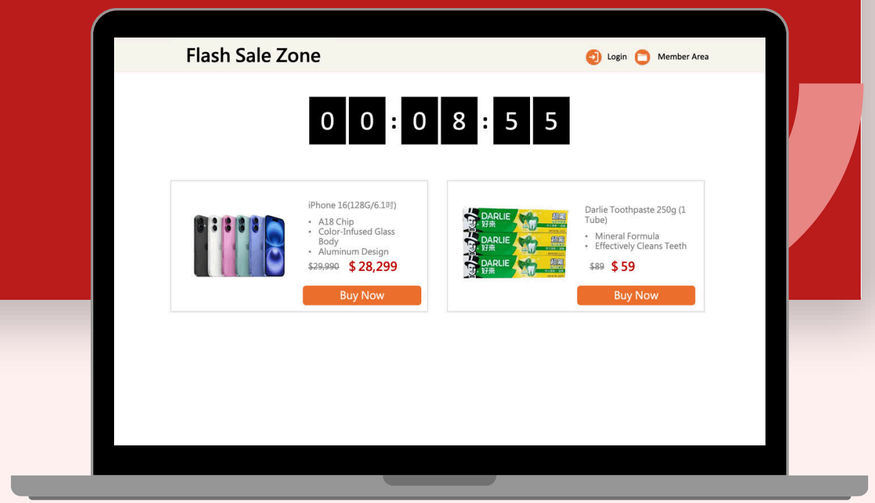
MARKETING RESEARCH

THE IMPACT OF **COUNTDOWN TIMER** ON **PURCHASE WILLINGNESS**

Group 5 | Final Presentaiton



Outline

01 Motivation&Hypothesis

02 Methods

03 Data Cleaning

04 Data Analysis

- Descriptive statistics
- Statistical inferences: Mediation analysis, Logistic Regression

