CONSUMER DEMAND FOR PERSONAL QUANTIFICATION

Jacqueline Pan, Joseph Reiff, & Jordan Etkin

jacqueline.pan@duke.edu

working paper

SUMMARY

Research Question

What factors drive consumer demand for personal quantification (i.e., tracking and monitoring of numerical datapoints about one's behaviors)?

Background

We explore the **antecedents** of personal quantification, rather than its consequences (Etkin 2016; Silverman & Barasch 2023).

We propose that quantification preferences are influenced by **beliefs about certain dimensions of behaviors.**

Methods

Qualitative surveys, web-scraped field data, causal experiments, conjoint analysis (**N** = 8,101)

Key Results

Consumers prefer to quantify behaviors they believe are:

H1: more (vs. less) important
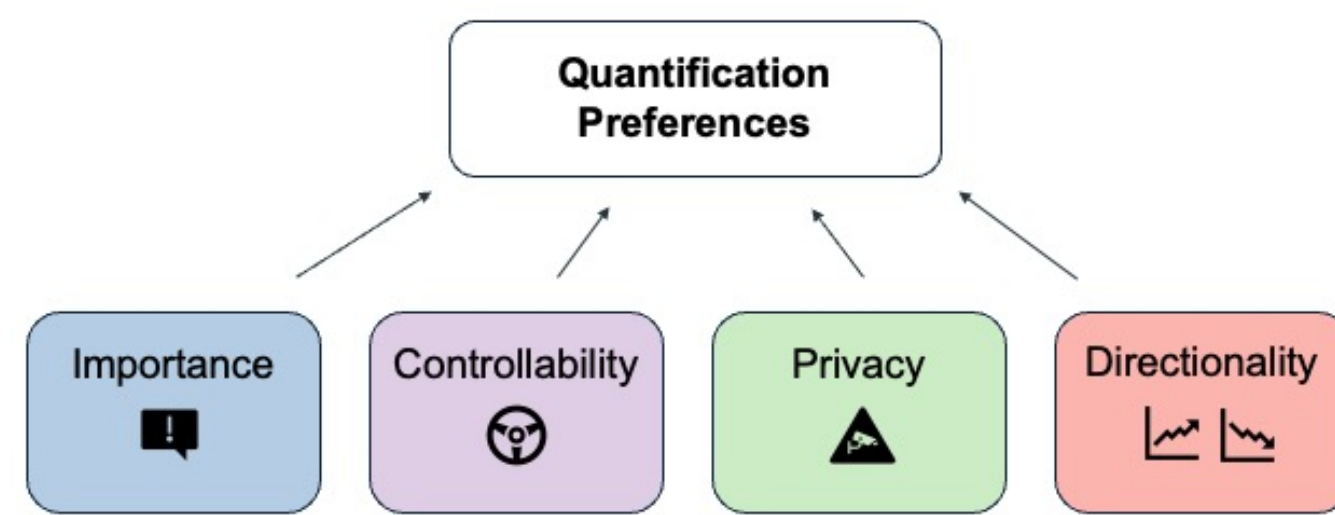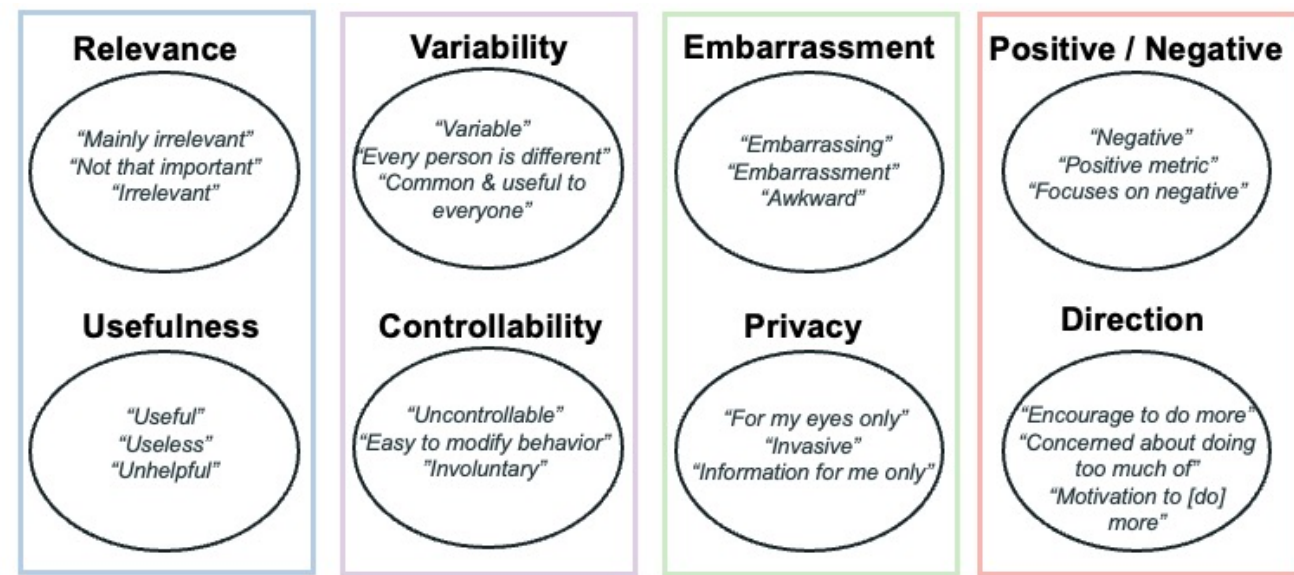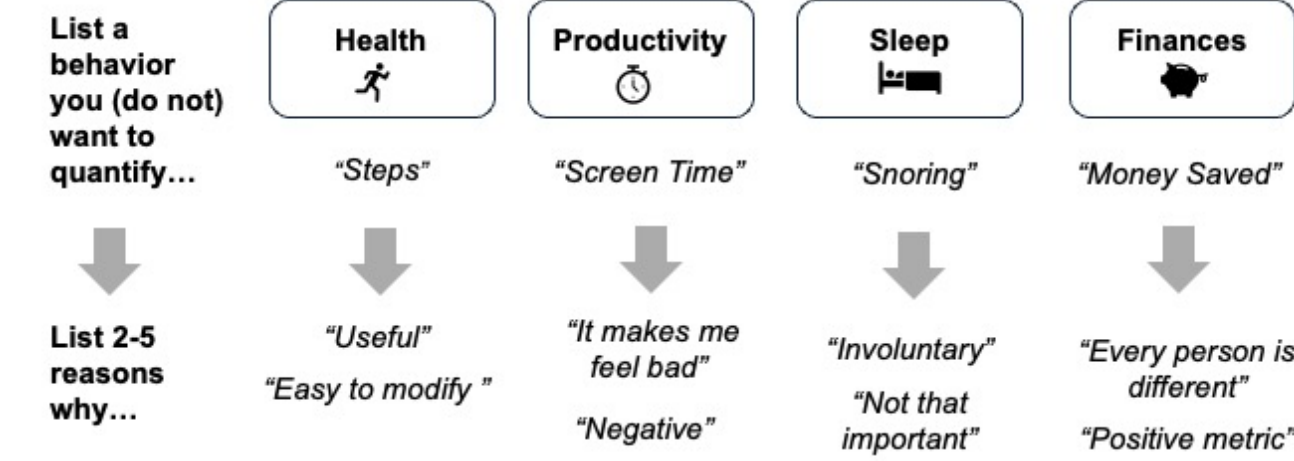
H2: more (vs. less) controllable

