

AMENDED Exhibit 127

PLAINTIFFS' OMNIBUS OPPOSITION TO DEFENDANTS' MOTIONS FOR SUMMARY JUDGMENT

Case No.: 4:22-md-03047-YGR

MDL No. 3047

In Re: Social Media Adolescent Addiction/Personal Injury Products Liability Litigation

Document Provided in Native Format

SOCIAL COMPARISON ON INSTAGRAM

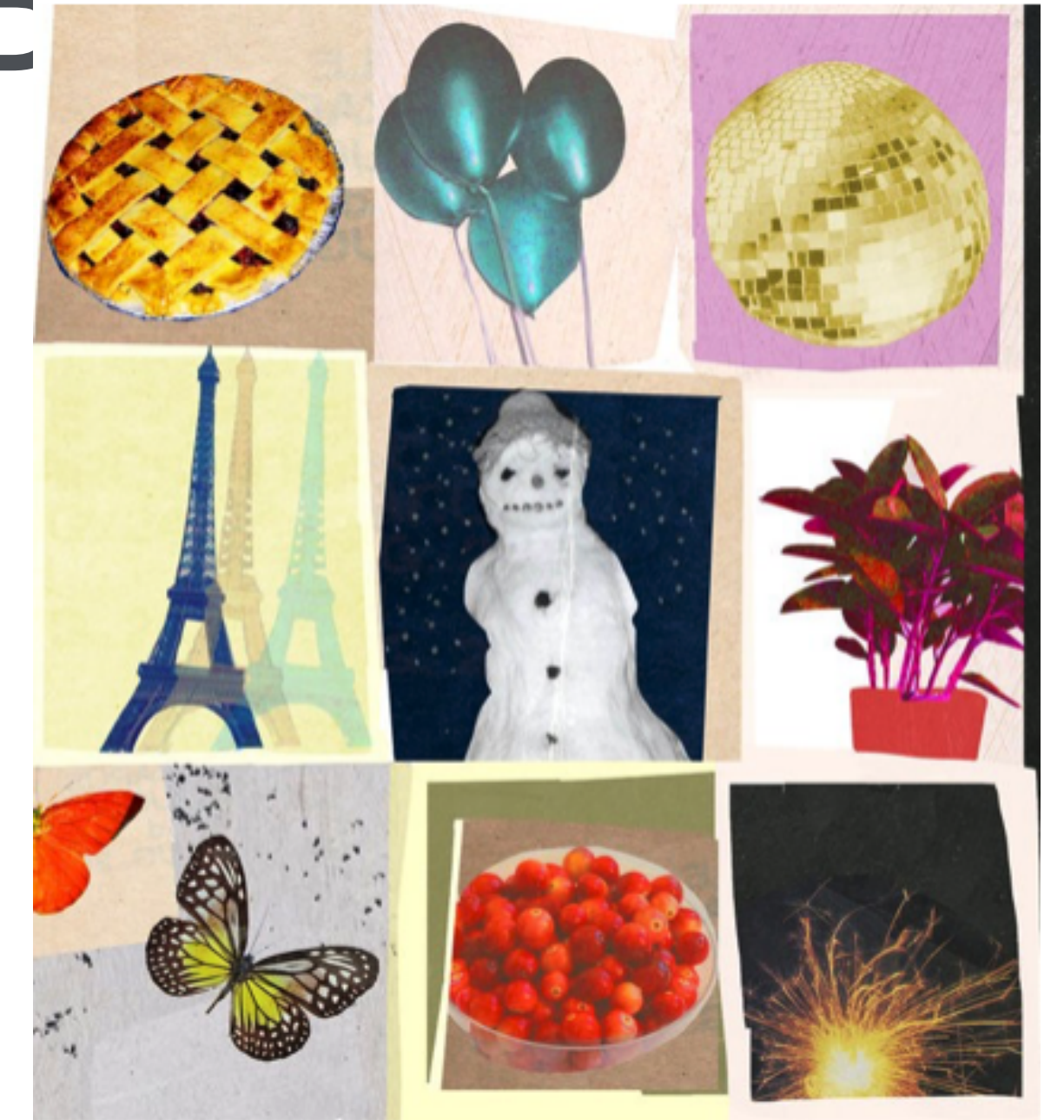
 Wellbeing Research
Nov, 2018

MASS MEDIA SHOW TREMENDOUS INTEREST IN SOCIAL COMPARISON ON OUR F

The New York Times

The Agony of Instagram

For many urban creative professionals these days, it's not unusual to scroll through one's Instagram feed and feel suffocated by fabulousness:



Do You Have 'Instagram Envy'?

BY SHANNON DOYNE DECEMBER 16, 2013 5:08 AM

Most people realize it's not healthy to compare themselves to other people — but social media presents abundant opportunities to do exactly that.

THE ACADEMIC LITERATURE ALSO PREDOMINATELY FOCUSES ON THE NEGATIVES

"social comparison" instagram



About 2,020 results (0.08 sec)

Instagram# instasad?: exploring associations among instagram use, depressive symptoms, negative social comparison, and strangers followed

K Lup, L Trub, L Rosenthal - Cyberpsychology, Behavior, and Social ..., 2015 - liebertpub.com

As the use and influence of social networking continues to grow, researchers have begun to explore its consequences for psychological well-being. Some research suggests that Facebook use can have negative consequences for well-being. **Instagram**, a photo-sharing ...

☆ ⓘ Cited by 93 Related articles All 10 versions ⓘ

Attractive celebrity and peer images on Instagram: Effect on women's mood and body image

Z Brown, M Tiggemann - Body image, 2016 - Elsevier

... body dissatisfaction. It was concluded that exposure to attractive celebrity and peer images can be detrimental to women's body image. Keywords. Body image. Celebrity. Peer. **Instagram**. Media. **Social comparison**. Introduction ...

☆ ⓘ Cited by 52 Related articles All 5 versions ⓘ

- Focused on **negative** outcomes: depression, loneliness, envy...
- Highlight **teens**, especially teen girls
- Hot topics: **body image**, no. of likes / followers, perfection as standard, inauthenticity

“So many of the behaviors we’re talking about have **pre-digital corollaries**,” says Weinstein, a digital media researcher at Harvard, “They’re the same sort of developmental challenges that adolescents have grappled with for decades, though **now they’re taking place in different spaces** that can certainly **amplify** them and **shift** their **quality**, **quantity**, and **scale**.”

Or, do they?
If so, how?

AS THE FIRST STUDY ON SOCIAL COMPARISON AT IG, THIS RESEARCH AIMS TO...

- 1 Quantify social comparison's **prevalence**, and identify **who's most susceptible**
- 2 Pinpoint **triggers** for social comparison
- 3 Evaluate social comparison's relationship with **authentic** expression
- 4 Assess **impact** of social comparison on **engagement with IG, wellbeing, and emotions**

WHAT WE DID

Quantitative



SURVEY

- 7 key markets
- 5,793 completes
- Conducted in Oct 2018



LOG DATA

- Matched with survey data
- Time spent
- Engagement level
- Tenure on IG

Qualitative



INTERVIEW

- 14 pair interviews of daily active users and habitual users
- 13 females and 15 males; 15-24 years old
- Conducted face-to-face in MPK and LA in September 2018

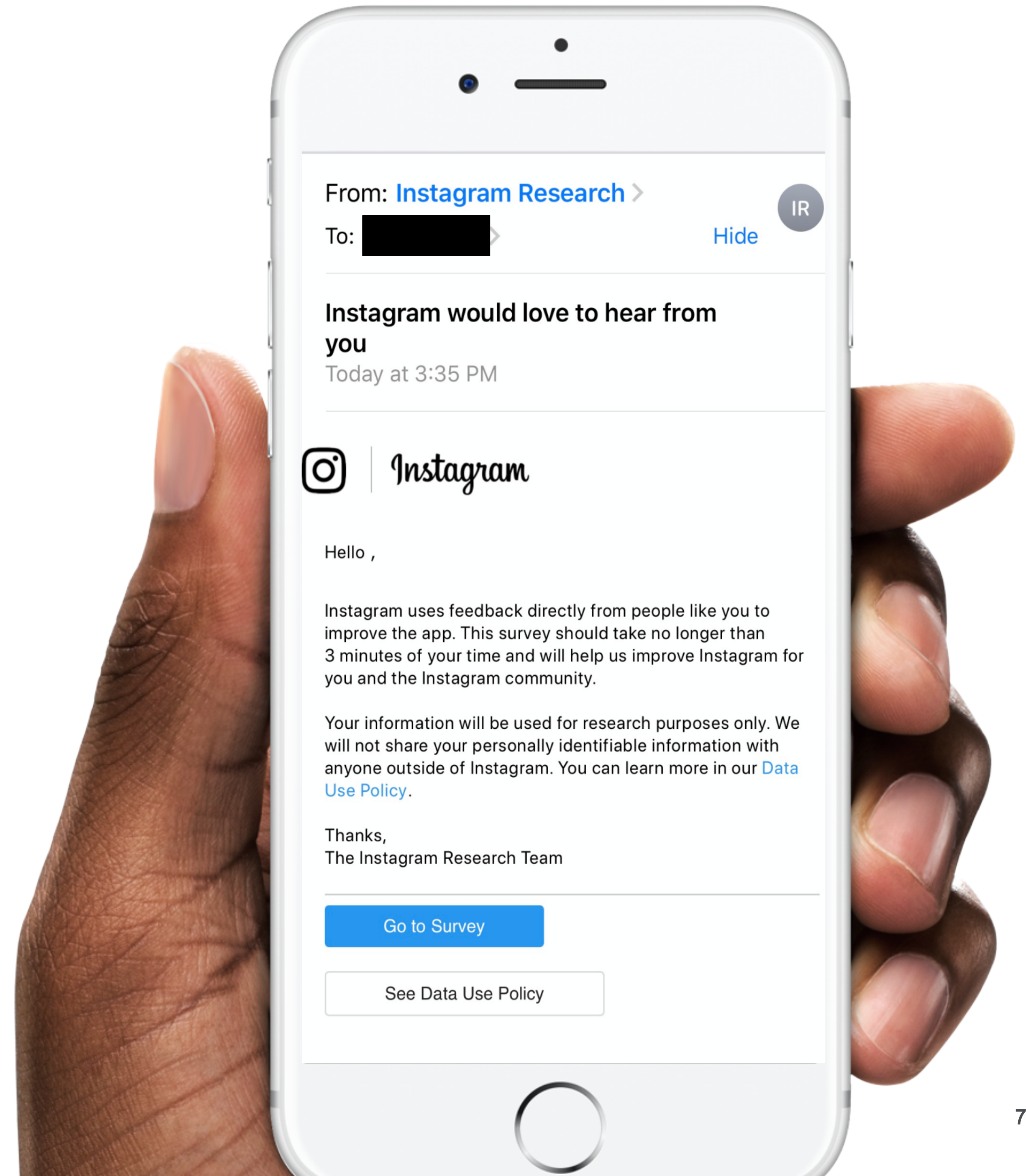
SURVEY

- A branded **email survey** of a randomly selected sample of monthly active users (L28>1)
- Stratified sampling in 7 key markets; Sample is then **weighted** based on country

Country	Male	Female	NA	Total
BR	167	301	110	578
CA	167	372	167	706
FR	278	683	229	1,190
GB	231	482	188	901
JA	258	445	191	894
MX	204	265	112	581
US	230	544	169	943
Total	1,535	3,092	1,166	5,793

Age	Male	Female	NA	Total
13-17	134	510	38	682
18-24	260	737	26	1,023
25-34	279	631	26	936
35-44	320	494	22	836
45-54	290	400	21	711
55 +	246	311	21	578
missing	6	9	1012	1,027
Total	1,535	3,092	1,166	5,793

Note: "NA" includes selection of "other" to gender, "prefer not to tell", and missing values



TL;DR WHAT WE FOUND

1. PREVALENCE

- Social comparison is **common** on IG. **51%** of people experience social comparison on IG. They either **compare their accomplishments** to others or **observe other people** to decide how they should act “sometimes” or more often.
 - **Women and teens** are more prone to social comparison, especially **negative** social comparison.
-

2. TRIGGERS

Negative social comparison is triggered mostly by **photo/video**, in particular regarding **beauty, fitness, fashion, travel, and romantic relationships**, posted by **weak ties** such as celebrities, strangers, and acquaintances.