05 Data Insight

Outline

01 **Motivation&Hypothesis**

02 Methods

03 Data Cleaning

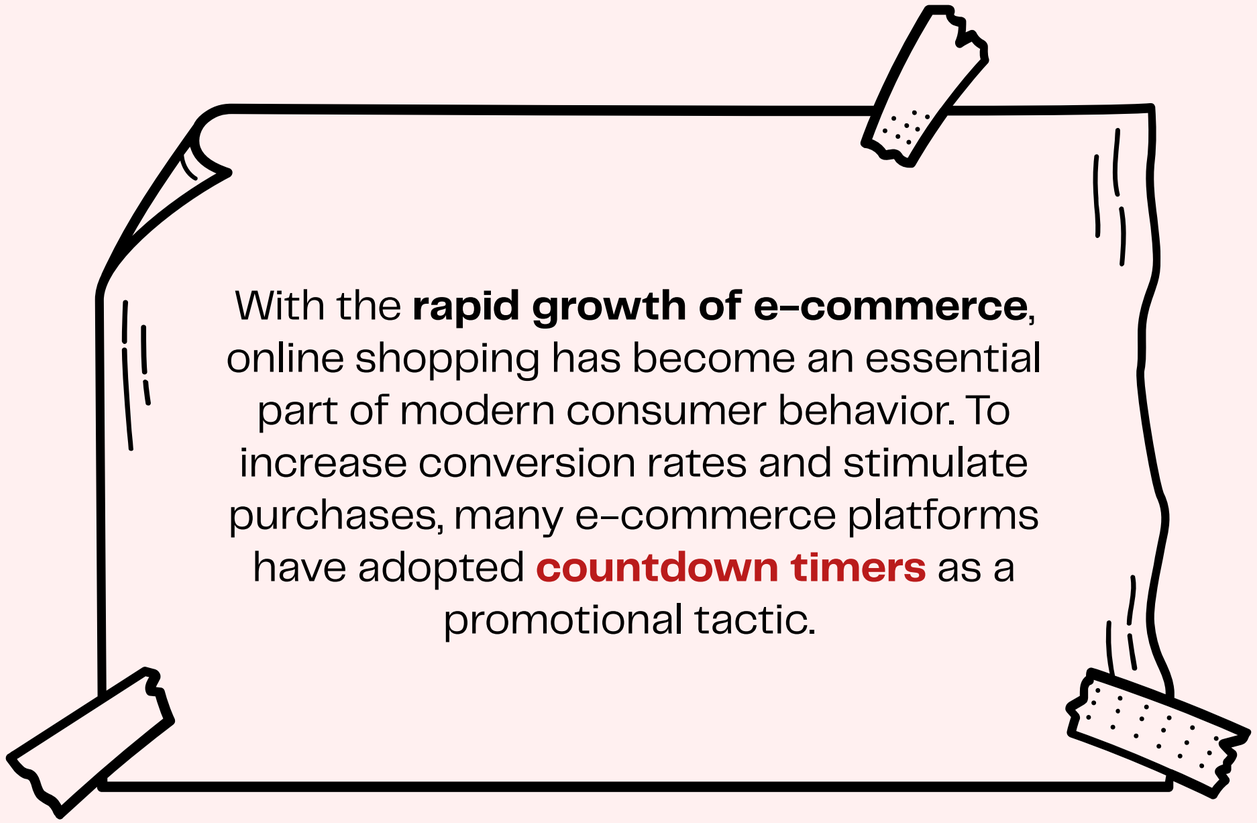
04 Data Analysis

- Descriptive statistics
- Statistical inferences: Mediation analysis, Logistic Regression

05 Data Insight

Research Motivation

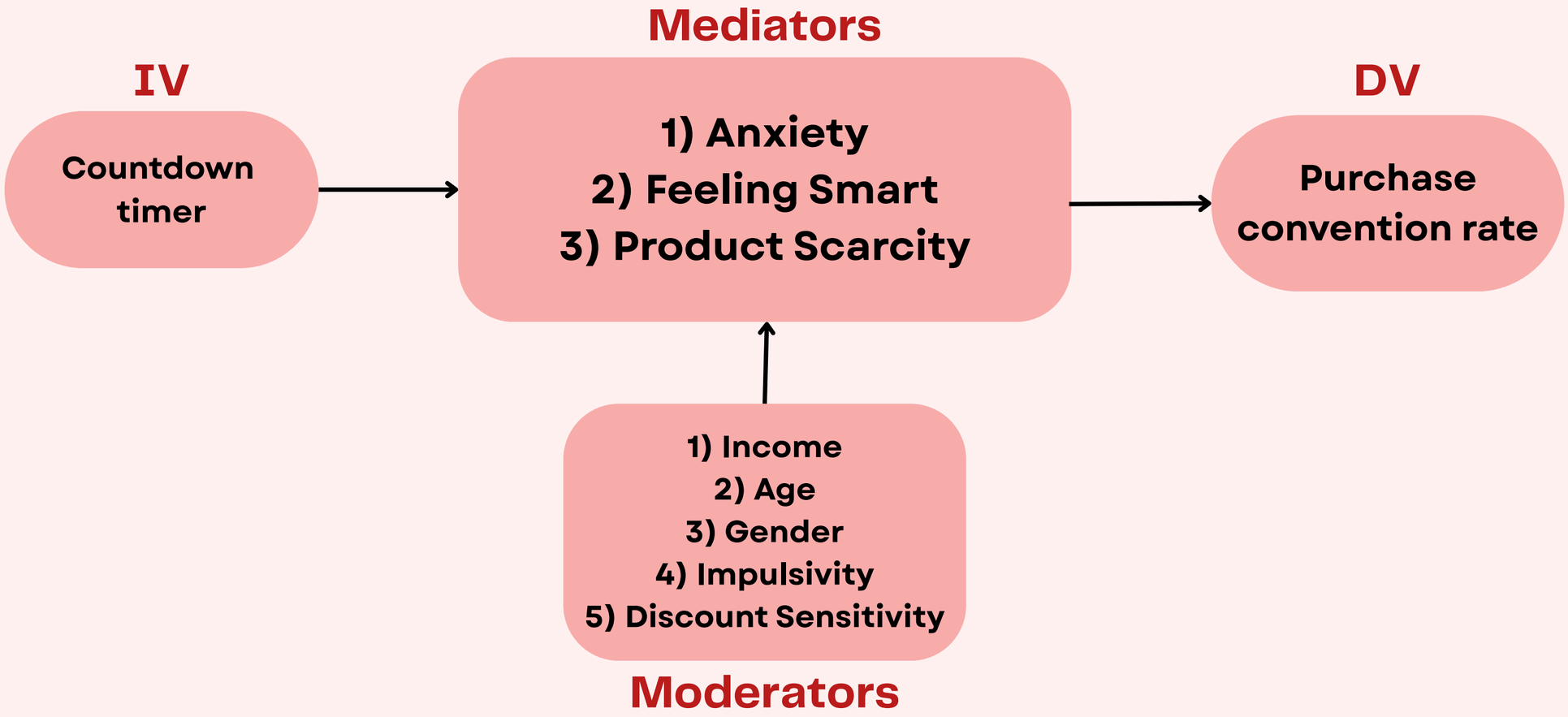
Do countdown promotions truly influence consumer purchase behavior?



