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The Heart Wants What It Wants: Effects of Desirability and Body Part Salience on Distance Perceptions (Heath)

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Abstract
Previous research has shown that the desirability of an object influences perceived distance from the object, such that desirable objects are perceived as closer than objects that are not desirable (Balcetis & Dunning, 2010). It has also been suggested that metaphors reflect how our knowledge is represented; so, for example, making the head or heart more salient produces characteristics commonly associated with those body parts (i.e., emotionality for the heart, rationality for the head) (Fetterman & Robinson, 2013). The current study examined the effects of head or heart salience and object desirability on distance perception. We hypothesized that, since common idioms relate the heart to desirability, salience of the heart would cause desirable objects to be perceived as closer than would salience of the head, but there would be no difference between the head and heart conditions when the object was neutral. To test this hypothesis, we conducted two experiments in which participants had their attention drawn to their head or their heart by placing their hand there while making an action-based (haptic) measure of distance to an object. After finding no significant results in Experiment 1, in Experiment 2 a verbal measure of distance perception was added and participants completed a two-minute filler task while touching the assigned body part to strengthen the body part salience effect before estimating distance. Besides replicating Proffitt's 2006 finding that haptic estimates of environmental features are more accurate than verbal estimates, we found no significant results in Experiment 2.

Keywords
Embodied cognition, distance perception, desirability, metaphor

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Cognition and Perception | Cognitive Psychology

Comments
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The Heart Wants What It Wants: Effects of Desirability and Body Part Salience on Distance Perceptions

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I affirm that I have upheld the highest principles of honesty and integrity in my academic work and have not witnessed a violation of the Honor Code.

Abstract

Previous research has shown that the desirability of an object influences perceived distance from the object, such that desirable objects are perceived as closer than objects that are not desirable (Balcetis & Dunning, 2010). It has also been suggested that metaphors reflect how our knowledge is represented; so, for example, making the head or heart more salient produces characteristics commonly associated with those body parts (i.e., emotionality for the heart, rationality for the head) (Fetterman & Robinson, 2013). The current study examined the effects of head or heart salience and object desirability on distance perception. We hypothesized that, since common idioms relate the heart to desirability, salience of the heart would cause desirable objects to be perceived as closer than would salience of the head, but there would be no difference between the head and heart conditions when the object was neutral. To test this hypothesis, we conducted two experiments in which participants had their attention drawn to their head or their heart by placing their hand there while making an action-based (haptic) measure of distance to an object. After finding no significant results in Experiment 1, in Experiment 2 a verbal measure of distance perception was added and participants completed a two-minute filler task while touching the assigned body part to strengthen the body part salience effect before estimating distance. Besides replicating Proffitt's 2006 finding that haptic estimates of environmental features are more accurate than verbal estimates, we found no significant results in Experiment 2.

"The Heart Wants What It Wants: Effects of Desirability
and Body Part Salience on Distance Perceptions"

While there is a popular phrase, "seeing is believing," perhaps a more accurate statement would be that "seeing is deceiving." A wealth of cognitive research suggests that people do not see their environments as objectively as they believe they do. Rather, individuals' perceptions of the environment are distorted by a number of biases intended to optimize the ability to interact with surroundings. This idea is consistent with the cognitive theory known as embodied cognition. This perspective proposes that the physical and psychological state of the human body affects cognitive and perceptual processes.

One factor that has been shown to influence perception is desirability of objects (Balcetis & Dunning, 2010). In a series of five studies, Balcetis and Dunning found that participants perceived desirable objects as being closer to them than undesirable objects. The researchers looked at a variety of desirable objects, including objects that fulfilled a physiological need (i.e., a bottle of water for thirsty participants), a social need (i.e., positive feedback), and a financial need (i.e., a $100 bill or a $25 gift card). Distance perceptions were measured using both an action-based beanbag toss towards the object as well as a numerical estimate. Across each type of desirable object and metric of perceived distance, results showed that participants perceived more desirable objects as closer than undesirable objects. In order to verify that desirability in particular influenced distance perceptions, in one study all participants estimated distance to a $100 bill, but those in one condition were told that they had an opportunity to win the money and those in the other condition were not given this information. Consistent with the results of the other studies, participants who were told that they could win the $100 bill perceived it as closer than those who were not told of the opportunity to obtain it, demonstrating that desirability itself, as opposed to potential confounds, influences distance perception.

