

When Stock Disappears, Psychology Appears: The Moderating Effect of the Regulatory Focus on Consumer Reactions to Out-of-Stock

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How to cite: Lopes, E. L., Mesquita, E., & Herrero, E. (2025). When stock disappears, psychology appears: The moderating effect of the regulatory focus on consumer reactions to out-of-stock. *BAR-Brazilian Administration Review*, 22(3), e240180.

DOI: <https://doi.org/10.1590/1807-7692bar2025240180>

Keywords:

regulatory focus; consumer behavior; out-of-stock; retail management; purchase intention

JEL Code:

M31

Received:

October 12, 2024.

This paper was with the authors for three revisions.

Accepted:

March 09, 2025.

Publication date:

August 08, 2025.

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Funding:

The authors thank to the Conselho Nacional de
Desenvolvimento Científico e Tecnológico (CNPq, Brazil),
304921/2023-8.

Conflict of Interests:

The authors stated that there was no conflict of interest.

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ABSTRACT

Objective: this study investigates the moderating effect of consumers' regulatory focus (promotion vs. prevention) on their reactions to out-of-stock (OOS) situations in retail environments. The objective is to understand how different regulatory profiles influence purchase intention when products are unavailable. **Methods:** three experimental studies were conducted. In the first study, we explored how consumers' regulatory focus affects purchase intention in OOS scenarios. The second study manipulated participants' regulatory focus to analyze its effect on product unavailability. The third study used eye-tracking technology to examine how regulatory focus influences visual attention in OOS contexts. **Results:** results show that promotion-focused consumers exhibit greater resilience, maintaining stable purchase intentions, while prevention-focused consumers demonstrate negative reactions, focusing more on empty spaces. **Conclusions:** these findings suggest that retailers can tailor marketing and inventory management strategies based on consumers' regulatory profiles to mitigate the negative effects of OOS situations. This study contributes to the literature by integrating regulatory focus theory with consumer responses to stockouts and offers practical insights for retail managers.



Data Availability: Lopes, E., Mesquita, E., & Herrero, E. (2025). Data for "When Stock Disappears, Psychology Appears: The Moderating Effect of the Regulatory Focus on Consumer Reactions to Out-of-Stock" published by BAR - Brazilian Administration Review [Data set]. Zenodo. doi: <https://doi.org/10.5281/zenodo.16782760>

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INTRODUCTION

Out-of-stock (OOS) situations remain a persistent challenge for both physical and online stores, often characterized by empty shelves. While previous research has extensively examined logistical failures (Hoang & Breugelmans, 2023), product unavailability (Peterson et al., 2020), and deficiencies in service structures (Kalantary et al., 2023), limited attention has been given to psychological factors, such as consumers' regulatory focus, and how these factors interact with stockouts to shape purchase intentions. Retailers experience concern and incur losses due to out-of-stock situations, as these significantly impact consumer purchasing behavior (Lastner et al., 2016; Huang & Zhang, 2016; Hoang & Breugelmans, 2023).

This study builds on existing research by examining the psychological mechanisms underlying consumers' reactions to out-of-stock situations, a problem for which no definitive solution yet exists (Che et al., 2012). Previous studies have explored the effects of stockouts on consumer evaluations of retailers (Fitzsimons, 2000; He & Oppewal, 2018), behavioral intentions (Andaur et al., 2021), shopping behavior and purchase decisions (Peterson et al., 2020), and recovery from service failures (Pizzi & Scarpi, 2013). Specifically, this study investigates how consumers' regulatory focus — promotion versus prevention — moderates purchase intentions in retail settings. This perspective offers novel insights by addressing a critical gap in the literature: the influence of individual psychological traits on consumer behavior during stockout situations. Understanding these dynamics enables retailers to design targeted strategies to mitigate negative reactions, such as dissatisfaction or store switching, while fostering engagement and loyalty. Out-of-stock scenarios frequently occur in retail stores, and consumer responses to these situations vary both by the cause of the out-of-stock and the type of product affected. Research indicates that an out-of-stock product resulting from increased sales due to a store promotion has different effects on consumers compared to an out-of-stock of a regularly priced product (Kalantary et al., 2023). Previous studies also noted differences in consumer responses when an out-of-stock affects a targeted product (one on the consumer's shopping list) versus a non-targeted product (Lopes & Herrero, 2018). Despite the necessity of studying the origins and contexts of out-of-stock incidents (He & Oppewal, 2018), little has been explored regarding the influence of the consumer profile in this context. Consumers' perceptions of product availability in retail settings significantly impact purchasing intentions and behaviors, likely influenced by their personal, psychological, and emotional characteristics

(Kumar et al., 2021; Hoang & Breugelmans, 2023). This study aims to fill this gap.