With the **rapid growth of e-commerce**, online shopping has become an essential part of modern consumer behavior. To increase conversion rates and stimulate purchases, many e-commerce platforms have adopted **countdown timers** as a promotional tactic.

Emotional & Behavioral Factors	Cognitive Factors
Anxiety	Feeling Smart
Impulsive Buying Tendencies	Product Involvement
Perceived Product Scarcity	Sensitivity to Discounts

Variables' box - arrow plot



Research Question & Hypothesis

Research Question

1) Do limited-time promotions truly enhance conversion rates?

2) How do time pressure from countdown timers influence consumer purchasing behavior, and how are these effects

- **mediated by psychological factors**
- **moderated by individual differences**

Research Question & **Hypothesis**

1 Main effect to IV and DV

- **Null Hypothesis (H_{01}):** Limited time won't affect the willingness to purchase decision
- **H1a:** Limited time **increases** the desire to make a purchase decision
- **H1b:** Limited time **decreases** the desire to make a purchase decision

Research Question & **Hypothesis**

2 Mediator Hypothesis

1) Anxiety
2) Feeling Smart
3) Product Scarcity

H_0 :There is no mediating effect of feeling smart, anxiety, or perceived product scarcity on the relationship between countdown timer presence and purchase intention.

- **Smart**
  - **H2a**: The countdown timer **increases** consumers' sense of **feeling smart**, which in turn **increases** their likelihood of purchase.
- **Anxiety**
  - **H2b:** The countdown timer **raises consumers' anxiety**, which in turn **decrease their likelihood of purchase.**
- **Product Scarcity**
  - **H2c:** The presence of a countdown timer **increases the perceived scarcity of the product**, which boosts the urgency to purchase.

Research Question & **Hypothesis**

3 **Moderation Hypothesis**

1) Income
2) Age
3) Gender
4) Impulsivity
5) Discount Sensitivity

- **Age**
  - **H_0:** Age does not moderate the effect of countdown timers on anxiety.
  - **H3a:** The impact of **countdown timers on anxiety** is stronger among **younger** consumers than older ones.
- **Income**
  - **H_0:** Income does not moderate the effect of countdown timers on purchase intention.
  - **H3b :** The influence of **countdown timers on purchase** intention is **stronger** among **lower-income** consumers due to higher price sensitivity.

Research Question & **Hypothesis**

3 **Moderation Hypothesis**

1) Income
2) Age
3) Gender
4) Impulsivity
5) Discount Sensitivity

- **Gender**
  - **H_0:** Gender does not moderate the relationship between countdown timers and perceived product scarcity.
  - **H3c:** The relationship between countdown timers and perceived product scarcity differs by gender, with females perceiving greater urgency than males.

Research Question & **Hypothesis**

3 **Moderation Hypothesis**

1) Income
2) Age
3) Gender
4) Impulsivity
5) Discount Sensitivity

- **Impulsivity & Discount sensitivity**
  - **H_0: Impulsivity & Discount sensitivity** does not moderate the effect of countdown timers on anxiety or product scarcity perception.
  - **H3d (Impulsivity as Moderator):** Consumers with high impulsivity levels are more affected by countdown timers in terms of anxiety and product scarcity perception.
  - **H3e (Discount Sensitivity as Moderator):** The relationship between countdown timers and the feeling of making a “smart deal” is stronger among consumers with high discount sensitivity.