Metaphors have also been shown to influence perception in a variety of ways. Metaphors are used as cognitive tools to help people simplify and understand abstract concepts in a way that is distinct from schemas (Landau, Meier, & Keefer, 2010). For example, consider the abstract concept of love. People are better able to conceptualize love and relationships with a significant other as a physical journey using metaphors such as “Where do you see us ten years down the road?”, or “I think we need to slow down.” Metaphors were traditionally thought of as purely linguistic elements to represent abstract concepts, but recent research in cognitive linguistics has shown that metaphors also shape the way that we think about these concepts. Thus, the influence of metaphors on perceptual tasks has been of increasing interest for psychologists in a variety of subdisciplines, including social and cognitive psychology.

One category of metaphors that affects perception consists of those referring to the head and the heart. Myriad metaphors about the heart suggest emotionality and, more specifically, a caring nature (i.e., saying that someone has a “big heart” suggests that they are extremely caring and loving). In contrast, metaphors about the head typically imply rationality and intelligence (i.e., telling someone to “use their head” when they need to think logically). Fetterman and Robinson (2013) examined the effects of head and heart metaphors in both correlational and experimental studies. In the correlational studies, participants were asked to locate the self in either their heart or their head (“Irrespective of what you know about biology, which body part do you more closely associate with your self. (Choose one): heart or brain”) prior to completing a battery of personality tests, intelligence tests, and/or moral dilemmas. Participants who self-located in the heart (heart-locators) were found to be more emotional, feminine, and interpersonally warm, and they solved moral dilemmas in a more emotional way than those who self-located in the head (head-locators). Furthermore, head-locators correctly answered a greater percentage of general knowledge questions, described themselves as more logical, and preferred to solve a greater percentage of moral dilemmas in rational ways than heart-locators. In Fetterman and Robinson's experimental work, researchers manipulated the salience of the head or the heart by asking participants to place their dominant index fingers on either the corresponding side of the temple (head condition) or the left portion of the upper chest (heart condition). After doing this, participants in the heart condition performed worse on a test of general knowledge and solved more moral dilemmas in emotional ways than those in the head condition, who solved the dilemmas more logically. These results show that traits associated with the head or the heart are more accessible when the body makes the respective organ salient.

The current study combined the research of Balceitis and Dunning (2010) and Fetterman and Robinson (2013) to examine how the head/heart manipulation moderates the effects of object desirability on distance perceptions. Desirability is often associated with the heart, as exemplified in expressions such as "the heart wants what it wants." Hence, we hypothesized that increased heart salience decreases perceived distance away from desirable objects more than increased head salience, but that this effect does not exist when the objects are neutral. If our hypothesis were supported, this would demonstrate that the head/heart manipulation is not relevant in all contexts and that it is related to desirability.

Experiment 1

Experiment 1 was a novel combination of the methodologies employed by Balceitis and Dunning (2010) and Fetterman and Robinson (2013). In this experiment, we had participants touch either their head or their heart (as in Fetterman and Robinson (2010)) and measured their perceptions of distance from either a desirable or a neutral object. Previous research by Proffitt (2006) has demonstrated that action-based (haptic) measures of environmental features are less susceptible to bodily effects than verbal measures and, as such, are more accurate (with respect to the true value of the feature). For example, participants are more accurate at estimating the slant of a hill when using their hand to make the slant of a board match the slant of the hill than when asked to verbally estimate the slant. Therefore, in order to assure that our measure of distance perception represented participants' distance perceptions as well as possible, in Experiment 1 we used a haptic measure of distance perception; in particular, a beanbag toss towards the object (as in Balcetis and Dunning (2010)). We predicted that there would be a significant interaction between desirability of object and hand placement. Specifically, we predicted that there would be no effect of hand placement when the object was neutral (i.e., throwing distances would be equal in the head and heart conditions), but that, when the object was desirable, heart-pointers would perceive the object as significantly closer than the head-pointers and, thus, would throw the beanbag a shorter distance than the head-pointers.

