**PATHS TO GOAL PURSUIT SUPPLEMENTAL MATERIALS**

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# Pilot Studies

# Study S1: Developing our Dependent Measures

We report this pilot study as the results may be informative to other researchers who might have questions about a similar approach. We considered whether to construct our means to goal attainment items as principled (the high road) or unprincipled (the easy way) or to simply detail specific more and less effortful means. As a way of creating principled and unprincipled means, we built from the purity aspect of Moral Foundations Theory (Graham et al., 2009) to operationalize the idea of taking the high road. We tried to operationalize fitness and academic means with the items listed in dependent measures below, with limited success—the variables did not yield reliable constructs and we could not come up with more than one way to ask about unprincipled means. Our inability to create a more than one-item measure of unprincipled means and our failure to create a reliable, principled-difficult construct led us to conclude that we should not try to operationalize principled means using purity as our guide. Instead, in the studies reported in our manuscript, we created concrete less-effortful and more-effortful means of goal attainment and asked people if they thought they would use them, if they thought they were effective, and if they thought their effort mattered when they used them.

***Sample***

University of Southern California (USC) undergraduates (*N* = 195, 132 females, *Mage*= 20.12, *SDage* = 2.0) participated as part of the subject pool.

***Method***

After giving consent, participants responded to statements in randomized order about their health goals (“*In thinking about my health and fitness goals, it is important to me that I do things…*”), and their academic goals (“*In thinking about my academic and career goals, it is important to me that I do things…*”), using a scale from 1 = strongly disagree to 7 = strongly agree). Then they considered their class choices (“*When choosing to take a class, how much weight would you place on each of the following factors from 0 = no weight at all to 100 = it would be the deciding factor?”* and “*When deciding to take a class, if the class [factor], would that make you more or less likely to take the class? (1=a lot less likely, 7=a lot more likely).”*). Finally, they read statements reflecting their difficulty mindsets (1=strongly disagree, 7=strongly agree) in randomized order. Then they reported their age and gender in that order in online surveys programmed and administered surveys through Qualtrics.

***Open Science***

All measures, data, code, and Supplemental Materials are available on the Open Science Framework at <https://osf.io/u7dbm/?view_only=235c171b61a842ff989f292bfcb995c0>.

## *Dependent Measures*

**Health Goals.**Our principled approach scale items were: “in ways that require effort, rather than taking shortcuts.” “The right way, even if that may take longer to attain a particular goal (e.g., a weight goal, a strength goal, a bodily form goal).” “In a way that is clean or pure (e.g., by sticking to fresh foods and natural products).” “In a way that respects my body and does not abuse it (e.g., by not ingesting artificial additives or highly processed ingredients)”. “In a way that follows authoritative medical advice.” The scale (*M* = 5.52, *SD =* 1.06), at *α* =.67 did not attain adequate reliability and we were only able to create a single statement regarding taking the most efficient route (“in the quickest and most efficient way to attain a particular goal (e.g., a weight goal, a strength goal, a bodily form goal”, *M =* 4.31, *SD =* 1.67). We also had one filler item (“in a way that follows latest and most trendy methods” *M* = 2.90, *SD* = 1.56).

**Academic Goals.** Our principled approach scale items were: “in ways that require effort, rather than taking shortcuts.” “The right way, even if that may take longer to attain a particular goal (e.g., a grade, knowledge, subject skill, and mastery).” “In a way that is moral (e.g., without copying, getting answers from friends, or cheating on exams, buying papers).” “In a way that respects the process (e.g., studying over time instead of cramming).” “In a traditional way (e.g., select a major, take prerequisites, engage in advanced study).” The scale (*M =* 5.45, *SD =* 1.12), at *α* =.66, did not attain adequate reliability and we were only able to create a single statement regarding taking the most efficient route (“in the quickest and most efficient way to attain a particular goal (e.g., a grade, knowledge, subject skill, and mastery” *M* = 4.93, *SD =* 1.58), one statement about doing one’s own thing (“in a way that allows me to follow my passion and do it in a way unique to me (e.g., creating my own major” *M* = 5.51, *SD =* 1.41).

**Class Choices.**Participants responded to the question, “*When choosing to take a class, how much weight would you place on each of the following factors from 0 = no weight at all to 100 = it would be the deciding factor?”* followed by six statements, three about the challenge (*M* = 62.47, *SD =* 19.73, *α* =.73., “learning”, “being challenged”, “how much it makes you think”)and three about the ease (*M* = 59.96, *SD =* 22.52 *α* =.61, “easy course load”, “easy time of day,” and (reverse coded) “difficulty of assignments.” They also read “*When deciding to take a class, if the class [factor], would that make you more or less likely to take the class? (1=a lot less likely, 7=a lot more likely)”* and rated the same 6 statements (challenge *α =* .65*, M =* 4.76, *SD =* 0.97; ease *α =* .62, *M =* 6.03, *SD =* 0.74). Thus, for class choice, we could devise 3-item scales but our ease scale did not attain adequate reliability no matter how we asked the question.

**Difficulty Mindsets.** Next participants rated their agreement or disagreement with 12 statements presented in randomized order, reflecting our three difficulty mindsets (difficulty-as-impossibility, *M* = 2.68, *SD =* 1.16, 𝛼 = .91 95% CI[.89, .93]; difficulty-as-importance, *M* = 4.28, *SD =* 1.01, 𝛼 = .89 95% CI [.86, .92] both from Fisher & Oyserman, 2017; difficulty-as-improvement, *M* = 4.87, *SD =* 0.86, 𝛼= .84 [95% CI .80, .88] Kiper et al., 2022), on a 6-pt response scale (1 = strongly disagree, 6 = strongly agree).

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# Study S2: Piloting Higher and Lower Effort Academic Methods

We piloted academic strategies of varying effort levels for Study 3. We asked students to *“Imagine using each of the following strategies to get good grades. How much mental and cognitive effort would each of these strategies require of you? (1=none at all, 6=a great deal)”* and showed them the 24 statements listed in Table **S1** in randomized order. For clarity in Table **S1**, we present statements from most to least effortful based on students’ responses, and we marked with an asterisk the statements we retained for Study 3 (Higher-Effort: 1, 2, and 5; Lower-Effort: 21, 22, and 24; and Filler Mid-Range: 6, 7, and 8).

##### Table S1

*Most to Least Effortful Academic Strategies Based on Students’ Ratings in Study S2*

|  |  |
| --- | --- |
| **Method** | **Mean (*SD*) Difficulty Rating** |
| 1. Spend 4-5 hours a day studying\* | 4.66 (1.36) |
| 1. Reread chapters\* | 4.15 (1.26) |
| 1. Do the extra credit assignments | 3.97 (1.34) |
| 1. Appeal/negotiate with my instructor to improve my grade | 3.91 (1.52) |
| 1. Rewatch lectures\* | 3.88 (1.34) |
| 1. Talk through and explain important concepts (whether to yourself or someone else)\* | 3.85 (1.31) |
| 1. Create flashcards \* | 3.76 (1.42) |
| 1. Write a summary of key points at the end of each paper or while I am reading.\* | 3.72 (1.36) |
| 1. Visit professor’s office hours | 3.68 (1.33) |
| 1. Have discussions with other students outside of class-time (e.g. study group) | 3.67 (1.37) |
| 1. Work with a private tutor | 3.59 (1.54) |
| 1. Visit TA’s office hours | 3.59 (1.37) |
| 1. Read through and organize notes taken during class | 3.54 (1.39) |
| 1. Write a quick summary of key points at the end of each class. | 3.54 (1.30) |
| 1. Asking questions in class | 3.38 (1.47) |
| 1. Ask classmates to explain concepts to you | 3.36 (1.35) |
| 1. Listen to recorded lectures while doing other things (e.g., while cooking, exercising, driving...) | 3.32 (1.46) |
| 1. Sneak a cheat sheet of key concepts or formula into the exam | 3.2 (1.81) |
| 1. Give up social media/ put away phone entirely while studying | 2.89 (1.54) |
| 1. Find premade flashcards online | 2.63 (1.36) |
| 1. Copy or paraphrase answers or essays found online\* | 2.62 (1.54) |
| 1. Find assignments completed by past students on website like CourseHero\* | 2.58 (1.45) |
| 1. Copy or paraphrase answers or essays from someone else (e.g., classmate, past student) | 2.53 (1.48) |
| 1. Get homework answers from someone else (e.g., classmate, past student)\* | 2.26 (1.33) |

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# Studies 1-3 Methods

## Samples

### Study 1 Sample Demographics

Race-ethnicity (rounded to the nearest whole percentage): 42% White, 25% Asian, 13% Hispanic, 9% multiracial, 6% Black/African American, 2% described another race-ethnicity, 2% preferred not to say, 1% American Indian/Alaska Native, 1% Native Hawaiian/Pacific Islander.

### Study 2 Sample Demographics

Race-ethnicity (to the whole %): 44% White, 22% Asian, 12% Hispanic, 9% multiracial, 6% Black/African American, 4% gave other descriptions, 2% Native Hawaiian/Pacific Islander.

### Study 3 Sample Demographics

Race-ethnicity (to nearest whole): 41% White, 28% Asian, 13% Hispanic, 6% Multiracial, 4% Black/African American, 4% Middle Eastern/North African, 2% described another race-ethnicity, 1% preferred not to say.

## Materials

### Study 1 Materials

  After consent, participants read: *Reaching any goal consists of multiple steps that get you progressively closer and closer to your goal. Imagine that your goal was to strengthen your core and abdominal muscles. There are several different ways you might work toward that goal.*

*In the next few pages, we will show you different ways you can strengthen your core muscles and obtain a more toned, athletic look. We will ask you questions about each one.* On each page, participants saw one of the Table **S2** text-image pairs, below which they responded to the DVs. In Study 1, we assessed the Effort DV with two items (Effort, Own Effort). Participants saw the text-image pairs in randomized order until they had seen all six. We present the images here in reduced size.

##### Table S2

*Study 1: Fitness Means*

|  |  |
| --- | --- |
| **Higher Effort Means** | |
| Ab roller | *This piece of equipment is an ab roller. You use it by laying your head down on the cushion, grasping the sides of the bar, and rolling your upper body up.*A picture containing person, laying, sitting, racket  Description automatically generated |
| Floor mat | *This piece of equipment is a floor mat. You use it by placing it on the ground and lying on it. It stabilizes you, provides cushioning against the hard floor, and allows you to perform abdominal toning exercises.*A picture containing indoor, person, young, table  Description automatically generated |
| Ab bench | *This piece of equipment is an ab bench. You use it by lying on it with your feet tucked under the cushioned bar and your head going down the sloped bench. From this position, you lift your upper body upward in a sit-up or crunch.*A picture containing sport, device, person, holding  Description automatically generated |
| Exercise ball | *This piece of equipment is an exercise ball. You use it by sitting on top of the ball with your feet on the ground and crunching your upper body up.* |
| **Lower Effort Means** | |
| Surgery | *A method that can be used to gain more pronounced ab muscles is getting 6-pack surgery. Plastic surgeons suction fat from the abdomen's superficial and deep layers to accentuate a patient's natural abdominal lines. Below you see a before-after photograph of someone who received surgery.*A person posing for the camera  Description automatically generated |
| Ab stimulator | *This piece of equipment is an ab stimulator. You use it by placing the electrodes over your ab muscles. The machine uses electrical muscle stimulation, passing electrical currents through your body that cause the muscles to contract.*A person posing for the camera  Description automatically generated |

### Study 2 Materials

After giving consent, participants read: *Reaching any goal consists of multiple steps that get you progressively closer and closer to your goal. Imagine you have the goal of attaining or maintaining your most ideal weight. There are several different methods you might use to attain that goal.*

*In the next few pages, we will show you different ways you can attain or maintain your most ideal weight. We will ask you questions about each one.*

On each page, participants saw one of the six (four more effortful, two less effortful) descriptions depicted in Table **S3,** in randomized order. We did not include images as in the pilot, images made the descriptions confusing.