Regulatory focus is a personal trait that influences individuals' perceptions and motivations in judgment and decision-making processes (Higgins, 2012). According to this theory, individuals can be classified as having either a preventive or promotional regulatory focus. Promotional individuals are oriented toward achieving positive outcomes, focusing on gains or non-gains, whereas preventive individuals are motivated by the avoidance of losses or non-losses (Lichtenthaler & Fischbach, 2019).

To investigate whether individual regulatory focus moderates consumers' purchase intentions in out-of-stock situations, we conducted three experimental studies. Each study was designed to explore specific aspects of this relationship: (1) the impact of regulatory focus on purchase intentions under different stock conditions; (2) the effects of manipulating regulatory focus on consumer behavior in stockout situations; and (3) the role of visual attention, measured through eye-tracking technology, in moderating these dynamics. These findings not only contribute to academic discourse but also provide practical insights for retail managers. For example, they suggest that targeted communication strategies, such as emphasizing restocking schedules for prevention-focused consumers or highlighting alternative promotions for promotion-focused consumers, can effectively address different customer needs.

LITERATURE REVIEW AND HYPOTHESES

Out-of-stock

Retailers commonly experience lack of or reduced stock levels in their products, evident in online (Hoang & Breugelmans, 2023) and physical (Kalantary et al., 2023) stores, characterized by empty shelves, sometimes without any prior warning of unavailability. This phenomenon, known as out-of-stock, has been extensively researched due to its complexity in management and profound impact on individuals' purchasing behavior (Lastner et al., 2016; Huang & Zhang, 2016; Hoang & Breugelmans, 2023).

In virtual retail stores, which also contend with out-of-stock issues, the adoption of the cross-docking strategy is increasingly common. This approach involves outsourcing the distribution of goods, where a distribution center manages brief storage and shipping directly to customers (Kalantary et al., 2023). However, despite these efforts, inaccurate inventories, unclear supplier product quantities, disorganized order processing, and fulfillment operations can exacerbate out-of-stock occurrences in virtual stores (Benrqrja, 2021).

This research primarily focuses on the challenges posed by out-of-stock in physical stores, where finding a definitive solution remains elusive (Che et al., 2012). Out-of-stock poses a significant challenge for all retailers, who encounter difficulties in effectively managing the situation. Factors such as logistics failures, deficiencies in purchasing and replenishment department structures, and supplier unavailability contribute to the persistent issue of empty space on shelves (Lastner et al., 2016; Peterson et al., 2020).

When faced with out-of-stock situations, consumers may opt to purchase substitute products (Huang & Zhang, 2016), develop a negative attitude toward the retailer (Benrqya, 2021), and, in some cases, even switch to alternative stores (Grubor et al., 2017). However, informing consumers about the reasons for out-of-stock can lead to a greater intention to purchase from the retailer in the future (Ozuem et al., 2017; He & Oppewal, 2018).

Initially, research on out-of-stock aimed to quantify the financial impacts and other losses incurred by retailers, including the erosion of consumer loyalty. Schary and Becker (1978) conducted early studies on consumer reactions to out-of-stock incidents at retailers but did not explore the specific elements and characteristics triggering these reactions. Despite the recurrent nature of out-of-stock scenarios in retail stores, understanding the various types of consumer responses to this context remains a research priority (Christy et al., 2015; Kalantary et al., 2023). Perceptions of product unavailability in a retailer's inventory significantly influence people's purchasing behavior due to their personal, psychological, and emotional traits (Jing & Lewis, 2011; He & Oppewal, 2018; Huang & Zhang, 2016). Thus, this research investigates consumer evaluations of out-of-stock incidents, their purchase intentions, and the influence of regulatory focus on these relationships.

Regulatory focus

The regulatory focus theory (Higgins et al., 1997; Higgins, 2012) categorizes individuals into two profiles: those with a promotion focus and those with a prevention focus. Promotional individuals are highly motivated to achieve positive results, focusing on gains or non-gains. Conversely, preventive individuals are driven by concerns over avoiding losses or negative outcomes (Lichtenthaler & Fischbach, 2019; Lopes & Veiga, 2019).