Method

Participants

Sixty Gettysburg College students between 18 and 22 years of age (M = 20.07, SD = 1.10, 44 women) participated in this study. Participants were volunteers and were recruited via word of mouth and email communication. A randomly selected participant out of the pool of those who participated in Experiment 1 or 2 was selected to win a $25 Amazon gift card.

Research Design

This study was a 2 (Desirability: desirable vs. neutral) x 2 (Hand-placement: head vs. heart) between-subjects design. Each researcher ran one-third (20) of the participants. In order to avoid making the experimenter a confounding variable, each experimenter tested exactly five participants in each of the four treatment conditions. Participants were randomly assigned to a condition. The dependent variable in this study was the participant's perceived distance away from the object, which was measured by the number of inches from the starting line that the participant threw the beanbag.

Procedure

This study was ethically approved by the instructor, Dr. Becca Fincher-Kiefer. Participants met the researcher in a designated hallway of the Gettysburg College Science Center. They then read and signed the informed consent form provided by the researcher (all forms/questionnaires were on paper). Next, participants filled out a short questionnaire with demographic information, including questions about hand dominance and prior athletic experience. The researcher then explained that the current study was examining the effects of hand dominance on throwing accuracy. The researcher informed participants that their goal was to throw a beanbag as close to the object as they could. The beanbag was one used in the game "Cornhole" (approximately 6 inches x 6 inches, weighing between 14 and 16 ounces) and was wrapped in plastic to minimize the distance that the beanbag slid after the participant's throw, as the experiment took place in a hallway with tile flooring. Participants were randomly assigned to throw the beanbag at either a $25 Amazon gift card (desirable object) or a Gettysburg College Student ID Card belonging to the researcher (neutral object) which was placed 156 inches away (the same distance used in Balcetis and Dunning (2010)). The desirable and neutral objects were the same size: approximately 3.38 inches x 2.13 inches. In the desirable object condition, participants were told that the participant who threw the beanbag the closest to the gift card would win the gift card at the end of the duration of the study.

All participants were told that they were in the dominant hand condition and would be using their dominant hand to throw the beanbag. The researcher then explained that, in order to be sure that their non-dominant hand did not influence their throwing (due to aiming, balance, etc.), they would place the index finger of their non-dominant hand in a specific location. If the participant was assigned to the head condition, they were told to place their non-dominant index finger on the corresponding side of the temple. If they were assigned to the heart condition, the participant was told to place their non-dominant index finger on the left portion of the upper chest (identical hand placements to the ones used in Fetterman and Robinson (2013)). The participant then threw the beanbag from the designated starting line to the object. Each participant had only one opportunity to throw the beanbag in order to control for practice effects.

After the participant threw the beanbag, the researcher measured the distance of the throw and informed the participant how far away from the object their throw was. It is important to note, however, that the metric of interest to the study was the distance of the throw from the starting point rather than the distance of the throw from the object. Then, the researcher asked the participant to fill out a short questionnaire (see Appendix A), which included a manipulation check (measured on a 1 – 7 Likert scale, with greater numbers indicating greater levels of desirability), a measure of suspicion, and the following question from Fetterman and Robinson (2013): “Irrespective of what you know about biology, which body part do you more closely associate with your self. (Choose one): heart or brain”. Once the participant finished the questionnaire, the researcher debriefed them and the participant was free to leave.

Results

Results are shown in Table 1. A paired samples *t*-test revealed that object desirability was successfully manipulated, as participants rated the Amazon gift card (M = 5.33, SD = 1.63) as more desirable than the student ID card (M = 3.40, SD = 1.92), t (58) = 4.21, $p < .001$. We conducted a two-way between-subjects analysis of variance (ANOVA) to examine the effects of object desirability (desirable, neutral) and body part salience (head, heart) on participants' perceptions of distance from an object, as measured using a beanbag toss. The interaction between object desirability and body part salience, the main effect of object desirability, and the main effect of body part salience were all nonsignificant, all F's < 1.0. Neither object desirability nor body part salience influenced beanbag toss distances, nor did the different combinations of the levels of object desirability and body part salience.