Outline

01 Motivation&Hypothesis

02 **Methods**

03 Data Cleaning

04 Data Analysis

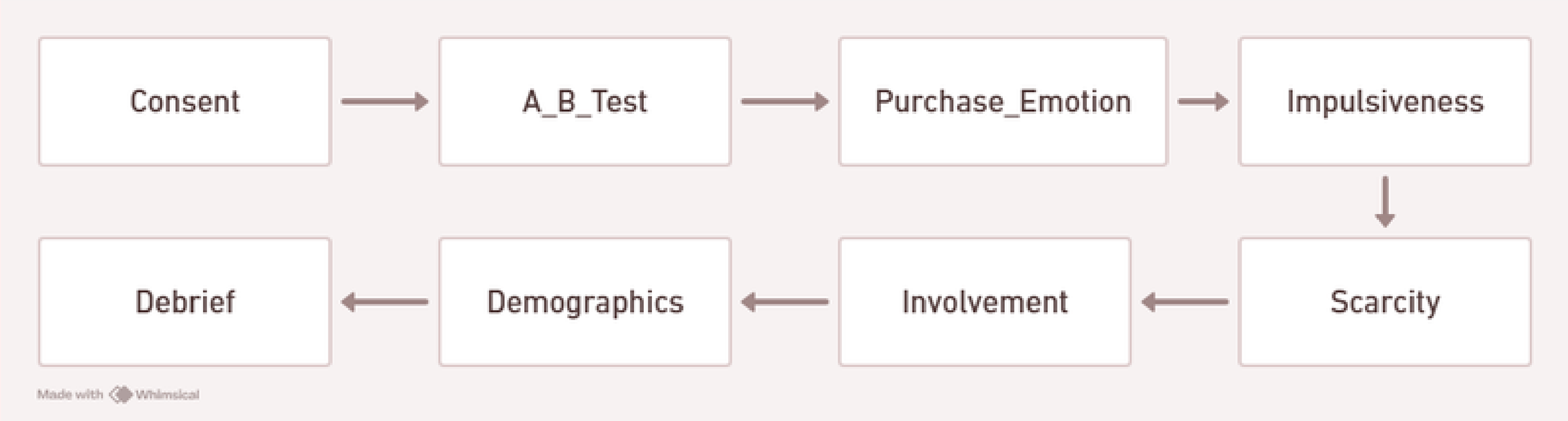
- Descriptive statistics
- Statistical inferences: Mediation analysis, Logistic Regression

05 Data Insight

Survey Design

“How the survey was designed”

- **Platform: Google Forms**
- **Structure: 8 structured sections**



Sampling & Distribution Survey Summary

2025

May, when survey was conducted

15–62

Age range of respondents

3

Countries (Taiwan • Thailand • US)

Forums

Distributed via NCCU

500

Incentive via lottery(NTD)

183

Valid responses

Attention check

(“Did you notice the countdown timer...?”)

Outline

01 Motivation&Hypothesis

02 Methods

03 **Data Cleaning**

04 Data Analysis

- Descriptive statistics
- Statistical inferences: Mediation analysis, Logistic Regression

05 Data Insight

Analysis & results

Use verification questions to validate data

	Total Sample	Valid Sample
Group A (With Countdown Timer)	89	**86**
Group B (Without Countdown Timer)	137	**97**
Total Size	226	**183**

Validation

We use verification questions to assess the authenticity of the responses.

In questionnaires that display a clock, we ask whether you saw a clock; in those that do not display a clock, we ask the opposite.

Analysis & results

Filling missing value with mean/median/mode

For Q19, Q20

For two Likert-scale questions (1–5), we used the **mean** to impute missing values.

Because Likert scales are often treated as interval data, and the mean preserves the central tendency.

For Age

For age, we used the **median** since it better represents the center in skewed distributions and is less affected by outliers.

For Gender

For gender (1/0), we used the **mode** to maintain the categorical nature of the variable and reflect the most common group.

