

# **MBDS Capstone Project: Using Augmented Reality to Explore Shoppers' Perceptions**

**By Bingling Wang**



# Project Objective

**Design a pilot study to explore the use of the novel Augmented Reality (AR) tool.**

## **Goal 1: Reflect on the AR Tool**

- Is it a useful survey tool?
- How can it be improved?
- Future applications?

## **Goal 2: Answer Research Question**

What's the impact of the shopping environment on consumers' in-the-moment perceptions of the stores and the products?

# The Augmented Reality Tool

“AR is one part of the general area of mixed reality... an AR system:

- combines real and virtual objects in a real environment
- registers (aligns) real and virtual objects with each other, and
- runs interactively, in three dimensions, and in real time”

-- Krevelen & Poelman, 2010



# The Augmented Reality Tool

## Benefit 1: Real-World Environment

*“Imagine that you are in a supermarket...”*

## Benefit 2: In-Context Experiences

*“How did **the music** in the store impact your shopping behavior?”*



# Research Topic

**What's the impact of the shopping environment on consumers' perceptions of the stores and the products?**

## **Why use AR in this study?**

- Real-world environment
- In-context experience

## **Why is the topic important?**

- Brands, retailers, & consumers
- Investigate the environment as a whole

# Research Procedure

## 1. Recruit Participants

- Family-and-friends approach
- \$25 electronic VISA gift card



## 2. Informed Consent & Screener

- Demographic information
- Compatibility check



## 3. Introduction Email

- Detailed instructions
- Survey link



## 4. Survey

- Walmart & Target
- By Nov. 24th

# Survey Flow

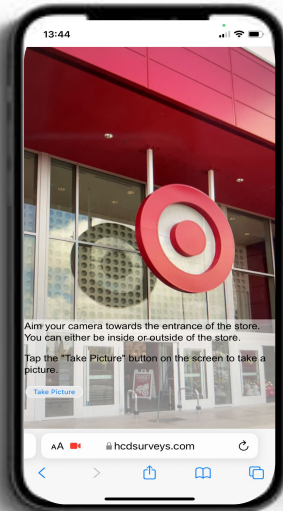


**Pre-shopping  
perception of the store**

**Store Entrance**

**Products**

**Store Entrance**



Aim your camera towards the entrance of the store.

Tap the “Take Picture” button on the screen to take a picture.

# Survey Flow



**Pre-shopping  
perception of the store**

**Store Entrance**

**Products**

**Store Entrance**



Rate how you feel right now about the store.

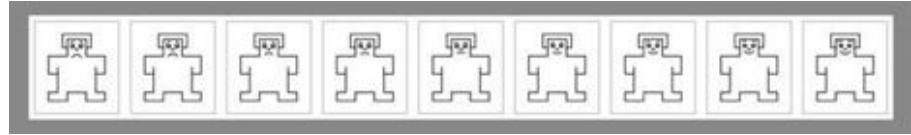
Survey tool: Self Assessment Manikin (SAM)



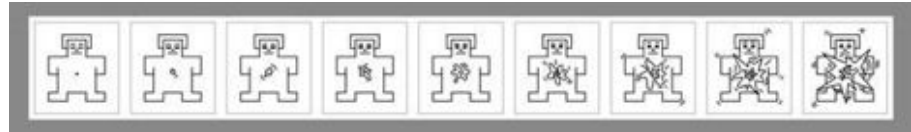
# Survey Tool: SAM



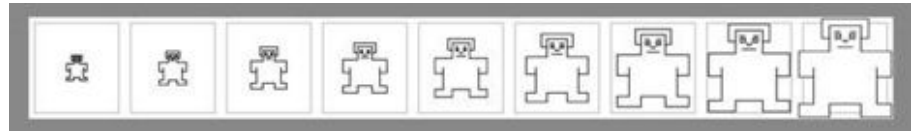
## Sad - Happy (Valence)



## Calm - Excited (Arousal)



## Controlled - In-Control (Dominance)



Bradley, M. M., & Lang, P. J. (1994). Measuring emotion: the self-assessment manikin and the semantic differential. *Journal of behavior therapy and experimental psychiatry*, 25(1), 49-59.

# Survey Flow



Rate how you feel right now about the product.

1. Bounty Select-A-Size Paper Towels, White, 6 Triple Rolls



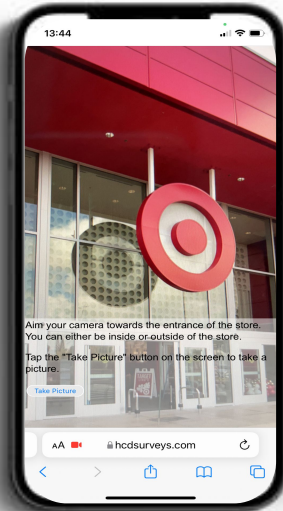
2. Noosa Blueberry Whole Milk Yogurt, 8oz