Subjects with a promotional focus are motivated by the desire to achieve objectives or goals quickly, striving to complete tasks with greater positivity. Meanwhile, a preventive focus directs individuals' attention to task responsibility, promoting vigilance and alertness to en-

sure optimal performance through careful attention and anticipation of potential negative results (Petrou et al., 2018).

Therefore, in the context of out-of-stock situations, preventive individuals exhibit heightened vigilance (Lee & Aaker, 2004), which may translate into meticulous performance on detail-oriented tasks, while anticipating negative outcomes (Lichtenthaler & Fischbach, 2019). Conversely, individuals with a more promotional focus tend to excel in tasks oriented toward broader goals and may prioritize information that leads to positive results (Derryberry & Reed, 1998; Förster & Higgins, 2005; Förster et al., 2006; Hüttermann et al., 2019).

Regulatory focus theory (Higgins et al., 1997; Higgins, 2012) differentiates individuals into two main profiles: promotion focus and prevention focus. While promotion focus is associated with the pursuit of gains and positive outcomes, prevention focus is linked to the avoidance of losses and the minimization of risks (Lichtenthaler & Fischbach, 2019). These distinct orientations influence how consumers process information and make decisions in retail environments (Fatimah et al., 2024).

Prevention-focused individuals are more vigilant and attentive to signs of potential failures or threats in their surroundings (Lee & Aaker, 2004). In out-of-stock contexts, such as empty shelves, these consumers may perceive unavailability as an indicator of risk or a problem, which tends to intensify negative reactions and lower their purchase intentions (Vriend et al., 2023).

Conversely, promotion-focused consumers have a goal-oriented mindset, interpreting adversities as opportunities. In out-of-stock situations, they may demonstrate greater resilience, exploring available alternatives and maintaining their purchase intentions (Förster & Higgins, 2005; Hüttermann & Memmert, 2015). These distinct behaviors suggest that regulatory focus moderates consumers' reactions to product unavailability.

As a result, preventive individuals are more likely to perceive out-of-stock situations as potential problems leading to negative results, influencing their purchasing decisions (Ku et al., 2012; Hüttermann & Memmert, 2015). Based on these premises, we formulated the following hypothesis:

H1. The regulatory profile of individuals will moderate the relationship between OOS (empty spaces on shelves [out-of-stock] versus full [in-stock]) and purchase intention. Thus, preventive (versus promotional) individuals will be more (versus less) sensitive to the out-of-stock condition, leading to a lower (versus higher) purchase intention.

Locus of focused attention

Humans cannot process all visual information from an environment simultaneously (Streicher et al., 2021). Studies suggest that people perceive and interpret the world through two primary cognitive modes: analytical thinking and holistic thinking (Monga & Williams, 2016; Morris & Peng, 1994; Nisbett et al., 2001; Streicher et al., 2021). The key distinction between these modes lies in the focus of attention, whether it centers on the object itself or its surrounding context, with significant implications. Holistic thinkers tend to maintain a broader visual focus, encompassing the entire scene (Lee et al., 2014; Nisbett et al., 2001). Conversely, analytical thinkers concentrate on specific targets (Lee et al., 2014; Nisbett et al., 2001), such as object attributes, often isolating them from their context.

In the retail setting, consumers scanning a shelf of products typically focus on individual items or a small set thereof, depending on their visual attention type (Chandon et al., 2009). This locus of attention, or the visual field where consumers concentrate, may exhibit a central fixation bias (Atalay et al., 2012) or encompass a broader or narrower visual area (Friedman et al., 2003). Central attentional focus involves concentrating on a limited number of stimuli, potentially ignoring other stimuli (Isaacowitz et al., 2006). Individuals with a wider focus of attention may spread their concentration across multiple stimuli and the overall environment, potentially overlooking details, for example (Fisher, 2021).

While individuals may demonstrate a chronic preference for either central or broad attention (Hüttermann et al., 2019), attentional breadth can also be impacted by situational contexts and individual conditions, such as personality traits (Hüttermann & Memmert, 2015; Fisher, 2021). Hüttermann and Memmert (2015), using eye-tracking technology, identified variations in attentional amplitude influenced by cues related to an individual's regulatory focus.