Outline

01 Motivation&Hypothesis

02 Methods

03 Data Cleaning

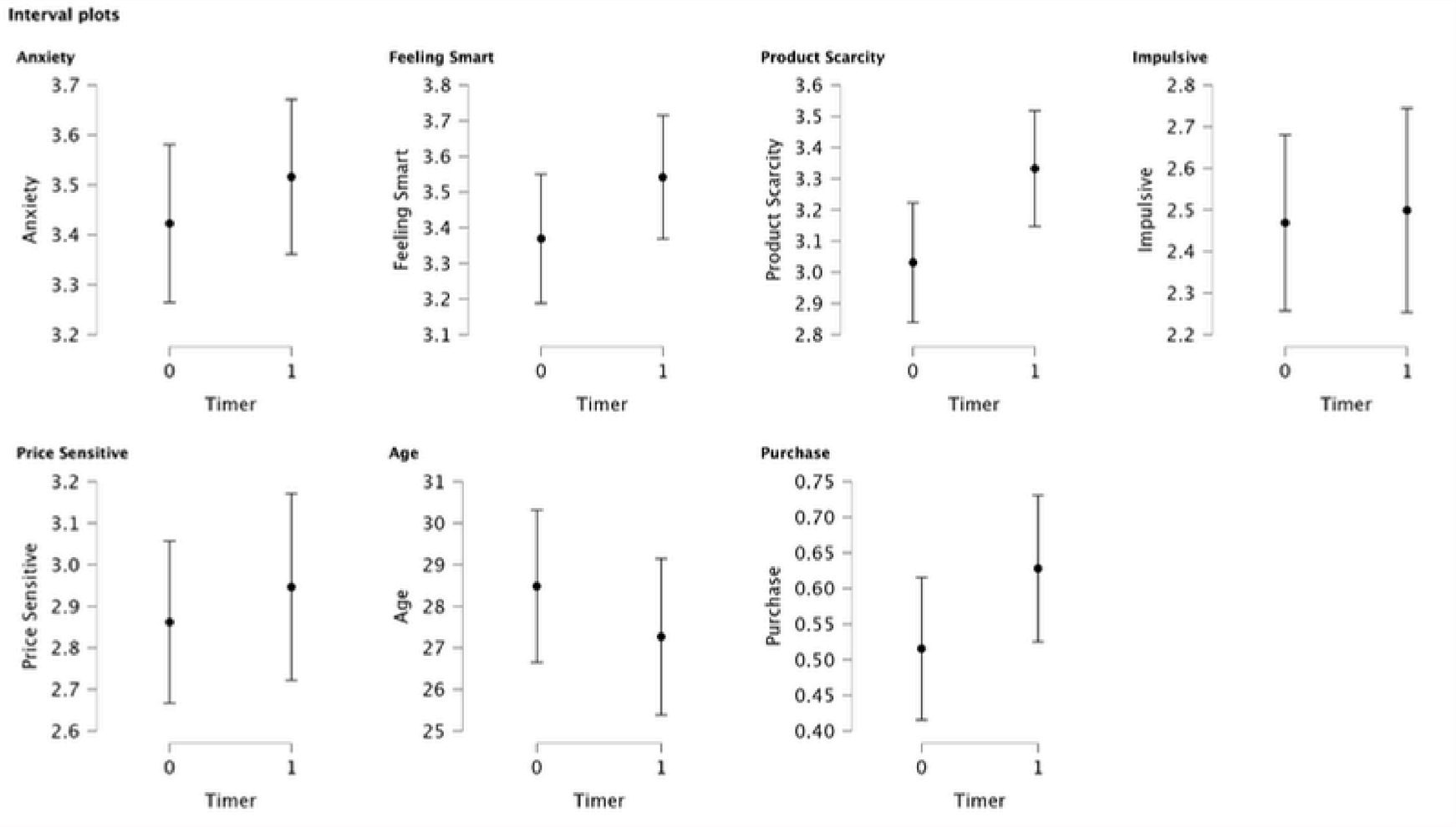
04 Data Analysis

- **Descriptive statistics**
- Statistical inferences: Mediation analysis, Logistic Regression

05 Data Insight

Analysis & results

Difference between A/B group



Analysis & results

Reliability & Correlation Analysis

Cronbach's alpha	Coefficient α
Feeling Smart	0.833
Impulsive Buying Tendencies	0.875
Perceived Product Scarcity	0.814
Sensitivity to Discounts and Promotions	0.793

Pearson's Correlation	Pearson's R	P-Value
Anxiety	0.609	<0.001

All four constructs have Cronbach's alpha coefficients exceeding the commonly accepted threshold of **0.70**, indicating that each scale demonstrates acceptable to good internal consistency.

