

# Experiments as a Research Method

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# 01

## Quest for causality

Why and when to do experiments?

# 02

## Components of experiments

What is a true experiment?



# 03

## Experimental designs

How to design an experiment?

# 04

## Analysis of results

How do we analyze experimental data?

## Experiments as a Research Method

Marketing (science) seeks to *describe, predict, control, and explain* behavior of market actors

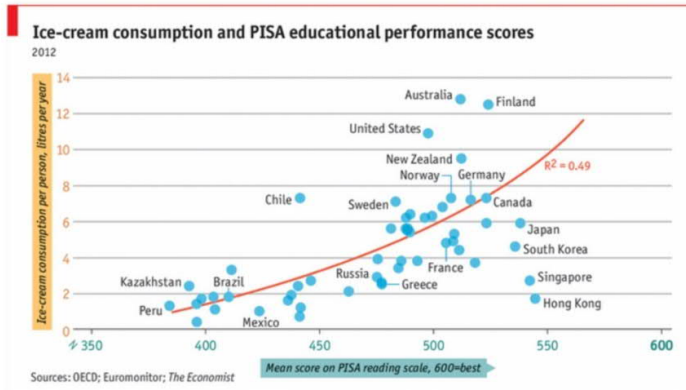
- Breaking up marketing-related phenomena in variables and relations between those variables
- Only a part aims at establishing **causal relationships** between variables
- When causality is the objective, experiment is the method of choice!

Can cause marketing  
boost firm sales revenues?  
(Andrews et al. 2014)

How does consumer  
contamination  
affect product evaluations  
and purchase intentions?  
(Argo et al. 2006)

How does oral interference  
influence advertising  
exposure effect?  
(Topolinski et al. 2014)

What is the effect of social  
exclusion on consumers'  
preferences for  
visual density?  
(Su et al. 2019)



## Causality vs. Correlation

Correlational: symmetrical (no "direction")

- E.g., relation between ad expenditure and sales

X  $\longleftrightarrow$  Y

Causal: asymmetrical (direction)

- Variable X causes variable Y

X  $\longrightarrow$  Y

## Conditions for Causality

**X must precede Y**

01

**X must covary with Y**

A change in X is accompanied by a change in Y

02

**X, and not other causes, is what affects Y**

03

Only experiments qualify to unequivocally establish causality!

# Causal Effects

## 1 Money in the Bank: Feeling Powerful Increases Saving

EMILY N. GARBINSKY  
ANNE-KATHRIN KLESSE  
JENNIFER AAKER

Across five studies, this research reveals that feeling powerful increases saving. This effect is driven by the desire to maintain one's current state. When the purpose of saving is no longer to accumulate money but to spend it on a status-related product, the basic effect is reversed, and those who feel powerless save more. Further, if money can no longer aid in maintaining one's current state because power is already secure or because power is maintained by accumulating an alternative resource (i.e., knowledge), the effect of feeling powerful on saving disappears. These findings are discussed in light of their implications for research on power and financial decision making.

Money is power. (Andrew Jackson)

Although the words in the epigraph were spoken almost 200 years ago, they remain true even today. Extant research has demonstrated a strong link between money and power as money is a common source of power (Keltner and Langner 2007). Knowing that possessing money makes people feel powerful (Furnham 1984), we set out to investigate if feeling powerful also prompts an increased willingness to save money. This question is particularly important for two reasons. First, individuals are likely to have experiences of feeling powerful (e.g., interviewing a potential employee, giving advice) or powerless (e.g., defending a thesis, sub-

insky 2008). Second, most Americans save too little. Even after the 2008 financial crisis, the majority of American households did not change their saving behavior (Kramer 2013).

Although explanations abound for why people fail to save their money (Bertrand, Mullainathan, and Shafir 2006; Mian et al. 2013; Vohs and Faber 2007), the majority of proposed explanations are relatively unchangeable, for example, education level, familial upbringing, and level of self-control. In this research, we focus on a small psychological shift in individuals' mind-set, whether they feel powerful, that may impact the amount of money they are willing to save. The

results of this research show that the accumulation of feeling

## 2

Jennifer J. Argo, Darren W. Dahl, & Andrea C. Morales

## Consumer Contamination: How Consumers React to Products Touched by Others

Although consumers like to touch products while shopping, the authors propose a theory of consumer contamination, positing that consumers evaluate products previously touched by other shoppers less favorably. The authors test the theory by manipulating cues that increase the salience that consumer contact has occurred. Furthermore, the authors investigate the role of disgust as the underlying mechanism of the theory.