	Object desirability	
Salient body part	Desirable	Neutral
Head	143.08 (21.10)	146.47 (22.58)
Heart	151.86 (17.53)	145.79 (22.84)

Table 1. Mean distance perception (inches) in each of the conditions of Experiment 1. Standard deviations are in parentheses.

Discussion

The data from Experiment 1 failed to support our hypothesis, which was that increased heart salience decreases perceived distance away from desirable objects more than increased head salience, but that this effect does not exist when the objects are neutral. In particular, none of the means of the four conditions were significantly different from any of the others.

Interestingly, participants in the desirable heart condition perceived the object as farther away than each of the other groups, whereas we predicted that this group would perceive the object as the closest out of all of the groups. However, we do not give much importance to this observation given the fact that the difference between the largest and smallest means (7.22 inches, the difference between heart desirable and head desirable) is less than half of the smallest standard deviation of any of the groups (17.53 inches in the desirable heart condition). Hence, relative to the standard deviations there is simply not enough variation in these data to take any trends very seriously. It is also interesting to observe that the nonsignificant main effect of desirability indicates that Experiment 1 failed to replicate Balcetis and Dunning's (2010) finding that people perceive desirable objects as closer than neutral objects. In short, the results from Experiment 1 do not suggest any effect of object desirability and/or body part salience on distance perception.

There are several potential reasons that our results in Experiment 1 did not support our hypothesis. Thus, to address the shortcomings of our first experiment and to better examine the relationship between object desirability and body part salience on distance estimates, we conducted a second experiment which was similar to Experiment 1 with some methodological modifications to test the same hypotheses. One change was that a verbal estimate of distance was added. According to Proffitt's (2006) work, verbal estimates of environmental features (i.e., distance perception) are more susceptible to bodily effects than haptic estimates, so we thought that a verbal measure of distance perception may be better able to identify an effect of object desirability and body part salience on distance perceptions than the haptic measure. Additionally, previous research has found that maintaining powerful positions for two minutes leads to physical and psychological changes (Carney, Cuddy, & Yap, 2010). Therefore, in

Experiment 2 a two-minute filler task was introduced before the distance perception measures in hopes that having participants touch the desired body part for at least two minutes would more effectively activate metaphors associated with that body part. The actual distance between participants and the object was also increased in Experiment 2 in order to introduce more variation into our data, as the throwing task in Experiment 1 may have been too easy to detect any differences between groups.

Experiment 2

Method

Participants

Sixty Gettysburg College students between 18 and 22 years of age (*M* = 19.85, *SD* = 1.15, 42 women) who did not participate in Experiment 1 participated in this experiment. Participants were volunteers and were recruited via word of mouth and email communication. A randomly selected participant out of the pool of those who participated in Experiment 1 or 2 was selected to win a $25 Amazon gift card.

Research Design

Experiment 2 had the same design as Experiment 1, with the lone exception being the addition of a verbal measure of distance perception.

Procedure

The procedure of Experiment 2 was identical to that of Experiment 1 with the following changes. First, Experiment 2 took place in a carpeted hallway. This change reduced the likelihood of the beanbag sliding long distances, so the beanbag was not wrapped in plastic. Second, while holding their hand in the assigned position participants completed a written task (the Remote Associates Task (Mednick, 1962)) for two minutes before making distance estimates. No data analysis was run on the results of this task, as the only purpose of the task was to draw participants' attention to their assigned body parts for two minutes. Third, the object was placed 192 inches away from participants, 36 inches further than in Experiment 1. Fourth, the neutral object was a black piece of paper of the same dimensions as the Amazon gift card. This change was made because several participants in Experiment 1 said that the student ID card was difficult to see. Finally, before throwing the beanbag at the object, the experimenter showed participants a ruler for reference and asked participants to verbally estimate the distance between their selves and the object.