3. Burt's Bees Beeswax Lip Balm with Vitamin E & Peppermint, 1 Tube



# Survey Flow

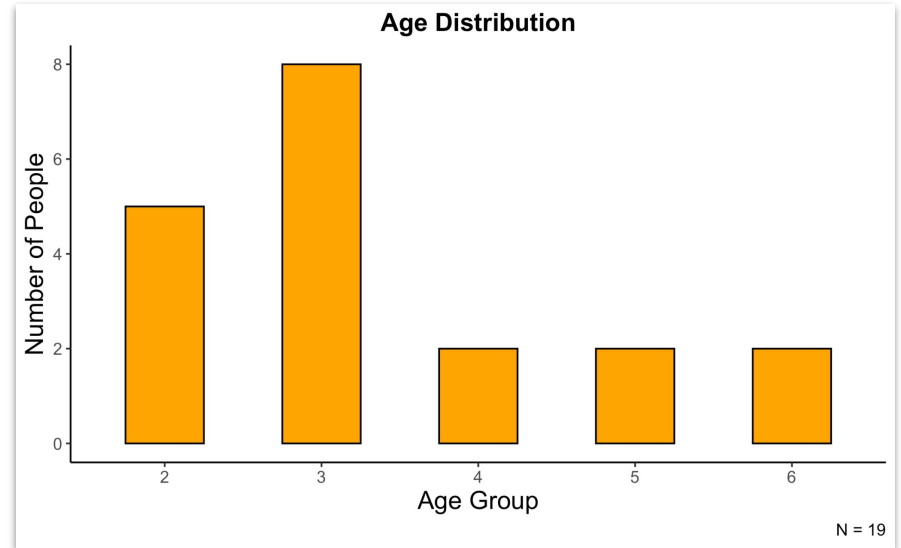


Rate how you feel right now about the store.

- Satisfied in-store experience?
- Comfortable in-store experience?
- Ease of finding?
- Pleasant to find?
- Willingness to purchase?

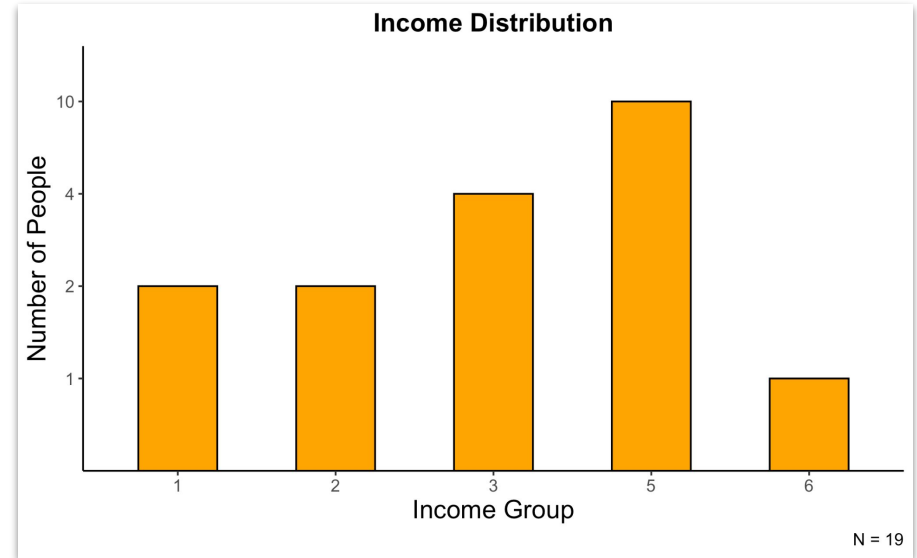
# Demographic Information

- Recruited 30 participants
- 19 of them completed the survey
- Avg. time spent at Walmart = 20.9 mins
- Avg. time spent at Target = 17.5 mins



# Demographic Information

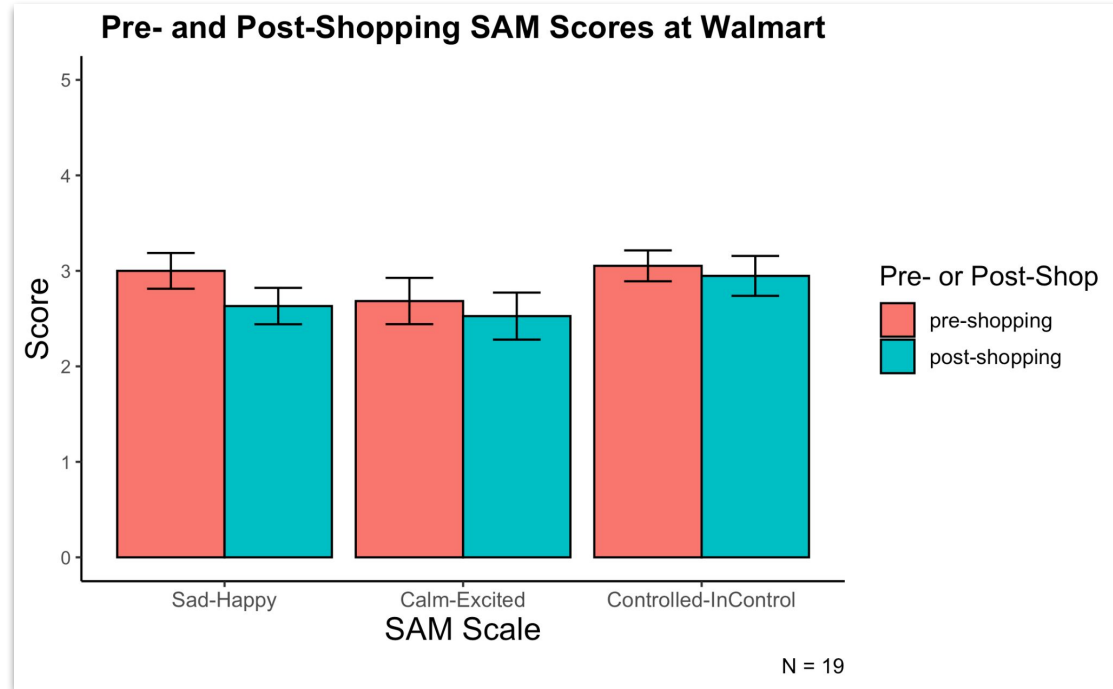
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# Perception of Store Experience: Walmart