A recent article in *The New York Sun* (Vanech 2005) highlights the difficulty that cosmetic retailers have in managing consumers' touching and interacting with their product offerings. Matthew Waitesmith, vice president of MAC cosmetics, is quoted as saying "we never double-dip" (p. 20), in reference to stringent policies the company uses in an effort to alleviate consumer concern over trial and sampling of its retail products. Similarly, in the best-selling book, *Why We Buy*, Paco Underhill (2000) discusses the challenges that retailers face in effectively managing the impact of consumers' touching display products. He notes that consumers often open the packaging of products to touch and feel them but usually choose to buy products that have been or appear to be untouched by others. Indeed, it is common for consumers to try on an article of clothing or flip through a magazine but, after deciding to make a purchase, select a "fresh" one from the back of the display. It is clear that there is a strong consumer aversion to touched products, and it is difficult to manage consumer touching behavior. However, little research has investigated the reason for this phenomenon or has provided managers with insight into how to address its implications.

1997; Citrin et al. 2003; McCabe and Nowlis 2003). Although prior research suggests that touch has a positive impact on consumer information search and product evaluations, the goal of the current research is to show that consumer contact with products may actually be a double-edged sword for marketers. Specifically, we develop a theory of consumer contamination, which we define as contamination from consumer touching. In the product context we investigated herein, this behavior results in negative implications for a touched product. Importantly, in our research, we test the impact of consumer contamination by examining cases in which products are unharmed objectively by contact with other consumers, but nevertheless the contact is still viewed as a contamination event. This differs from actual physical contamination in which a product becomes soiled or dirty as a result of consumer contact.

Using the law of contagion (Frazer [1890] 1959; Mauss [1902] 1972; Tylor [1871] 1974) as a theoretical framework, we propose that when consumers become cognizant that another consumer has previously touched a product, their evaluations of and purchase intentions for the product decrease. We test this prediction in a retail shoe store envi-

## Main Effect

Feeling powerful (X) increases saving (Y). (1)

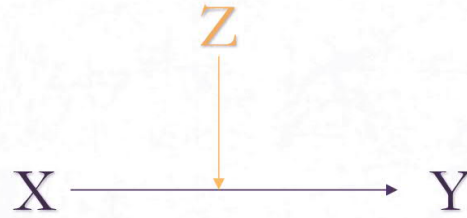
Consumers evaluate products previously touched by other shoppers less favorably. (2)





## Moderation

Interaction effect



### Strenght of an effect: ordinal interactions

- Moderator attenuates the effect: interferes with the process
- Moderator boosts the effect: facilitates the process

### Direction of an effect: disordinal interaction

- Moderator flips the effect: captures the full process and its logical implication (crossover effect)



## Moderation

Interaction effect

### Strenght of an effect

When proximity to contact is closer and when the number of contact sources is higher, consumer evaluations, purchase intentions, and WTP for a touched product decrease. (2)

### Direction of an effect

If money can no longer aid in maintaining one's current state because power is already secure or because power is maintained by accumulating an alternative resource (i.e., knowledge), the effect of feeling powerful on saving disappears. (1)

## Mediation

Underlying mechanism

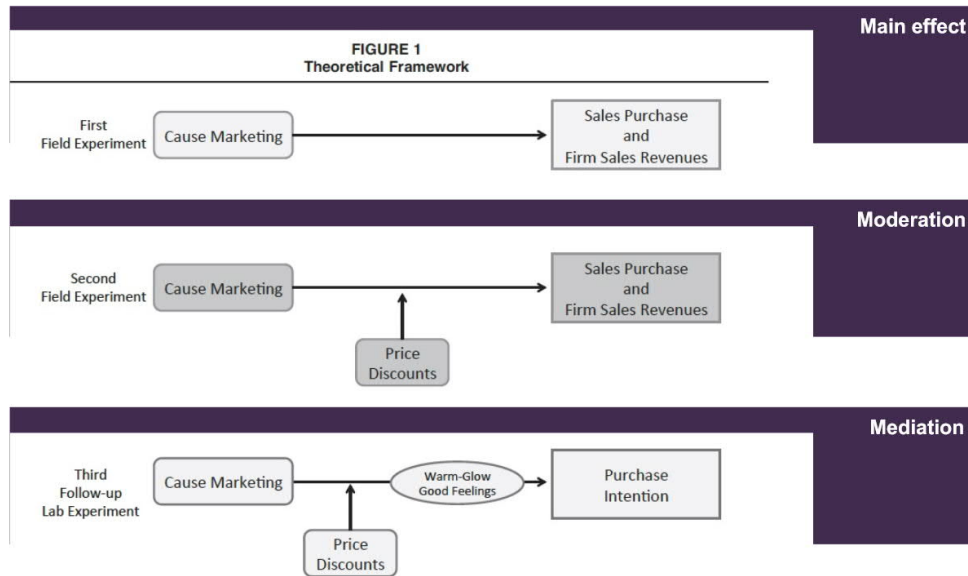
The desire to maintain one's current state mediates the effect of feeling powerful on saving. (1)

