely to activate a general action goal (e.g., outdoor, gym) than in places where people are more likely to activate a general inaction goal (e.g., library). Our results also have implications for the selection of media channels. For instance, mobile technology may be the best channel for communication recommending close action. In contrast, more traditional media, such as print, are typically consumed in more passive situations and may be inappropriate for communications recommending immediate action.

Despite the robustness of our findings, several limitations of our work are worth mentioning. First, the contrived nature of the lab experiment settings undoubtedly shapes research findings. Even though the movement and deadline manipulations in our research were realistic, among human participants, the experimental method triggers concerns with being observed. Second, in natural conditions, numerous stimuli compete for attention and thus goal inducement is less predictable than in the lab conditions. Third, motivational effects like the ones we observed are likely to be overridden by economic incentives. For example, paying participants to receive a flu shot may lead to near universal adherence and diminish the importance of general goals of the type we studied. Lastly, our findings are circumscribed to the domains under study and should thus be replicated across populations,

contexts, and topics.

There are questions for future research associated with each study. First, in Study 1, walking participants were interrupted to administer the study while they stood. This choice was based on both practical reasons as well as the need to maintain comparable levels of attention while dependent measures were administered. From a theoretical point of view, however, goal disruption produces an increase in goal tension that should heighten rather than reduce goal activation, consistent with the Zeigarnik effect (Liberman et al., 2007; Masicampo & Baumeister, 2011; Zeigarnik, 1927/1938). Our results suggest that this was the case in this research.

Furthermore, Studies 2–4 included two manipulation checks. One manipulation check was designed to check respondents' body feelings to the extent that respondents felt their body moving or still. The other manipulation check was designed to check respondents' general action-inaction goals at the time. Both manipulation checks are necessary as they check different aspects of the manipulations. However, they bring up the question of whether asking people to consider their bodily feelings might have increased or decreased awareness of general action and inaction goals. Based on past research on the effect of calling attention to the source of influence, we believe that the inclusion of the feeling items could have decreased reports of action and inaction goals. This possibility is reassuring given that the manipulation checks still demonstrated effects of movement on action and inaction goals.

Our research investigated two nontrivial behaviors such as coupon redemption and attending a clinic for a flu vaccination, both of which require interested participants to move to a location to enact the behavior (i.e., going to the café to redeem the coupon, walking to the clinic to get the flu). Although future research may collect specific data on this point, the synergy between general action-inaction goals and deadlines should occur regardless of whether the behavior itself requires movement. For example, even though redeeming a coupon online is less effortful than redeeming a coupon in person, a close deadline and a general action goal is likely to encourage relatively easy actions. This prediction is consistent with prior research showing that general action goals affect relatively uninvolved behaviors such as doodling or eating (Albarracín et al., 2008; Albarracín, Wang, & Leeper, 2009).

Another important question concerns calibrating close and distant deadlines. For example, a one-day deadline may be close to buy a car but distant to buy a cup of coffee or redeem a grocery-store coupon. Based on pilot testing, our manipulation checks, and the context of our research, our choice of a one-day deadline as distant was appropriate. However, future research should extend our results to other contexts in which one day may represent a close deadline. The deadline distance should be calibrated with appropriate knowledge about the nature of the decision and the decision context.

Additional future research seems in order to generalize our results. First, our results could be replicated with movement manipulations. For example, strolling in the park or walking along the beach may be less active than walking to work. Second, our results could also be generalized to motor transitions. For example, both walking and sitting may be achieved with more or less effort, as in the cases of standing to prepare to walk or sitting down while running. These transitional states are likely all active and may produce different results. Third, experimenting with more intense physical activities will be an interesting avenue for future research, both with and without deadlines. Finally, because of the application of our results to mobile technologies, it will be important to demonstrate the effects of movement when people make decisions on the go.

In line with previous research on embodiment, our studies found that enacted or imagined physical behaviors influence the effectiveness of deadlines to a great extent by activating distinct general goals. However, differing from previous research focusing on establishing the connection between bodily experience and cognitions (e.g., concepts, feelings, and metaphors (Krishna & Schwarz, 2014)), our research furthered this scholarship by investigating how the embodiment of action and inaction can inform people of their *general* motivational states. In closing, physical behaviors surrounding decisions may be objectively irrelevant to decisions, but this irrelevance does not make them inconsequential. Our research provides conclusive evidence of the combined effects of deadlines and general action-inaction goals in ways not easily anticipated by prior scholarship. Movement and stasis can stimulate general goals, but these goals matter only when people are pressed by time.

Open practices

Complete data and codes can be found on the Open Science Framework at https://osf.io/qt28v/.

For all experiments, all participant exclusions, measures and manipulations are reported.