3. AUTHENTICITY

Social comparison is associated with **pressure to be perfect** and **less freedom to express true-self**.

4. IMPACT

- Negative social comparison **reduces engagement** with IG.
- Negative social comparison **lowers well-being** (loneliness, life satisfaction, self worth, and self efficacy), and people with lower well-being may be more prone to negative social comparison.
- Most people (38%) report that the **upsetting feeling** caused by negative social comparison only lasted for “less than a few minutes” **when it happened last time**, however the **cumulative duration** is substantial: 33% of people have been feeling worse about themselves on IG for “several months to a year”.

TL;DR PRODUCT IMPLICATIONS

- 1 What if we give people **more control of the types of contents they want to see**, e.g. feed filters: “show me more of the content that I liked”; “show me content like this only once a week”?

- 2 What if we give people **more control of what they want to share with whom**, e.g. some shared privately within a group; some shared publicly?
-- so that fewer people would be exposed to “luxurious lifestyle from random people”

- 3 What if IG suggests photo filters selectively, e.g. **only to certain types of photos** such as **landscape** (low risk to trigger social comparison) but not to **people portraits** (major trigger for social comparison)?

- 4 What if we launch **campaigns** such as “No Filter Friday”, hashtag “#beyoutrueself” to **promote authentic expression on IG**?

ROADMAP

1. How **prevalent** is social comparison, and **who's** most susceptible?
2. What **triggers** negative social comparison on IG?
3. How does social comparison relate to **authentic expression**?
4. What's the **impact** of social comparison?
 - On **engagement** with IG
 - On **wellbeing**
 - On **emotion**

1.1. HOW PREVALENT IS SOCIAL COMPARISON ON IG?

SOCIAL COMPARISON IS HUMAN NATURE AND IT IS A VALUE NEUTRAL CONCEPT

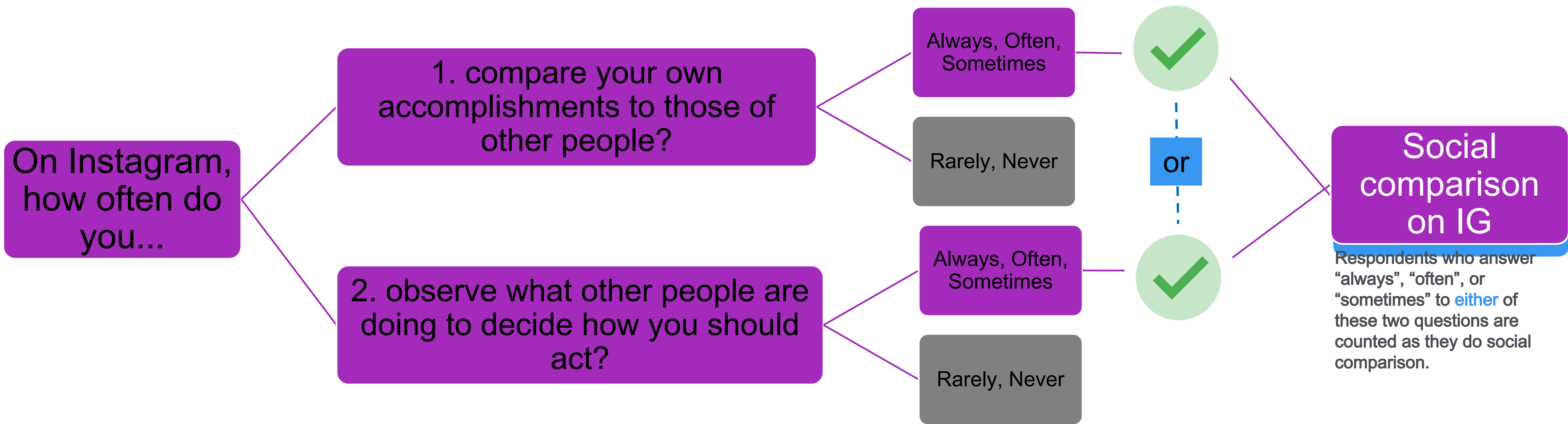
What is “social comparison”?

Hypothesis I: There exists, in the human organism, a drive to evaluate his opinions and his abilities.

Hypothesis II: To the extent that objective, non-social means are not available, people evaluate their opinions and abilities by comparison respectively with the opinions and abilities of others.

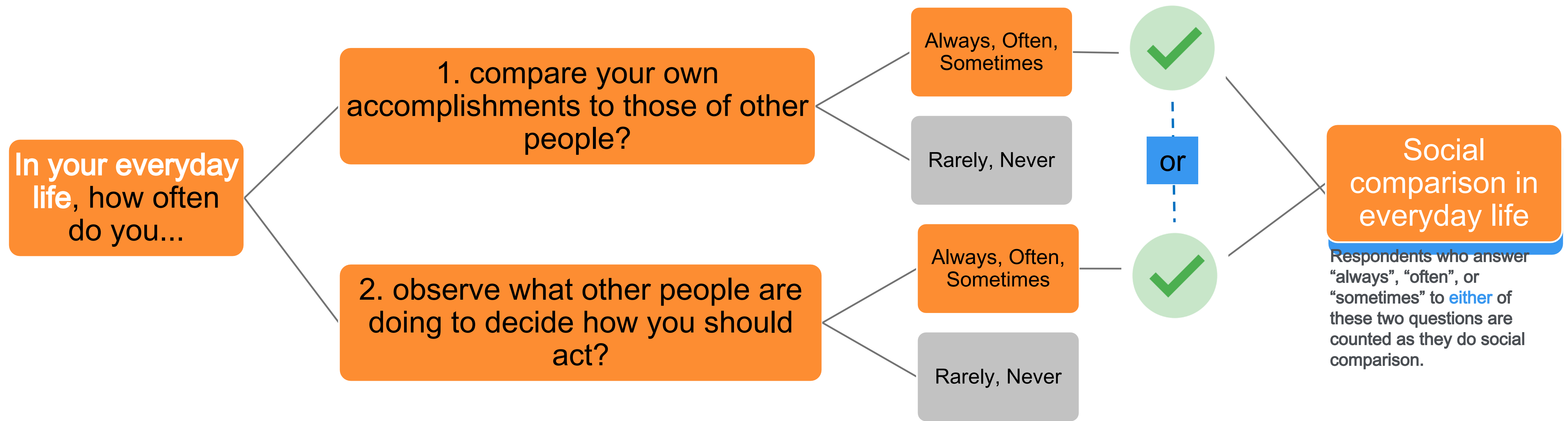
-----“A Theory of Social Comparison Processes” ([Festinger 1954](#))

WE MEASURE SOCIAL COMPARISON ON IG BY ASKING....



Note: These questions are modified based on the widely cited Iowa-Netherlands Comparison Orientation Scale, see Gibbons, F.X. & Buunk, B.P. (1999). Individual differences in social comparison: The development of a scale of social comparison orientation. *Journal of Personality and Social Psychology*, 76, 129-142.

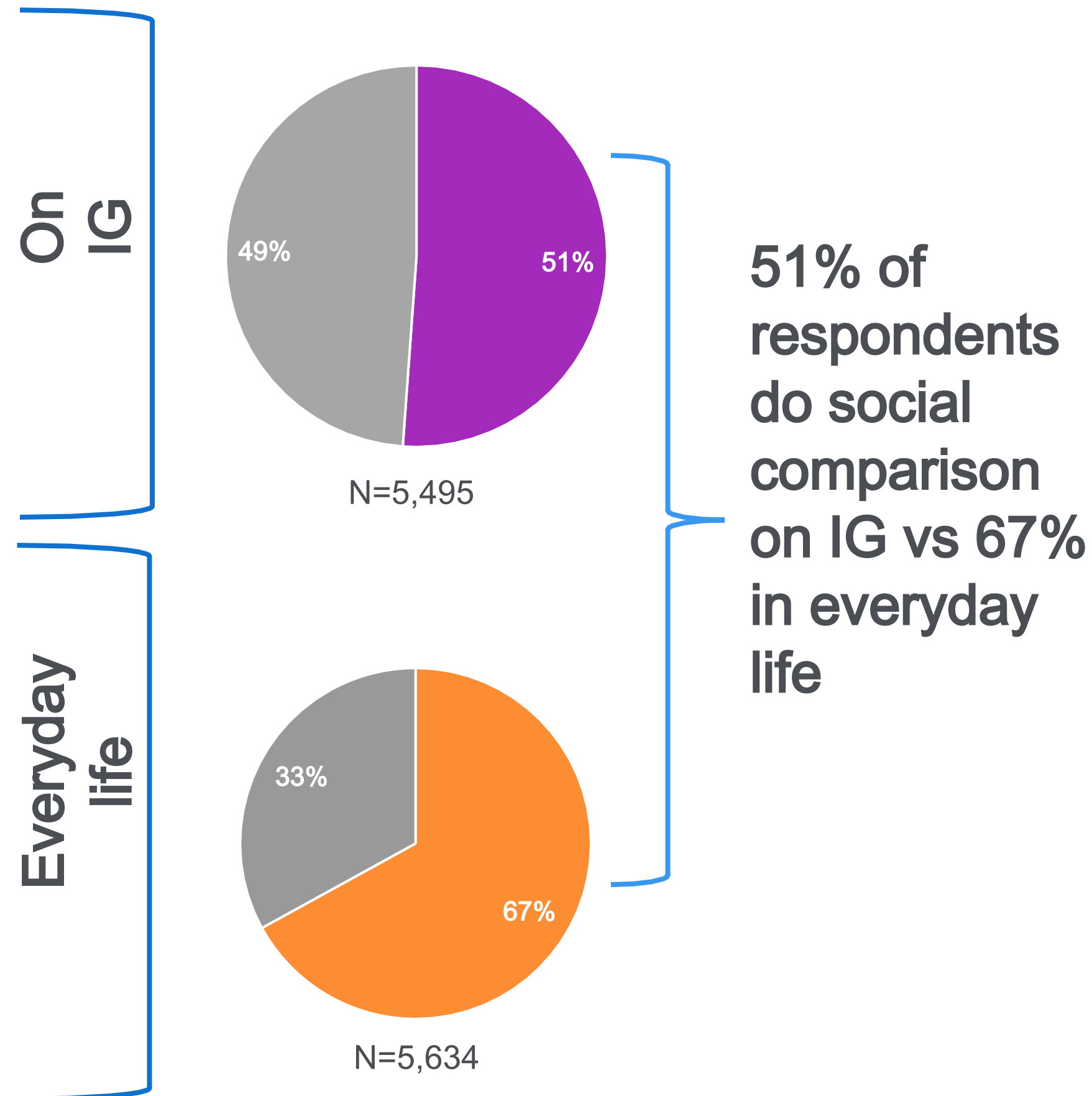
SIMILARLY, WE MEASURE SOCIAL COMPARISON IN EVERYDAY LIFE BY ASKING....



Note: These questions are modified based on the widely cited Iowa-Netherlands Comparison Orientation Scale, see Gibbons, F.X. & Buunk, B.P. (1999). Individual differences in social comparison: The development of a scale of social comparison orientation. *Journal of Personality and Social Psychology*, 76, 129-142.