Also, the Pearson correlation coefficient of the questions under Anxiety is **strong positive linear relationship** and is statistically significant at **$p < 0.001$**

Outline

01 Motivation&Hypothesis

02 Methods

03 Data Cleaning

04 Data Analysis

- Descriptive statistics
- **Statistical inferences: Chi-square test, Mediation analysis, Logistic Regression**

05 Data Insight

Relationship between Timer and Purchase

Purchase Willingness between two groups are NOT significantly different.

Contingency Tables

Contingency Tables

	Purchase		
Timer	0	1	Total
0	47	50	97
1	32	54	86
Total	79	104	183

Note. Each cell displays the observed counts

Chi-Squared Tests

	Value	df	p
X^2	2.349	1	0.125
N	183		

Chi-square test

- The chi-square test: **p-value of 0.125** (not significant)
- No statistically significant difference in purchase willingness between the two groups.
- The observed variation in purchase behavior is likely due to random chance rather than a meaningful effect.

Mediation Analysis

Product Scarcity Has significant mediation effect

Mediation Analysis

- Direct Effect: Estimate = 0.046, p = 0.500 (not significant)
- **Indirect Effect: Estimate = 0.067, p = 0.037 (significant)**
- Total Effect: Estimate = 0.112, p = 0.123 (not significant)

- Although the timer does not directly influence purchase behavior, it significantly increases perceived product scarcity, which in turn enhances the likelihood of purchase.
- This indicates the presence of a significant indirect pathway.

Path coefficients

							95% Confidence Interval	
			Estimate	Std. error	z-value	p	Lower	Upper
Product Scarcity	→	Purchase	0.222	0.031	7.209	< .001	0.157	0.278
Timer	→	Purchase	0.046	0.067	0.675	0.500	−0.082	0.183
Timer	→	Product Scarcity	0.302	0.137	2.207	0.027	0.035	0.571

Mediation Analysis

Anxiety has NO significant mediation effect

Mediation Analysis

- Direct Effect: Estimate = 0.104, p = 0.154 (not significant)
- Indirect Effect: Estimate = 0.008, p = 0.450 (not significant)
- Total Effect: Estimate = 0.112, p = 0.123 (not significant)

- **The mediation effect does not hold.**
- Although Anxiety positively influences purchase behavior, Timer does not effectively induce this emotion.
- Timer may not be a strong predictive factor.

Path coefficients

							95% Confidence Interval	
			Estimate	Std. error	z-value	p	Lower	Upper
Anxiety	→	Purchase	0.086	0.043	2.002	0.045	−0.002	0.167
Timer	→	Purchase	0.104	0.073	1.425	0.154	−0.040	0.250
Timer	→	Anxiety	0.094	0.114	0.824	0.410	−0.123	0.325

Mediation Analysis

Feeling Smart has NO significant mediation effect

Mediation Analysis

- Direct Effect: Estimate = 0.065, p = 0.311 (not significant)
- Indirect Effect: Estimate = 0.048, p = 0.184 (not significant)
- Total Effect: Estimate = 0.112, p = 0.123 (not significant)

- **The mediation effect does not hold.**
- Although Feeling Smart significantly promotes purchase behavior, Timer does not effectively enhance this feeling.
- Timer may not function as a strong predictor through this psychological pathway.