Results

Results are shown in Tables 2 (haptic estimates) and 3 (verbal estimates). A paired samples *t*-test showed that object desirability was not successfully manipulated, as participants did not rate the Amazon gift card (M = 4.73, SD = 1.51) and the paper (M = 4.20, SD = 2.02) significantly differently on the desirability scale, t (58) = 1.16, p = .25. For both the haptic and verbal measures of distance perception, we conducted a two-way between-subjects ANOVA to examine the effects of object desirability (desirable, neutral) and body part salience (head, heart) on participants' perceptions of distance from an object. For both measures, the interaction between object desiraility and body part salience, the main effect of object desirability, and the main effect of body part salience were all nonsignificant, all F's < 1.0. Neither object desirability nor body part salience influenced beanbag toss distances or verbal estimates of distance, nor did the different combinations of the levels of object desirability and body part salience. In order to compare the accuracy of verbal estimates of distance and haptic estimates of distance, we calculated accuracy scores for each group by calculating the distance of each throw from the target distance of 192 inches. A paired samples *t*-test showed that haptic estimates (*M* = 15.87, *SD* = 13.18) of distance were more accurate than verbal estimates (*M* = 53.20, *SD* = 39.05), t (59) = -6.83, $p < .001$.

	Object desirability	
Salient body part	Desirable	Neutral
Head	204.14 (25.21)	196.13 (14.25)
Heart	195.03 (21.71)	195.98 (17.27)

Table 2. Mean distance perception (inches) as measured haptically in each of the conditions of Experiment 2. Standard deviations are in parentheses.

	Object desirability	
Salient body part	Desirable	Neutral
Head	166.40 (54.59)	168.00 (64.14)
Heart	178.40 (72.12)	180.00 (67.73)

Table 3. Mean distance perception (inches) as measured verbally in each of the conditions of Experiment 2. Standard deviations are in parentheses.

Discussion

The data from Experiment 2 failed to support our hypothesis, which was that increased heart salience decreases perceived distance away from desirable objects more than increased head salience, but that this effect does not exist when the objects are neutral. None of the means of the four groups were significantly different from any of the others, suggesting the lack of an effect of body part salience and/or object desirability on distance perceptions. Experiment 2 was another failed replication of Balcetis and Dunning's (2010) finding that desirable objects are perceived as closer than undesirable objects, and this time the failed replication occurred using two different metrics of distance perception.

An interesting result of this experiment is the finding that haptic estimates of distance perception were more accurate than verbal estimates. This is consistent with Proffitt (2006), who found that verbal estimates of environmental features are less accurate than haptic estimates across multiple different tasks. Anecdotal evidence from our everyday lives suggests that this result makes perfect sense – even though some people may not be excellent at estimating the height of a stair in inches, we do not consistently see people falling down stairs because their bodies are still able to interact with the environment just fine. This principal aligns with embodied cognition, as it posits that we most effectively understand the world by using our body to interact with it. Our results indicate that participants were better at demonstrating knowledge of the world (how far away the object was) by interacting with it (throwing the beanbag at the object) than by verbally explaining it (stating how far away the object was). Hence, while our results failed to support embodiment in the way in which we originally hypothesized, they nevertheless supported embodiment in another way.

Another observation about the difference between the verbal and haptic measures of distance perception is that all of the groups underestimated their distances from the object when they estimated distances verbally but overestimated the distances when they estimated haptically. This is possibly a consequence of the phenomenon that people tend to communicate in terms of units of five: Unless people have something understood with great precision, they rarely schedule meetings for 2:33 pm, price products at $97.41, or set assignments to be worth 18% of a student's grade in a course. The verbal estimates of distance in Experiment 2 ranged from eight feet to 30 feet, but out of this 23-foot range 33 out of 60 participants (55%) estimated a distance that was one of five different values; namely, the values in the range which are multiples of five feet (nine said 10 feet, 15 said 15 feet, four said 20 feet, three said 25 feet, and two said 30 feet). Thus, more than half of the participants' estimates fell into a range that, assuming that participants could only guess integer numbers of feet (Participants did not actually have this restriction, although all of them did make such a guess so it is reasonable to analyze the distribution of verbal estimates under such an assumption.), made up less than 25% of the range of possible values. Unsurprisingly, since the actual distance was closer to 15 feet than 20 feet and closer to 10 feet than 25 feet, a strong majority of these guesses were for 15 feet or 10 feet, which were both below the actual distance of 16 feet. In contrast, participants did not (and simply would not have been able to) fit their haptic estimates into this set of "nice" numbers. This discrepancy likely explains why the verbal estimates were smaller than the haptic estimates overall – perhaps if the actual distance had been 19 feet we would have seen the reversed pattern. Future research should further investigate people's propensities to guess "nice" numbers and the impact this plays on experimental data.