51% OF OUR USERS DO SOCIAL COMPARISON ON IG COMPARED TO 67% IN EVERYDAY LIFE

Overall social comparison prevalence from **survey data**



However, in our **interviews...**

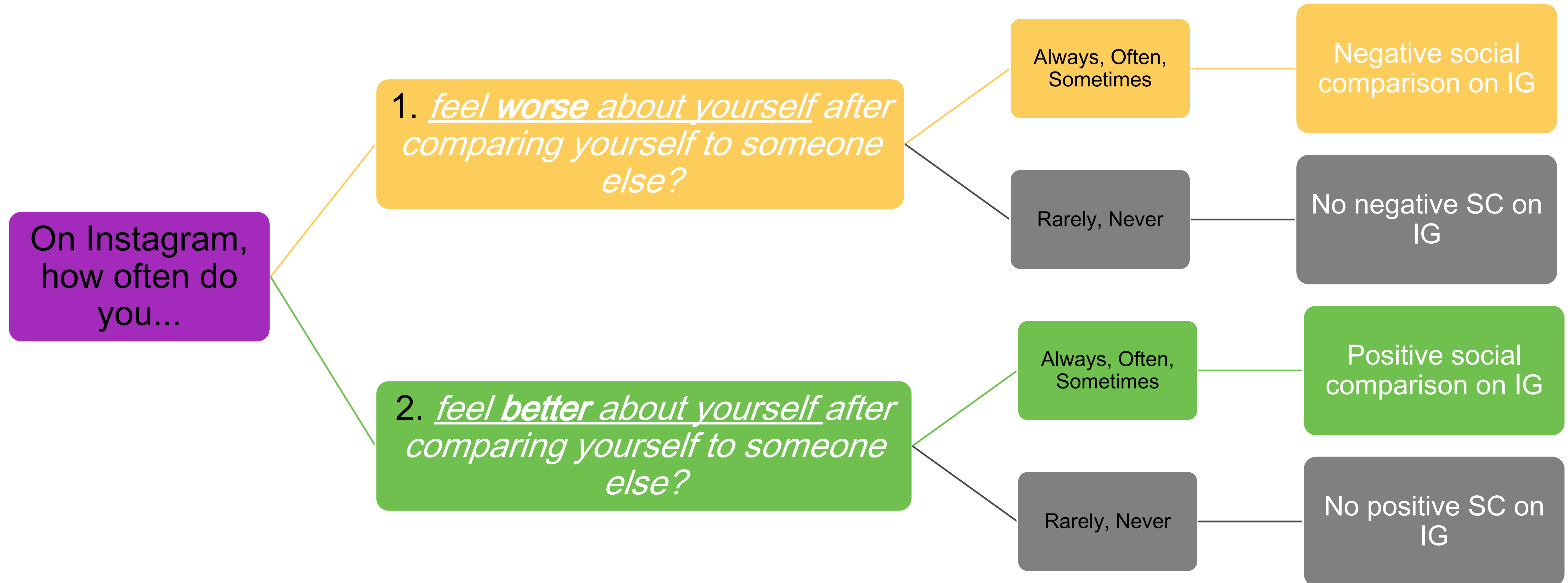
Most respondents say that social comparison **happens more often online than in real life**, because respondents think that:

- posting on Instagram is a very deliberate process where the posters **curate their profiles**: “People put their best on Instagram to make them look in certain ways (Nicole, 23, Female)”
- audience can **scrutinize the posts**: “You can take your time and sit on someone's profile for as long as you want, whereas in real life, it would be weird to stop and stare at someone for 10 minutes or to ask them a bunch of questions about their lives (Zack, 21, Male)”
- the **exposure to information** is **more extensive** than in real life: “More on Instagram, coz you can see **people all around the world** (██████████ 16, Male).”

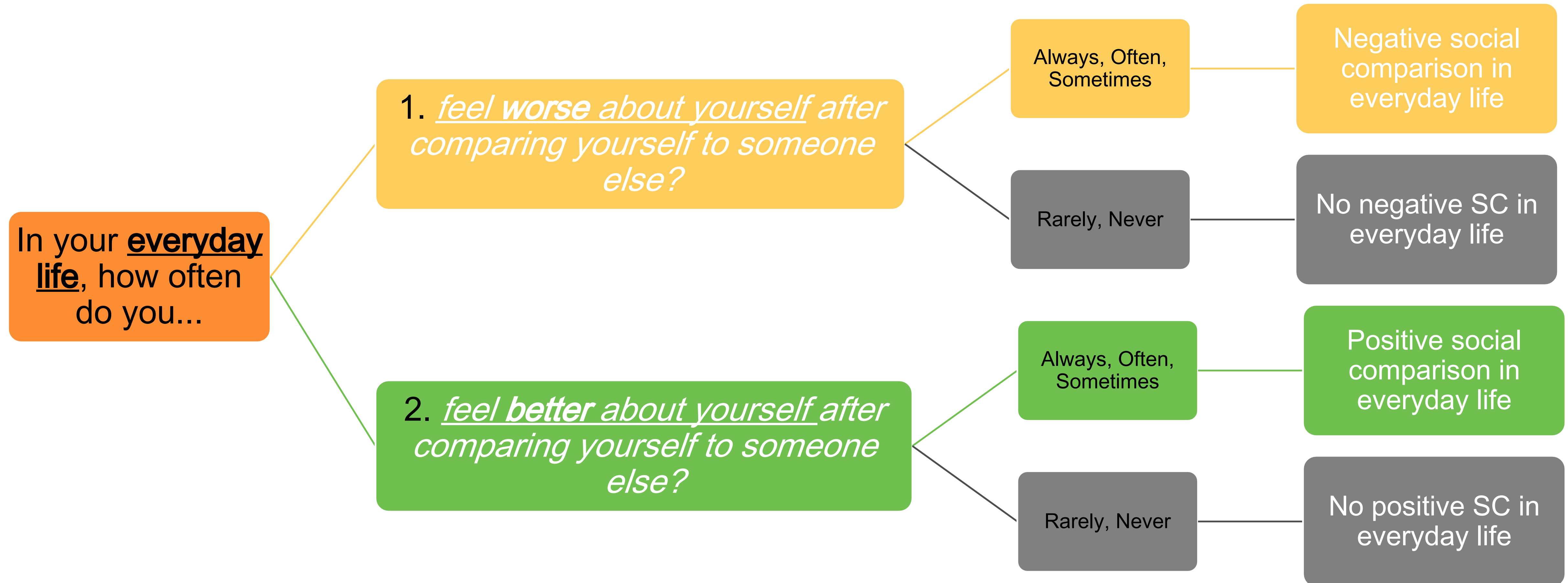
So what?

- This is the **first and only** data point available on IG social comparison. **More data are needed** to better compare prevalence online vs. offline.
- Facebook is running a **parallel survey** with the exact questions, which will provide more data to compare online vs offline.
- Note that people might under report due to **social desirability bias**

WE FURTHER DIFFERENTIATE **POSITIVE** AND **NEGATIVE** SOCIAL COMPARISON **ON IG** BY ASKING...



WE ASK THE SAME QUESTIONS FOR EVERYDAY LIFE

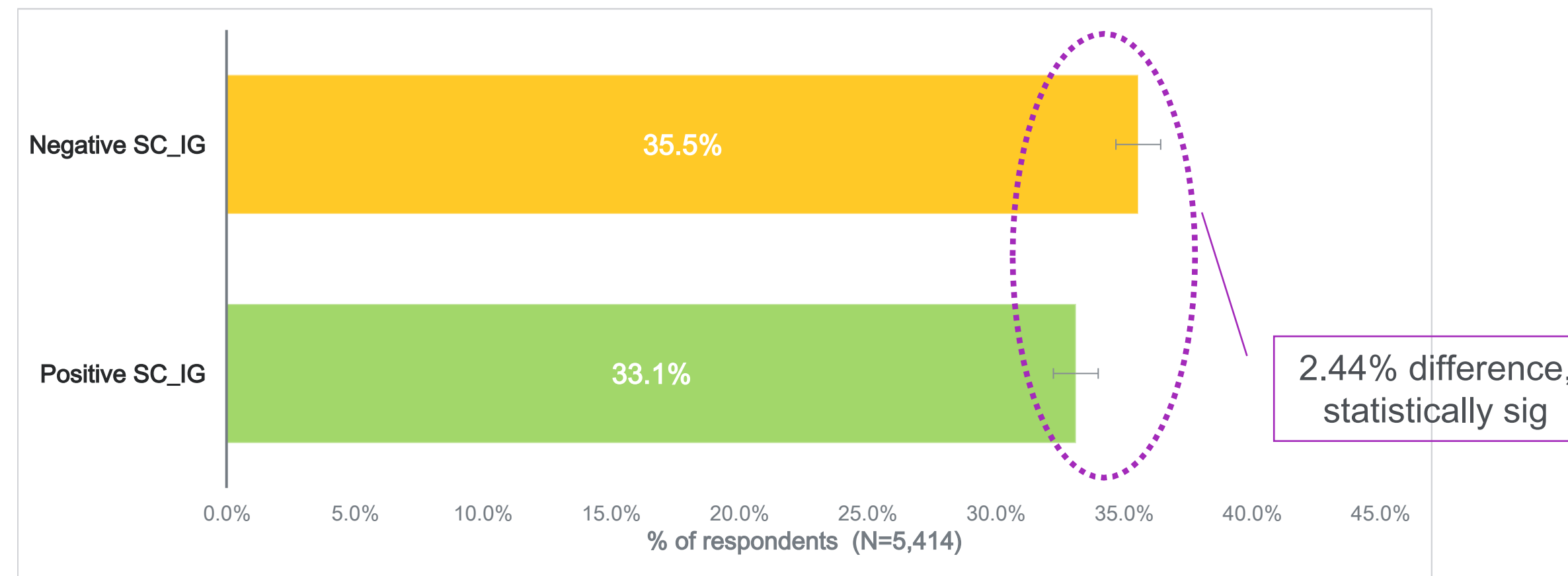


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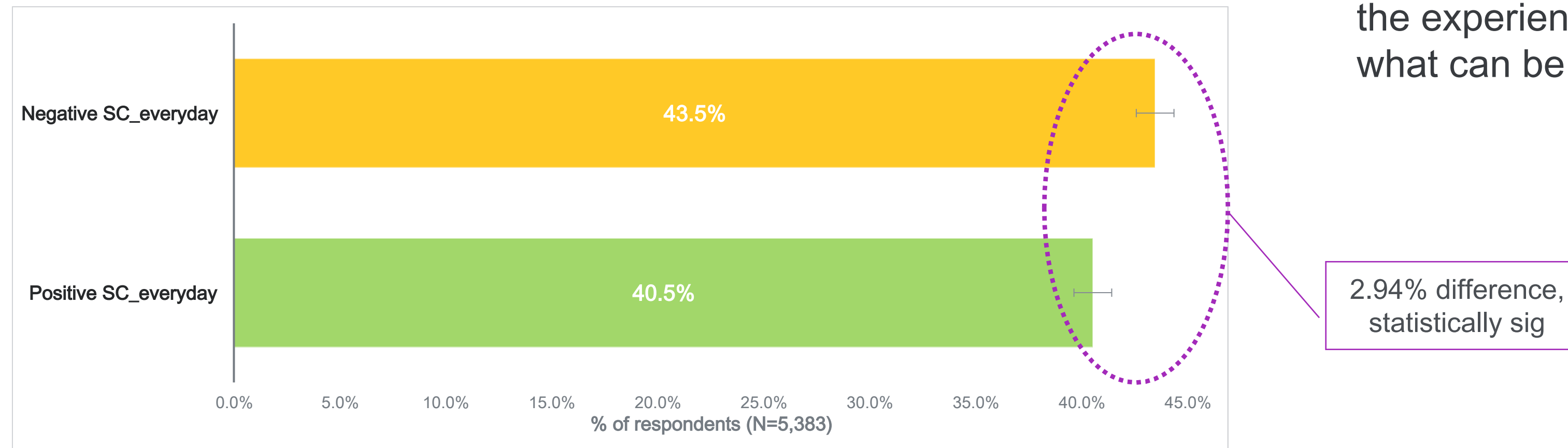
POSITIVE SOCIAL COMPARISON HAPPENS ALMOST AS OFTEN AS NEGATIVE ONES—BOTH ON IG AND IN EVERYDAY LIFE

Positive vs negative SC

On IG



Everyday life



So what?