To date, no study has examined how preventive and promotional individuals behave in the out-of-stock context. Therefore, we propose that individuals with a more preventive orientation, due to their heightened vigilance and aversion to loss, will focus more on out-of-stock items, whereas predominantly promotional individuals will direct their attention toward available product opportunities. Thus, we developed Hypothesis 2 of this research:

H2. Individuals with a preventive (versus promotional) focus will exhibit greater attention toward out-of-stock (versus in-stock) options.

METHOD

This experimental research consists of three studies, following the methodological steps outlined by Hernandez et al. (2014). The approach of a causal study composed of several experimental studies mitigates the possibility of alternative explanations (MacLin, 2024) while enhancing the external validity of the findings (Abramson, 2023).

Study 1

Study 1 aimed to assess the effect of out-of-stock sceneries on purchase intentions between two groups of individuals characterized by their personal traits. Therefore, it employed a full factorial experimental design with two levels of out-of-stock conditions (empty versus full shelf) and two regulatory profiles (preventive versus promotional).

Data collection took place in a computer laboratory with students from two public higher education institutions (HEIs). Students were invited to participate voluntarily in a market study, with the understanding that the task was not mandatory and offered no compensation or academic incentives, with an estimated response time of 10 minutes. Upon agreeing to participate, students were randomly assigned to different experimental conditions involving narratives and images depicting supermarket shelves (full versus empty shelf), as shown in Figures 1 and 2.

The scenario chosen for Experiment 1 — the purchase of milk in a supermarket — was selected for its practical relevance and broad applicability. Basic necessity products, such as milk, are highly likely to appear on consumers' shopping lists, making them an appropriate choice for exploring reactions to out-of-stock situations (Huang & Zhang, 2016). Additionally, the target audience's familiarity with this type of purchase minimizes behavioral variations associated with a lack of knowledge or prior experience, enabling a more accurate analysis of the effects of regulatory focus.

Measurements

For this study, we adopted the single-item purchase intention scale adapted from Barton et al. (2022) to measure the dependent variable (I would definitely shop at this store if I could — Without a doubt, I would buy from this supermarket if I could [our adaptation]), assessed using a seven-point Likert scale, ranging from 1 (totally disagree) to 7 (totally agree). Single-item scales are considered appropriate when the concept/construct to be measured is unambiguous and narrowly defined (Allen et al., 2022).

To assess regulatory focus, we utilized the forced-choice scale developed by

Chammas and Hernandez (2024). This scale consists of 18 items arranged in nine pairs, with nine items designed to measure each regulatory focus. Participants' scores are derived by summing responses (0 for preventive statements and +1 for promotional statements), resulting in scores ranging from 0 to 9.

Manipulation

The manipulation occurred through storytelling: "Imagine yourself in the following situation: you opened your refrigerator, and it is empty, an unusual occurrence as you typically shop weekly. Due to not

having time for grocery shopping last week, your food supplies were low. So, as usual, you went out to buy groceries. While walking, you notice a newly opened supermarket in your neighborhood. You decide to try this new store and go in to do your shopping. Among other items, you need to buy milk. As you approach the dairy section, you see the milk shelf depicted in the photograph below."

After reading the text, respondents were instructed to immediately view one of the randomly presented images (Figures 1 or 2). They were assured they could take as much time as needed to complete the task.



Source: The authors.

Figure 1. Experiment 1 stimulus — Out-of-stock



Source: The authors.

Figure 2. Experiment 1 stimulus — In stock

To ensure respondents focused on the image, they were instructed to review it again:

"Since this step is crucial, please take the time to carefully observe the photo again before proceeding. Your attention to detail is greatly appreciated!" Consequently, respondents viewed the shelf (full versus empty) once more.

After the second viewing of the images (full versus empty shelf), respondents evaluated their purchase intention and regulatory focus using scales. To verify manipulation efficiency, respondents were asked if the store's product availability was at 100%.