##### 

##### Table S3

*Study 2: Weight Means*

|  |  |
| --- | --- |
| **Higher Effort Means** | |
| Fasting | *One method you could use to attain or maintain your ideal weight is time-restricted eating. In this method, you restrict when you eat by eating only within a window of time. A common practice is eating only during a 7-hour window every day (e.g., eating only between the hours of 11 am and 6 pm).* |
| Program | *Another method you could use to attain or maintain your most ideal weight is signing up for a weight loss program. In this method, you restructure what and how you eat by signing up for a weight loss program that specifically guides you on what to eat every day. You must carefully follow the plan on what to eat and when.* |
| Tracking | *Another method you could use to attain or maintain your ideal weight is carefully tracking all your caloric intake and output. In this method, you restructure the balance between what you eat and what your body needs by carefully tracking what you eat (your caloric intake) and your exercise (your caloric output) for one month. You ensure that every week, your caloric output exceeds your caloric intake.* |
| Restriction | *Another method you could use to attain or maintain your ideal weight is cutting all processed sugars and carbohydrates from your diet. This works through restricting all processed sugars and carbohydrates (e.g., soda, white bread). This restriction can help with weight loss.* |
| **Lower Effort Means** | |
| Liposuction | *Another method you could use to attain or maintain your ideal weight is getting liposuction. Liposuction is a surgical procedure that uses a suction technique to remove fat from specific areas of the body, such as the abdomen, hips, thighs, buttocks, arms, or neck. Liposuction also shapes (contours) these areas.* |
| Surgery | *Another method you could use to attain or maintain your ideal weight is getting bariatric surgery. The most common type of bariatric surgery is an operation that makes the stomach smaller. The decrease in stomach size causes you to eat less and makes you feel full sooner, thereby helping you lose weight.* |

**Study 2 Exploratory Variable: Weight Salience*.*** After rating the DVs for the weight means and difficulty mindsets, students reported current or previous weight loss attempts (Table **S4**). Q1 “Are you currently trying to lose weight?” (67% were), Q2 “Are you currently trying to maintain your weight?” (77% were); Q3 “Have you gained or lost weight recently due to Covid-19?” (63% had) and Q4 “Have you previously ever pursued a method to lose weight?” (65% had). Following our pre-registration, we created a sum score from the four questions. Due to researcher error, we did not use a yes/no response option in Q1, Q2, or Q3, so we re-coded responses to no=0 or yes=1 dichotomies before summing to create a composite “weight salience” score. Q1 and Q2, original: 1 = not at all, 2 = slightly, 3 = actively; Q1 and Q2 became: no=1 yes=2, 3. Q3 original: 1 = Lost weight, 2 = Lost weight slightly, 3 = weight has stayed the same, 4 = Gained weight slightly, 5 = Gained weight; became no=1, 2, 3 yes=4, 5. Weight salience scores could range from 0 = no to 4 = yes across all four questions (*M*=2.48, *SD*=1.15).

##### Table S4

*Current and Previous Weight Engagement: Questions, Response Options, Responses*

|  |  |  |  |
| --- | --- | --- | --- |
| **Question** | | **Response** | |
| **Label** | **Wording** | **Options** | **Distribution** |
| Current weight loss | Are you currently trying to lose weight? | 1 = not at all  2 = slightly  3 = actively | 32%  51%  16% |
| Current weight maintenance | Are you currently trying to maintain your weight? | 1 = not at all  2 = slightly  3 = actively | 23%  50%  27% |
| Covid-related weight change | Have you gained or lost weight recently due to Covid-19? | 1 = Lost weight  2 = Lost weight slightly  3 = Weight has stayed the same  4 = Gained weight slightly  5 = Gained weight | 5%  21%  37%  29%  8% |
| Previous weight loss | Have you previously ever pursued a method to lose weight? | 0 = No  1 = Yes | 35%  65% |

**Study 2 Exploratory Variable: Gender.** We explored whether being a woman moderates the association between weight goals and difficulty mindsets in Study 2.

### Study 3 Materials

**Means to goal attainment (close-ended).** After giving consent, participants read: *Reaching any goal consists of multiple steps that get you progressively closer and closer to your goal. Imagine that your goal was to get good grades in college. There are several different ways you might work toward that goal.*

*In the next few pages, we will show you different methods you can use to get good grades. We will ask you questions about each one.*

We presented each of the Table **S5** text and image pairs in randomized order (one pair per page). Participants rated the DVs for each of the text-image pairs. We present the images here in reduced size.

##### Table S5

*Study 3: Academic Means*

|  |  |
| --- | --- |
| **Higher Effort Means** | |
| Study 4-5 hours | *One method you could use to get good grades is studying 4-5 hours a day.*Asian student studying in library - VLC |
| Re-read | *One method you could use to get good grades is re-reading textbook chapters.*Male African American college student reading and studying in the library  by Take A Pix Media - College student, Education - Stocksy United |
| Rewatch | *One method you could use to get good grades is rewatching lectures.*College students laptop and headphones Stock Photos - Page 1 : Masterfile |
| **Filler Midrange-Effortful Means** | |
| Explain | *One method you could use to get good grades is talking through and explaining important concepts, whether to yourself or someone else.*Premium Photo | Two serious multicultural students listening to their  groupmate during discussion of homework in college cafe |
| Flashcards | *One method you could use to get good grades is creating flashcards.*A few flashcards for environmental law ⚖️ #Law #girlboss #lawschool #college  #university #student #lawstudentlife #environmen… | Cuadernos, Disenos de  unas |
| Paper summary | *One method you could use to get good grades is writing a summary of key points at the end of each paper or while you are reading.*Student Essay: The Importance of Writing - National Day of Writing Contest |
| **Lower Effort Means** | |
| Paraphrase | *One method you could use to get good grades is copying or paraphrasing answers or essays found online.*Graphical user interface, text, application, Word  Description automatically generated |
| Find assignments | *One method you could use to get good grades is finding and using assignments completed by past students on websites like CourseHero*Graphical user interface, text, application  Description automatically generated |
| Get answers | *One method you could use to get good grades is getting homework answers from someone else (e.g., classmate, past student).*bigstock-two-college-students-reading-b-49888535 - CBD Training Ltd |

*Note.* Pictures have been reduced in size to fit the table.

**Means to goal attainment (open-ended).** Next, students described their most common study method. To obtain a visualization of what students were writing, we pulled responses from 20 students starting with row 24 and list each as a separate bullet point:

* reviewing and summarising my study notes and talking to classmates
* rewriting notes
* I like rewatching lectures/going over class powerpoints and explaining things to other people. I also do reread textbook material frequently.
* Taking notes during class and compiling main ideas into one study guide
* reread course material
* Flashcards or summary of papers
* Tell my friends and partner about what I'm learning when it excites me or when I don't really understand it.
* I rewatched lectures or reread textbook chapters.
* Make a flashcard with all the info I need for my test
* Rereading notes
* study
* I pay attention in lectures, take notes and associate the terms or concepts with personal experience
* rewriting notes
* Re-watching lectures and studying with others

### 

**Mastery and Performance Goal Orientations.** Next, students rated their agreement or disagreement with 12 statements that constituted our measure of Mastery and Performance Goal Orientation. These statements reflected interpretations of success and failure designed to tap into mastery and performance goals. Students read: “Please consider the courses you are taking this semester and rate how much you agree or disagree with the following statements (1=strongly disagree, 6=strongly agree). When you think about your academic goals, to what extent does succeeding mean each of the following? Followed by the stem “Success means…” and six statements in randomized order. Then, they read “When you think about your academic goals, to what extent does failing mean each of the following?” Followed by the stem “Failure means…” in randomized order.

We conducted exploratory factor analysis using the R package *psych* (Revelle, 2022) to ascertain whether statements mapped onto four (e.g., mastery approach, mastery avoid, performance approach, performance avoid) or fewer constructs (e.g., performance, mastery). We submitted all items to a parallel analysis. Two eigenvalues larger than 1 emerged, suggesting that items likely load onto two factors. As a follow-up, we conducted exploratory factor analyses using maximum likelihood estimation and varimax rotation, testing two-, three-, and four-factor solution models. The fit indices are reported in Table **S6**. Based on these indices, we decided to use a four-factor solution. As Table **S7** depicts, items map onto one of four three-item factors—mastery success; mastery failure; performance success; and performance failure (we omit loadings <.40 for clarity). We averaged the three items to produce scale scores (mastery-success (*M* = 5.10, *SD* = 0.77), mastery-failure (*M* = 4.42, *SD* = 0.98). The two cross-loading items (‘success means getting a good GPA’ and ‘failure means not getting As’) were in the performance success and performance failure factors. Because the former loaded more on performance success and the latter more on performance failure, we decided to consider the former as part of the 3-item performance success factor (*M* = 5.28 *SD* = 0.83), and the latter as part of the 3-item performance failure factor (*M =* 4.90, *SD* =1.08). Table S7 provides the items.

The four achievement orientation scores correlated. Using Cohen’s rule of thumb that correlations of .10 are small, those of .30 are moderate, and those of .50 are large (Cohen, 1988), the size of correlations in the large range for performance success and performance failure; moderate range for mastery success and mastery failure; moderate range for performance success and mastery success; and small-to-moderate range for performance failure and mastery failure. The other correlations were in the small to very small range. Table **S8** presents these correlations.

##### Table S6

*Achievement Orientation Measures: Exploratory Factor Analysis Solutions*

|  |  |  |  |
| --- | --- | --- | --- |
| **Factor solution** | **RMSEA** | **TLI** | **BIC** |
| two-factor | 0.173 | .667 | 75.67 |
| three-factor | 0.080 | .928 | -99.60 |
| four-factor | 0.045 | .977 | -93.43 |

##### 

##### Table S7

*Achievement Orientation Measures: Items and Exploratory Factor Analysis Factor Loadings*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Question Stem | Item | Mastery  - Success | Mastery- Failure | Performance- Success | Performance- Failure |
| *Success means...* | mastering the material | .74 |  |  |  |
| understanding the content | .72 |  |  |  |
| learning as much as I can | .72 |  |  |  |
| *Failure means...* | forgetting what I learned |  | .55 |  |  |
| not being able to apply what I learned |  | .66 |  |  |
| not being able to apply what I learned in one class in another class even when it’s relevant |  | .81 |  |  |
| *Success means...* | getting As |  |  | .89 |  |
| doing well on assignments |  |  | .61 |  |
| getting a good GPA |  |  | .72 | .42 |
| *Failure means...* | not getting As |  |  | .52 | .64 |
| doing poorly on assignments |  |  |  | .72 |
| getting a low GPA |  |  |  | .84 |

##### Table S8

*Achievement Orientation Correlations with 95% Confidence Intervals*

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | Mastery success | Mastery failure | Performance success |
| 1. Mastery success |  |  |  |
| 2. Mastery failure | .43 [.31, .53]  *p <* .001 |  |  |
| 3. Performance success | .31 [.18, .43]  *p <* .001 | .03 [-.11, .16]  *p =* .693 |  |
| 4. Performance failure | .11 [-.03, .24]  *p =* .129 | .24 [.11, .37]  *p =* .001 | .64 [.56, .72]  *p <* .001 |

# 

# Studies 1-3 Results

## Studies 1-3 Dependent Measure Construction

For each means of goal attainment, we asked participants three questions (DV1, DV2, DV3). The exception is in Study 1, where we assessed DV1 with two questions (Own Effort, “If you use [means], how much does success depend on your own efforts?”; and Effort, “How much effort would [means] require of you?”). We included both of these items from Study 1 in our analysis.

We expected that the items we used to assess the DVs in each of our studies would converge on a single construct. Hence, for each study, we conducted two two-level Exploratory Factor Analyses (EFAs) with Maximum Likelihood Estimation and Geomin Rotation using Mplus software (Muthén & Muthén, 1998-2017) on these items. The first EFA entailed response to the higher-effort means and the second EFA entailed responses to the lower-effort ones. Our models were identified for higher-effort means in each Study but were identified for lower-effort means only in Study 3. So, we focused our next analyses on the higher-effort means in all three studies and on lower-effort means only in Study 3. In our multilevel-EFA, we specified one factor at the within level and one at the between level. Factor loadings were heterogeneous at both levels, as shown in Table **S9**. Our DVs do not constitute a single, parsimonious factor at either level, so we analyze each DV separately.

##### 

##### Table S9

*Studies 1 to 3: Within and Between-Level Factor Loadings of DVs*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Study | Means Effort Level | Item | Loadings | |
|  |  |  | Within-level | Between-level |
| 1 | Higher-effort means | Own Effort | 0.43 | 0.89 |
| Effective | 0.95 | 0.84 |
| Likelihood | 0.73 | 0.77 |
| Effort | 0.28 | 1.03 |
| 2 | Higher-effort means | Own Effort | 0.00 | 0.25 |
| Effective | 44.20 | 1.20 |
| Likelihood | 0.01 | 0.67 |
| 3 | Higher-effort means | Own Effort | 0.31 | 0.55 |
| Effective | 1.38 | 1.25 |
| Likelihood | 0.32 | 0.38 |
| Lower-effort means | Own Effort | 0.47 | 0.44 |
| Effective | 0.53 | 0.73 |
| Likelihood | 0.87 | 0.94 |

# 

# Studies 2-3 Supplemental Analyses

## *Analytic Strategy*

For supplemental analyses that looked at an interaction (e.g., difficulty mindset by gender), we centered difficulty mindsets. For any analysis that did not involve an interaction, we entered difficulty mindsets into the model uncentered.

***Study 2: Moderating Effect of Gender and Goal Relevance***

We planned to explore whether being a woman and weight goal relevance moderate the association between difficulty-mindsets and our DVs. Weight was a relevant goal for most participants (see Table S4), but our weight goal score did not significantly moderate results. Given the ubiquity of weight goals, it might be accurate to say that our results come from a sample of participants with personal experiences with weight goals. Regarding gender, we were underpowered to examine if being a woman moderated effects because we had only 47 men in the sample.

***Study 2: Perceived Hardness of Weight Means***

Given that weight is often moralized (Ringel & Ditto, 2019), in Study 2, we also pre-registered as a secondary prediction that people believe that means they perceive to be hard require more of their own effort and are more effective for reaching their weight goals. Overall, we found that with regards to high-effort weight means (fasting, weight loss program, calorie tracking, restriction), the harder people perceived the means to be, the more they believed their own effort mattered, but the less effective they found these means. With regards to low-effort weight means (surgery, liposuction), finding the means hard did not matter for judgments on how much one’s own effort matters, but did so for effectiveness: harder means were seen as less effective.