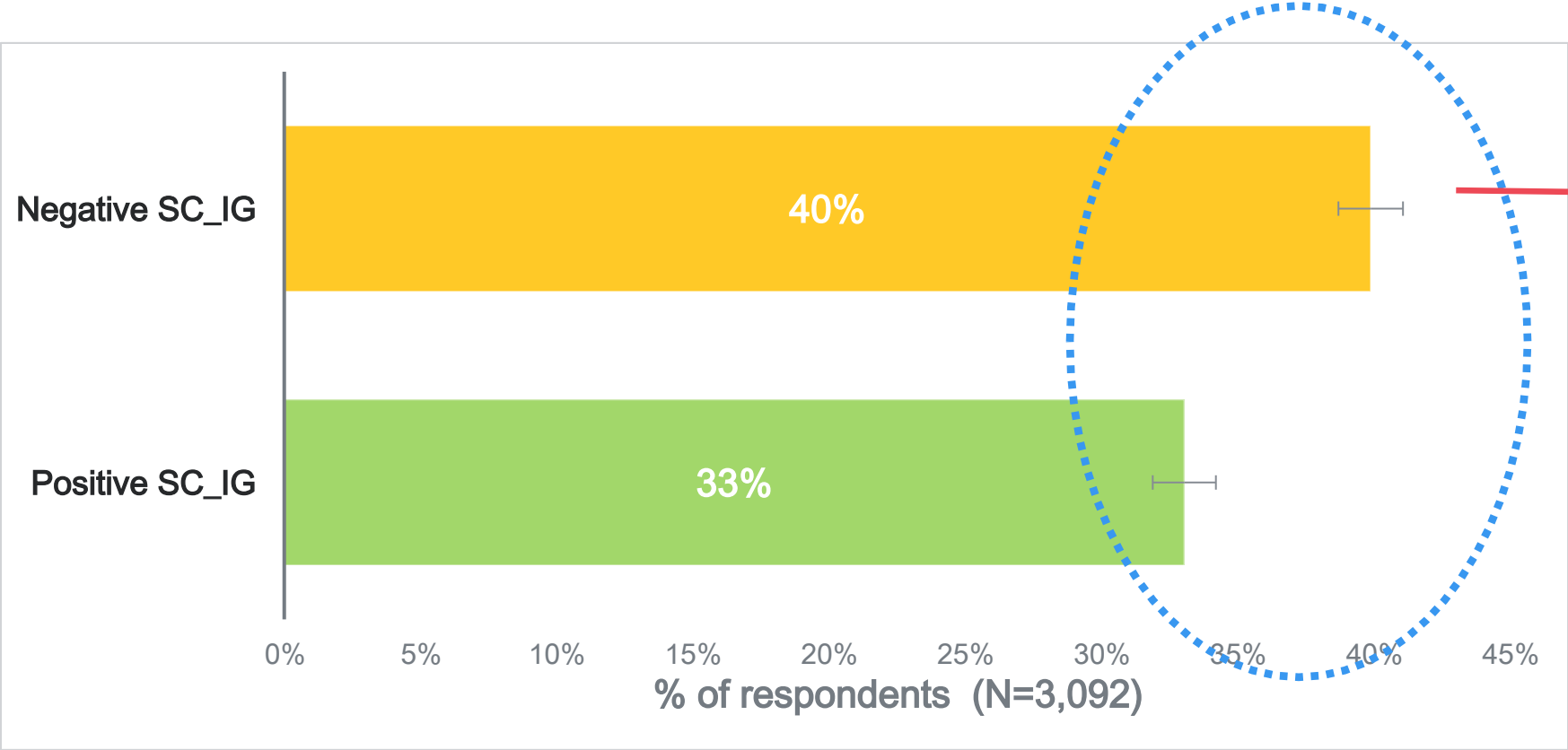
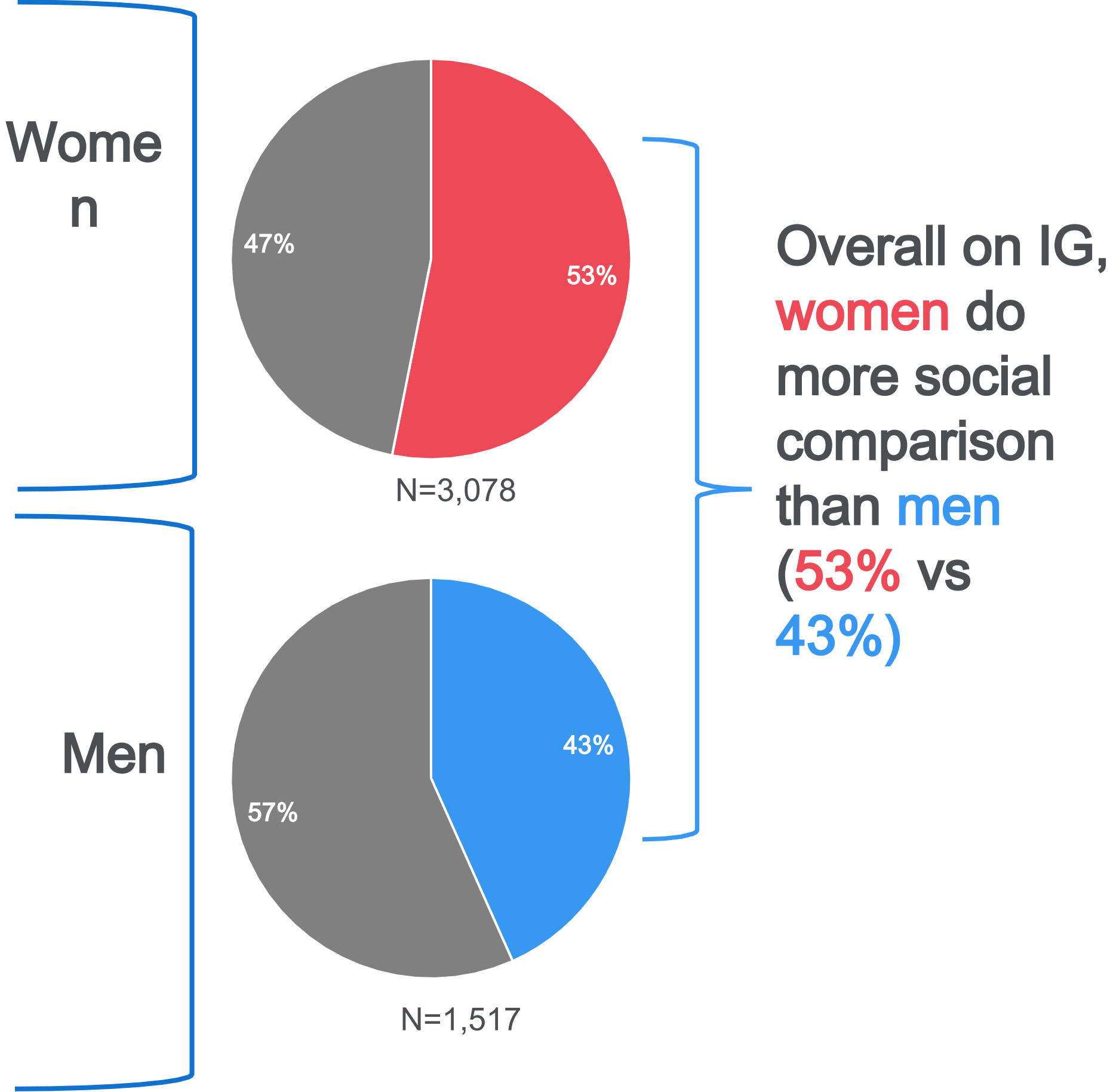
- Although negative social comparison is slightly more prevalent than positive ones both on IG and in everyday life, **the difference is small.**
- This provides **fresh evidence** to the overwhelming attention of popular media and academic literature that focused solely on negative social comparison.
- This finding is also surprising to us. We designed this survey with an emphasis on negative social comparison. **Future studies** should further explore the experience of **positive** social comparison and what can be done to promote it.

Note: The sum of negative and positive social comparison does not equal to the overall prevalence because they are not mutually exclusive, i.e. a respondent can do both negative and positive comparisons. Also, this question is asked to all respondents; it is not restricted to respondents who indicate they do social comparison prior to this question.

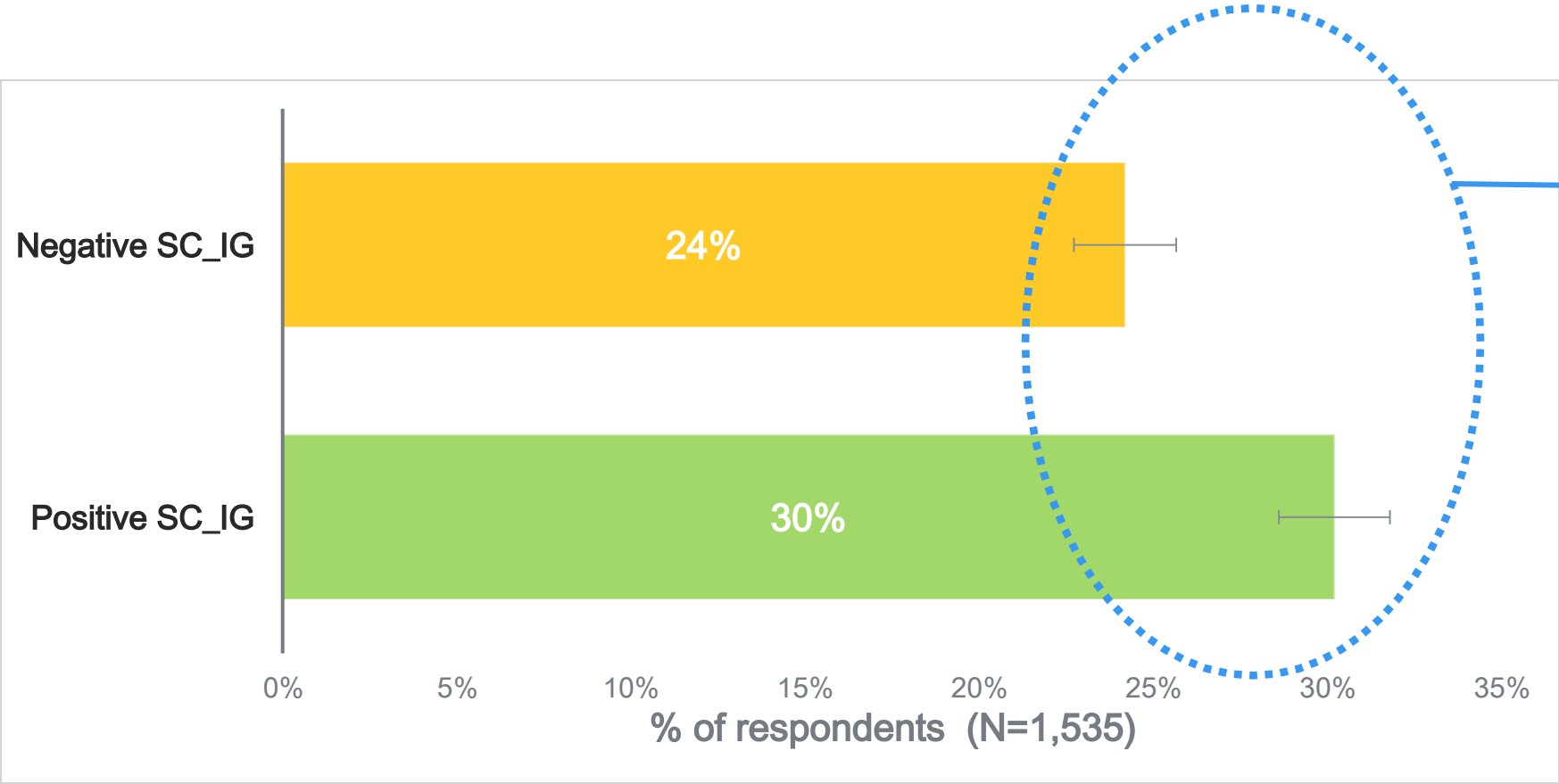
1.2. WHO'S MOST SUSCEPTIBLE TO SOCIAL COMPARISON ON IG?