*“Did Jane’s shopping experience at Walmart change her feelings about Walmart?”*

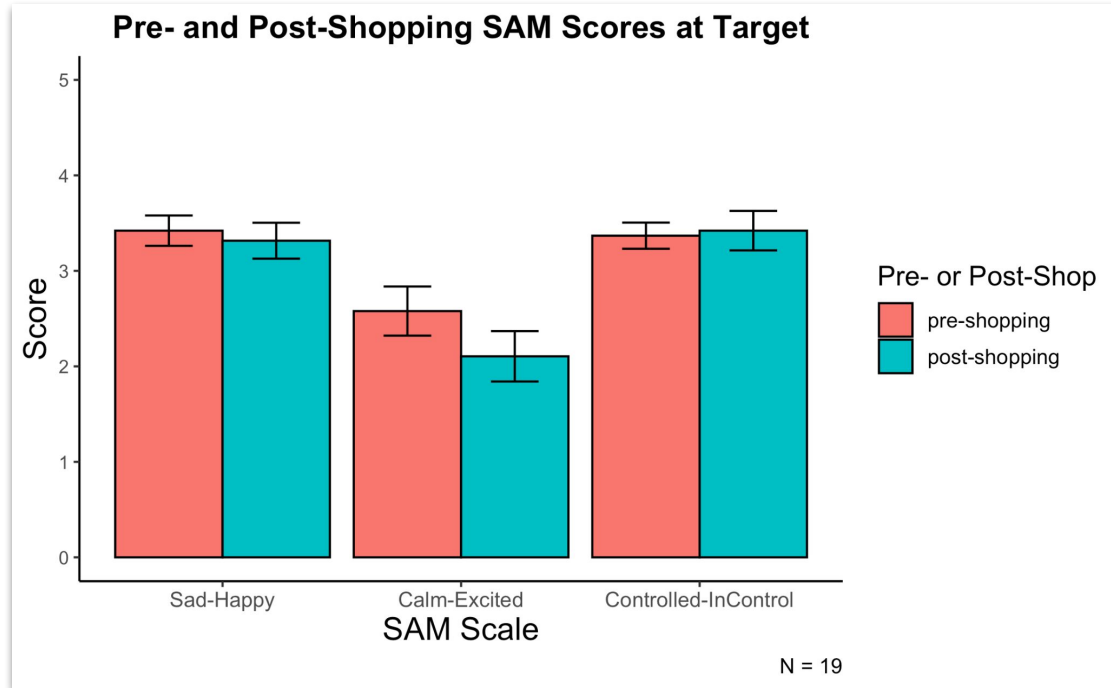
- The shopping experience made shoppers feel **less happy, less excited, and less in control.**



# Perception of Store Experience: Target

*“Did Jane’s shopping experience at Target change her feelings about Target?”*

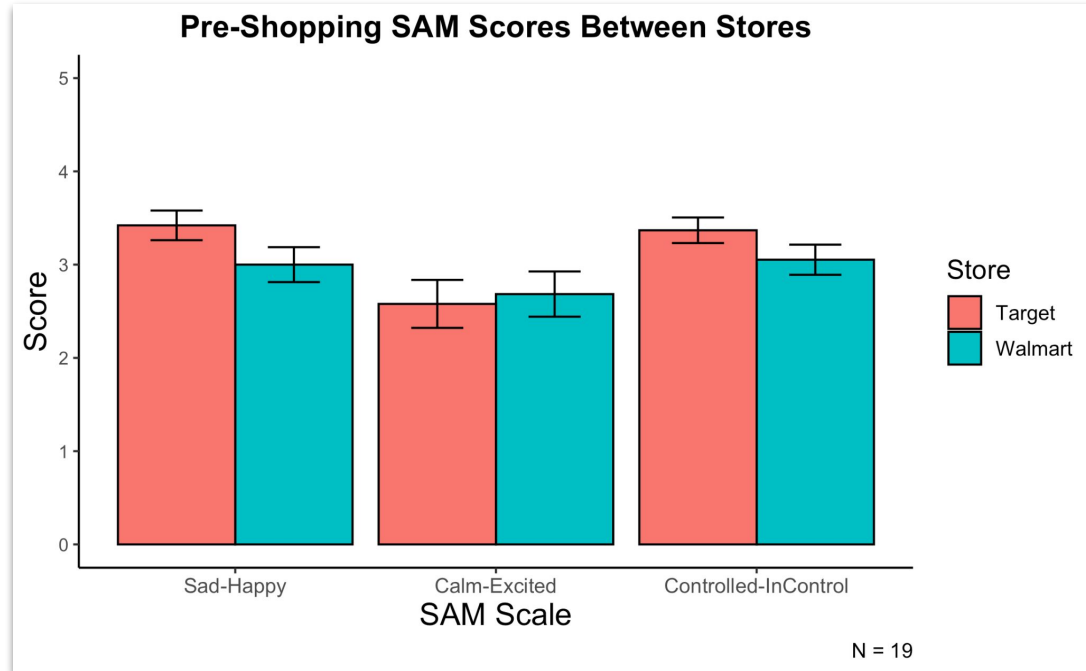
- The shopping experience made shoppers feel **less happy** and **less excited**.
- The shopping experience made shoppers feel **more in control**.