Analysis and discussion of results — Study 1

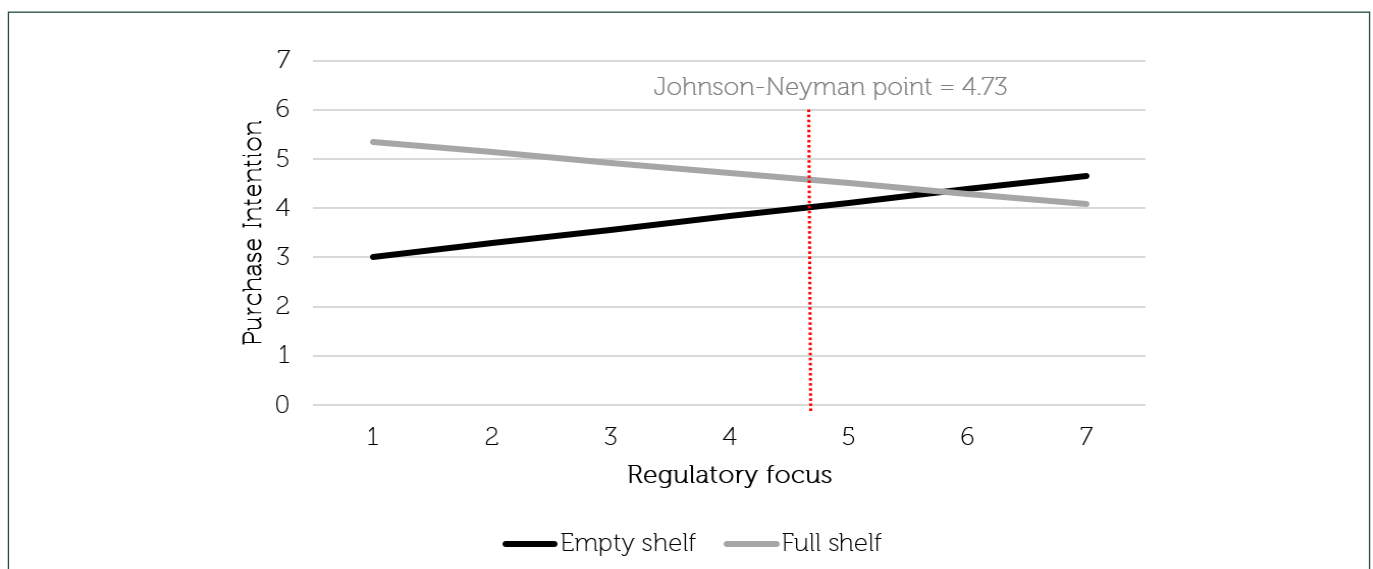
The final sample of this study consisted of 160 respondents, of whom 81 (50.6%) were women. The average age of the sample was 23 years ($\sigma = 5.1$), with 112 (69.4%) having postgraduate degrees, and more than half of the respondents (52.5%) reported an income between BRL 1,820.00 and BRL 7,278.00. Additionally, only 22 (12.5%) respondents reported making purchases infrequently.

Before testing the hypotheses, we examined the potential influence of extraneous variables (Hernandez et al., 2014; Tabachnick & Fidell, 2007). Thus, we conducted Student's t-tests to determine if there were differences between the groups (0 = empty shelf versus 1 = full shelf) regarding the frequency of milk purchases ($M_{\text{empty}} = 2.99$, $M_{\text{full}} = 3.07$, $t(158) = -0.600$, $p > 0.10$), supermarket shopping frequency ($M_{\text{empty}} = 2.60$, $M_{\text{full}} = 2.64$, $t(158) = -0.260$, $p > 0.10$), and general shopping frequency ($M_{\text{empty}} = 2.55$, $M_{\text{full}} = 2.65$, $t(158) = -0.730$, $p > 0.10$). According to the results, none of the covariates showed significant differences and were therefore not included in the hypothesis testing analyses. Although there were no theoretical assumptions suggesting possible effects between demographic variables and the dependent variable, we analyzed the relationship of age ($r = 0.001$; $p > 0.10$), education ($Z = 2.060$), and gender ($M_{\text{men}} = 3.96$; $M_{\text{women}} = 4.01$; $t(158) = 0.234$; $p > 0.10$) on purchase intention, with no significant effects found. Additionally, the manipulation proved to be ef-

fective, as individuals perceived a difference in the volume of products on the shelves ($M_{\text{empty}} = 2.09$, $M_{\text{full}} = 5.25$, $t(158) = -12.108$, $p < 0.01$).

Using Student's t-test, we also identified a difference in purchase intention between the groups ($M_{\text{empty}} = 3.89$, $M_{\text{full}} = 4.94$, $t(158) = -3.164$, $p < 0.01$). Therefore, it can be concluded that individuals exposed to a full product shelf (versus out-of-stock) displayed a higher (versus lower) purchase intention. Next, we tested the hypotheses.