We predicted that if a weight-goal means was perceived as being hard to do, people would believe their effort mattered for that means and that it would be effective for reaching their goal. We also predicted that the hardness-effectiveness relationship would be moderated by difficulty-as-impossibility. Before running any of our regressions, we separated perceived hardness into its level-1 (item-level) and level-2 (person-level) effects. To test the relationship between perceived hardness and the two DVs, we ran linear regressions with only the two perceived hardness variables as predictors (not including difficulty mindsets) and the specific weight-goal means as a control. We ran these analyses for high-effort means, then for low-effort means. Perceived hardness was positively related to seeing one’s own effort as mattering for the high-effort means (person-level *b* = .14, *SE* = .07, *t* = 2.14, *p =* .034; item-level *b* = .24, *SE*=.03, *t* = 7.18, *p<*.001). It was negatively related to perceived effectiveness of both higher-effort means (person-level *b* = -.36, *SE*=.06, *t* = -5.73, *p<*.001; item-level *b* = -.22, *SE*=.04, *t* = -4.96, *p<*.001) and lower-effort means (person-level *b* = -.36, *SE*=.08, *t* = -4.42, *p<*.001; item-level *b* = -.26, *SE*=.06, *t* = -4.16, *p<*.001). It was not related to seeing one’s own effort as mattering for low-effort means (person-level *b* = .10, *SE*=.08, *t* = 1.13, *p=*.261; item-level *b* = .13, *SE*=.08, *t* = 1.65, *p=*.102). Finally, we looked at the interaction between difficulty-as-impossibility and perceived hardness with regards to the effectiveness DV. These interactions were not significant for either the high-effort or low-effort means.

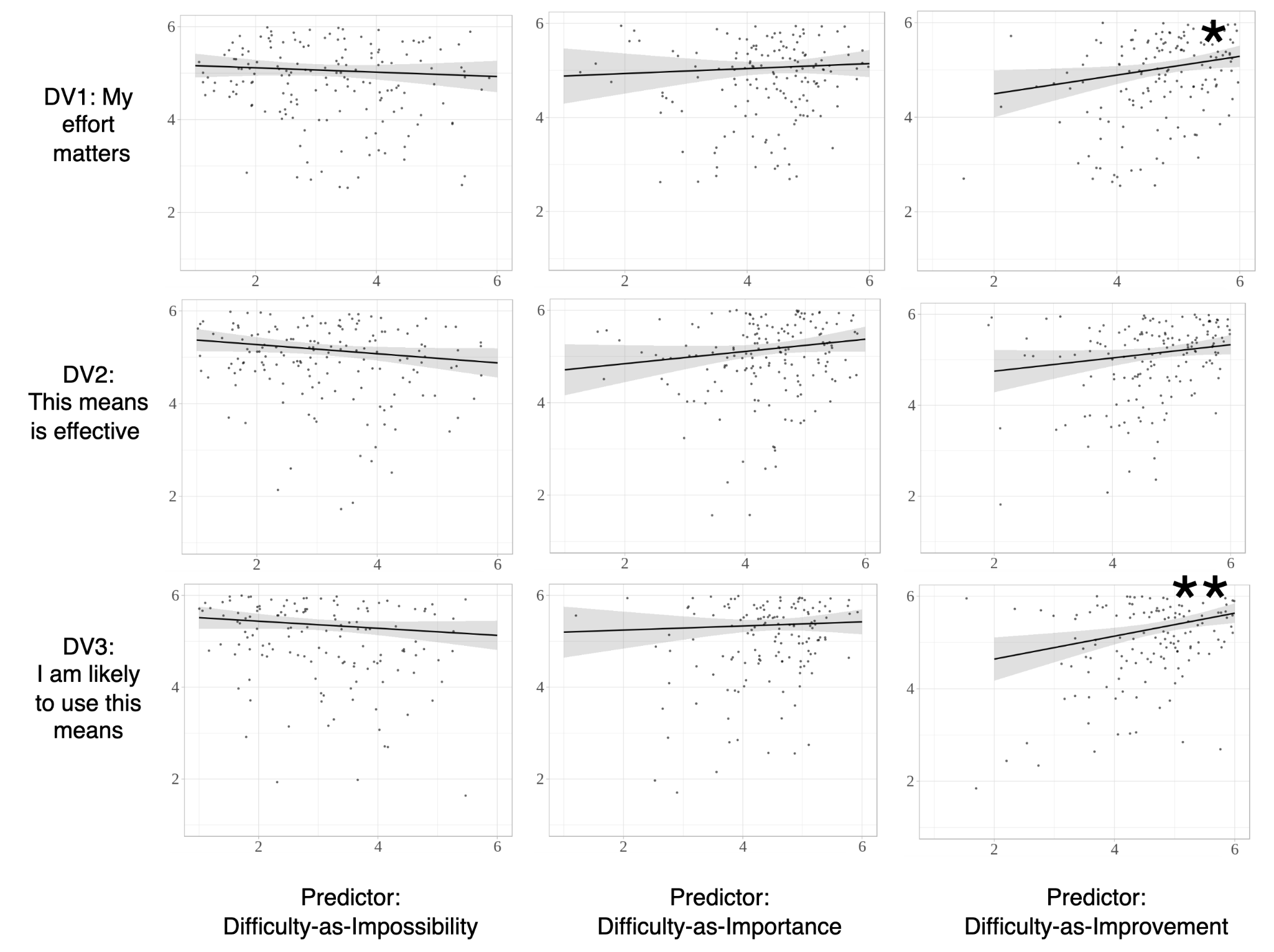
***Study 3: Students’ Own Study Means***

In terms of perceived hardness, students rated their own way of studying as about as hard (*M*= 2.77, *SD*=1.26) as they rated less effortful ways (*M* = 2.42, *SD*= 1.37). We explored the relationship between difficulty mindsets and our three DVs for students’ way of studying using the regression models (one for each DV) we used for our H1 and H2. As detailed in Figure **S1** and Table **S10**, people who scored higher in difficulty-as-improvement rated their way of studying as one in which their effort mattered and said they were likely to use it. No other relationships were significant, though the pattern of results for perceived effectiveness suggests that people higher in difficulty-as-improvement found their way of studying effective while people higher in difficulty-as-impossibility did not. Means and SDs of these DVs with respect to students’ own methods are detailed in Table **S12.**

##### 

##### Figure S1

*Study 3: Difficulty Mindsets and Effort Matters, Effectiveness, and Likelihood of Using for Students’ Own Study Means*

**

*Note.* Whiskers represent 95% Confidence Intervals of the estimates.

##### 

##### Table S10

*Study 3: Association Between Difficulty Mindsets and DVs for Students’ Own Study Means*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| DV | Difficulty Mindset | Estimate | 95% CI | *p* | Adjusted R2 |
| Own Effort Matters | Impossibility | -0.05 | [-0.16, 0.06] | .394 | 0.05 |
| Importance | 0.05 | [-0.12, 0.22] | .536 |
| Improvement | 0.20 | [0.03, 0.37] | .021 |
| Effective Means | Impossibility | -0.10 | [-0.20, 0.00] | .057 | 0.08 |
| Importance | 0.13 | [-0.03, 0.29] | .100 |
| Improvement | 0.15 | [-0.01, 0.30] | .071 |
| Likelihood of Using | Impossibility | -0.08 | [-0.18, 0.03] | .140 | 0.12 |
| Importance | 0.04 | [-0.11, 0.20] | .579 |
| Improvement | 0.25 | [0.09, 0.41] | .002 |

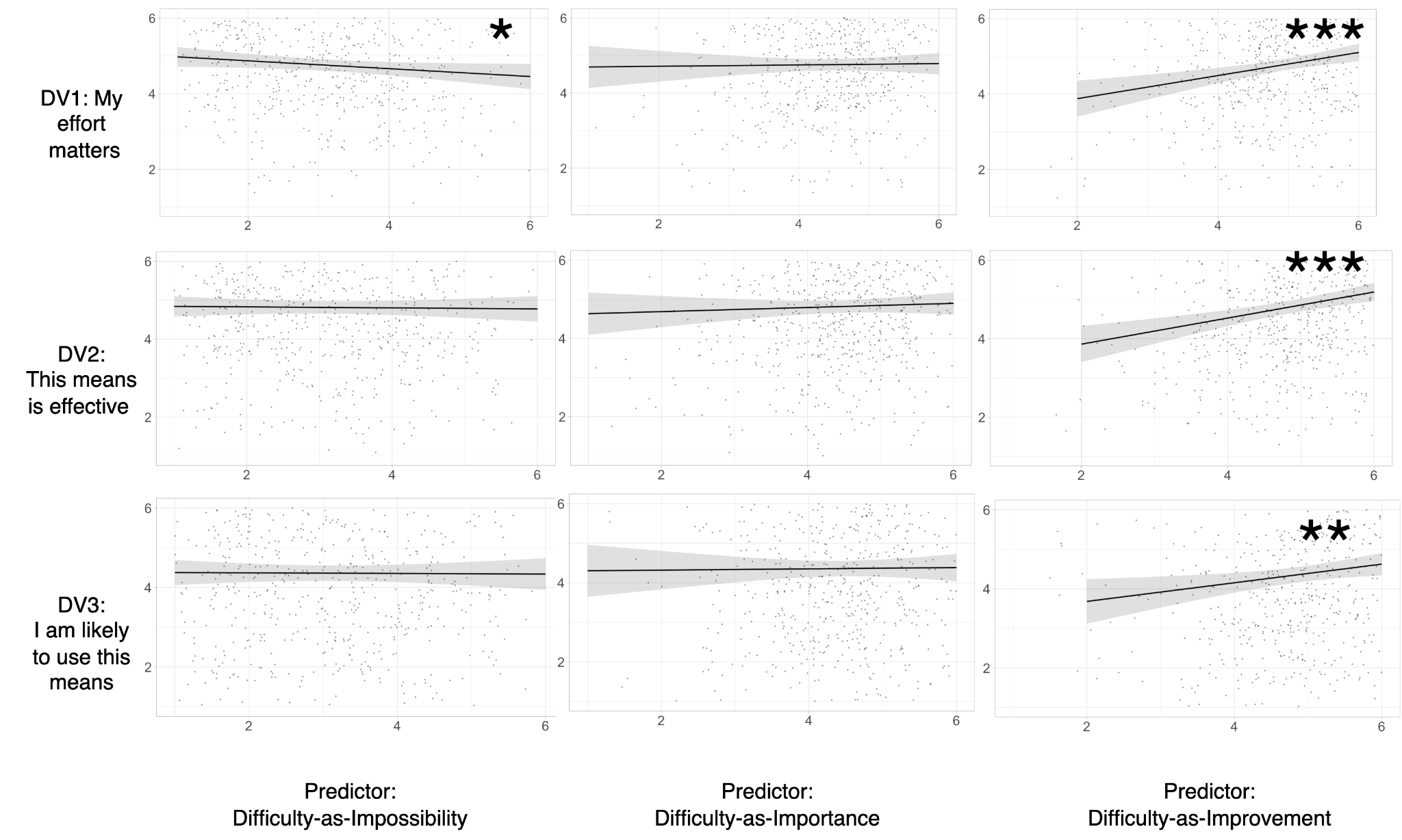
***Study 3: Midrange Effortful Means***

We found a significant positive association between difficulty-as-improvement and each of our three DVs with regards to the midrange-effortful academic means. Table **S11** details and Figure S2 shows the regression coefficients from three regression equations including each difficulty mindset simultaneously in predicting each of our DVs for our filler methods. As depicted in Figure S2, effects are not significant for difficulty-as-importance and difficulty-as-impossibility. Means and SDs of these DVs with respect to midrange-effortful methods are detailed in Table **S12.**

##### 

##### Figure S2

*Study 3: Difficulty Mindsets and Effort Matters, Effectiveness, and Likelihood of Using for Midrange-Effortful Means*



##### Table S11

*Study 3: Association Between Difficulty Mindsets and DVs for Midrange-Effortful Study Means*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| DV | Difficulty Mindset | Estimate | 95% CI | *p* | Adjusted R2 |
| Own Effort Matters | Impossibility | -0.10 | [-0.21, -0.002] | .049 | .12 |
| Importance | 0.02 | [-0.14, 0.17] | .825 |
| Improvement | 0.31 | [0.15, 0.46] | <.001 |
| Effective Means | Impossibility | -0.01 | [-0.11, 0.08] | .798 | .16 |
| Importance | 0.05 | [-0.10, 0.20] | .491 |
| Improvement | 0.33 | [0.18, 0.48] | <.001 |
| Likelihood of Using | Impossibility | -0.01 | [-0.13, 0.11] | .900 | .15 |
| Importance | 0.02 | [-0.16, 0.20] | .862 |
| Improvement | 0.24 | [0.05, 0.42] | .013 |

##### Table S12

*Mean and SD for Perceived Hardness and the DVs Grouped by Type of Means*

|  |  |  |  |
| --- | --- | --- | --- |
| Measure | Means of Studying | *Mean* | *SD* |
| Perceived hardness of… | lower-effort | 2.42 | 1.37 |
| filler midrange | 3.06 | 1.42 |
| higher-effort | 3.70 | 1.52 |
| students’ own way | 2.77 | 1.26 |
| Value of effort for... | lower-effort | 2.22 | 1.27 |
| midrange-effortful | 4.69 | 1.15 |
| higher-effort | 4.64 | 1.22 |
| students’ own way | 5.06 | 0.93 |
| Effectiveness of... | lower-effort | 2.79 | 1.48 |
| filler midrange | 4.40 | 1.26 |
| higher-effort | 4.27 | 1.32 |
| students’ own way | 5.17 | 0.88 |
| Likelihood of using... | lower-effort | 2.18 | 1.29 |
| filler midrange | 3.82 | 1.51 |
| higher-effort | 3.48 | 1.56 |
| students’ own way | 5.35 | 0.91 |

### 

***Study 3: Association Between Difficulty Mindsets and Achievement Orientation***

We explored the association between difficulty mindsets and achievement orientation. **Table S13** shows the correlations. Bivariate correlations suggest that mastery success is correlated with difficulty mindsets with size of correlations ranging from small to moderate. Mastery failure has a small-sized correlation with difficulty-as-importance; performance success has a small-sized correlation with difficulty-as-improvement; and performance failure is not significantly correlated with any of the difficulty mindsets.