H3: less (vs. more) private

H4: better to increase (i.e., positive) rather than decrease (i.e., negative)

Beliefs along these dimensions:

1. Predict real-world demand for quantification apps on Google Play (*study 1*)

2. Causally affect quantification preferences (*studies 2A-2D*)

3. Have monetary value for firms (*study 3*)

DIMENSION DEVELOPMENT

List a behavior you (do not) want to quantify… **Health** *"Steps"* / **Productivity** *"Screen Time"* / **Sleep** *"Snoring"* / **Finances** *"Money Saved"*

List 2-5 reasons why…
- *"Useful" "Easy to modify"*
- *"It makes me feel bad" "Negative"*
- *"Involuntary" "Not that important"*
- *"Every person is different" "Positive metric"*

Relevance *"Mainly irrelevant" "Not that important" "Irrelevant"*
Variability *"Variable" "Every person is different" "Common & useful to everyone"*
Embarrassment *"Embarrassing" "Embarrassment" "Awkward"*
Positive / Negative *"Negative" "Positive metric" "Focuses on negative"*

Usefulness *"Useful" "Useless" "Unhelpful"*
Controllability *"Uncontrollable" "Easy to modify behavior" "Involuntary"*
Privacy *"For my eyes only" "Invasive" "Information for me only"*
Direction *"Encourage to do more" "Concerned about doing too much of" "Motivation to [do] more"*

Quantification Preferences

Importance / **Controllability** / **Privacy** / **Directionality**

STEP 1: P's (**N** = 182; Prolific) identified 1 behavior from each of 4 domains and listed 2-5 factors to explain their interest in quantifying.