Appendix A

Correlations: Study 2

All participants	1	2	3	4
1. Intention	1			
	218			
2. Attitude	0.578**	1		
	0			
	218	218		
3. Active feelings	0.135	0.098	1	
	0.104	0.237		
	147	147	147	
4. Arousal	−0.029	0.005	−0.466**	1
	0.725	0.955	0	
	147	147	147	147
5. Action goals	0.049	0.068	0.136	−0.479**
	0.557	0.41	0.1	0
	147	147	147	147
Participants with a close deadline	1	2	3	4
1. Intention	1			
	107			
2. Attitude	0.583**	1		
	0			
	107	107		
3. Active feelings	0.295*	0.217	1	
	0.012	0.069		
	71	71	71	

4. Arousal	−0.182	−0.166	−0.392**	1
	0.130	0.166	0.001	
	71	71	71	71
5. Action goals	0.246*	0.276*	0.189	−0.546**
	0.039	0.20	0.115	0
	71	71	71	71

Participants with a distant deadline	1	2	3	4
1. Intention	1			
	111			
2. Attitude	0.574**	1		
	0			
	111	111		
3. Active feelings	−0.021	−0.020	1	
	0.856	0.861		
	76	76	76	
4. Arousal	0.100	0.156	−0.537**	1
	0.391	0.178	0	
	76	76	76	76
5. Action goals	−0.118	−0.125	0.081	−0.418**
	0.309	0.283	0.488	0
	76	76	76	76

Correlations: Study 3

All participants	1	2	3	4
1. Intention	1			
	203			
2. Attitude	0.777**	1		
	0			
	203	203		
3. Active feelings	0.279**	0.193**	1	
	0	0.006		
	203	203	203	
4. Arousal	0.072	0.073	−0.258**	1
	0.309	0.301	0	
	203	203	203	203
5. Action goals	0.156*	0.099	0.361**	−0.439**
	0.027	0.161	0	0
	203	203	203	203

Participants with a close deadline	1	2	3	4
1. Intention	1			
	100			
2. Attitude	0.706**	1		
	0			
	100	100		
3. Active feelings	0.369**	0.172	1	
	0	0.087		
	100	100	100	
4. Arousal	0.021	0.109	−0.166	1
	0.834	0.279	0.100	
	100	100	100	100
5. Action goals	0.163	0.065	0.329**	−0.474**
	0.106	0.520	0.001	0
	100	100	100	100

Participants with a distant deadline	1	2	3	4
1. Intention	1			
	103			
2. Attitude	0.857**	1		
	0			
	103	103		
3. Active feelings	0.189	0.216*	1	
	0.055	0.029		
	103	103	103	
4. Arousal	0.130	0.033	−0.363**	1
	0.192	0.740	0	
	103	103	103	103
5. Action goals	0.149	0.133	0.396**	−0.400**
	0.133	0.179	0	0
	103	103	103	103

Correlations: Study 4

All participants	1	2	3	4	5

1. Intention	1				
	289				
2. Attitude	0.719**	1			
	0				
	289	289			
3. Active feelings	0.062	−0.039	1		
	0.395	0.589			
	193	193	193		
4. Arousal	0.125	0.157*	−0.189**	1	
	0.084	0.030	0.008		
	193	193	193	193	
5. Action goals	−0.001	0.064	0.252**	−0.138	1
	0.993	0.282	0	0.056	
	289	289	193	193	289
6. Perceived fit	0.684**	0.687**	0.069	0.199**	0.054
	0	0	0.340	0.006	0.363
	289	289	193	193	289

Participants with a close deadline	1	2	3	4	5
1. Intention	1				
	146				
2. Attitude	0.735**	1			
	0				
	146	146			
3. Active feelings	0.070	−0.127	1		
	0.495	0.272			
	98	98	98		
4. Arousal	0.147	0.100	−0.176	1	
	0.148	0.329	0.083		
	98	98	98	98	
5. Action goals	0.156	0.155	0.369*	−0.099	1
	0.060	0.062	0	0.330	
	146	146	98	98	146
6. Perceived fit	0.673**	0.701**	0.114	0.195	0.201*
	0	0	0.262	0.054	0.015
	146	146	98	98	146

Participants with a distant deadline	1	2	3	4	5
1. Intention	1				
	143				
2. Attitude	0.703**	1			
	0				
	143	143			
3. Active feelings	0.053	0.057	1		
	0.612	0.585			
	95	95	95		
4. Arousal	0.099	0.219*	−0.209*		
	0.340	0.033	0.042		
	95	95	95	95	
5. Action goals	−0.140	−0.009	0.138	−0.177	1
	0.095	0.920	0.181	0.086	
	143	143	95	95	143
6. Perceived fit	0.695**	0.669**	0.025	0.207*	−0.071
	0	0	0.808	0.044	0.402
	143	143	95	95	143

For each variable, the first vertical entry is *r*, the second is the *p* value, and the third is the *N*.

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

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