##### Table S13

*Study 3: Means and Correlations [95% Confidence Intervals] Achievement Orientations and Difficulty Mindsets*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | Mastery-  success | Mastery-  Failure | Performance-  Success | Performance-  Failure |
| Difficulty-as-  Impossibility | -.15 [-.28, -.01]  *p =* .032 | .05 [-.09, .18]  *p =* .501 | -.09 [-.22, .05]  *p =* .217 | .06 [-.07, .20]  *p =* .358 |
| Difficulty-as-  Importance | .25 [.11, .37]  *p <* .001 | .15 [.01, .28]  *p =* .030 | .08 [-.06, .21]  *p =* .267 | .07 [-.07, .21]  *p =* .317 |
| Difficulty-as-  Improvement | .37 [.24, .48]  *p <* .001 | .10 [-.04, .24]  *p =* .144 | .14 [.01, .28]  *p =* .039 | .01 [-.13, .15]  *p =* .884 |

*Note.* Values in square brackets indicate the 95% confidence interval.

# Studies 1-3: Pre-registered Analytic Strategy

We pre-registered a more complicated analytic strategy than what we present in the main text. We describe and present the results of that analytic strategy here.

For Study 2, we pre-registered that we would gradually build a regression model by adding more predictors to the model at each step. We described this analysis for the higher-effort means only, implying that we should run the linear mixed effect regressions separately for higher-effort and lower-effort means. In our pre-registration for Study 2, we described four steps to the regression. However, despite the description of the 4-step approach in the Study 2 pre-registration, we noted in the Study 3 pre-registration that we would be testing the main effect of each difficulty mindset without controlling for the other two difficulty mindsets, in addition to testing all three together. This plan required us to add more steps to the initially described 4-step approach. This general analytic approach yielded nine steps for the models testing higher-effort means and seven for the models testing lower-effort means. We had fewer steps in the lower-effort means models because the last two steps, which entailed testing the perceived hardness-difficulty mindset interactions, were too complex for the models testing lower-effort means and caused failure of model convergence. Thus, we test the perceived hardness-difficulty mindset interactions in the higher-effort means models only.

Overall, our pre-registered strategy yielded six models to test for each of the three studies: three models each testing one of the three DVs for higher-effort means, and three models each testing one of the three DVs for lower-effort means.

Finally, we provide by-study analyses which involve testing either only lower-effort means (two or three depending on the study) or higher-effort means (three or four depending on the study) for each of the three DVs. These are a low number of clusters to consider “means” as a type of clustering, and many of the models ran into errors if we attempted to include “means” as a random effect, hence, we decided to include “means” as a fixed effect in each model instead. This differs from the parsimonious models presented in the main paper, where there were a sufficient number of means in each model so that means could be added as a random effect.

## 

## Study 1 Detailed Regression Models

In Tables **S14 to S19**, the estimate is shown with Standard Error in parentheses, \* *p*<.05, \*\**p*<.01, \*\*\**p*<.001. The abbreviations are as follows: Interaction 1: Person-level hardness\*Difficulty-as-Impossibility. Interaction 2: Person-level hardness\*Difficulty-as-Importance. Interaction 3: Person-level hardness\*Difficulty-as-Improvement. Interaction 4: Item-level hardness\* Difficulty-as-Impossibility. Interaction 5: Item-level hardness\* Difficulty-as-Importance. Interaction 6: Item-level hardness\* Difficulty-as-Improvement.

##### 

##### Table S14

*Study 1: Own Effort Matters for Using Higher-Effort Means of Strengthening One’s Core*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Model | | | | | | | | |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Intercept (Ball) | 4.27\*\*\* (0.06) | 3.15\*\*\* (0.18) | 3.27\*\*\*  (0.21) | 2.93\*\*\*  (0.31) | 3.09\*\*\*  (0.35) | 2.12\*\*\*  (0.36) | 2.28\*\*\*  (0.43) | 2.23  (1.35) | 2.28\*\*\*  (0.43) |
| Bench |  | 0.31\*\*\*  (0.09) | 0.31\*\*\*  (0.09) | 0.31\*\*\*  (0.09) | 0.31\*\*\*  (0.09) | 0.31\*\*\*  (0.09) | 0.31\*\*\*  (0.09) | 0.31\*\*\*  (0.09) | 0.31\*\*\*  (0.09) |
| Mat |  | 0.05  (0.09) | 0.05  (0.09) | 0.05  (0.09) | 0.05  (0.09) | 0.05  (0.09) | 0.05  (0.09) | 0.05  (0.09) | 0.06  (0.09) |
| Roller |  | -0.40\*\*\*  (0.09) | -0.40\*\*\*  (0.09) | -0.40\*\*\*  (0.09) | -0.40\*\*\*  (0.09) | -0.40\*\*\*  (0.09) | -0.40\*\*\*  (0.09) | -0.40\*\*\*  (0.09) | -0.40\*\*\*  (0.09) |
| Person-level hardness |  | 0.42\*\*\*  (0.06) | 0.43\*\*\*  (0.06) | 0.42\*\*\*  (0.06) | 0.43\*\*\*  (0.06) | 0.44\*\*\*  (0.06) | 0.45\*\*\*  (0.06) | 0.44  (0.47) | 0.45\*\*\*  (0.06) |
| Item-level hardness |  | 0.34\*\*\*  (0.04) | 0.34\*\*\*  (0.04) | 0.34\*\*\*  (0.04) | 0.34\*\*\*  (0.04) | 0.34\*\*\*  (0.04) | 0.34\*\*\*  (0.04) | 0.34\*\*\*  (0.04) | 0.46\*  (0.22) |
| Difficulty-as-  Impossibility |  |  | -0.06  (0.06) |  | -0.05  (0.06) |  | -0.02  (0.06) | 0.07  (0.18) | -0.02  (0.06) |
| Difficulty-as-  Importance |  |  |  | 0.05  (0.06) | 0.04  (0.06) |  | -0.06  (0.07) | -0.24 (0.21) | -0.06  (0.07) |
| Difficulty-as- Improvement |  |  |  |  |  | 0.20\*\*  (0.06) | 0.22\*\*  (0.07) | 0.36 (0.20) | 0.22\*\*  (0.07) |
| Interaction 1 |  |  |  |  |  |  |  | -0.03 (0.06) |  |
| Interaction 2 |  |  |  |  |  |  |  | 0.07  (0.07) |  |
| Interaction 3 |  |  |  |  |  |  |  | -0.05  (0.07) |  |
| Interaction 4 |  |  |  |  |  |  |  |  | 0.01  (0.03) |
| Interaction 5 |  |  |  |  |  |  |  |  | 0.01  (0.03) |
| Interaction 6 |  |  |  |  |  |  |  |  | -0.04  (0.04) |
|  | .00 | .23 | .23 | .23 | .23 | .25 | .25 | .25 | .25 |
| AIC | 2435.76 | 2247.04 | 2251.84 | 2252.07 | 2257.14 | 2242.59 | 2253.28 | 2268.75 | 2273.08 |
| BIC | 2449.77 | 2284.4 | 2293.87 | 2294.09 | 2303.84 | 2284.61 | 2304.65 | 2334.12 | 2338.45 |
| Log Likelihood | -1214.88 | -1115.52 | -1116.92 | -1117.03 | -1118.57 | -1112.29 | -1115.64 | -1120.38 | -1122.54 |
| # Observations | 788 | 788 | 788 | 788 | 788 | 788 | 788 | 788 | 788 |
| # Groups: id | 197 | 197 | 197 | 197 | 197 | 197 | 197 | 197 | 197 |
| Var: id (Intercept) | 0.53 | 0.44 | 0.44 | 0.44 | 0.44 | 0.41 | 0.41 | 0.42 | 0.41 |
| Var: Residual | 0.95 | 0.71 | 0.71 | 0.71 | 0.71 | 0.71 | 0.71 | 0.71 | 0.72 |

##### 

##### Table S15

*Study 1: Effectiveness of Using Higher-Effort Means of Strengthening One’s Core*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Model | | | | | | | | |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Intercept (Ball) | 3.93\*\*\*  (0.06) | 3.15\*\*\*  (0.20) | 3.26\*\*\*  (0.24) | 2.47\*\*\*  (0.33) | 2.52\*\*\*  (0.38) | 1.81\*\*\*  (0.39) | 1.67\*\*\*  (0.47) | 1.67  (1.44) | 1.67\*\*\*  (0.47) |
| Bench |  | 0.81\*\*\*  (0.12) | 0.81\*\*\*  (0.12) | 0.81\*\*\*  (0.12) | 0.81\*\*\*  (0.12) | 0.81\*\*\*  (0.12) | 0.81\*\*\*  (0.12) | 0.81\*\*\*  (0.12) | 0.82\*\*\*  (0.12) |
| Mat |  | 0.32\*\*  (0.12) | 0.32\*\*  (0.12) | 0.32\*\*  (0.12) | 0.32\*\*  (0.12) | 0.32\*\*  (0.12) | 0.32\*\*  (0.12) | 0.32\*\*  (0.12) | 0.34\*\*  (0.12) |
| Roller |  | -0.17  (0.12) | -0.17  (0.12) | -0.17  (0.12) | -0.17  (0.12) | -0.17  (0.12) | -0.17  (0.12) | -0.17  (0.12) | -0.18  (0.12) |
| Person-level hardness |  | 0.20\*\*  (0.07) | 0.21\*\*  (0.07) | 0.19\*\*  (0.06) | 0.19\*\*  (0.07) | 0.22\*\*\*  (0.06) | 0.21\*\*  (0.06) | 0.17  (0.51) | 0.21\*\*  (0.06) |
| Item-level hardness |  | -0.07  (0.05) | -0.07  (0.05) | -0.07  (0.05) | -0.07  (0.05) | -0.07  (0.05) | -0.07  (0.05) | -0.07  (0.05) | -0.2  (0.30) |
| Difficulty-as-  Impossibility |  |  | -0.05  (0.06) |  | -0.02  (0.06) |  | 0.01  (0.06) | 0.03  (0.19) | 0.01  (0.06) |
| Difficulty-as-  Importance |  |  |  | 0.17\*  (0.06) | 0.16\*  (0.07) |  | 0.06  (0.07) | -0.2  (0.23) | 0.06  (0.07) |
| Difficulty-as-  Improvement |  |  |  |  |  | 0.26\*\*\*  (0.07) | 0.23\*\*  (0.08) | 0.46\*  (0.22) | 0.23\*\*  (0.08) |
| Interaction 1 |  |  |  |  |  |  |  | 0  (0.07) |  |
| Interaction 2 |  |  |  |  |  |  |  | 0.1  (0.08) |  |
| Interaction 3 |  |  |  |  |  |  |  | -0.08  (0.07) |  |
| Interaction 4 |  |  |  |  |  |  |  |  | 0.14\*\*  (0.04) |
| Interaction 5 |  |  |  |  |  |  |  |  | 0.06  (0.05) |
| Interaction 6 |  |  |  |  |  |  |  |  | -0.1  (0.06) |
|  | .00 | .09 | .09 | .10 | .10 | .12 | .12 | .12 | .13 |
| AIC | 2732.76 | 2677.2 | 2682.26 | 2676.3 | 2681.95 | 2667.66 | 2678.12 | 2692.38 | 2681.85 |
| BIC | 2746.77 | 2714.56 | 2724.29 | 2718.32 | 2728.65 | 2709.68 | 2729.49 | 2757.75 | 2747.22 |
| Log Likelihood | -1363.38 | -1330.6 | -1332.13 | -1329.15 | -1330.98 | -1324.83 | -1328.06 | -1332.19 | -1326.92 |
| # observations | 788 | 788 | 788 | 788 | 788 | 788 | 788 | 788 | 788 |
| # groups: id | 197 | 197 | 197 | 197 | 197 | 197 | 197 | 197 | 197 |
| Var id Intercept | 0.36 | 0.37 | 0.37 | 0.35 | 0.35 | 0.32 | 0.32 | 0.33 | 0.33 |
| Var Residual | 1.58 | 1.41 | 1.41 | 1.41 | 1.41 | 1.41 | 1.41 | 1.41 | 1.38 |