STEP 2: Using an inductive procedure, we developed conceptual categories for factors related to quantification preferences.

STEP 3: We consolidated the codes into 4 distinct themes related to beliefs about behaviors.

A pre-registered follow-up study (**N** = 96), using a top-down coding procedure, confirmed that consumers naturally consider these dimensions.
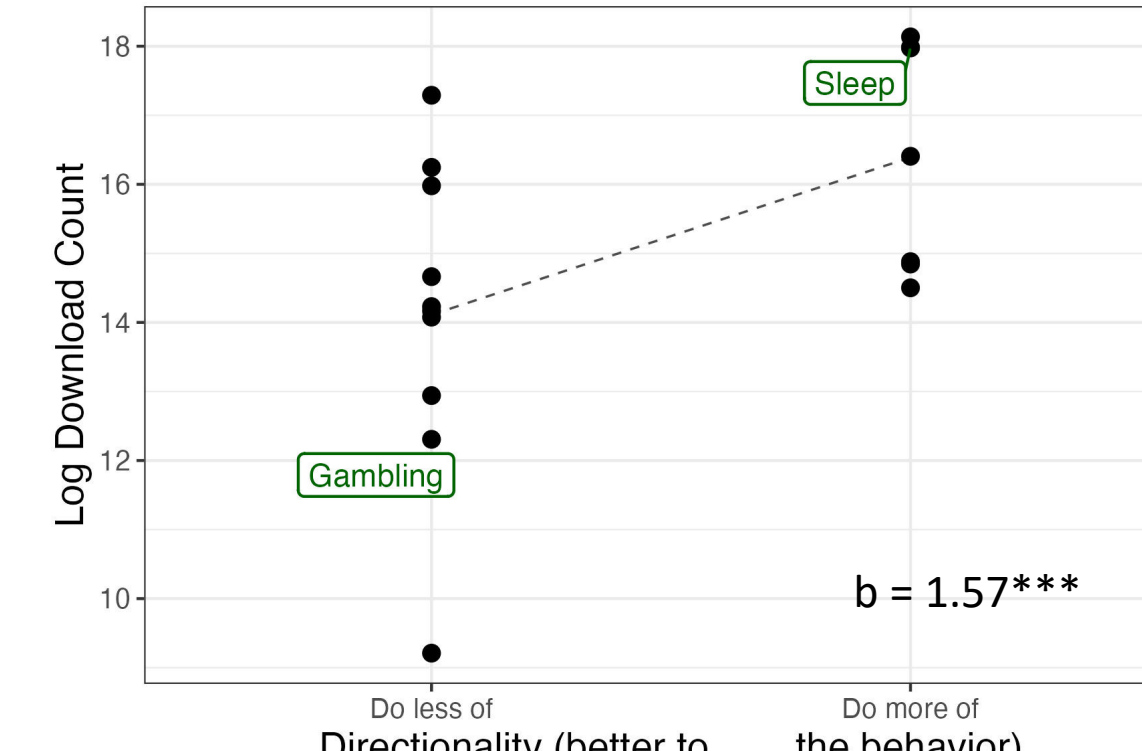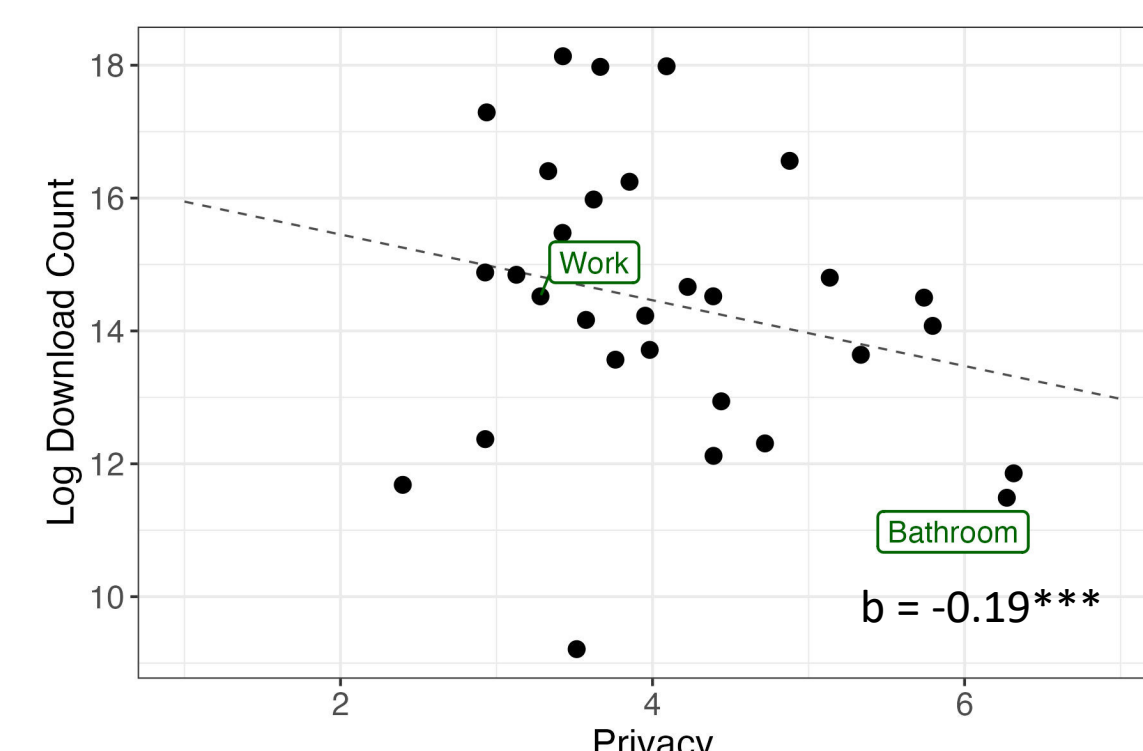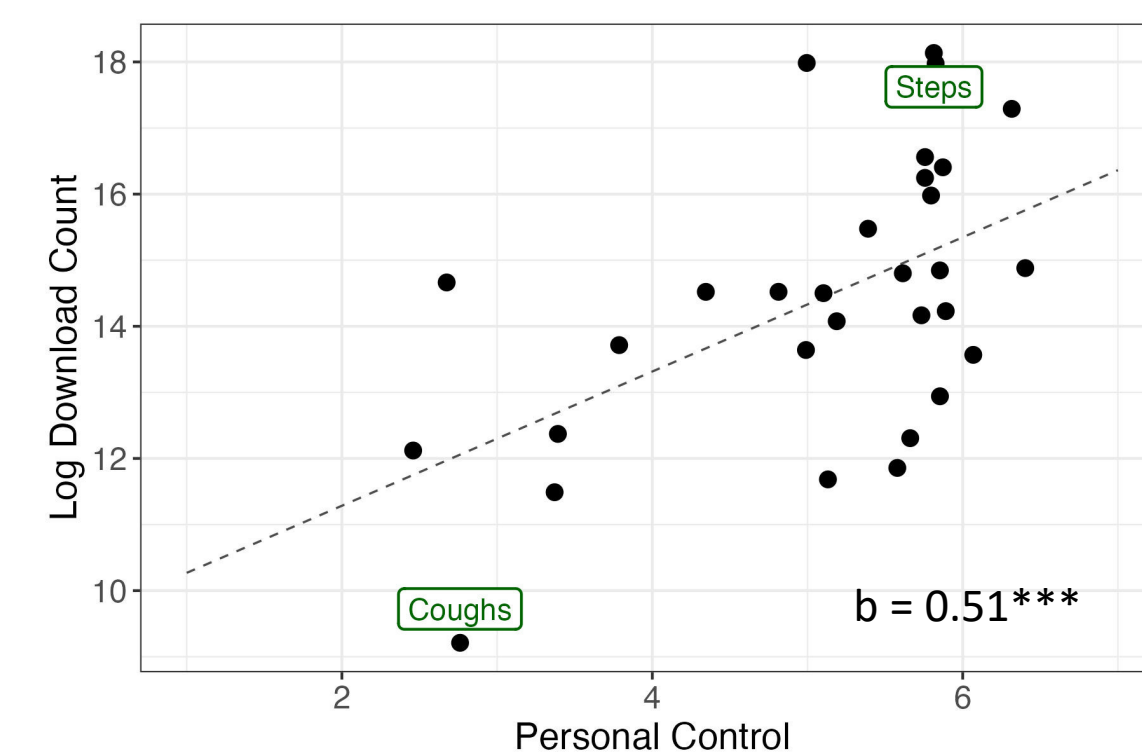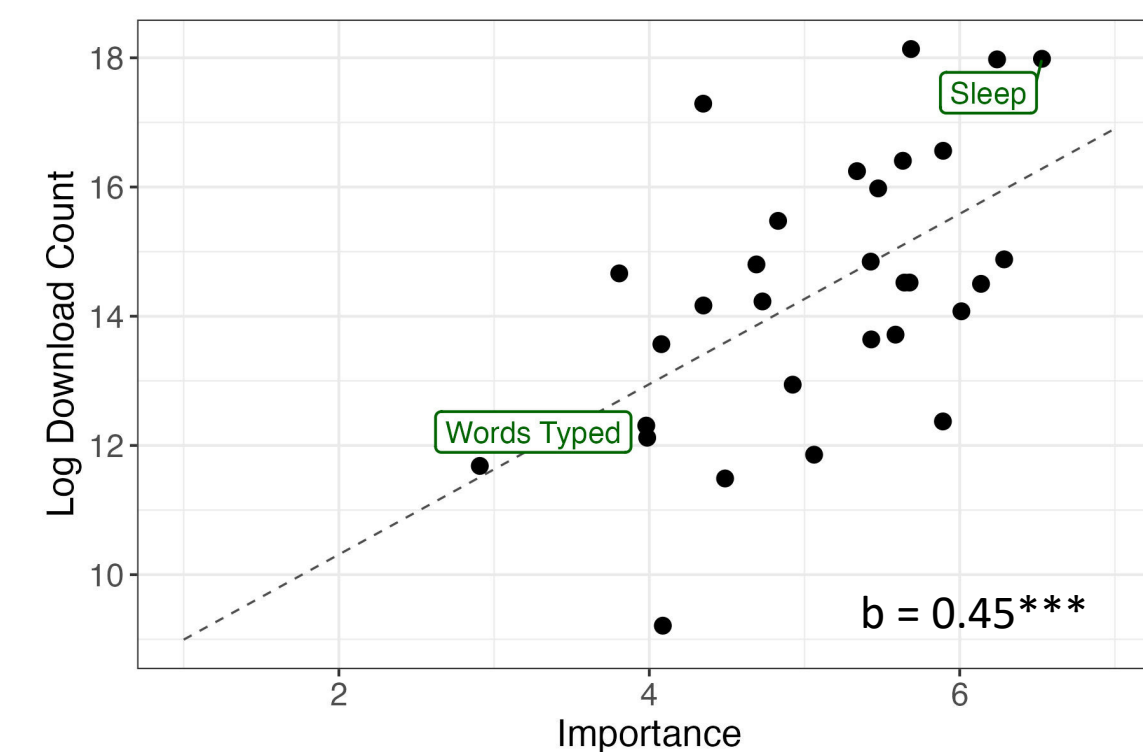
STUDY 1: FIELD EVIDENCE FROM GOOGLE PLAY