The failed manipulation of desirability in Experiment 2 is surprising, particularly given the success with which desirability was manipulated in Experiment 1 using the same desirable stimulus and measured using the same question: "How appealing was the card at which you threw the beanbag (i.e., how much did you want it)?". The most likely explanation is that, since the neutral stimulus in Experiment 2 (a piece of black paper) was extremely neutral and bland, participants interpreted the question of desirability to mean something along the lines of, "How badly did you want to hit the card with the beanbag?" rather than as a question about the desirability of the card itself. Upon being debriefed, a few participants commented that this had been their interpretation of the question. Although this also happened several times during Experiment 1 and a successful manipulation was still shown in that experiment, there is little other possible explanation for the discrepancy between the two experiments in this regard.

General Discussion

Results of Experiments 1 and 2 both failed to support our hypothesis. We hypothesized that increased heart salience decreases perceived distance away from desirable objects more than increased head salience, but that this effect does not exist when the objects are neutral. However, neither experiment produced an interaction effect between body part salience and object desirability supporting this hypothesis. In fact, neither experiment produced any significant interactions or main effects, regardless of whether a haptic or verbal measure of distance perception was used.

Perhaps the most striking result of the current study was our failure to replicate Balcetis and Dunning's (2010) finding that desirable objects are perceived as closer than neutral objects across both experiments. Our failure to replicate their findings calls the replicability of the result into question, as all three attempts (if the verbal and haptic estimates of Experiment 2 are considered separately) at finding a main effect of desirability on distance perception produced F values less than 1.0. These miniscule F values and the facts that our sample sizes (60) were both larger than theirs in the study in which they demonstrated this effect using a beanbag toss (40) and that we used the same distance as them in Experiment 1 pose particularly strong challenges to the replicability of their results.

Seeing as head/heart salience has not been directly tied to distance perceptions in previous studies, from our data we cannot say with much confidence whether our manipulation of body part salience was successful or not. Regardless, there is one noteworthy methodological difference between the current experiments and the work of Fetterman and Robinson (2013) which may have contributed to our failure to find a significant interaction effect between body part salience and object desirability: Fetterman and Robinson had participants put their dominant hand on the assigned body part, whereas we had participants put their nondominant hand on the assigned body part. We made this procedural decision so that participants could throw the beanbag with their dominant hand, as we wanted their throws to be a reflection of their perceptions of distance from the object as opposed to a reflection of their throwing abilities with their non-dominant hand. However, this decision likely reduced the effects of body part salience, as it is likely that touching a body part with one's dominant hand draws more attention to the body part than touching it with one's non-dominant hand. Future work should further investigate the relationship between body part salience, metaphor activation, and handedness.

Aside from the explanations we have already discussed, there are other possible reasons for our failure to find the hypothesized interaction between head/heart salience and object desirability. Perhaps touching the heart while looking at the desirable object made the object so desirable that participants focused harder on estimating the distance accurately in hopes of earning the object as opposed to perceiving the object as being closer to them. Similarly, touching the head should also make participants more accurate because of Fetterman and Robinson's (2013) finding that drawing attention to the head makes people think more logically. Thus, if this explanation is true, it would make sense that there was no significant difference between the different conditions. This explanation would also not contradict the findings of Balcetis and Dunning (2010), as in the study in which the researchers told participants they had a chance to win a prize the participant's winning of the prize was contingent upon luck (drawing a particular card from a deck) as opposed to their estimate of distance. Thus, perhaps a better way of doing the current study would have been to tell participants that the gift card would be given to a random participant, as opposed to the participant who threw the beanbag the closest to the gift card, before they estimated their distance from it. Another reason that we may not have found a significant interaction is that, even when we increased the distance from 156 inches to 192 inches, the throwing task was too easy to produce sufficient variation in our data. Low power (in particular, a small sample of only 15 participants per condition in each study) could also have been at the root of our data's failure to support our hypothesis.