##### Table S16

*Study 1: Likelihood of Using Higher-Effort Means of Strengthening One’s Core*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | Model |  |  |  |  |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Intercept (Ball) | 3.82\*\*\*  (0.07) | 3.16\*\*\*  (0.23) | 3.27\*\*\*  (0.27) | 2.70\*\*\*  (0.38) | 2.80\*\*\*  (0.44) | 1.29\*\*  (0.44) | 1.34\*  (0.52) | 4.59\*\*  (1.60) | 1.33\*  (0.52) |
| Bench |  | 0.75\*\*\*  (0.14) | 0.75\*\*\*  (0.14) | 0.75\*\*\*  (0.14) | 0.75\*\*\*  (0.14) | 0.75\*\*\*  (0.14) | 0.75\*\*\*  (0.14) | 0.75\*\*\*  (0.14) | 0.75\*\*\*  (0.14) |
| Mat |  | 0.76\*\*\*  (0.14) | 0.76\*\*\*  (0.14) | 0.76\*\*\*  (0.14) | 0.76\*\*\*  (0.14) | 0.76\*\*\*  (0.14) | 0.76\*\*\*  (0.14) | 0.76\*\*\*  (0.14) | 0.77\*\*\*  (0.14) |
| Roller |  | -0.30\*  (0.13) | -0.30\*  (0.13) | -0.30\*  (0.13) | -0.30\*  (0.13) | -0.30\*  (0.13) | -0.30\*  (0.13) | -0.30\*  (0.13) | -0.30\*  (0.13) |
| Person-level hardness |  | 0.14  (0.07) | 0.15  (0.08) | 0.13  (0.07) | 0.14  (0.08) | 0.16\*  (0.07) | 0.16\*  (0.07) | (1.04)  (0.56) | 0.16\*  (0.07) |
| Item-level hardness |  | -0.18\*\*  (0.06) | -0.18\*\*  (0.06) | -0.18\*\*  (0.06) | -0.18\*\*  (0.06) | -0.18\*\*  (0.06) | -0.18\*\*  (0.06) | -0.18\*\*  (0.06) | (0.05)  (0.34) |
| Difficulty-as-Impossibility |  |  | -0.05  (0.07) |  | -0.03  (0.07) |  | 0.02  (0.07) | -0.14  (0.22) | 0.02  (0.07) |
| Difficulty-as-Importance |  |  |  | 0.11  (0.07) | 0.1  (0.08) |  | -0.07  (0.08) | -0.41  (0.25) | -0.07  (0.08) |
| Difficulty-as-Improvement |  |  |  |  |  | 0.36\*\*\*  (0.07) | 0.40\*\*\*  (0.09) | 0.14  (0.24) | 0.40\*\*\*  (0.09) |
| Interaction 1 |  |  |  |  |  |  |  | 0.06  (0.07) |  |
| Interaction 2 |  |  |  |  |  |  |  | 0.13  (0.09) |  |
| Interaction 3 |  |  |  |  |  |  |  | 0.09  (0.08) |  |
| Interaction 4 |  |  |  |  |  |  |  |  | 0.06  (0.05) |
| Interaction 5 |  |  |  |  |  |  |  |  | 0.02  (0.05) |
| Interaction 6 |  |  |  |  |  |  |  |  | -0.08  (0.06) |
|  | .00 | .11 | .11 | .11 | .11 | .15 | .15 | .16 | .15 |
| AIC | 2944.38 | 2860.97 | 2865.85 | 2864.11 | 2869.34 | 2843.49 | 2853.28 | 2864.3 | 2867.35 |
| BIC | 2958.39 | 2898.33 | 2907.87 | 2906.14 | 2916.04 | 2885.51 | 2904.64 | 2929.68 | 2932.72 |
| Log Likelihood | -1469.19 | -1422.48 | -1423.92 | -1423.06 | -1424.67 | -1412.74 | -1415.64 | -1418.15 | -1419.67 |
| # observations | 788 | 788 | 788 | 788 | 788 | 788 | 788 | 788 | 788 |
| # groups: id | 197 | 197 | 197 | 197 | 197 | 197 | 197 | 197 | 197 |
| Var id (Intercept) | 0.43 | 0.5 | 0.5 | 0.49 | 0.49 | 0.4 | 0.4 | 0.39 | 0.4 |
| Var Residual | 2.09 | 1.77 | 1.77 | 1.77 | 1.77 | 1.77 | 1.77 | 1.77 | 1.76 |

##### Table S17

*Study 1: Own Effort Matters for Using Lower-Effort Means of Strengthening One’s Core*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | Model |  |  |  |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Intercept (Surgery) | 2.78\*\*\*  (0.07) | 1.91\*\*\*  (0.18) | 1.55\*\*\*  (0.21) | 2.19\*\*\*  (0.30) | 1.69\*\*\*  (0.34) | 2.24\*\*\*  (0.33) | 1.72\*\*\*  (0.40) |
| Ab stimulator |  | -1.01\*\*\*  (0.11) | -1.01\*\*\*  (0.11) | -1.01\*\*\*  (0.11) | -1.01\*\*\*  (0.11) | -1.01\*\*\*  (0.11) | -1.01\*\*\*  (0.11) |
| Person-level hardness |  | 0.40\*\*\*  (0.05) | 0.38\*\*\*  (0.05) | 0.39\*\*\*  (0.05) | 0.38\*\*\*  (0.05) | 0.40\*\*\*  (0.05) | 0.38\*\*\*  (0.05) |
| Item-level hardness |  | 0.34\*\*\*  (0.05) | 0.34\*\*\*  (0.05) | 0.34\*\*\*  (0.05) | 0.34\*\*\*  (0.05) | 0.34\*\*\*  (0.05) | 0.34\*\*\*  (0.05) |
| Difficulty-as-Impossibility |  |  | 0.16\*\*  (0.05) |  | 0.16\*\*  (0.05) |  | 0.16\*\*  (0.05) |
| Difficulty-as-Importance |  |  |  | -0.06  (0.06) | -0.03  (0.06) |  | -0.02  (0.06) |
| Difficulty-as-Improvement |  |  |  |  |  | -0.07  (0.06) | -0.01  (0.07) |
|  | .00 | .46 | .48 | .47 | .48 | .47 | .48 |
| AIC | 1339.06 | 1105.64 | 1101.32 | 1110.24 | 1106.99 | 1110.04 | 1112.54 |
| BIC | 1350.99 | 1129.5 | 1129.15 | 1138.07 | 1138.8 | 1137.88 | 1148.33 |
| Log Likelihood | -666.53 | -546.82 | -543.66 | -548.12 | -545.5 | -548.02 | -547.27 |
| Num. obs. | 394 | 394 | 394 | 394 | 394 | 394 | 394 |
| Num. groups: id | 197 | 197 | 197 | 197 | 197 | 197 | 197 |
| Var: id (Intercept) | 0 | 0.14 | 0.11 | 0.14 | 0.11 | 0.13 | 0.12 |
| Var: Residual | 1.71 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 |

##### 

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##### Table S18

*Study 1: Effectiveness of Using Lower-Effort Means of Strengthening One’s Core*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | Model |  |  |  |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Intercept (Surgery) | 2.82\*\*\*  (0.08) | 2.95\*\*\*  (0.28) | 2.28\*\*\*  (0.32) | 2.88\*\*\*  (0.47) | 1.85\*\*\*  (0.52) | 3.33\*\*\*  (0.51) | 1.97 \*\*  (0.61) |
| Ab stimulator |  | -0.21  (0.17) | -0.21  (0.17) | -0.21  (0.17) | -0.21  (0.17) | -0.21  (0.17) | -0.21  (0.17) |
| Person-level hardness |  | -0.01  (0.07) | -0.04  (0.07) | -0.01  (0.07) | -0.04  (0.07) | 0  (0.07) | -0.04  (0.07) |
| Item-level hardness |  | 0  (0.08) | 0  (0.08) | 0  (0.08) | 0  (0.08) | 0  (0.08) | 0  (0.08) |
| Difficulty-as- Impossibility |  |  | 0.31\*\*\*  (0.08) |  | 0.33\*\*\*  (0.08) |  | 0.32\*\*\*  (0.08) |
| Difficulty-as- Importance |  |  |  | 0.02  (0.09) | 0.09  (0.09) |  | 0.11  (0.10) |
| Difficulty-as- Improvement |  |  |  |  |  | -0.08  (0.09) | -0.04  (0.10) |
|  | .00 | .01 | .05 | .01 | .05 | .01 | .05 |
| AIC | 1442.71 | 1455.21 | 1445.06 | 1460.22 | 1449.00 | 1459.37 | 1453.59 |
| BIC | 1454.64 | 1479.06 | 1472.9 | 1488.05 | 1480.81 | 1487.21 | 1489.38 |
| Log Likelihood | (718.35) | (721.60) | (715.53) | (723.11) | (716.50) | (722.69) | (717.79) |
| Num. obs. | 394 | 394 | 394 | 394 | 394 | 394 | 394 |
| Num. groups: id | 197 | 197 | 197 | 197 | 197 | 197 | 197 |
| Var: id (Intercept) | 0.27 | 0.28 | 0.19 | 0.29 | 0.19 | 0.28 | 0.2 |
| Var: Residual | 1.97 | 1.97 | 1.97 | 1.97 | 1.97 | 1.97 | 1.97 |

##### 

##### Table S19

*Study 1: Likelihood of Using Lower-Effort Means of Strengthening One’s Core*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Model | | | | | | |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Intercept (Surgery) | 2.12\*\*\*  (0.08) | 1.80\*\*\*  (0.28) | 0.92\*\*  (0.31) | 2.20\*\*\*  (0.47) | 0.92  (0.50) | 2.68\*\*\*  (0.51) | 1.20\*  (0.59) |
| Ab stimulator |  | 0.70\*\*\*  (0.14) | 0.70\*\*\*  (0.14) | 0.70\*\*\*  (0.14) | 0.70\*\*\*  (0.14) | 0.70\*\*\*  (0.14) | 0.70\*\*\*  (0.14) |
| Person-level hardness |  | -0.01  (0.07) | -0.05  (0.07) | -0.01  (0.07) | -0.05  (0.07) | 0.01  (0.07) | -0.04  (0.07) |
| Item-level hardness |  | -0.06  (0.06) | -0.06  (0.06) | -0.06  (0.06) | -0.06  (0.06) | -0.06  (0.06) | -0.06  (0.06) |
| Difficulty-as- Impossibility |  |  | 0.40\*\*\*  (0.07) |  | 0.40\*\*\*  (0.08) |  | 0.39\*\*\*  (0.08) |
| Difficulty-as- Importance |  |  |  | -0.09  (0.09) | 0  (0.08) |  | 0.04  (0.09) |
| Difficulty-as- Improvement |  |  |  |  |  | -0.19\*  (0.09) | -0.09  (0.10) |
|  | .00 | .07 | .15 | .08 | .15 | .09 | .16 |
| AIC | 1400.53 | 1373.78 | 1351.77 | 1377.71 | 1356.91 | 1374.43 | 1360.92 |
| BIC | 1412.46 | 1397.64 | 1379.6 | 1405.54 | 1388.72 | 1402.27 | 1396.71 |
| Log Likelihood | -697.27 | -680.89 | -668.88 | -681.85 | -670.46 | -680.22 | -671.46 |
| # Observations | 394 | 394 | 394 | 394 | 394 | 394 | 394 |
| # Groups: id | 197 | 197 | 197 | 197 | 197 | 197 | 197 |
| Var: id Intercept | 0.47 | 0.62 | 0.46 | 0.62 | 0.47 | 0.6 | 0.47 |
| Var: Residual | 1.59 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 |

# 

## Study 2 Detailed Regression Models

In Tables **S20 to S25,** the estimate is shown with Standard Error in parentheses, \* *p*<.05, \*\**p*<.01, \*\*\**p*<.001. The abbreviations are as follows: Interaction 1: Person-level hardness\*Difficulty-as-Impossibility. Interaction 2: Person-level hardness\*Difficulty-as-Importance. Interaction 3: Person-level hardness\*Difficulty-as-Improvement. Interaction 4: Item-level hardness\* Difficulty-as-Impossibility. Interaction 5: Item-level hardness\* Difficulty-as-Importance. Interaction 6: Item-level hardness\* Difficulty-as-Improvement.