Path coefficients

							95% Confidence Interval	
			Estimate	Std. error	z-value	p	Lower	Upper
Feeling Smart	→	Purchase	0.276	0.033	8.453	< .001	0.209	0.337
Timer	→	Purchase	0.065	0.064	1.014	0.311	−0.063	0.187
Timer	→	Feeling Smart	0.173	0.126	1.374	0.170	−0.081	0.414

Moderation Analysis-Logistic Regression

Moderation effect of Impulsivity is NOT supported

Model Fit：Model M_1 → Purchase：$\Delta X^2 = 34.233$，$p < 0.001$

Path	Estimate	p value	Odds Ratio	Results
Timer → Purchase	-0.651	0.468	0.522	Not significant, possibly decreases purchase
Impulsive → Purchase	0.643	**p < 0.005**	1.902	**Significant, increases Purchase Willingness**
Timer × Impulsive → Purchase	0.535	0.161	1.707	Not significant, no moderation effect
Intercept	-1.502	**p < 0.005**	0.223	**Significant, baseline Purchase Willingness is low**

- The overall model has significant explanatory power.
- **No moderation effect is supported.**
- Impulsive can directly increase Purchase, but it fails to significantly moderate the effect of Timer on Purchase.

Moderation effect of Discount Sensitive is NOT supported

Model Fit：Model M_1 → Purchase：$\Delta X^2 = 51.877$，$p < 0.001$

Path	Estimate	p value	Odds Ratio	Results
Timer → Purchase	0.344	0.783	1.410	Not significant
Discount Sensitive → Purchase	1.251	**p < 0.001**	3.492	**Significant, increases purchase likelihood**
Timer × Discount Sensitive → Purchase	0.076	0.864	1.079	Not significant, no moderation effect
Intercept	-3.483	**p < 0.001**	0.031	**Significant, baseline purchase rate is low**

- The overall model has significant explanatory power.
- **No moderation effect is supported.**
- Discount Sensitive directly increases Purchase, but it fails to significantly moderate the effect of Timer on Purchase.

Moderation Analysis-Logistic Regression

Moderation effect of Age is NOT supported

Model Fit：Model M_1 → Purchase：$\Delta X^2 = 6.371$，$p = 0.095$

Path	Estimate	p value	Odds Ratio	Results
Timer → Purchase	1.358	0.186	3.890	Not significant
Age → Purchase	0.045	0.064	1.046	**Not significant**
Timer × Age → Purchase	-0.031	0.384	0.969	Not significant, no moderation effect
Intercept	-1.205	0.088	0.300	Significant, baseline purchase rate is low

- **The overall model is not significant.**
- The relationship between Age, Timer and Purchase is not significant.
- Age neither directly and significantly affects purchasing behavior, nor effectively regulates the effect of Timer on purchase.

Moderation Analysis-Logistic Regression

Moderation effect of Gender is NOT supported

Model Fit：Model M_1 → Purchase：$\Delta X^2 = 6.371$，$p = 0.095$

Path	Estimate	p value	Odds Ratio	Results
Timer → Purchase	0.316	0.357	1.372	Not significant
Gender → Purchase	-0.076	0.884	0.927	Not significant
Timer × Gender → Purchase	0.571	0.438	1.770	Not significant, no moderation effect
Intercept	0.076	0.736	1.079	Significant, baseline purchase rate is low

- **The overall model is not significant.**
- The relationship between Gender, Timer and Purchase is not significant.
- Gender neither directly and significantly affects purchasing behavior, nor effectively moderates the effect of Timer on purchase.

Overall explanatory power of our variables

Explanatory power of the logistic regression model

Logistic regression model

Logistic Regression

Model Summary – Purchase

Model	Deviance	AIC	BIC	df	ΔX^2	p	McFadden R^2	Nagelkerke R^2	Tjur R^2	Cox & Snell R^2
M_0	250.266	252.266	255.475	182			0.000		0.000	
M_1	175.735	193.735	222.620	174	74.531	< .001	0.298	0.449	0.349	0.335

Note. M_1 includes Anxiety, Feeling Smart, Product Scarcity, Impulsive, Price Sensitive, Age, Gender(F:0/M:1), Timer

- The full model (M_1) significantly improves upon the baseline model (M_0), as indicated by a chi-square difference of $\Delta\chi^2 = 74.531$, $p < .001$.
- Pseudo R^2 values (e.g., McFadden $R^2 = 0.298$, Nagelkerke $R^2 = 0.449$)
- **Suggest that the model explains a moderate to substantial portion of the variance in purchase behavior.**