Intriguingly, all of the means of the haptic measure of distance perception in Experiment 2 were greater than the actual distance of 192 inches, whereas all of the means in Experiment 1 were below the actual distance of 156 inches. There are several reasonable explanations for this effect, two of which were related to the setting of the experiments. One possibility is that participants may have overestimated how much the plastic-wrapped beanbag would slide on the tile floor in Experiment 1 and underestimated how much the beanbag would slide on the carpeted floor in Experiment 2. This thinking could have led participants to throw the beanbag short in Experiment 1, expecting it to slide to the card, and long in Experiment 2, expecting it to stop where it landed. The other possible explanation is that Experiment 1 took place at one end of a long hallway, with a long stretch of hallway extending beyond where the target object was placed. In contrast, the hallway in which Experiment 2 occurred was substantially shorter and had an end several feet beyond the object (the end of this hallway never came particularly close to interfering with throws, though). Perhaps in Experiment 1, participants were cautious not to throw the beanbag too far because there was so much space behind the object where the beanbag could have gone. In Experiment 2, on the other hand, with the end of the hallway being relatively close, participants were more aggressive in their throws, knowing that even if they overthrew the object it would not go extremely far past the object.

Our experiments had a number of limitations to them. As mentioned previously, we did not have the resources necessary to gather particularly large sample sizes. The population from which we could draw our sample was not particularly diverse, particularly with regard to age. A fascinating future study would be to look at the effects of body part salience and object desirability on distance perceptions in children. On one hand, children tend to have less control over their emotions than college students, so their feelings of desirability may be powerful enough to overwhelm their rational appraisal of distance and cause some interesting distance measures, both verbally and haptically. On the other hand, children have had less time than college students to form connections between different body parts and personality traits and have less experience with estimating distances. Similar studies could be done with older adults, comparing different age groups, or a longitudinal study could look at how people's responses to factors such as object desirability and body part salience change over time. Another limitation of the study is that we did not have much time during which we could collect our data and, as such, the trials were rushed more than we would have liked. With more time, we could have potentially strengthened the head/heart salience and desirability effects.

Although the results of the current study did not lend support to an effect of body part salience and/or object desirability on distance perception, the methodological observations made above suggest that future research should continue exploring the possibility of such a relationship using studies that make the appropriate methodological changes. Future work should also look more explicitly for a relationship between heart salience and feelings of desirability. Although we did not investigate such a connection directly, given the existence of metaphors associating the heart with desirability it is likely that such a relationship exists and could play a role in future research. Finally, future research could examine the effects of creating body part salience through different means. In particular, a study in which body part salience is drawn using clothing would be intriguing since clothing and fashion are so ubiquitous and important in our lives and the world.

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Appendix A

Hand-Dominance and Throwing Accuracy: Post-Survey

Celeste Campbell, Ellie DeWitt, and Bailey Heath

1. How appealing was the card at which you threw the beanbag (i.e., how much did you want it)?

1 2 3 4 5 6 7

2. How much confidence do you have in your throwing abilities with your **dominant** hand? Please circle a number below. Greater numbers indicate greater levels of confidence.

1 2 3 4 5 6 7

3. How much confidence do you have in your throwing abilities with your **non-dominant** hand? Please circle a number below. Greater numbers indicate greater levels of confidence.

1 2 3 4 5 6 7

4. How much confidence do you have in your handwriting abilities with your **dominant** hand? Please circle a number below. Greater numbers indicate greater levels of confidence.

1 2 3 4 5 6 7

5. How much confidence do you have in your handwriting abilities with your **non-dominant** hand? Please circle a number below. Greater numbers indicate greater levels of confidence.

1	2	3	4	5	6	7

6. Did anything about the study seem unusual? If so, please explain.

- Yes
- No

7. Irrespective of what you know about biology, which body part do you more closely associate with your self?

- Heart
- Brain