##### Table S20

*Study 2: Own Effort Matters for Higher-Effort Means of Achieving Weight Goals*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Model | | | | | | | | |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Intercept (Restriction) | 4.56\*\*\*  (0.08) | 4.35\*\*\*  (0.24) | 4.12\*\*\*  (0.30) | 4.51\*\*\*  (0.45) | 4.20\*\*\*  (0.52) | 3.59\*\*\*  (0.50) | 3.38\*\*\*  (0.60) | 1.41  (1.53) | 3.38\*\*\* (0.60) |
| Fasting |  | -0.60\*\*\*  (0.12) | -0.60\*\*\*  (0.12) | -0.61\*\*\*  (0.12) | -0.61\*\*\*  (0.12) | -0.60\*\*\*  (0.12) | -0.61\*\*\*  (0.12) | -0.61\*\*\*  (0.12) | -0.59\*\*\*  (0.12) |
| Program |  | -0.54\*\*\*  -(0.12) | -0.54\*\*\*  (0.12) | -0.55\*\*\*  (0.12) | -0.55\*\*\*  (0.12) | -0.54\*\*\*  (0.12) | -0.55\*\*\*  (0.12) | -0.55\*\*\*  (0.12) | -0.54\*\*\*  (0.12) |
| Tracking |  | 0.13  (0.12) | 0.13  (0.12) | 0.14  (0.12) | 0.14  (0.12) | 0.13  (0.12) | 0.14  (0.12) | 0.14  (0.12) | 0.14  (0.12) |
| Person-level hardness |  | 0.14\*  (0.07) | 0.13\*  (0.07) | 0.14\*  (0.07) | 0.14\*  (0.07) | 0.14\*  (0.07) | 0.12  (0.07) | 0.77  (0.46) | 0.12  (0.07) |
| Item-level hardness |  | 0.24\*\*\*  (0.03) | 0.24\*\*\*  (0.03) | 0.25\*\*\*  (0.03) | 0.25\*\*\*  (0.03) | 0.24\*\*\*  (0.03) | 0.25\*\*\*  (0.03) | 0.25\*\*\*  (0.03) | 0.48  (0.25) |
| Difficulty-as-  Impossibility |  |  | 0.09  (0.08) |  | 0.09  (0.08) |  | 0.11  (0.08) | 0.3  (0.20) | 0.11  (0.08) |
| Difficulty-as-  Importance |  |  |  | -0.04  (0.09) | -0.02  (0.09) |  | -0.15  (0.10) | -0.01  (0.28) | -0.15  (0.10) |
| Difficulty-as-  Improvement |  |  |  |  |  | 0.15  (0.09) | 0.28\*  (0.11) | 0.45  (0.30) | 0.28\*  (0.11) |
| Interaction 1 |  |  |  |  |  |  |  | -0.06  (0.06) |  |
| Interaction 2 |  |  |  |  |  |  |  | -0.05  (0.08) |  |
| Interaction 3 |  |  |  |  |  |  |  | -0.06  (0.09) |  |
| Interaction 4 |  |  |  |  |  |  |  |  | 0.01  (0.04) |
| Interaction 5 |  |  |  |  |  |  |  |  | -0.05  (0.04) |
| Interaction 6 |  |  |  |  |  |  |  |  | -0.01  (0.05) |
|  | .00 | .14 | .14 | .14 | .15 | .15 | .17 | .17 | .17 |
| AIC | 1815.35 | 1727.67 | 1731.43 | 1719.19 | 1723.16 | 1729.72 | 1721.36 | 1735.39 | 1738.37 |
| BIC | 1828.25 | 1762.06 | 1770.12 | 1757.82 | 1766.07 | 1768.41 | 1768.57 | 1795.47 | 1798.45 |
| Log Likelihood | -904.68 | -855.83 | -856.72 | -850.6 | -851.58 | -855.86 | -849.68 | -853.69 | -855.18 |
| # observations | 544 | 544 | 544 | 540 | 540 | 544 | 540 | 540 | 540 |
| # groups: id | 136 | 136 | 136 | 135 | 135 | 136 | 135 | 135 | 135 |
| Var: id (Intercept) | 0.53 | 0.58 | 0.57 | 0.59 | 0.59 | 0.56 | 0.55 | 0.56 | 0.55 |
| Var: Residual | 1.27 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |

##### 

##### Table S21

*Study 2: Effectiveness of Using Higher-Effort Means of Achieving Weight Goals*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | Model |  |  |  |  |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Intercept (Restriction) | 4.05\*\*\*  (0.08) | 5.64\*\*\*  (0.24) | 5.62\*\*\*  (0.30) | 5.15\*\*\*  (0.43) | 5.09\*\*\*  (0.50) | 4.54\*\*\*  (0.48) | 4.33\*\*\*  (0.58) | 3.43\*  (1.46) | 4.32\*\*\*  (0.58) |
| Fasting |  | -0.86\*\*\*  (0.16) | -0.86\*\*\*  (0.16) | -0.83\*\*\*  (0.16) | -0.83\*\*\*  (0.16) | -0.86\*\*\*  (0.16) | -0.83\*\*\*  (0.16) | -0.83\*\*\*  (0.16) | -0.81\*\*\*  (0.16) |
| Program |  | -0.67\*\*\*  (0.16) | -0.67\*\*\*  (0.16) | -0.65\*\*\*  (0.16) | -0.65\*\*\*  (0.16) | -0.67\*\*\*  (0.16) | -0.65\*\*\*  (0.16) | -0.65\*\*\*  (0.16) | -0.62\*\*\*  (0.16) |
| Tracking |  | -0.09  (0.16) | -0.09  (0.16) | -0.07  (0.16) | -0.07  (0.16) | -0.09  (0.16) | -0.07  (0.16) | -0.07  (0.16) | -0.08  (0.16) |
| Person-level hardness |  | -0.36\*\*\*  (0.06) | -0.36\*\*\*  (0.06) | -0.36\*\*\*  (0.06) | -0.36\*\*\*  (0.06) | -0.37\*\*\*  (0.06) | -0.37\*\*\*  (0.06) | -0.07  (0.44) | -0.37\*\*\*  (0.06) |
| Item-level hardness |  | -0.22\*\*\*  (0.04) | -0.22\*\*\*  (0.04) | -0.21\*\*\*  (0.04) | -0.21\*\*\*  (0.04) | -0.22\*\*\*  (0.04) | -0.21\*\*\*  (0.04) | -0.21\*\*\*  (0.04) | -0.70\*  (0.32) |
| Difficulty-as  Impossibility |  |  | 0.01  (0.07) |  | 0.02  (0.07) |  | 0.04  (0.07) | -0.15  (0.19) | 0.04  (0.07) |
| Difficulty-as-  Importance |  |  |  | 0.11  (0.08) | 0.11  (0.08) |  | -0.01  (0.10) | -0.13  (0.27) | -0.01  (0.10) |
| Difficulty-as-  Improvement |  |  |  |  |  | 0.23\*\*  (0.09) | 0.25\*  (0.10) | 0.63\*  (0.29) | 0.25\*  (0.10) |
| Interaction 1 |  |  |  |  |  |  |  | 0.06  (0.06) |  |
| Interaction 2 |  |  |  |  |  |  |  | 0.04  (0.07) |  |
| Interaction 3 |  |  |  |  |  |  |  | -0.12  (0.08) |  |
| Interaction 4 |  |  |  |  |  |  |  |  | 0.06  (0.04) |
| Interaction 5 |  |  |  |  |  |  |  |  | -.12\*  (0.06) |
| Interaction 6 |  |  |  |  |  |  |  |  | .17\*\*  (0.06) |
|  | .00 | .16 | .16 | .16 | .16 | .17 | .17 | .18 | .18 |
| AIC | 1981.54 | 1919.86 | 1925.26 | 1908.75 | 1914.06 | 1918.04 | 1912.74 | 1925.9 | 1921.36 |
| BIC | 1994.44 | 1954.25 | 1963.95 | 1947.37 | 1956.98 | 1956.73 | 1959.94 | 1985.98 | 1981.45 |
| Log Likelihood | -987.77 | -951.93 | -953.63 | -945.37 | -947.03 | -950.02 | -945.37 | -948.95 | -946.68 |
| # observations | 544 | 544 | 544 | 540 | 540 | 544 | 540 | 540 | 540 |
| # groups: id | 136 | 136 | 136 | 135 | 135 | 136 | 135 | 135 | 135 |
| Var: id (Intercept) | 0.47 | 0.35 | 0.36 | 0.34 | 0.34 | 0.32 | 0.31 | 0.31 | 0.32 |
| Var: Residual | 1.85 | 1.62 | 1.62 | 1.63 | 1.63 | 1.62 | 1.63 | 1.63 | 1.6 |

##### 

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##### Table S22

*Study 2: Likelihood of Using Higher-Effort Means of Achieving Weight Goals*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | Model |  |  |  |  |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Intercept (Restriction) | 3.22\*\*\*  (0.09) | 4.88\*\*\*  (0.25) | 4.89\*\*\*  (0.31) | 4.09\*\*\*  (0.44) | 4.01\*\*\*  (0.52) | 3.71\*\*\*  (0.50) | 3.38\*\*\*  (0.61) | 1.61  (1.54) | 3.37\*\*\*  (0.61) |
| Fasting |  | 0  (0.14) | 0  (0.14) | 0.01  (0.14) | 0.01  (0.14) | 0  (0.14) | 0.01  (0.14) | 0.01  (0.14) | 0.01  (0.14) |
| Program |  | -0.07  (0.13) | -0.07  (0.13) | -0.05  (0.13) | -0.05  (0.13) | -0.07  (0.13) | -0.05  (0.13) | -0.05  (0.13) | -0.05  (0.13) |
| Tracking |  | 0.36\*\*  (0.13) | 0.36\*\*  (0.13) | 0.37\*\*  (0.14) | 0.37\*\*  (0.14) | 0.36\*\*  (0.13) | 0.37\*\*  (0.14) | 0.37\*\*  (0.14) | 0.37\*\*  (0.13) |
| Person-level hardness |  | -0.53\*\*\*  (0.07) | -0.53\*\*\*  (0.07) | -0.52\*\*\*  (0.07) | -0.52\*\*\*  (0.07) | -0.53\*\*\*  (0.07) | -0.53\*\*\*  (0.07) | 0.04  (0.46) | -0.53\*\*\*  (0.07) |
| Item-level hardness |  | -0.49\*\*\*  (0.04) | -0.49\*\*\*  (0.04) | -0.48\*\*\*  (0.04) | -0.48\*\*\*  (0.04) | -0.49\*\*\*  (0.04) | -0.48\*\*\*  (0.04) | -0.48\*\*\*  (0.04) | -1.02\*\*\*  (0.28) |
| Difficulty-as-  Impossibility |  |  | 0  (0.08) |  | 0.02  (0.08) |  | 0.04  (0.08) | -0.13  (0.20) | 0.04  (0.08) |
| Difficulty-as-  Importance |  |  |  | 0.18\*  (0.08) | 0.18\*  (0.09) |  | 0.08  (0.10) | 0.21  (0.28) | 0.08  (0.10) |
| Difficulty-as-  Improvement |  |  |  |  |  | 0.24\*\*  (0.09) | 0.21\*  (0.11) | 0.54  (0.30) | 0.21\*  (0.11) |
| Interaction 1 |  |  |  |  |  |  |  | 0.06  (0.06) |  |
| Interaction 2 |  |  |  |  |  |  |  | -0.03  (0.08) |  |
| Interaction 3 |  |  |  |  |  |  |  | -0.11  (0.09) |  |
| Interaction 4 |  |  | | | | | | | 0.08\*  (0.04) |
| Interaction 5 |  |  | | | | | | | 0.07  (0.05) |
| Interaction 6 |  | | | | | | | | 0  (0.05) |
|  | .00 | .32 | .32 | .33 | .33 | .34 | .34 | .34 | .34 |
| AIC | 1998.99 | 1812.87 | 1818.18 | 1798.33 | 1803.51 | 1810.85 | 1804.25 | 1816.77 | 1817.68 |
| BIC | 2011.88 | 1847.26 | 1856.87 | 1836.95 | 1846.42 | 1849.54 | 1851.46 | 1876.86 | 1877.76 |
| Log Likelihood | -996.49 | -898.44 | -900.09 | -890.16 | -891.75 | -896.43 | -891.12 | -894.39 | -894.84 |
| # observations | 544 | 544 | 544 | 540 | 540 | 544 | 540 | 540 | 540 |
| # groups: id | 136 | 136 | 136 | 135 | 135 | 136 | 135 | 135 | 135 |
| Var id: intercept | 0.79 | 0.54 | 0.55 | 0.52 | 0.53 | 0.5 | 0.51 | 0.5 | 0.51 |
| Var: Residual | 1.76 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.19 |

##### 

##### Table S23

*Study 2: Own Effort Matters for Using Lower-Effort Means of Achieving Weight Goals*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | Model |  |  |  |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Intercept (Surgery) | 2.92\*\*\*  (0.12) | 2.42\*\*\*  (0.42) | 2.22\*\*\*  (0.59) | 2.22\*\*  (0.68) | 1.87\*  (0.87) | 3.38\*\*\*  (0.77) | 2.87\*\*  (0.99) |
| Liposuction |  | 0.12  (0.17) | 0.12  (0.17) | 0.08  (0.17) | 0.09  (0.16) | 0.12  (0.17) | 0.08  (0.17) |
| Person-level hardness |  | 0.1  (0.08) | 0.11  (0.09) | 0.09  (0.09) | 0.1  (0.09) | 0.11  (0.09) | 0.11  (0.09) |
| Item-level hardness |  | 0.13  (0.08) | 0.13  (0.08) | 0.12  (0.08) | 0.12  (0.08) | 0.13  (0.08) | 0.12  (0.08) |
| Difficulty-as-  Impossibility |  |  | 0.06  (0.12) |  | 0.08  (0.12) |  | 0.05  (0.12) |
| Difficulty-as-  Importance |  |  |  | 0.06  (0.13) | 0.08  (0.13) |  | 0.24  (0.16) |
| Difficulty-as-  Improvement |  |  |  |  |  | -0.21  (0.14) | -0.35\*  (0.17) |
|  | .00 | .01 | .01 | .01 | .01 | .02 | .04 |
| AIC | 1019.73 | 1030.02 | 1034.22 | 1023.1 | 1027.04 | 1031.9 | 1026.57 |
| BIC | 1030.53 | 1051.63 | 1059.43 | 1048.27 | 1055.8 | 1057.12 | 1058.92 |
| Log Likelihood | -506.86 | -509.01 | -510.11 | -504.55 | -505.52 | -508.95 | -504.28 |
| # observations | 271 | 271 | 271 | 269 | 269 | 271 | 269 |
| # groups: id | 136 | 136 | 136 | 135 | 135 | 136 | 135 |
| Var: id (Intercept) | 1.17 | 1.17 | 1.18 | 1.21 | 1.22 | 1.15 | 1.18 |
| Var: Residual | 1.55 | 1.54 | 1.54 | 1.49 | 1.49 | 1.54 | 1.49 |