IV: Participants' beliefs (**N** = 369; Prolific)
- Rated 4 belief dimensions for 8 randomly assigned behaviors (from a set of 30)
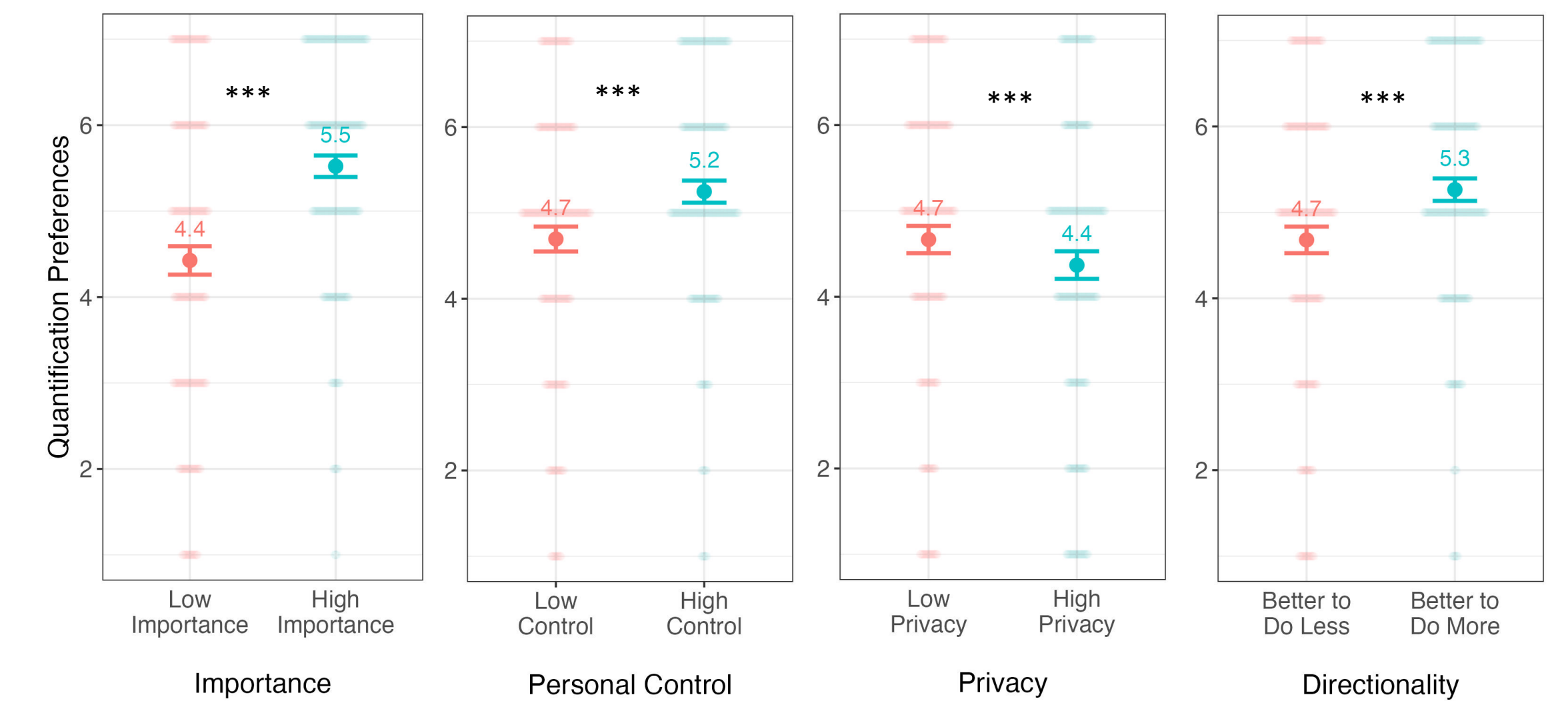
DV: Quantification app popularity on Google Play
- Web-scaped average download & review counts for all apps quantifying each of the 30 behaviors