ON IG, **WOMEN** ARE MORE AFFECTED BY **NEGATIVE** COMPARISON WHEREAS **MEN** ARE MORE AFFECTED BY **POSITIVE** ONES

Social comparison prevalence on IG by gender Positive vs negative SC on IG by gender

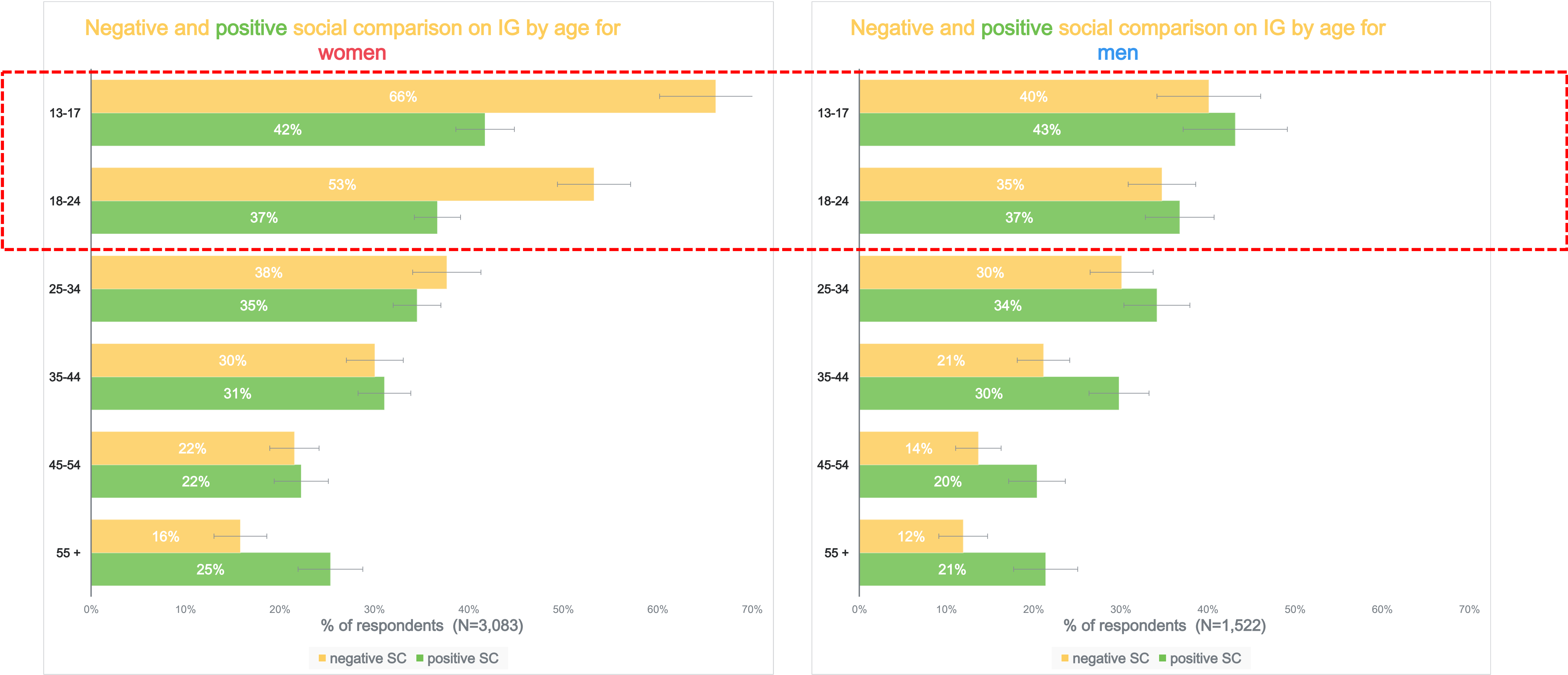


When women do social comparison, they more often feel **WORSE** about themselves.



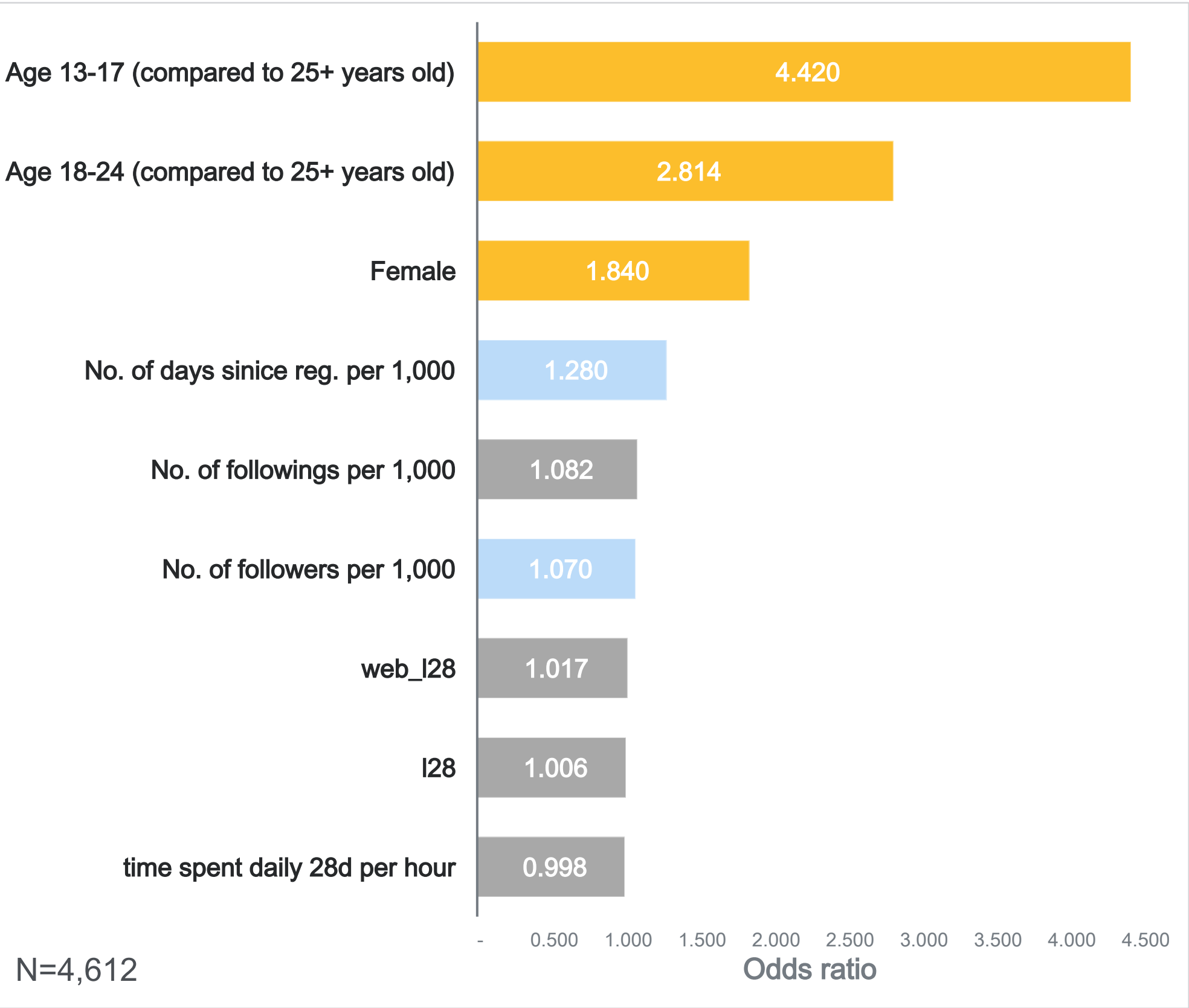
When men do social comparison, they more often feel **BETTER** about themselves.

TEEN GIRLS AND YOUNG WOMEN ARE PARTICULARLY PRONE TO NEGATIVE SOCIAL COMPARISONS



LOGISTIC REGRESSION WITH LOG DATA SHOWS THAT AGE AND GENDER ARE THE STRONGEST PREDICTORS OF NEGATIVE SOCIAL COMPARISON

Odds ratio of logistic regression on negative social comparison on IG



Statistical significance (p<0.05)

Interpretation: All else equal, the odds of experiencing negative social comparison on IG...

Yes	for 13-17 years old are 4.42 times larger compared to being 25 + years old
Yes	for 18-24 years old are 2.814 times larger compared to being 25 + years old
Yes	for females are 1.84 times larger compared to males
Yes	for people who have been on IG 1,000 days longer is 1.28 larger than people who don't
No	Not statistically significant
Yes	for people who have 1,000 more followers is 1.07 larger than people who don't
No	Not statistically significant
No	Not statistically significant
No	Not statistically significant

Compared to 25+ years old men, the odds for teen girls to do negative SC are 8x; for young women 5x, controlling for tenure, engagement level, no. of follow(er)s, and country.

Note: Logistics regression isolates the independent influence of each independent variable on the dependent variable while holding all other independent variables in the model constant. The full model controls for country (result not reported). 8x is calculated by 4.420*1.840; 5X is calculated by 2.814*1.840

INSIGHTS AND OPPORTUNITIES FOR PREVALENCE

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INSIGHTS:

- **51%** of people do social comparison on IG. Positive and negative social comparison are **almost equally prevalent** (33% and 35%).
- **Teen girls and young women** do more social comparison, especially negative social comparison.
- Controlling for controlling for tenure, engagement level, no. of follow(er)s, and country, the odds for **teen girls** to do negative SC are **8x** and for **young women 5x** larger than 25+ years old men.

OPPORTUNITIES:

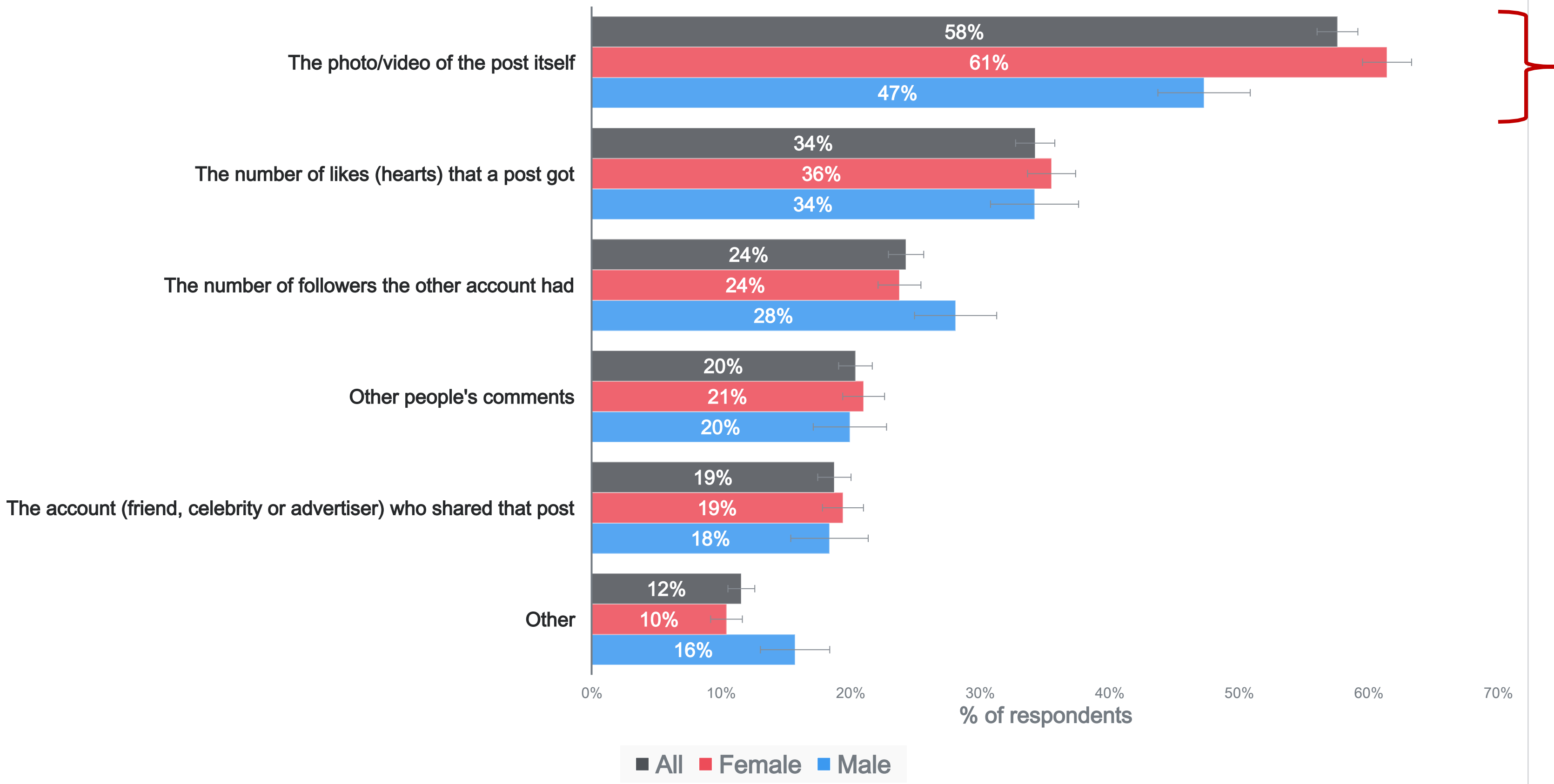
- How can we improve IG experience especially for **targeted populations**?
 - ✓ What if IG has a “**teen mode**”? Teens are vulnerable not only to negative social comparison found in this study but also **a range of other stressors**. We could have a product feature that better cater to teenagers’ needs and better protect them.
 - ✓ More studies on teens are needed to better understand their social comparison experience, e.g. a feeds study that ask teens to go through their typical IG feeds and identify which ones are triggers and why.

2. WHAT TRIGGERS NEGATIVE SOCIAL COMPARISON ON IG?

PHOTO/VIDEO IS THE NO.1 TRIGGER FOR NEGATIVE SOCIAL COMPARISON ESPECIALLY FOR WOMEN

You indicated that you felt worse about yourself after comparing yourself to someone on Instagram. Thinking about the last time it happened, what specifically made you feel worse? [select all that apply]

Triggers for negative social comparison on IG by gender



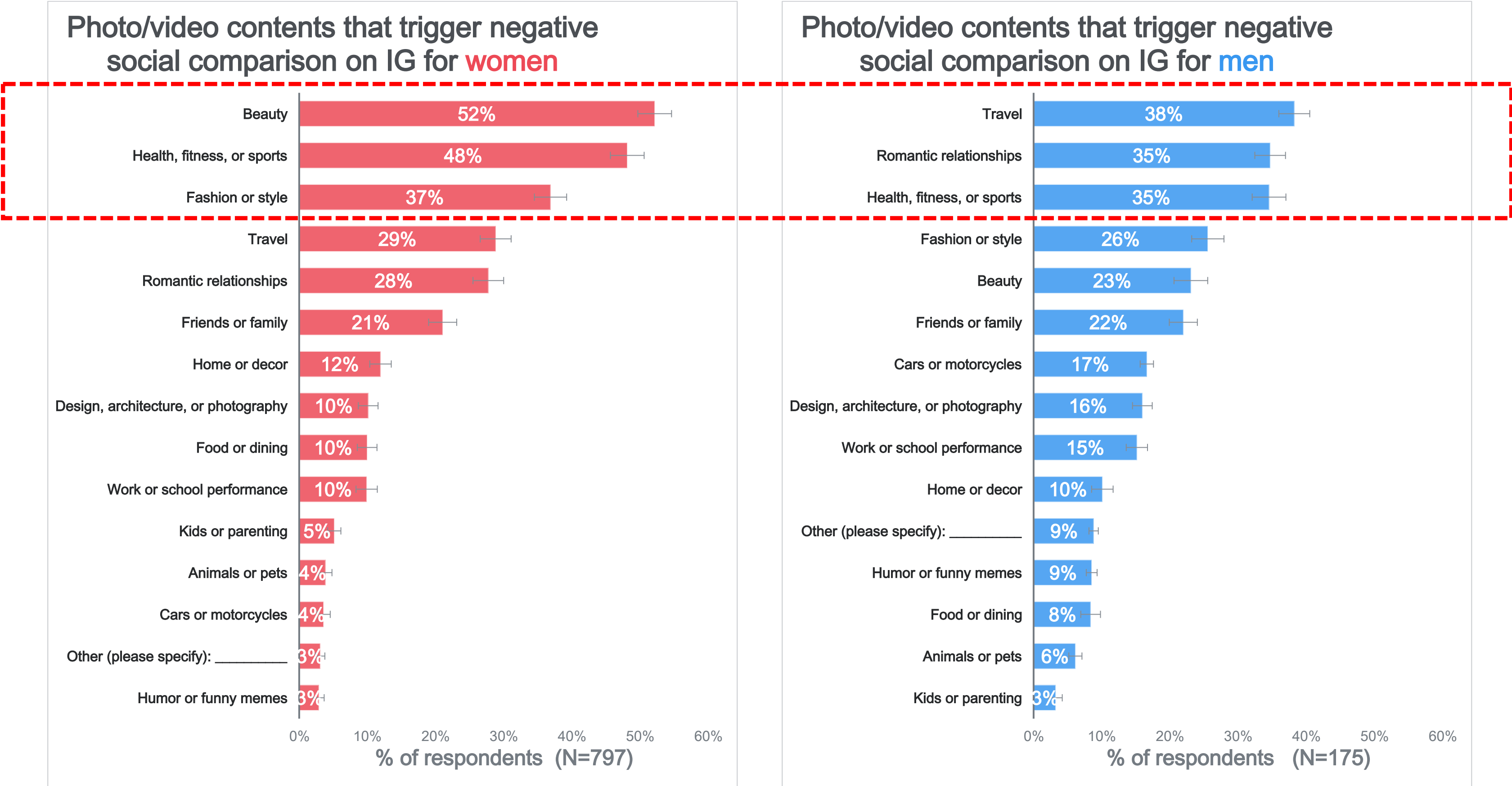
N_all=1,855; N_Female=1,273; N_male=346



BEAUTY, FITNESS, AND FASHION ARE TOP THREE CONTENTS THAT TRIGGER NEGATIVE COMPARISON FOR WOMEN

Whereas, top three for men are travel, romantics, and fitness

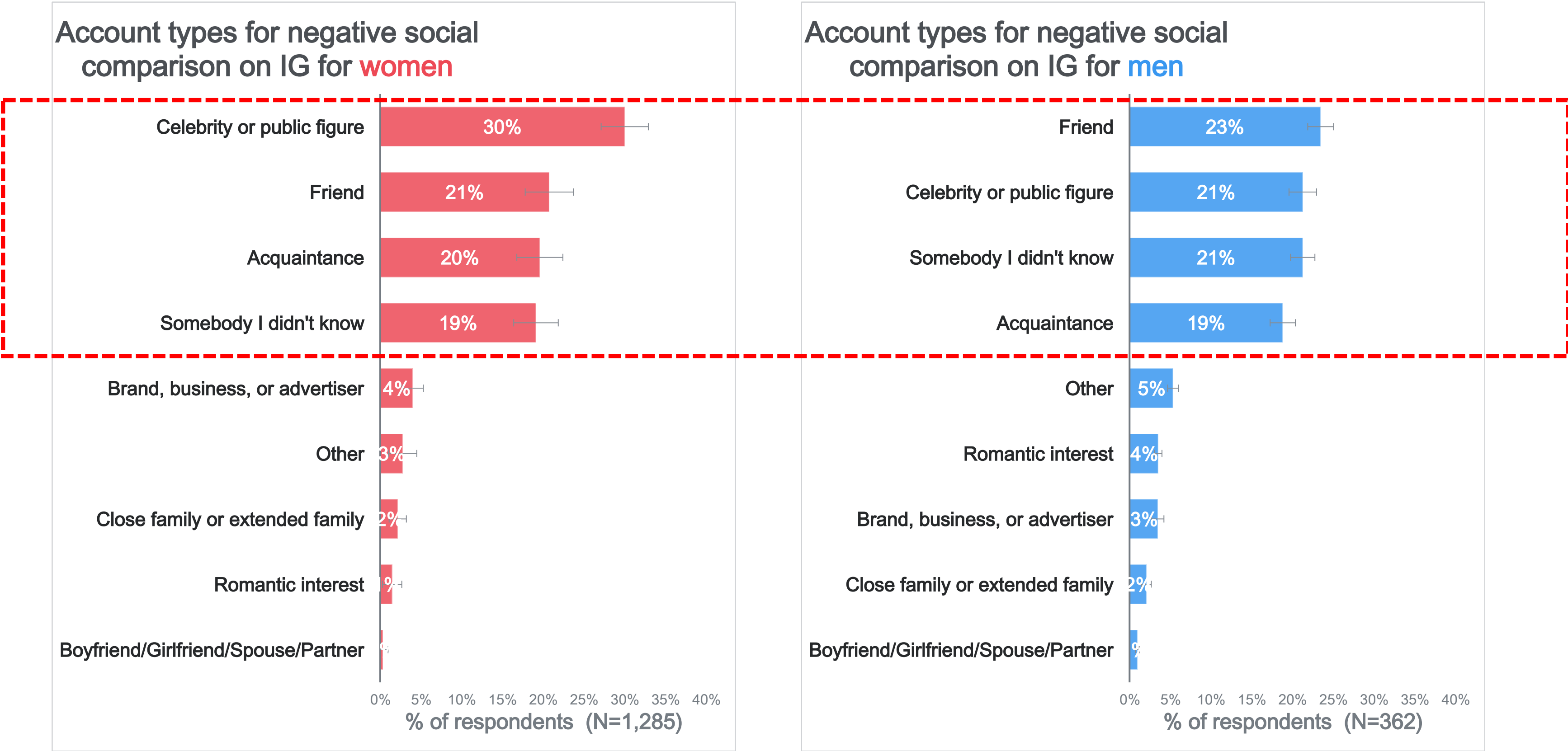
You indicated that it was the photo/video of the post that made you worse about yourself, what was it about? [select all that apply]