# Perception of Store Experience: Walmart vs. Target

*“Did Jane’s feeling about Walmart differ from her feeling about Target **before** she started shopping?”*

- Before shopping, shoppers at Target feel **happier** and **more in control** than at Walmart.
- Before shopping, shoppers at Walmart feel **more excited** than at Target.

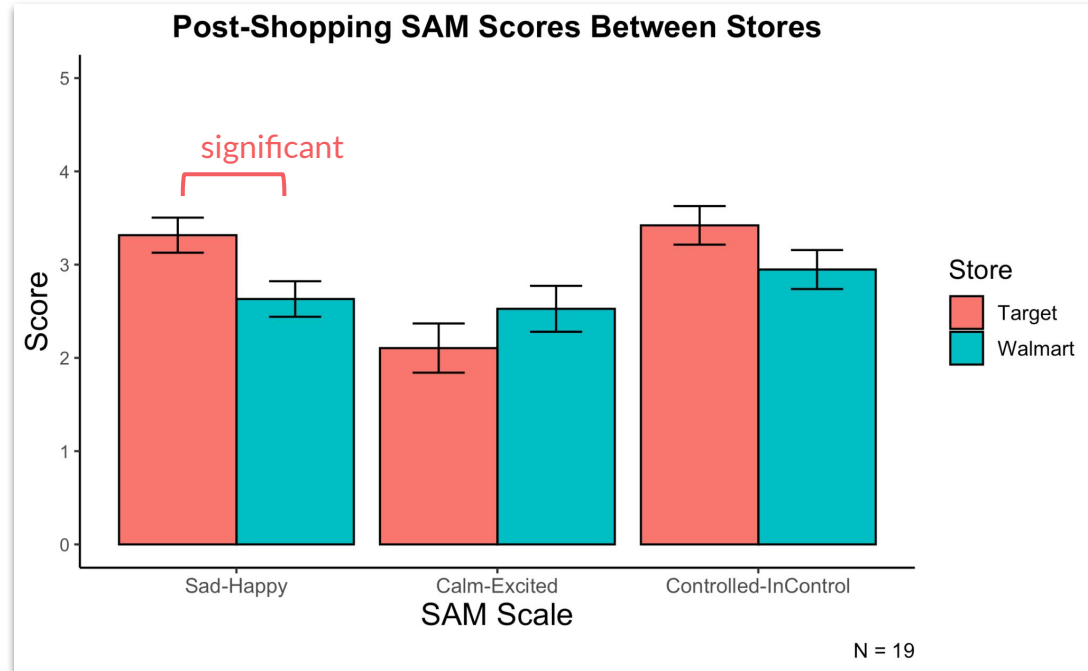




# Perception of Store Experience: Walmart vs. Target

*“Did Jane’s feeling about Walmart differ from her feeling about Target **after** she started shopping?”*

- After shopping, shoppers at Target feel **happier** and **more in control** than at Walmart.
- After shopping, shoppers at Walmart feel **more excited** than at Target.

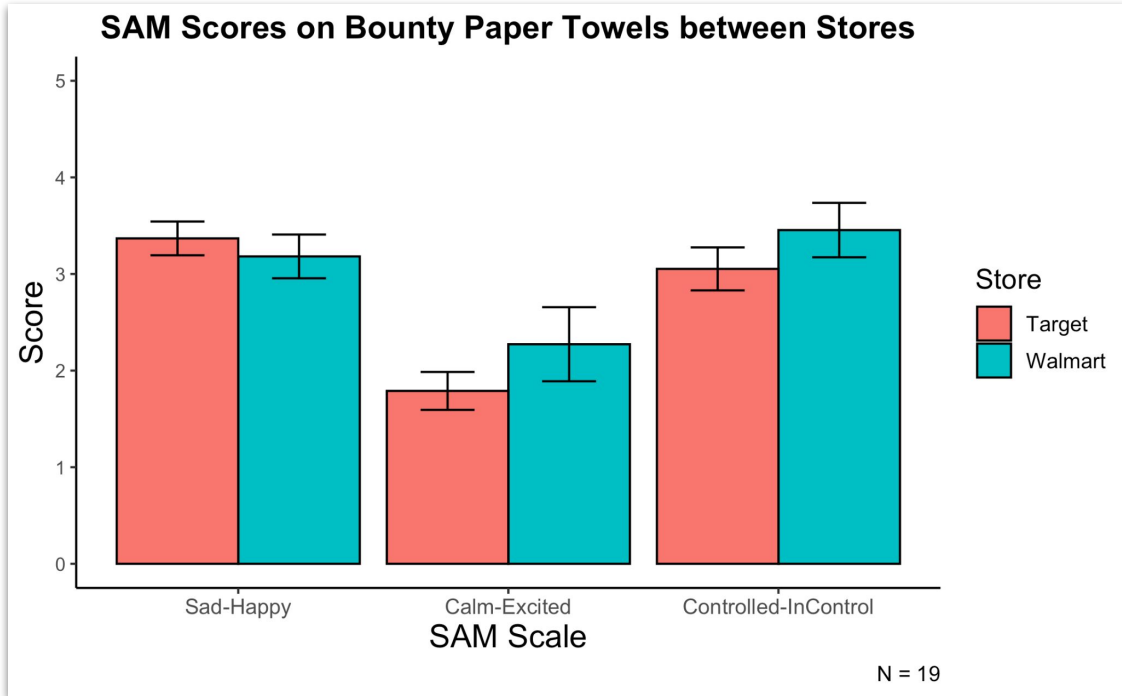


# Perception of Products: Bounty Paper Towels



*“Was Jane’s feeling about Bounty Paper Towels in Target different from that in Walmart?”*