For the hypothesis tests, we used SPSS software (version 23) with support from the PROCESS macro (Hayes & Montoya, 2017), model 1, and bootstrap with 10,000 iterations. The regression analyses for hypothesis testing indicated a direct effect of OOS (0 = empty versus 1 = full) on purchase intention ($\beta = 2.819$, $se = 0.881$, 95% CI [1.078; 4.560], $t = 3.199$, $p < 0.01$). We also confirmed the moderating effect of regulatory focus ($\beta = -0.274$, $se = 0.148$, 95% CI [-0.882; -0.088], $t = -2.411$, $p < 0.01$) on the relationship between OOS and purchase intention. Thus, the more promotion-focused (versus prevention-focused) individuals exposed to an OOS condition (versus full shelf) are, the greater their purchase intention for a particular product. Using the Johnson-Neyman technique ($M = 4.73$ and below), we identified that the moderation effect occurred for 58.1% of the individuals, as shown in the graph in Figure 3.



Source: Research data.

Figure 3. Moderation of Study 1

Study 1 provided initial evidence that regulatory profile moderates the relationship between out-of-stock situations and intention to purchase products from retailers. The findings offer preliminary support for H1, indicating

that consumers with a promotional profile exhibit greater intention to purchase a product compared to those with a preventive profile when exposed to out-of-stock conditions. This result suggests that promotion-focused

consumers are more resilient to the challenges posed by stockouts, maintaining their focus on goal achievement despite the unavailability of the product.

Conversely, in out-of-stock scenarios, consumers with more preventive profiles tend to focus on vigilance (Lee & Aaker, 2004), potentially leading to a less favorable evaluation of the retailer due to heightened awareness of issues. This aligns with prevention-focused individuals' heightened sensitivity to perceived risks and losses, which exacerbates their negative reactions to stockouts.

These results advance the understanding of consumer behavior in stockout situations by demonstrating that regulatory focus influences not only purchase intentions but also the emotional and cognitive processing of unavailability. For instance, promotion-focused consumers may reinterpret stockouts as opportunities to explore alternative products or benefit from potential discounts, reinforcing their positive engagement with the retailer (Kumar et al., 2021). In contrast, prevention-focused consumers may perceive the same situation as a failure in service, damaging their evaluation of the retailer and reducing loyalty.

The implications of these findings are twofold. Theoretically, they expand regulatory focus theory by applying it to the underexplored context of stockouts, revealing how individual motivational profiles shape responses to scarcity. Managerially, the results suggest that retailers can mitigate the negative impact of stockouts by tailoring their communication strategies. For prevention-focused consumers, messages emphasizing reliability and future restocking can alleviate frustration, while promotion-focused consumers may respond positively to promotional offers or alternative product suggestions.

Study 2

Study 2 maintained the primary objective of Study 1, which was to examine the impact of out-of-stock situations on purchase intention among different groups (preventive versus promotional). However, in this iteration, we enhanced the internal validity of the results by manipulating the participants' regulatory focus. This study employed a complete factorial experimental design with two levels of out-of-stock conditions (empty versus full shelf) and a manipulated variable of regulatory profiles (preventive versus promotional).

Data collection for this study took place in a computer laboratory with students from two public HEIs. Students were informed that the survey consisted of two parts, and for each fully completed questionnaire, the researchers would donate BRL 2.00 to charity, allowing students to choose between two organizations (GRAAC — Hospital Infantil or ADJ — Brazilian Diabetes Association). To participate, students needed to click 'agree' on their computer screens. Soon after, students were prompted to choose between two random colors, with each color leading them to one of the two stimuli.

Manipulation

The manipulation in this study occurred in two stages. Initially, individuals were induced into either a promotional or preventive state through storytelling. Participants were instructed to choose between two random colors, each associated with a different stimulus (promotional versus preventive). Figures 4 and 5 depict the stimuli (the original stimuli are presented in Figure 6).

1. Please spend a few seconds thinking about one thing you should avoid doing in the short, medium, or long term to be successful in life. Describe what you thought.
2. Please spend a few seconds thinking about something you stopped doing a short time ago that made you feel strongly about having succeeded.
3. Please spend a few seconds thinking about something that you didn't want to happen and that most people didn't want either. Now describe what you avoided or are avoiding doing to prevent what you didn't want from happening, but which most people were unable to prevent.
4. Write what comes to mind after reading the following excerpt: "Prevention is the best way to prevent harm from happening."