THE UPSETTING POSTS ARE MOST OFTEN POSTED BY CELEBRITIES, FRIENDS, STRANGERS, AND ACQUAINTANCES

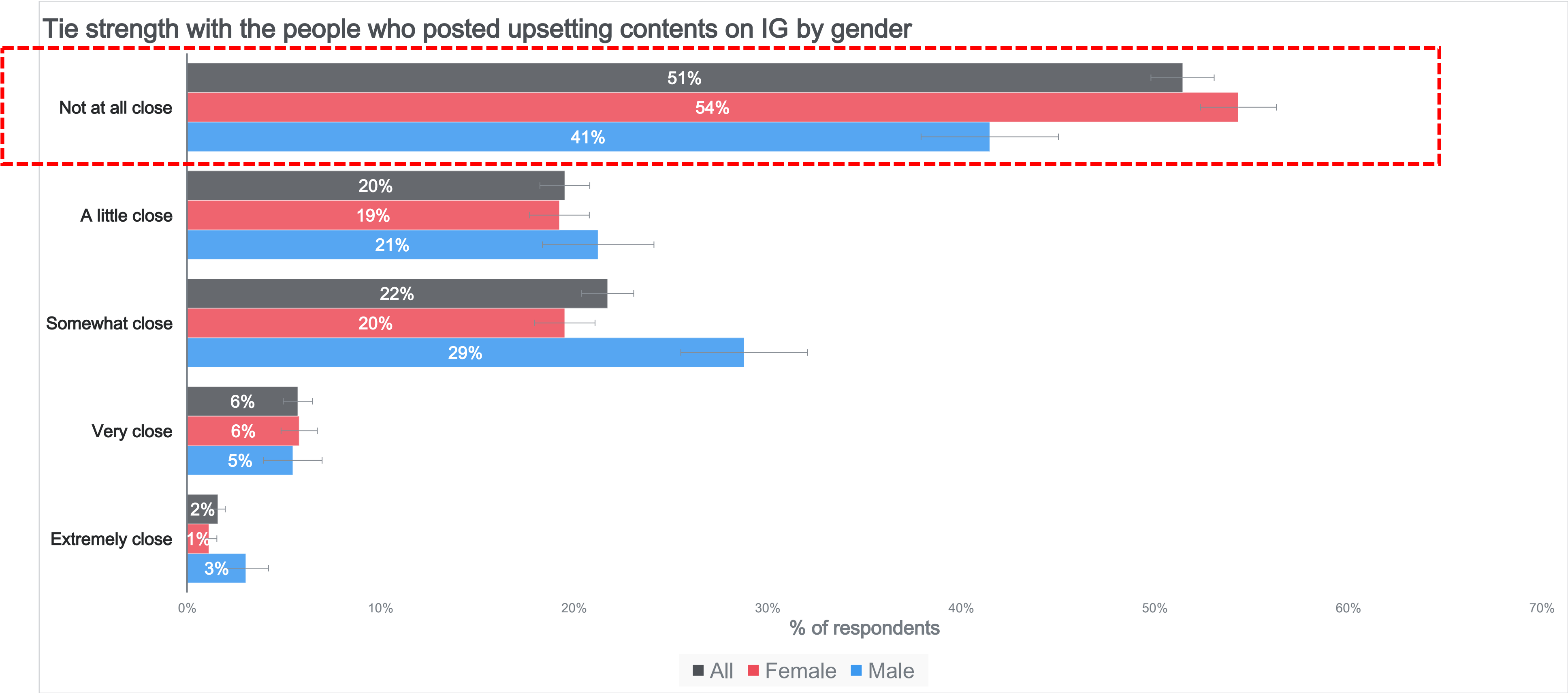
The top 4 are the same for both genders, but the ranking is different

You indicated that you felt worse about yourself after comparing yourself to someone on Instagram. Thinking about the last time it happened, Which of the following BEST describes the account who posted that content?



MOST RESPONDENTS FELT “NOT AT ALL CLOSE” WITH THE PEOPLE WHO POSTED THE UPSETTING CONTENTS

You indicated that you felt worse about yourself after comparing yourself to someone on Instagram. Thinking about the last time it happened, How close did you feel to the person when they shared that photo/video?



INSIGHTS AND OPPORTUNITY FOR TRIGGERS

INSIGHTS:

- Negative social comparison is triggered mostly by **photo/video**, in particular regarding **beauty, fitness, fashion, travel, and romantic relationships**.
 - These contents are usually posted by **weak ties** such as celebrities, strangers, and acquaintances, who people feel “not at all close” to.
-

OPPORTUNITIES:

- How can we make these triggers **less salient**?
 - ✓ What if we **train content classifiers** to better label and classify these content?
 - ✓ What if content classifiers and feed filters work together to give people **more control of what they want to see**?
E.g. “show me more of the content that I liked”; “show me content like this only once a week”
 - ✓ What if we give people the option of posting things **either privately within a group** of people vs **publicly to the whole IG community**? (so that fewer people would be exposed to “luxurious lifestyle from random people”)
 - ✓ What if IG **suggests photo filters only to certain types of photos** such as landscape (low risk to trigger social comparison) but not to people portraits (major trigger for social comparison)?

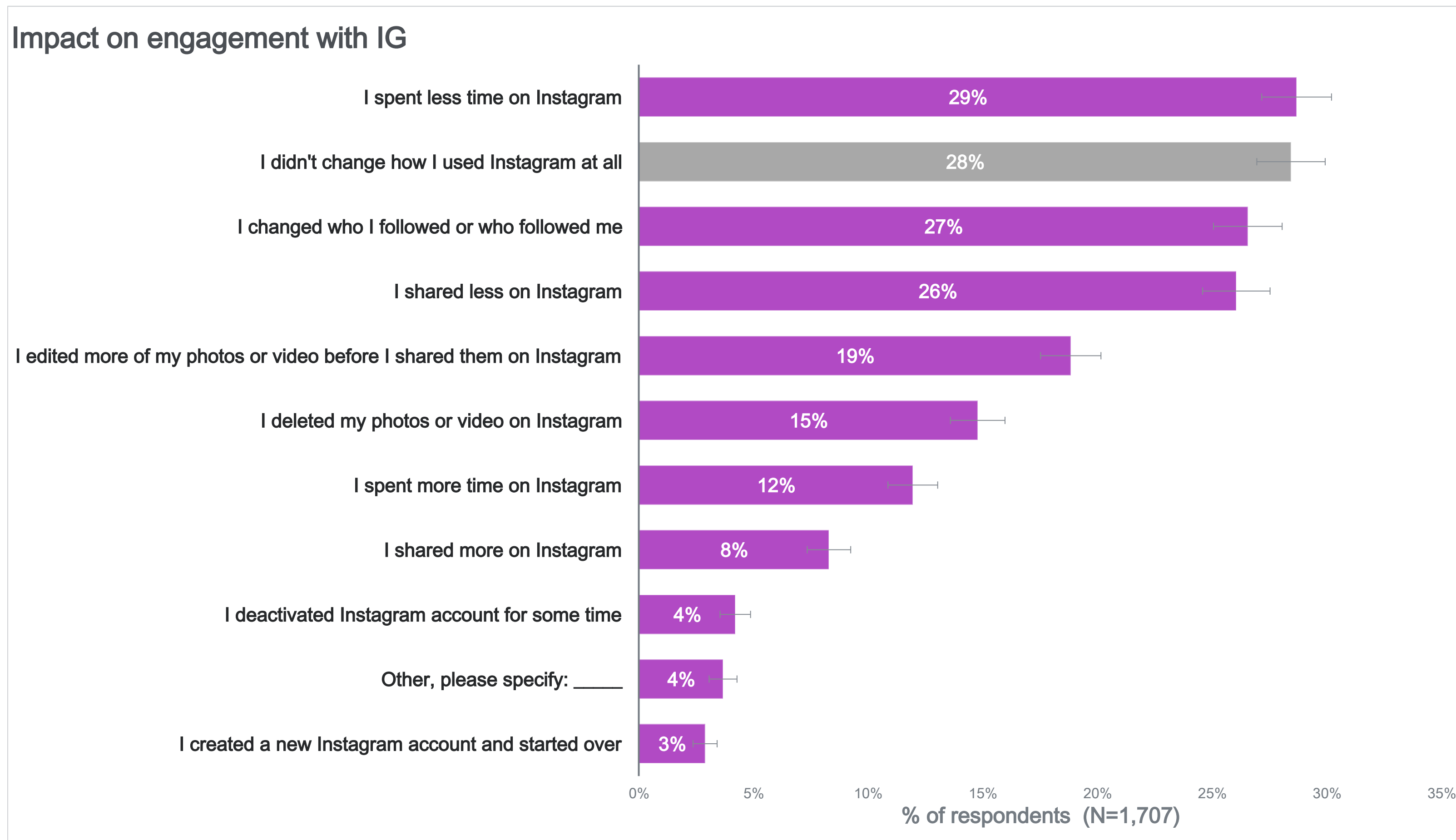
4. WHAT'S THE IMPACT OF SOCIAL COMPARISON?

4.1

IMPACT ON ENGAGEMENT WITH IG

NEGATIVE SOCIAL COMPARISON RESULTS IN REDUCED ENGAGEMENT WITH IG

Have you changed how you use Instagram as a result of seeing these posts that made you feel worse in comparison? [Select all that apply]



“So, what I do is I put my phone away. I try to get off of it. 'Cause it's a pattern: you go on there and you see all these photos. You'll go on one model to another model. You just see stunning photos of beautiful women and you start to feel down about yourself. You're like, "Oh my god, I'm so ugly." Like, "I need to crawl in a hole and not come out.”

Golkoo, 26, female

Source: Survey date and LA interview: [https://fb.facebook.com/notes/\[REDACTED\]/keeping-up-with-the-joneses-in-the-digital-age-interview-findings-from-instagram/147143206237714/](https://fb.facebook.com/notes/[REDACTED]/keeping-up-with-the-joneses-in-the-digital-age-interview-findings-from-instagram/147143206237714/)

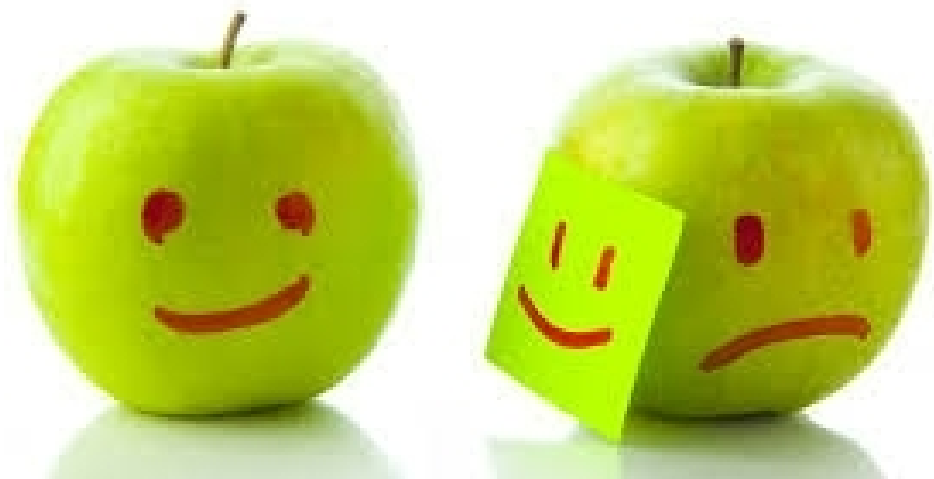
Note: these are self-reported data. Future studies should leverage log data together with on-platform experiments to further understand social comparison's impact on engagement with IG.