Disgust mediates the influence of consumer contamination on product evaluations and purchase intentions. (2)



Andrews, M., Luo, X., Fang, Z., & Aspara, J. (2014). Cause marketing effectiveness and the moderating role of price discounts. *Journal of Marketing* 78, 120-142.

Examines the effect of CM on consumer purchases through three individual experiments



***“An experiment means that individuals are randomly allocated to groups, which receive different treatments, followed by a comparison of the group reactions after the treatments”***

Söderlund 2018



A typical contemporary experiment does not contain any information on individual reactions, and the participating individuals are anonymous.

Experiments require *at least two groups* in order to draw conclusions regarding the effects of specific treatment.



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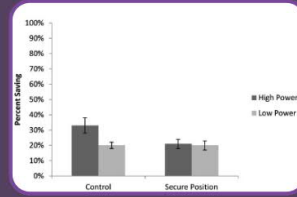
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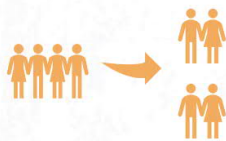
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The experimenter manipulates a factor when creating a treatment that exposes participants to this factor.



**Group comparison** is the activity that reveals if there is influence. If there is a difference between the groups in terms of the level of an effect variable Y, it indicates influence in causal terms

## Experimental Designs



### Between-subjects

Every individual in a particular group is exposed to one type of treatment.



### Within-subjects

Same participants receive several treatments.

Topolinski et al. (2014) investigated what happens when participants eat while being exposed to advertising.

This experiment included three versions of the treatment: some participants were instructed to *eat popcorn*, others were instructed to *chew gum* and a third group was instructed to *eat a sugar cube* while watching commercials.

**What if this was a within-subject design?**

## Single-factor Experiments

Establishing a main effect: manipulating an IV (cause) and measuring a DV (effect)

Establishing mediation: manipulating an IV (cause), measuring a mediation and measuring a DV (effect)

**= one factor with two or more levels**

- e.g., feeling powerful (factor), high vs. low power (2 levels)

*Each factor and each level is to correspond to a separate group of participants!*

## Multi-factor Experiments

There can be several causes behind a specific reaction and these causes may interact

- Establishing moderation: manipulating two IVs and measuring a DV

For example...

In 2x2 factorial design there are **two factors** each with **two levels**.



In 3X2 factorial design there are **two factors**, one with **three levels** and one with **two levels**.



Glikson et al. (2017, experiment 3) tested in **2x2 factorial design** why using smileys in work-related contexts backfires.

They examined the nature of the context (Z) as a moderator of the impact of smileys in text (IV) on perceived warmth and competence (DV).

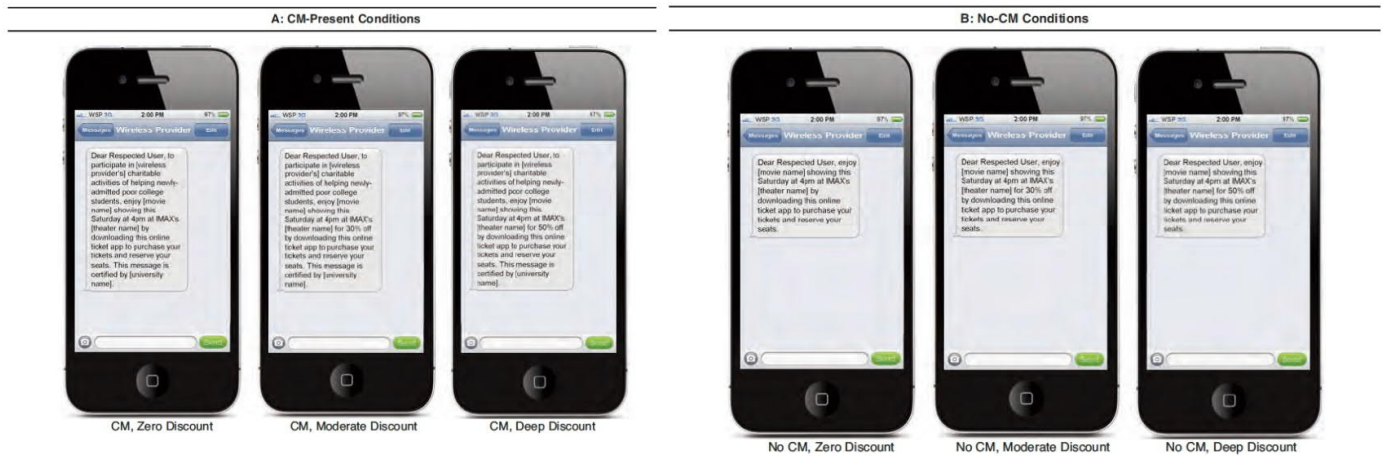
**Table 6.** The E-Mail Participants Read in the Four Conditions of Experiment 3.