##### 

##### Table S24

*Study 2: Effectiveness of Using Lower-Effort Means of Achieving Weight Goals*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | Model |  |  |  |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Intercept (Surgery) | 2.75\*\*\*  (0.12) | 4.43\*\*\*  (0.40) | 4.01\*\*\*  (0.56) | 5.61\*\*\*  (0.62) | 5.19\*\*\*  (0.80) | 4.80\*\*\*  (0.74) | 4.89\*\*\*  (0.92) |
| Liposuction |  | -0.06  (0.13) | -0.06  (0.13) | -0.05  (0.13) | -0.05  (0.13) | -0.06  (0.13) | -0.05  (0.13) |
| Person-level hardness |  | -0.36\*\*\*  (0.08) | -0.34\*\*\*  (0.08) | -0.36\*\*\*  (0.08) | -0.34\*\*\*  (0.08) | -0.35\*\*\*  (0.08) | -0.35\*\*\*  (0.08) |
| Item-level hardness |  | -0.26\*\*\*  (0.06) | -0.26\*\*\*  (0.06) | -0.26\*\*\*  (0.06) | -0.26\*\*\*  (0.06) | -0.26\*\*\*  (0.06) | -0.26\*\*\*  (0.06) |
| Difficulty-as-  Impossibility |  |  | 0.12  (0.11) |  | 0.09  (0.11) |  | 0.1  (0.11) |
| Difficulty-as-  Importance |  |  |  | -0.28\*  (0.12) | -0.26\*  (0.12) |  | -0.31\*  (0.15) |
| Difficulty-as-  Improvement |  |  |  |  |  | -0.08  (0.14) | 0.11  (0.16) |
|  | .00 | .13 | .13 | .16 | .16 | .13 | .17 |
| AIC | 980.35 | 958.98 | 962.39 | 946.77 | 950.59 | 962.79 | 954.00 |
| BIC | 991.17 | 980.61 | 987.63 | 971.96 | 979.38 | 988.03 | 986.39 |
| Log Likelihood | (487.18) | (473.49) | (474.20) | (466.39) | (467.29) | (474.39) | (468.00) |
| # observations | 272 | 272 | 272 | 270 | 270 | 272 | 270 |
| # groups: id | 136 | 136 | 136 | 135 | 135 | 136 | 135 |
| Var: id (Intercept) | 1.48 | 1.3 | 1.3 | 1.2 | 1.2 | 1.31 | 1.21 |
| Var: Residual | 1.08 | 0.96 | 0.96 | 0.95 | 0.95 | 0.96 | 0.95 |

##### 

##### Table S25

*Study 2: Likelihood of Using Lower-Effort Means of Achieving Weight Goals*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | Model |  |  |  |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Intercept (Surgery) | 1.73\*\*\*  (0.09) | 3.35\*\*\*  (0.27) | 2.82\*\*\*  (0.37) | 3.69\*\*\*  (0.42) | 2.96\*\*\*  (0.53) | 3.63\*\*\*  (0.49) | 3.05\*\*\*  (0.61) |
| Liposuction |  | 0.14  (0.13) | 0.14  (0.13) | 0.1  (0.13) | 0.1  (0.13) | 0.14  (0.13) | 0.1  (0.13) |
| Person-level |  | -0.37\*\*\*  (0.05) | -0.34\*\*\*  (0.06) | -0.38\*\*\*  (0.05) | -0.35\*\*\*  (0.05) | -0.36\*\*\*  (0.05) | -0.35\*\*\*  (0.05) |
| Item-level hardness |  | -0.24\*\*\*  (0.06) | -0.24\*\*\*  (0.06) | -0.25\*\*\*  (0.06) | -0.25\*\*\*  (0.06) | -0.24\*\*\*  (0.06) | -0.25\*\*\*  (0.06) |
| Difficulty-as-  Impossibility |  |  | 0.15\*  (0.07) |  | 0.16\*  (0.08) |  | 0.16\*  (0.08) |
| Difficulty-as-  Importance |  |  |  | -0.07  (0.08) | -0.03  (0.08) |  | -0.02  (0.10) |
| Difficulty-as-  Improvement |  |  |  |  |  | -0.06  (0.09) | -0.03  (0.10) |
|  | .00 | .22 | .23 | .24 | .25 | .22 | .25 |
| AIC | 899.64 | 853.3 | 854.7 | 834.25 | 834.85 | 857.84 | 839.46 |
| BIC | 910.46 | 874.94 | 879.94 | 859.44 | 863.63 | 883.08 | 871.85 |
| Log Likelihood | -446.82 | -420.65 | -420.35 | -410.13 | -409.42 | -421.92 | -410.73 |
| # observations | 272 | 272 | 272 | 270 | 270 | 272 | 270 |
| # groups: id | 136 | 136 | 136 | 135 | 135 | 136 | 135 |
| Var: id (Intercept) | 0.47 | 0.29 | 0.27 | 0.3 | 0.28 | 0.29 | 0.28 |
| Var: Residual | 1.15 | 0.99 | 0.99 | 0.91 | 0.91 | 0.99 | 0.91 |

## 

## Study 3 Detailed Regression Models

## 

##### In Tables S26 to S31, the estimate is shown with Standard Error in parentheses, \* *p*<.05, \*\**p*<.01, \*\*\**p*<.001. The abbreviations are as follows: Interaction 1: Person-level hardness\*Difficulty-as-Impossibility. Interaction 2: Person-level hardness\*Difficulty-as-Importance. Interaction 3: Person-level hardness\*Difficulty-as-Improvement. Interaction 4: Item-level hardness\* Difficulty-as-Impossibility. Interaction 5: Item-level hardness\* Difficulty-as-Importance. Interaction 6: Item-level hardness\* Difficulty-as-Improvement.

##### 

##### Table S26

*Study 3: Own Effort Matters for Higher-Effort Means of Getting Good Grades*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | Model |  |  |  |  |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Intercept (Study 4-5 hrs) | 4.64\*\*\*  (0.07) | 4.03\*\*\*  (0.24) | 4.52\*\*\*  (0.28) | 2.71\*\*\*  (0.37) | 3.22\*\*\*  (0.40) | 2.49\*\*\*  (0.37) | 2.72\*\*\*  (0.44) | 1.67  (1.33) | 2.73\*\*\*  (0.44) |
| Re-watch lecture |  | -0.67\*\*\*  (0.09) | -0.67\*\*\*  (0.09) | -0.67\*\*\*  (0.09) | -0.67\*\*\*  (0.09) | -0.67\*\*\*  (0.09) | -0.67\*\*\*  (0.09) | -0.67\*\*\*  (0.09) | -0.69\*\*\*  (0.09) |
| Re-read |  | -0.47\*\*\*  (0.09) | -0.47\*\*\*  (0.09) | -0.47\*\*\*  (0.09) | -0.47\*\*\*  (0.09) | -0.47\*\*\*  (0.09) | -0.47\*\*\*  (0.09) | -0.47\*\*\*  (0.09) | -0.47\*\*\*  (0.08) |
| Person-level hardness |  | 0.27\*\*\*  (0.06) | 0.28\*\*\*  (0.06) | 0.27\*\*\*  (0.06) | 0.29\*\*\*  (0.06) | 0.25\*\*\*  (0.06) | 0.27\*\*\*  (0.06) | 0.56  (0.36) | 0.27\*\*\*  (0.06) |
| Item-level hardness |  | 0.17\*\*\*  (0.03) | 0.17\*\*\*  (0.03) | 0.17\*\*\*  (0.03) | 0.17\*\*\*  (0.03) | 0.17\*\*\*  (0.03) | 0.17\*\*\*  (0.03) | 0.17\*\*\*  (0.03) | -0.27  (0.21) |
| Difficulty-as-  Impossibility |  |  | -0.17\*\*\*  (0.05) |  | -0.16\*\*  (0.05) |  | -0.13\*  (0.05) | -0.16  (0.18) | -0.13\*  (0.05) |
| Difficulty-as-  Importance |  |  |  | 0.29\*\*\*  (0.07) | 0.28\*\*\*  (0.06) |  | 0.16\*  (0.08) | -0.21  (0.33) | 0.16\*  (0.08) |
| Difficulty-as- Improvement |  |  |  |  |  | 0.33\*\*\*  (0.06) | 0.20\*\*  (0.08) | 0.78\*  (0.33) | 0.20\*\*  (0.08) |
| Interaction 1 |  |  |  |  |  |  |  | 0.01  (0.05) |  |
| Interaction 2 |  |  |  |  |  |  |  | 0.09  (0.08) |  |
| Interaction 3 |  |  |  |  |  |  |  | -0.15  (0.08) |  |
| Interaction 4 |  |  |  |  |  |  |  |  | 0.05  (0.03) |
| Interaction 5 |  |  |  |  |  |  |  |  | -0.04  (0.04) |
| Interaction 6 |  |  |  |  |  |  |  |  | 0.09\*  (0.04) |
|  | .00 | .15 | .18 | .20 | .22 | .22 | .24 | .25 | .24 |
| AIC | 1912.76 | 1800.07 | 1795.08 | 1786.47 | 1782.96 | 1779.86 | 1781.45 | 1795.11 | 1795.63 |
| BIC | 1926.01 | 1830.99 | 1830.42 | 1821.8 | 1822.71 | 1815.19 | 1825.61 | 1852.52 | 1853.05 |
| Log Likelihood | -953.38 | -893.04 | -889.54 | -885.23 | -882.48 | -881.93 | -880.72 | -884.55 | -884.81 |
| Num. obs. | 612 | 612 | 612 | 612 | 612 | 612 | 612 | 612 | 612 |
| Num. groups: id | 204 | 204 | 204 | 204 | 204 | 204 | 204 | 204 | 204 |
| Var: id Intercept | 0.56 | 0.56 | 0.52 | 0.49 | 0.46 | 0.47 | 0.44 | 0.44 | 0.45 |
| Var: Residual | 0.93 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 |

##### Table S27

*Study 3: Effectiveness of Using Higher-Effort Means of Getting Good Grades*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | Model |  |  |  |  |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Intercept (Study 4-5 hrs) | 4.27\*\*\*  (0.07) | 4.63\*\*\*  (0.25) | 4.69\*\*\*  (0.30) | 3.25\*\*\*  (0.39) | 3.27\*\*\*  (0.43) | 3.35\*\*\*  (0.40) | 2.88\*\*\*  (0.47) | 3.80\*\*  (1.42) | 2.89\*\*\*  (0.47) |
| Re-watch lecture |  | -0.40\*\*\*  (0.12) | -0.40\*\*\*  (0.12) | -0.40\*\*\*  (0.12) | -0.40\*\*\*  (0.12) | -0.40\*\*\*  (0.12) | -0.40\*\*\*  (0.12) | -0.40\*\*\*  (0.12) | -0.42\*\*\*  (0.12) |
| Re-read |  | -0.75\*\*\*  (0.11) | -0.75\*\*\*  (0.11) | -0.75\*\*\*  (0.11) | -0.75\*\*\*  (0.11) | -0.75\*\*\*  (0.11) | -0.75\*\*\*  (0.11) | -0.75\*\*\*  (0.11) | -0.75\*\*\*  (0.11) |
| Person-level hardness |  | 0.01  (0.06) | 0.01  (0.06) | 0.01  (0.06) | 0.01  (0.06) | -0.01  (0.06) | 0  (0.06) | -0.26  (0.38) | 0  (0.06) |
| Item-level hardness |  | 0.01  (0.04) | 0.01  (0.04) | 0.01  (0.04) | 0.01  (0.04) | 0.01  (0.04) | 0.01  (0.04) | 0.01  (0.04) | -0.37  (0.27) |
| Difficulty-as-  Impossibility |  |  | -0.02  (0.06) |  | 0  (0.05) |  | 0.02  (0.05) | -0.2  (0.19) | 0.02  (0.05) |
| Difficulty-as-  Importance |  |  |  | 0.30\*\*\*  (0.07) | 0.30\*\*\*  (0.07) |  | 0.21\*  (0.08) | -0.45  (0.35) | 0.21\*  (0.08) |
| Difficulty-as- Improvement |  |  |  |  |  | 0.27\*\*\*  (0.07) | 0.16  (0.08) | 0.71\*  (0.35) | 0.16  (0.08) |
| Interaction 1 |  |  |  |  |  |  |  | 0.06  (0.05) |  |
| Interaction 2 |  |  |  |  |  |  |  | 0.17  (0.09) |  |
| Interaction 3 |  |  |  |  |  |  |  | -0.14  (0.09) |  |
| Interaction 4 |  |  |  |  |  |  |  |  | 0.05  (0.03) |
| Interaction 5 |  |  |  |  |  |  |  |  | -0.02  (0.05) |
| Interaction 6 |  |  |  |  |  |  |  |  | 0.07  (0.05) |
|  | .00 | .06 | .06 | .10 | .10 | .09. | .11 | .12 | .11 |
| AIC | 2048.18 | 2022.55 | 2028.31 | 2009 | 2015.02 | 2012.16 | 2016.63 | 2027.71 | 2033.37 |
| BIC | 2061.43 | 2053.47 | 2063.64 | 2044.33 | 2054.77 | 2047.5 | 2060.79 | 2085.13 | 2090.79 |
| Log Likelihood | -1021.09 | -1004.28 | -1006.16 | -996.5 | -998.51 | -998.08 | -998.31 | -1000.86 | -1003.69 |
| Num. obs. | 612 | 612 | 612 | 612 | 612 | 612 | 612 | 612 | 612 |
| Num. groups: id | 204 | 204 | 204 | 204 | 204 | 204 | 204 | 204 | 204 |
| Var: id (Intercept) | 0.43 | 0.48 | 0.48 | 0.4 | 0.41 | 0.41 | 0.4 | 0.39 | 0.4 |
| Var: Residual | 1.31 | 1.17 | 1.17 | 1.17 | 1.17 | 1.17 | 1.17 | 1.17 | 1.17 |