- Shoppers at Target feel **happier** about the product than at Walmart.
- Shoppers at Walmart feel **more excited** and **in control** about the product than at Target.

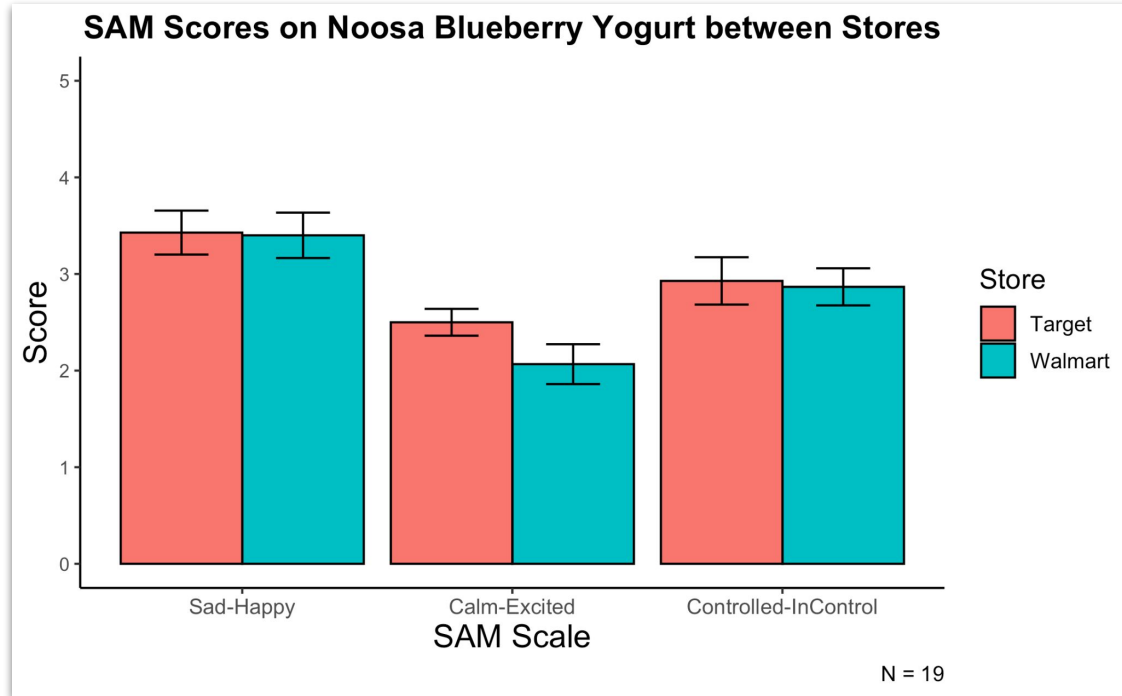


# Perception of Products: Noosa Yogurt



*“Was Jane’s feeling about Noosa Yogurt in Target different from that in Walmart?”*

- Shoppers at Target feel **happier**, **more excited**, and **more in control** about the product than at Walmart.