IMPACT ON WELLBEING

NEGATIVE SOCIAL COMPARISON IS ASSOCIATED WITH WORSENERD WELL-BEING MEASURES ACROSS THE BOARD

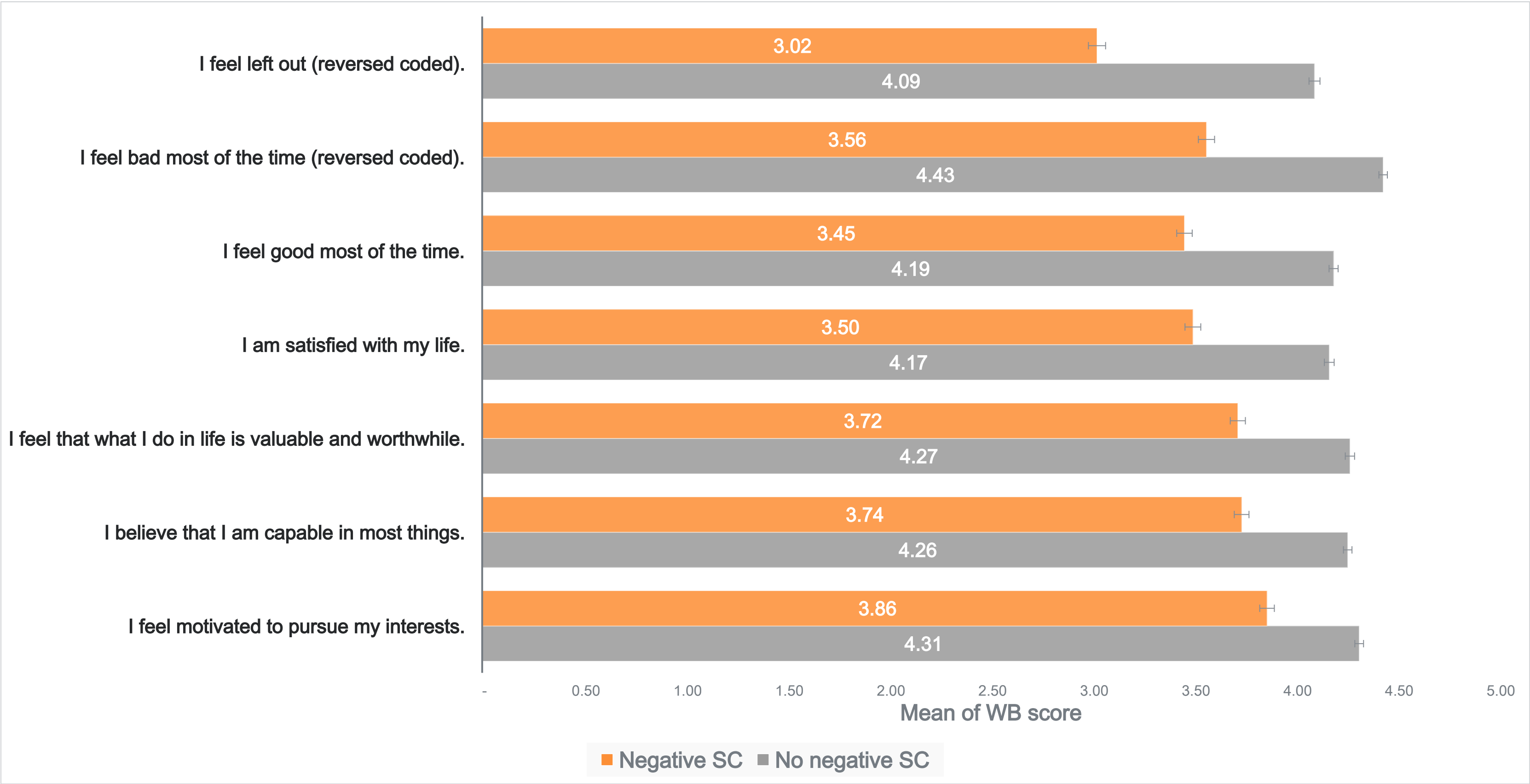
How much do you agree or disagree with the following statements?



Wellbeing by whether or not experienced negative social comparison on IG

Difference

Interpretation



-1.07

-0.87

-0.73

-0.67

-0.55

-0.52

-0.45

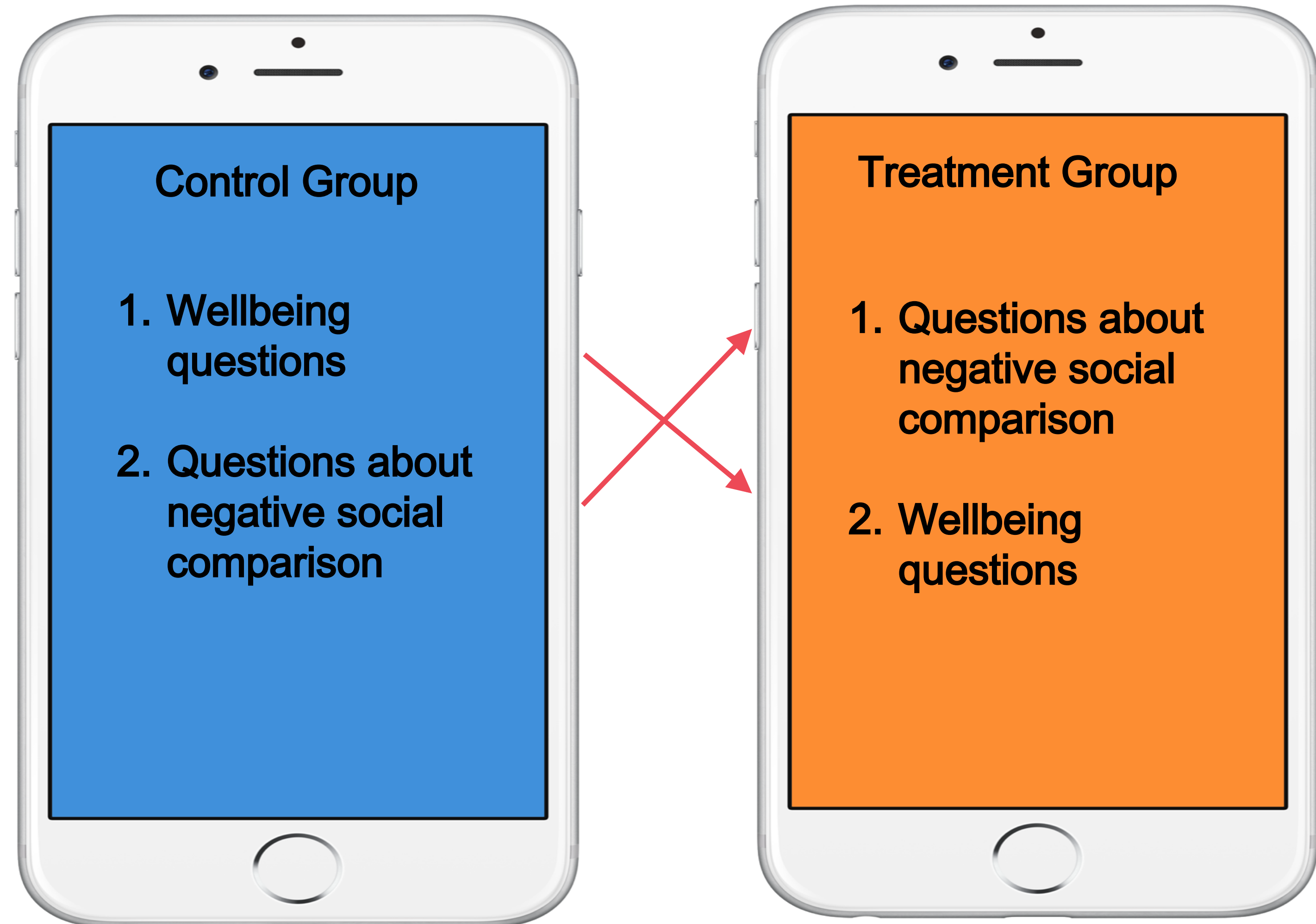
- People who have experienced **negative** comparison on IG have **lowered** WB scores than people who have not (all differences are statistically significant)
- The biggest gap comes in “**I feel left out**”. “Left out” can mean loneliness, but in social comparison context it can also mean **a sense of falling behind**, e.g. my friends are making progress in their lives/having accomplishments whereas I am not.

Note: N_negative SC = 1,789, N_no negative SC = 3,192
I assigned scores 1-5 respectively to *strongly disagree*, *somewhat disagree*, *neither disagree nor agree*, *somewhat agree*, *strongly agree*. “I feel left out” and “I feel bad most of the time” are reversed coded.
For brevity, I followed common practice to treat these variables as continuous rather than ordinal categorical variables.

WE USE AN **EXPERIMENT** TO TEST IF **PRIMING** PEOPLE THEIR PAST SOCIAL COMPARISON EXPERIENCES MAY AFFECT WELLBEING

Survey takers are randomly put into two groups, where the **question order** is flipped

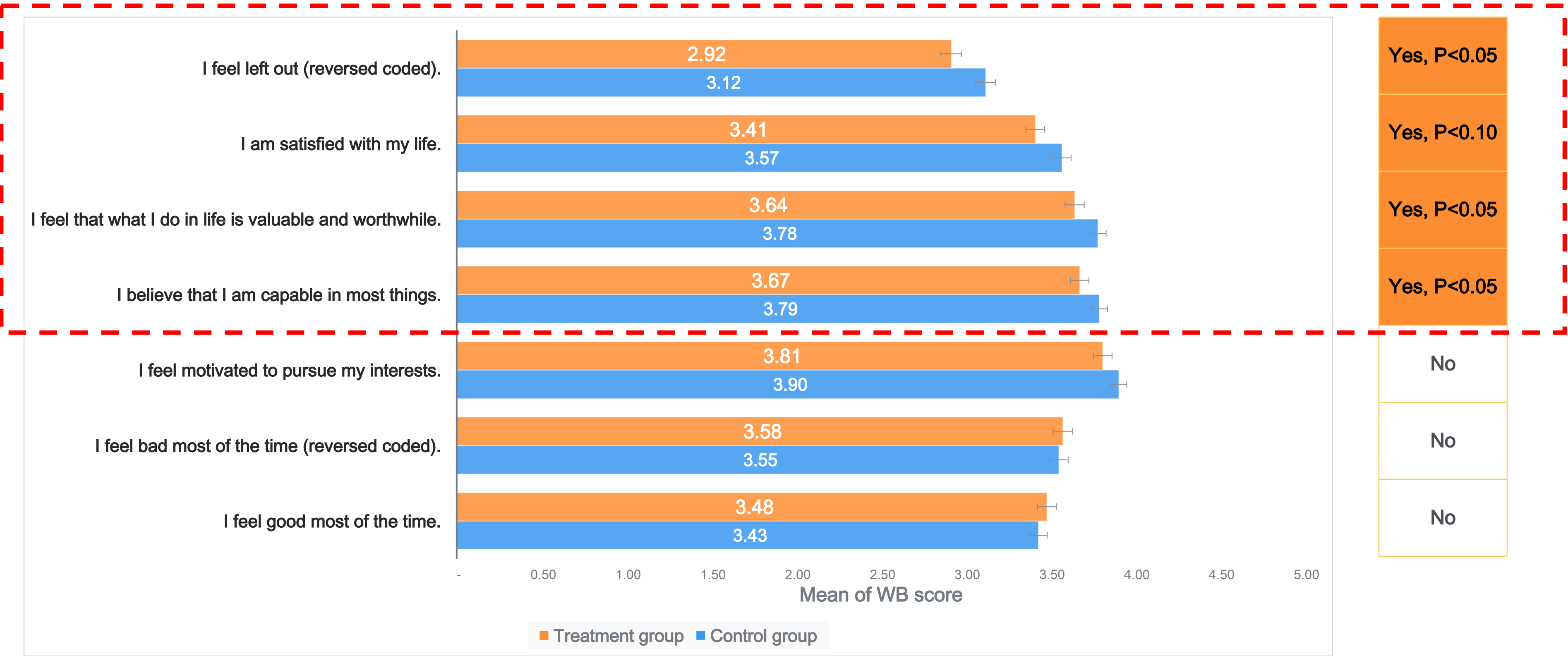
Experiments can test whether social comparison **causes** lowered wellbeing or is only **associated** with it



EXPERIMENT SHOWS AT LEAST SOME OF THIS ASSOCIATION IS CAUSAL

How much do you agree or disagree with the following statements?

Wellbeing by experiment group



- **Priming** people their past negative social comparison experience results in lowered WB **measures 4 out of 7, but not across the board** as found in the previous slide. This suggests that relationship between social comparison and wellbeing may be **reciprocal**, i.e. people in poor WB do more social comparison, which return further lowers their WB.
- Note that the lowered WB scores shown left **are only due to priming**. It is reasonable to believe that the **actually experiencing** negative social comparison may have a **larger impact**

Note: N_treatment group= 846, N_control group= 943. Every respondent was put randomly into treatment or control group. The small sample size here is because these are only those who experienced negative social comparison on IG.

I assigned scores 1-5 respectively to *strongly disagree*, *somewhat disagree*, *neither disagree nor agree*, *somewhat agree*, *strongly agree*. "I feel left out" and "I feel bad most of the time" are reversed coded.

For brevity, I followed common practice to treat these variables as continuous rather than ordinal categorical variables.

4.3

IMPACT ON EMOTION