Log Download Count vs Importance — Sleep, Words Typed — b = 0.45***

Log Download Count vs Personal Control — Steps, Coughs — b = 0.51***

Log Download Count vs Privacy — Work, Bathroom — b = -0.19***

Log Download Count vs Directionality (better to ___ the behavior) — Sleep, Gambling — b = 1.57***

Estimates are from regressions with participant fixed effects and participant-level clustered standard errors. *p<0.05; **p<0.01; ***p<0.001.

STUDY 2: CAUSAL EFFECTS OF EACH DIMENSION

IV: Manipulated beliefs about real behaviors (**N** ~ 1000 each; Prolific)
DV: Quantification preferences (1-7 Likert scale)

Importance: Low Importance 4.4, High Importance 5.5 ***
Personal Control: Low Control 4.7, High Control 5.2 ***
Privacy: Low Privacy 4.7, High Privacy 4.4 ***
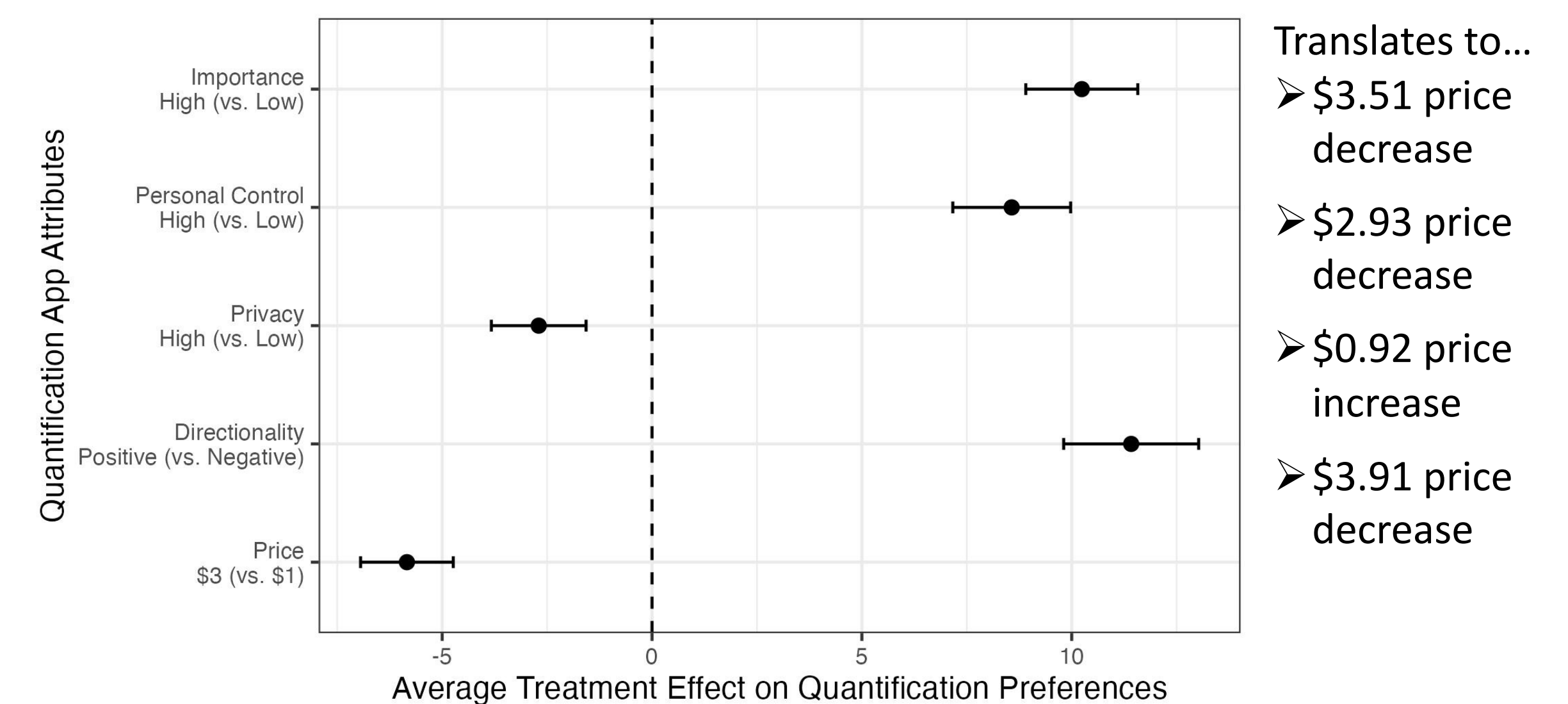Directionality: Better to Do Less 4.7, Better to Do More 5.3 ***

Statistical significance was estimated using t-tests. Points reflect means and error bars reflect 95% CIs; ***p<0.001.

STUDY 3: ROLE OF EACH DIMENSION W/ CONJOINT

IV: Beliefs of 4 dimensions of "Behavior A" & app price (**N** = 498; Prolific)
DV: Interest in downloading (100-point sliding scale)
Procedure: Evaluated 8 app profiles quantifying Behavior A (from a set of 32; 5 separate versions of partial factorial set)

Quantification App Attributes — Average Treatment Effect on Quantification Preferences
- Importance High (vs. Low)
- Personal Control High (vs. Low)
- Privacy High (vs. Low)
- Directionality Positive (vs. Negative)
- Price $3 (vs. $1)

Translates to…
- ➤ $3.51 price decrease
- ➤ $2.93 price decrease
- ➤ $0.92 price increase
- ➤ $3.91 price decrease

Estimated with an OLS regression with participant fixed effects and standard errors clustered by participant. Error bars reflect 95% CIs.

DISCUSSION

We develop a framework outlining how beliefs about 4 key behavioral dimensions – **importance, controllability, privacy, and directionality** – shape demand for personal quantification.

Our findings add to research on **information preferences** and deepen our understanding of **personal quantification antecedents.**