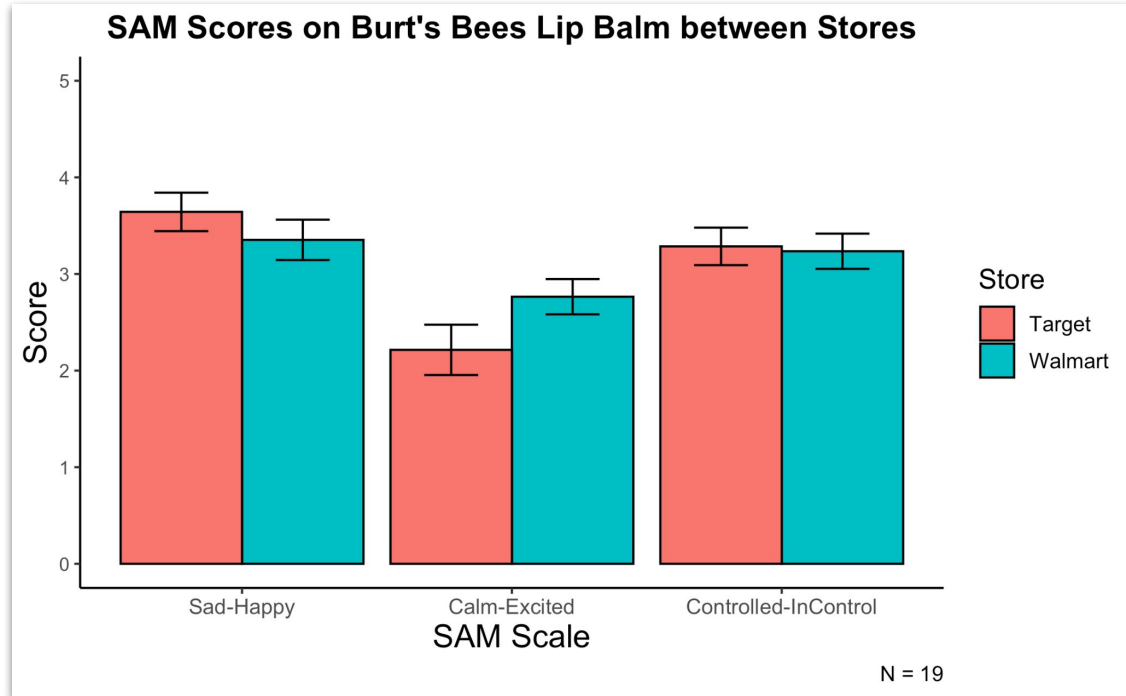


# Perception of Products: Burt's Bees Lip Balm



*“Was Jane’s feeling about Burt’s Bees Lip Balm in Target different from that in Walmart?”*

- Shoppers at Target feel **happier** and **more in control** about the product than at Walmart.
- Shoppers at Walmart feel **more excited** about the product than at Target.



# Linear Regression: What Explains the Emotions?

## DV1: Sad-Happy

- + Noosa Yogurt
- + Purchase likelihood
- + Pre-shop Controlled-InControl
- + Post-shop Sad-Happy
- Easy to find the product
- Total time spent on survey
- Pleasant to find the product

## DV2: Calm-Excited

- + Familiarity with the product
- Pre-shop Calm-Excited
- Price is about right (-1.94)
- Price is too high (-2.03)
- Familiarity with Walmart

## DV3: Controlled-In-Control

- + Pre-shop Calm-Excited
- + Income group 30k - 50k
- + Purchase Likelihood
- Actual price of the product

Product type only matters to the emotion dimension of **valance**.

# Linear Regression: What Explains the Emotions?

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The emotional dimensions can influence one another across time.

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- + Pre-shop Calm-Excited
- + Income group 30k - 50k
- + Purchase Likelihood
- Actual price of the product

Shoppers' perceptions of the product's price only affect the emotion dimension of **arousal**.

# Study Limitations

## Doing Surveys in the Field

There is a trade-off between study design and costs of recruiting.

- Within- or between-subject
- Store location

## Timing of the Study

Avoid executing the study at times that may change the shopping experience.

- Holiday seasons vs. other time of the year
- Covid concern

## Survey Instructions

Provide clearer survey instructions that accommodate more situations.