##### 

##### Table S28

*Study 3: Likelihood of Using Higher-Effort Means of Getting Good Grades*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | Model |  |  |  |  |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Intercept (Study 4-5 hrs) | 3.48\*\*\*  (0.07) | 4.65\*\*\*  (0.28) | 4.44\*\*\*  (0.33) | 3.60\*\*\*  (0.44) | 3.30\*\*\*  (0.48) | 3.96\*\*\*  (0.45) | 3.15\*\*\*  (0.53) | 5.07\*\*  (1.60) | 3.16\*\*\*  (0.53) |
| Re-watch lecture |  | 0.03  (0.14) | 0.03  (0.14) | 0.03  (0.14) | 0.03  (0.14) | 0.03  (0.14) | 0.03  (0.14) | 0.03  (0.14) | 0.02  (0.14) |
| Re-read |  | -0.41\*\*  (0.13) | -0.41\*\*  (0.13) | -0.41\*\*  (0.13) | -0.41\*\*  (0.13) | -0.41\*\*  (0.13) | -0.41\*\*  (0.13) | -0.41\*\*  (0.13) | -0.42\*\*  (0.13) |
| Person-level hardness |  | -0.28\*\*\*  (0.07) | -0.29\*\*\*  (0.07) | -0.28\*\*\*  (0.07) | -0.29\*\*\*  (0.07) | -0.29\*\*\*  (0.07) | -0.29\*\*\*  (0.07) | -0.83  (0.43) | -0.29\*\*\*  (0.07) |
| Item-level hardness |  | -0.36\*\*\*  (0.05) | -0.36\*\*\*  (0.05) | -0.36\*\*\*  (0.05) | -0.36\*\*\*  (0.05) | -0.36\*\*\*  (0.05) | -0.36\*\*\*  (0.05) | -0.36\*\*\*  (0.05) | -0.65\*  (0.32) |
| Difficulty-as-  Impossibility |  |  | 0.08  (0.06) |  | 0.09  (0.06) |  | 0.1  (0.06) | -0.26  (0.22) | 0.1  (0.06) |
| Difficulty-as-  Importance |  |  |  | 0.23\*\*  (0.08) | 0.24\*\*  (0.08) |  | 0.21\*  (0.09) | -0.21  (0.39) | 0.21\*  (0.09) |
| Difficulty-as- Improvement |  |  |  |  |  | 0.15  (0.08) | 0.06  (0.09) | 0.27  (0.39) | 0.06  (0.09) |
| Interaction 1 |  |  |  |  |  |  |  | 0.1  (0.06) |  |
| Interaction 2 |  |  |  |  |  |  |  | 0.11  (0.10) |  |
| Interaction 3 |  |  |  |  |  |  |  | -0.05  (0.10) |  |
| Interaction 4 |  |  |  |  |  |  |  |  | 0.04  (0.04) |
| Interaction 5 |  |  |  |  |  |  |  |  | -0.02  (0.06) |
| Interaction 6 |  |  |  |  |  |  |  |  | 0.05  (0.06) |
|  | .00 | .12 | .13 | .14 | .15 | .13 | .15 | .16 | .15 |
| AIC | 2265.38 | 2196.49 | 2200.58 | 2192.68 | 2195.97 | 2198.02 | 2200.48 | 2212.06 | 2217.9 |
| BIC | 2278.63 | 2227.41 | 2235.91 | 2228.01 | 2235.72 | 2233.35 | 2244.65 | 2269.48 | 2275.32 |
| Log Likelihood | -1129.69 | -1091.24 | -1092.29 | -1088.34 | -1088.99 | -1091.01 | -1090.24 | -1093.03 | -1095.95 |
| Num. obs. | 612 | 612 | 612 | 612 | 612 | 612 | 612 | 612 | 612 |
| Num. groups: id | 204 | 204 | 204 | 204 | 204 | 204 | 204 | 204 | 204 |
| Var: id (Intercept) | 0.47 | 0.49 | 0.49 | 0.45 | 0.44 | 0.48 | 0.45 | 0.44 | 0.44 |
| Var: Residual | 1.95 | 1.64 | 1.64 | 1.64 | 1.64 | 1.64 | 1.64 | 1.64 | 1.65 |

##### Table S29

*Study 3: Own Effort Matters for Lower-Effort Means of Getting Good Grades*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | Model |  |  |  |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Intercept (Find assignments) | 2.22\*\*\*  (0.07) | 2.69\*\*\*  (0.21) | 1.46\*\*\*  (0.23) | 2.08\*\*\*  (0.36) | 2.07\*\*\*  (0.40) | 2.45\*\*\*  (0.39) | 2.56\*\*\*  (0.47) |
| Paraphrase |  | -1.03\*\*\*  (0.11) | -0.11  (0.10) | -0.11  (0.10) | -0.11  (0.10) | -0.11  (0.10) | -0.11  (0.10) |
| Get answers |  | -0.17 | -0.21\* | -0.21\* | -0.21\* | -0.21\* | -0.21\* |
|  | (0.11) | (0.10) | (0.10) | (0.10) | (0.10) | (0.10) |
| Person-level hardness |  | 0.21\*\* | 0.34\*\*\* | 0.34\*\*\* | 0.33\*\*\* | 0.32\*\*\* | 0.32\*\*\* |
|  | (0.08) | (0.07) | (0.06) | (0.07) | (0.06) | (0.07) |
| Item-level hardness |  | 0.04 | 0.17\*\*\* | 0.17\*\*\* | 0.17\*\*\* | 0.17\*\*\* | 0.17\*\*\* |
|  | (0.05) | (0.04) | (0.04) | (0.04) | (0.04) | (0.04) |
| Difficulty-as- Impossibility |  |  | 0.01 |  | 0 |  | -0.02 |
|  |  | (0.06) |  | (0.05) |  | (0.06) |
| Difficulty-as- Importance |  |  |  | -0.13 | -0.13 |  | -0.03 |
|  |  |  | (0.07) | (0.07) |  | (0.08) |
| Difficulty-as- Improvement |  |  |  |  |  | -0.18\*\* | -0.17\* |
|  |  |  |  |  | (0.07) | (0.08) |
|  | .00 | .12 | .09 | .10 | .10 | .11 | .11 |
| AIC | 1964.5 | 2081.13 | 1944.63 | 1940.83 | 1946.79 | 1936.98 | 1947.82 |
| BIC | 1977.75 | 2112.05 | 1979.96 | 1976.17 | 1986.54 | 1972.31 | 1991.98 |
| Log Likelihood | -979.25 | -1033.57 | -964.32 | -962.42 | -964.4 | -960.49 | -963.91 |
| Num. obs. | 612 | 612 | 612 | 612 | 612 | 612 | 612 |
| Num. groups: id | 204 | 204 | 204 | 204 | 204 | 204 | 204 |
| Var: id (Intercept) | 0.6 | 0.79 | 0.5 | 0.49 | 0.49 | 0.47 | 0.48 |
| Var: Residual | 1.02 | 1.16 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |

##### Table S30

*Study 3: Effectiveness for Lower-Effort Means of Getting Good Grades*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | Model |  |  |  |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Intercept (Find assignments) | 2.79\*\*\* | 2.69\*\*\* | 2.46\*\*\* | 3.13\*\*\* | 2.88\*\*\* | 3.27\*\*\* | 3.07\*\*\* |
| (0.08) | (0.21) | (0.27) | (0.44) | (0.48) | (0.47) | (0.56) |
| Paraphrase |  | -1.03\*\*\* | -1.03\*\*\* | -1.03\*\*\* | -1.03\*\*\* | -1.03\*\*\* | -1.03\*\*\* |
|  | (0.11) | (0.11) | (0.11) | (0.11) | (0.11) | (0.11) |
| Get answers |  | -0.17 | -0.17 | -0.17 | -0.17 | -0.17 | -0.17 |
|  | (0.11) | (0.11) | (0.11) | (0.11) | (0.11) | (0.11) |
| Person-level hardness |  | 0.21\*\* | 0.19\* | 0.20\*\* | 0.18\* | 0.19\* | 0.18\* |
|  | (0.08) | (0.08) | (0.08) | (0.08) | (0.08) | (0.08) |
| Item-level hardness |  | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
|  | (0.05) | (0.05) | (0.05) | (0.05) | (0.05) | (0.05) |
| Difficulty-as- Impossibility |  |  | 0.09 |  | 0.08 |  | 0.08 |
|  |  | (0.07) |  | (0.07) |  | (0.07) |
| Difficulty-as- Importance |  |  |  | -0.1 | -0.09 |  | -0.05 |
|  |  |  | (0.08) | (0.08) |  | (0.10) |
| Difficulty-as- Improvement |  |  |  |  |  | -0.11 | -0.06 |
|  |  |  |  |  | (0.08) | (0.10) |
|  | .00 | .12 | .12 | .12 | .12 | .12 | .12 |
| AIC | 2165.8 | 2081.13 | 2084.86 | 2084.96 | 2088.9 | 2084.42 | 2093.23 |
| BIC | 2179.05 | 2112.05 | 2120.2 | 2120.29 | 2128.65 | 2119.76 | 2137.39 |
| Log Likelihood | -1079.9 | -1033.57 | -1034.43 | -1034.48 | -1035.45 | -1034.21 | -1036.61 |
| Num. obs. | 612 | 612 | 612 | 612 | 612 | 612 | 612 |
| Num. groups: id | 204 | 204 | 204 | 204 | 204 | 204 | 204 |
| Var: id (Intercept) | 0.73 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 |
| Var: Residual | 1.47 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 |

##### Table S31

*Study 3: Likelihood of Using Lower-Effort Means of Getting Good Grades*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | Model |  |  |  |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Intercept (Find assignments) | 2.18\*\*\*  (0.07) | 2.02\*\*\*  (0.20) | 1.63\*\*\*  (0.25) | 2.94\*\*\*  (0.41) | 2.51\*\*\*  (0.44) | 3.39\*\*\*  (0.44) | 3.06\*\*\*  (0.51) |
| Paraphrase |  | -0.44\*\*\*  (0.09) | -0.44\*\*\*  (0.09) | -0.44\*\*\*  (0.09) | -0.44\*\*\*  (0.09) | -0.44\*\*\*  (0.09) | -0.44\*\*\*  (0.09) |
| Get answers |  | -0.13  (0.09) | -0.13  (0.09) | -0.13  (0.09) | -0.13  (0.09) | -0.13  (0.09) | -0.13  (0.09) |
| Person-level hardness |  | 0.15\*  (0.07) | 0.11  (0.07) | 0.13  (0.07) | 0.1  (0.07) | 0.11  (0.07) | 0.09  (0.07) |
| Item-level hardness |  | 0.03  (0.04) | 0.03  (0.04) | 0.03  (0.04) | 0.03  (0.04) | 0.03  (0.04) | 0.03  (0.04) |
| Difficulty-as-  Impossibility |  |  | 0.16\*  (0.06) |  | 0.14\*  (0.06) |  | 0.12  (0.06) |
| Difficulty-as-  Importance |  |  |  | -0.20\*  (0.08) | -0.19\*  (0.08) |  | -0.08  (0.09) |
| Difficulty-as- Improvement |  |  |  |  |  | -0.26\*\*\*  (0.08) | -0.19\*  (0.09) |
|  | .00 | .04 | .05 | .05 | .07 | .07 | .08 |
| AIC | 1940.1 | 1932.37 | 1931.79 | 1931.13 | 1931.28 | 1925.76 | 1932.06 |
| BIC | 1953.35 | 1963.29 | 1967.12 | 1966.46 | 1971.03 | 1961.1 | 1976.23 |
| Log Likelihood | -967.05 | -959.18 | -957.89 | -957.56 | -956.64 | -954.88 | -956.03 |
| # observations | 612 | 612 | 612 | 612 | 612 | 612 | 612 |
| # groups: id | 204 | 204 | 204 | 204 | 204 | 204 | 204 |
| Var: id Intercept | 0.77 | 0.77 | 0.75 | 0.75 | 0.72 | 0.72 | 0.71 |
| Var: Residual | 0.9 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |

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