Conditions	Formal Condition	Informal Condition
Control condition	Dear Sarah, My name is Alex and I've started working here this week. Thank you for sending me the invitation to join the <b><u>staff</u></b> <b><u>meeting</u></b> on Friday. Could you please let me know where it will be taking place? Thank you very much, Alex Bledow	Dear Sarah, My name is Alex and I've started working here this week. Thank you for sending me the invitation to join the <b><u>social</u></b> <b><u>gathering</u></b> on Friday. Could you please let me know where it will be taking place? Thank you very much, Alex Bledow
Smiley condition	Dear Sarah, My name is Alex and I've started working here this week. ☺ Thank you for sending me the invitation to join the <b><u>staff</u></b> <b><u>meeting</u></b> on Friday. Could you please let me know where it will be taking place? ☺ Thank you very much, Alex Bledow	Dear Sarah, My name is Alex and I've started working here this week. ☺ Thank you for sending me the invitation to join the <b><u>social</u></b> <b><u>gathering</u></b> on Friday. Could you please let me know where it will be taking place? ☺ Thank you very much, Alex Bledow

Note. The formality manipulation is highlighted here by the bold and underlined text. This emphasis was not part of the actual manipulation.

Andrews et al. (2014, experiment 2) employs a **2x3 between-subjects design** to study price discounts as a moderator of the impact of CM on sales

Two CM conditions (no CM vs. CM) and three price discount conditions (zero vs. moderate vs. deep discount)





## Analysis of Results

= Comparing experimental groups

Number of groups	Type of scale	Statistical test
Two groups	Nominal	Chi-square
	Ordinal	Mann-Whitney U test
	Interval	t test
	Ratio	t test
More than two groups	Nominal	Chi-square
	Ordinal	Kruskall-Wallis ANOVA
	Interval	ANOVA
	Ratio	ANOVA

**Also the number of factors affects the choice of test!**



## Analysis of Results

= Comparing experimental groups

### One factor, two levels (groups)

Independent samples t-test

- Tests the null hypothesis that there is NO difference in means between the groups

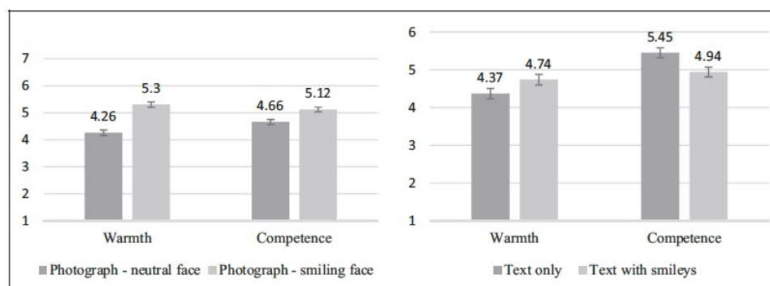
### One factor, more than two levels (groups)

One-way analysis of variance (ANOVA)

- A significant one-way ANOVA means that one is able to reject the null hypothesis, BUT it does not give any information with regard to what extent there are differences between specific pairs of groups

➤ Post hoc test

(For examples see e.g., Argo et al. 2006 or Glikson et al. 2017)



**Figure 1.** Perceptions of warmth and competence presented separately for the photograph conditions (neutral vs. smiling face) and for the text conditions (text only vs. text with smileys) including standard errors (Experiment 1).

Glikson et al. 2017

## References

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# Thanks

Do you have any questions?

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