- Rules for unexpected conditions



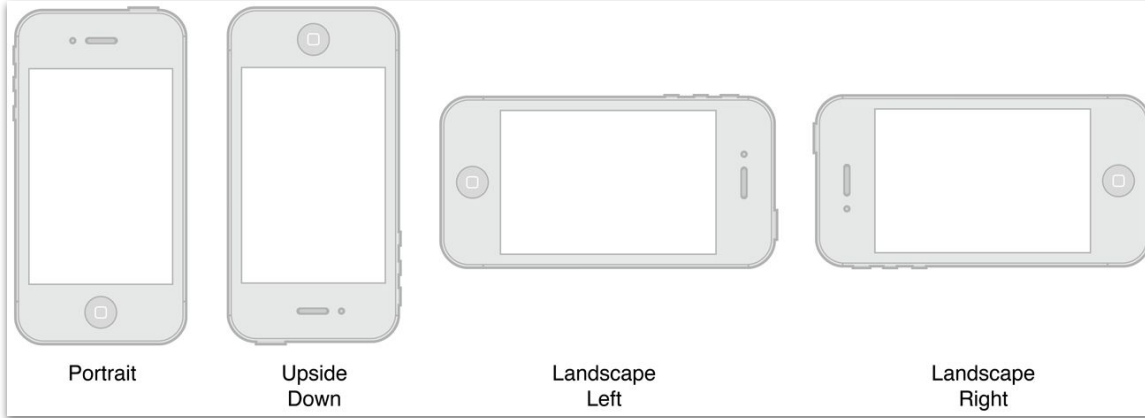
# Reflect on the AR Tool

## Doing Surveys on Smartphones

Limitations

Solutions

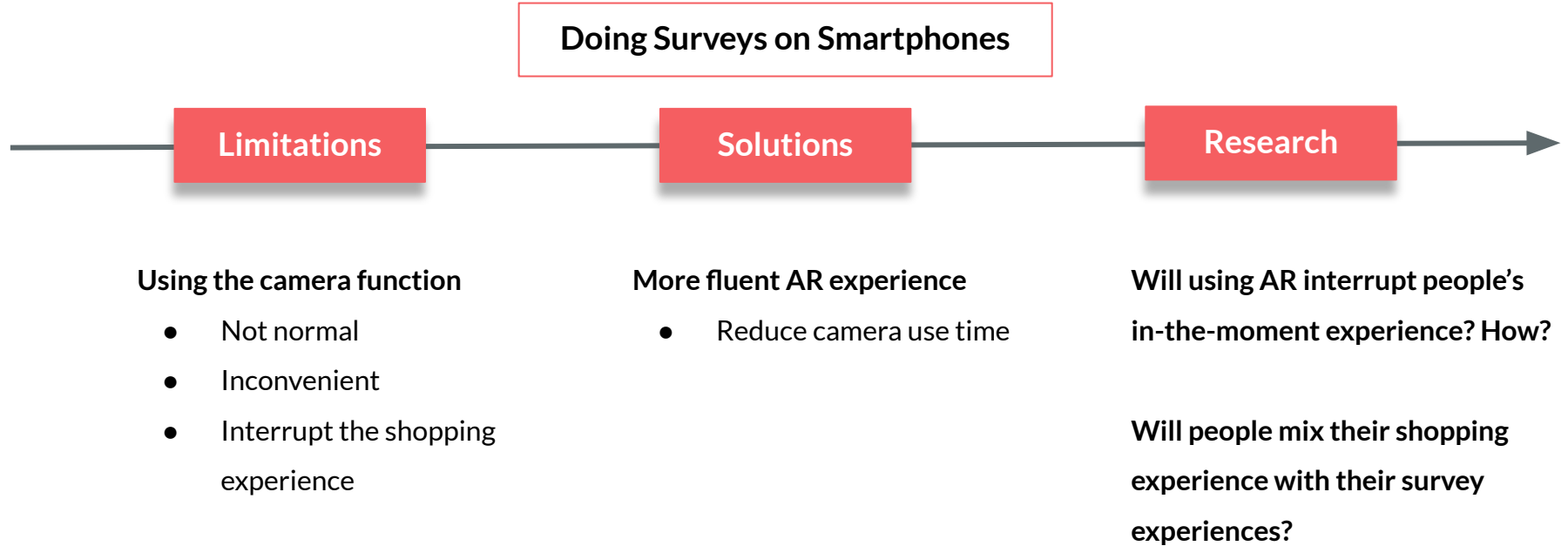
Research



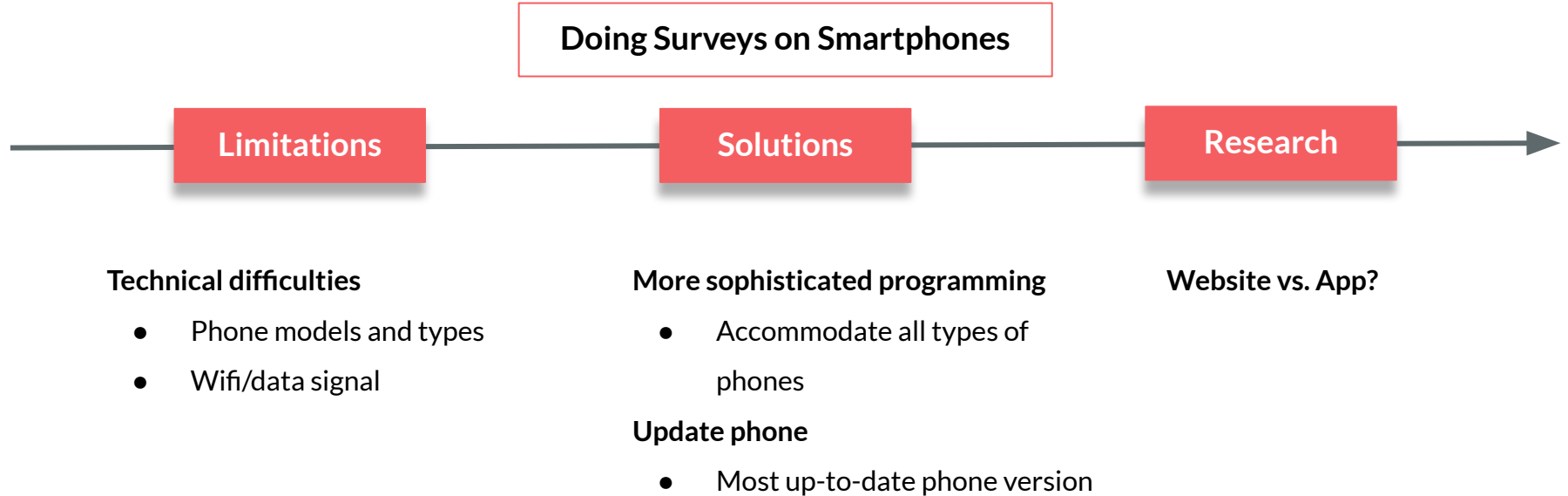
### Landscape vs. Portrait?