Overall explanatory power of our variables

Coefficients of the logistic regression model

Coefficients

Model		Estimate	Standard Error	Odds Ratio	z	Wald Test		
						Wald Statistic	df	p
M_0	(Intercept)	0.275	0.149	1.316	1.842	3.394	1	0.065
M_1	(Intercept)	−7.540	1.595	5.312×10^{-4}	−4.729	22.362	1	< .001
	Anxiety	−0.154	0.291	0.857	−0.530	0.281	1	0.596
	Feeling Smart	0.883	0.298	2.418	2.965	8.792	1	0.003
	Product Scarcity	0.282	0.298	1.326	0.948	0.899	1	0.343
	Impulsive	0.495	0.255	1.640	1.939	3.759	1	0.053
	Discount Sensitive	0.606	0.284	1.833	2.134	4.553	1	0.033
	Age	0.049	0.023	1.050	2.116	4.479	1	0.034
	Gender(F:0/M:1) (1)	0.475	0.453	1.608	1.049	1.101	1	0.294
	Timer (1)	0.511	0.385	1.667	1.326	1.757	1	0.185

Note. Purchase level '1' coded as class 1.

Overall explanatory power of our variables

Explanatory power of the logistic regression model

logistic regression model

Logistic Regression

Model Summary – Purchase

Model	Deviance	AIC	BIC	df	ΔX^2	p	McFadden R^2	Nagelkerke R^2	Tjur R^2	Cox & Snell R^2
M_0	250.266	252.266	255.475	182			0.000		0.000	
M_1	175.735	193.735	222.620	174	74.531	< .001	0.298	0.449	0.349	0.335

Note. M_1 includes Anxiety, Feeling Smart, Product Scarcity, Impulsive, Price Sensitive, Age, Gender(F:0/M:1), Timer

- The full model (M_1) significantly improves upon the baseline model (M_0), as indicated by a chi-square difference of $\Delta\chi^2 = 74.531$, $p < .001$.
- Pseudo R^2 values (e.g., McFadden $R^2 = 0.298$, Nagelkerke $R^2 = 0.449$)
- **Suggest that the model explains a moderate to substantial portion of the variance in purchase behavior.**

Timers work indirectly through Product Scarcity, Feeling Smart and Discount Sensitivity stronger directly impact Purchase.

Variable	Significance	Effect Direction	Interpretation
Anxiety	Not significant	—	No link to purchase intention
Feeling Smart	**Significant (p < .01)**	Positive	Feeling smart increases purchase likelihood
Product Scarcity	Not significant	—	Scarcity cues have no clear effect
Impulsive	Marginal (p ≈ .05)	Positive	Higher impulsivity may slightly boost purchase
Price Sensitive	**Significant (p < .05)**	Positive	Price-sensitive people are more likely to purchase
Age	**Significant (p < .05)**	Positive	Older individuals slightly more likely to purchase
Gender	Not significant	—	No meaningful difference between genders
Timer	Not significant	—	Countdown timer has no significant effect

Outline

01 Motivation&Hypothesis

02 Methods

03 Data Cleaning

04 Data Analysis

- Descriptive statistics
- Statistical inferences: Mediation analysis, Logistic Regression

05 Data Insight

Data Insight

Countdown timers alone are not enough to significantly increase consumer purchasing behavior.

- **Timer** has an indirect effect on purchase behavior by **enhancing the perceived scarcity** of the product, which in turn increases the likelihood of purchase. Timer works more effectively by **creating a psychological context** rather than by directly pressuring consumers with urgency.

- Consumers are more likely to make a purchase when they feel they are making a **"smart deal,"** are highly sensitive to discounts, or are older in age. These psychological and demographic factors are stronger drivers of purchasing than time pressure alone.

- Anxiety and gender do not significantly influence purchase decisions, and while **impulsiveness is linked to higher purchasing tendencies**, it does not amplify the effect of the timer.

Timer work best by creating a sense of scarcity, but their overall impact is limited unless paired with other psychological and value-based strategies. Marketers should **focus on making consumers feel smart** about their purchases and **target discount-sensitive or older consumers** for maximum impact.