- More information per page
- People's phone use habit
- Convenience

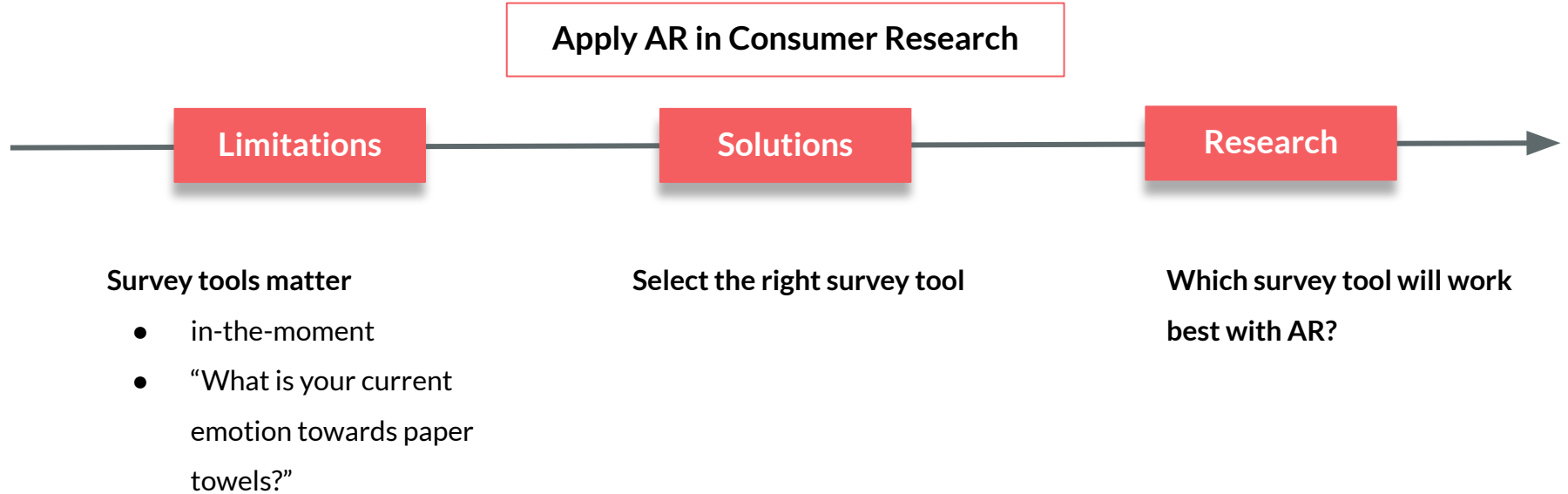
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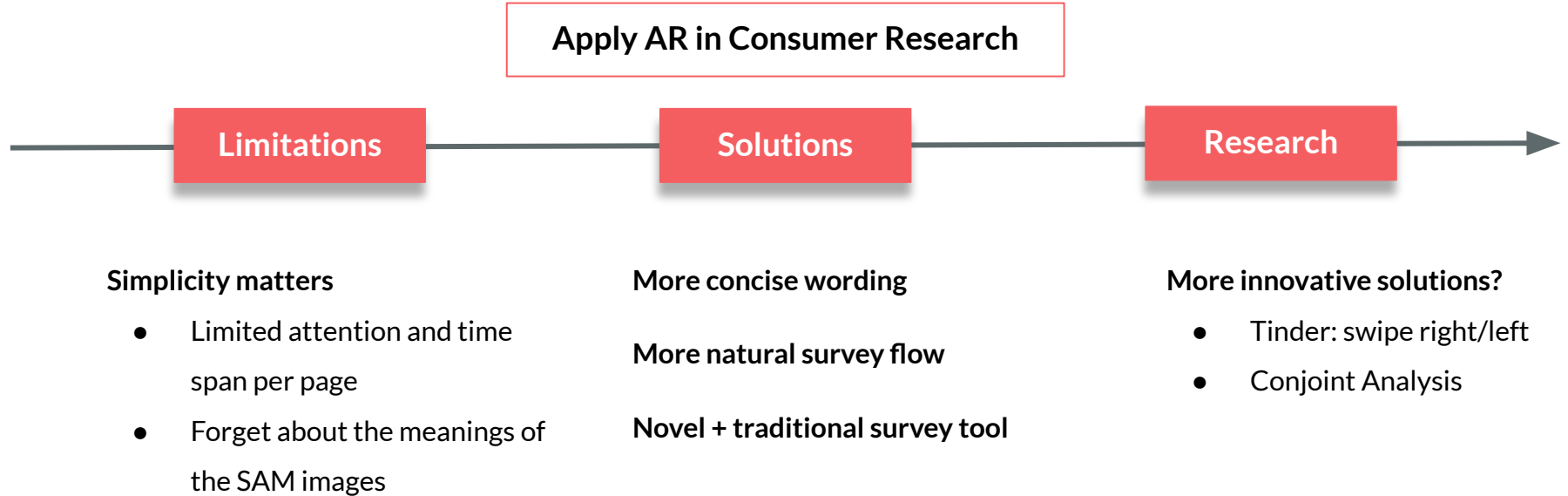
# Reflect on the AR Tool



# Reflect on the AR Tool



# Reflect on the AR Tool



# Conclusion



## Research on Shoppers' Perception

### Key Research Findings

- Shoppers' emotional states went downward after their shopping.
- People in general felt more positive about Target than Walmart.
- Product type only matters to emotional valence.
- The emotional dimensions can influence one another across time.
- The product's perceived price only affect emotional arousal.

## Test and Validate the use of AR

### Study Limitations & Improvements

- There is a trade-off between study design and costs of recruiting.
- Avoid executing the study at times that may change the shopping experience.
- Provide clearer survey instructions that accommodate more situations.

# Conclusion



## Research on Shoppers' Perception

### Identified Issues with AR

- Doing surveys on smartphones
  - Phone screen
  - Camera function
  - Technical difficulties
- Apply AR in consumer research
  - Survey tool
  - Simplicity

## Test and Validate the use of AR

### Future Research on AR

- Landscape vs. portrait orientation?
- Will AR help better identify or interrupt the customer experience?
- Will people mix their shopping experience with their survey experiences?
- Which survey tool works best with AR?
- Any innovative solution to simplify the process of using AR for the participants?

***Thank you for listening!***

***A big shout-out to Michelle, Kathryn,  
Pat, and Cara!***

***Any questions?***