Source: Elaborated by the authors.

Figure 4. Experiment 2 stimulus — Preventive focus condition.

1. Please spend a few seconds thinking about something you envision doing in the short, medium, or long term to be successful in life. Describe what you thought.
2. Please spend a few seconds thinking about something you did recently that made you feel a strong sense of success. Describe what you thought.
3. Please spend a few seconds thinking about something you wanted that most other people wanted too. Write down what you did or are doing to get what you wanted, but most people didn't do or aren't doing.
4. Write what comes to your mind after reading the following excerpt: "Success in life is determined by action."

Source: Elaborated by the authors.

Figure 5. Experiment 2 stimulus — Promotional focus condition.

- | |
|---|
| <ol style="list-style-type: none"> 1. Por favor, gaste alguns segundos pensando em alguma coisa que você deve evitar fazer no curto/médio/ longo prazos para ser bem-sucedido na vida. Descreva o que você pensou. 2. Por favor, gaste alguns segundos pensando sobre algo que você tenha deixado de fazer há pouco tempo e que lhe fez ter uma forte sensação de ter tido sucesso. Descreva o que você pensou. 3. Por favor, gaste alguns segundos pensando em algo que você não queria que acontecesse e que a maioria das pessoas também não queria. Agora descreva o que você evitou ou está evitando fazer para impedir que acontecesse aquilo que você não queria, mas que a maioria das pessoas não conseguiu evitar fazer. 4. Escreva o que lhe vem à cabeça após ler o seguinte trecho: "Prevenir é a melhor forma de evitar que os males aconteçam" |
| <ol style="list-style-type: none"> 1. Por favor, gaste alguns segundos pensando sobre algo que você imagina fazer no curto/médio/longo prazos para ser bem-sucedido na vida. Descreva o que você pensou. 2. Por favor, gaste alguns segundos pensando sobre algo que você tenha feito há pouco tempo e que lhe fez ter uma forte sensação de sucesso. Descreva o que você pensou. 3. Por favor, gaste alguns segundos pensando em algo que você queria e que a maioria das outras pessoas também queria. Escreva a seguir o que você fez ou está fazendo para conseguir o que você queria, mas a maioria das pessoas não fez ou não está fazendo. 4. Escreva o que lhe vem à cabeça após ler o seguinte trecho: "Sucesso na vida é determinado pela ação" |

Source: Elaborated by the authors.

Figure 6. Original stimuli from Study 2.

Then, individuals underwent additional randomization and were directed to view an image depicting either a high or low out-of-stock level. Before viewing the image, participants read the following text:

"Imagine yourself in the following situation: after work your mother asks you to buy some items before returning home. Since this request is not common, you stop at a store along your route from work to her house. Although unfamiliar with this store, you decide to check it out. Among other products, your mother specifically requested two light bulbs for the

living room lamp to replace the burnt-out ones. Thus, you head to the lighting section of the store and encounter the shelf shown in the photo. Take your time to analyze the photo thoroughly. Once ready, select one of the options provided directly after the photo."

After reading the text, respondents were instructed to view an image (Figures 7 e 8) promptly, ensuring they had as much time as needed for the task. Following the image viewing, participants completed the questionnaire.



Source: The authors.

Figure 7. Experiment 2 stimulus — High level of out-of-stock.



Source: The authors.

Figure 8. Experiment 2 stimulus — Low level of out-of-stock.

Variables in this study were measured using the same scales as in Study 1, and this time, the regulatory focus scale (Chammas & Hernandez, 2024) was employed to verify the manipulation.

In Experiment 2, the choice of light bulbs as the target product reflects an attempt to explore a context distinct from the first experiment. Products like light bulbs, though less common in regular purchases, represent items of situational necessity that, when unavailable, may cause greater frustration for consumers (Ozuem et al., 2017). This variation in product type allows for an investigation of whether the effects of regulatory focus

are consistent across different purchasing scenarios, contributing to a broader understanding of the phenomenon under study.

Analysis of results — Study 2

The final sample for this study consisted of 203 respondents, with 115 (56.7%) being women. The average age of the sample was 28 ($\sigma = 8.1$) years, with 180 (88.7%) having higher education. More than half of the respondents (53.2%) reported an income between BRL 1,820.00 and BRL 7,278.00. Only 13 (6.4%) respondents reported

making purchases infrequently. Regarding charity selection, GRAAC was chosen by 170 (83.7%) students.

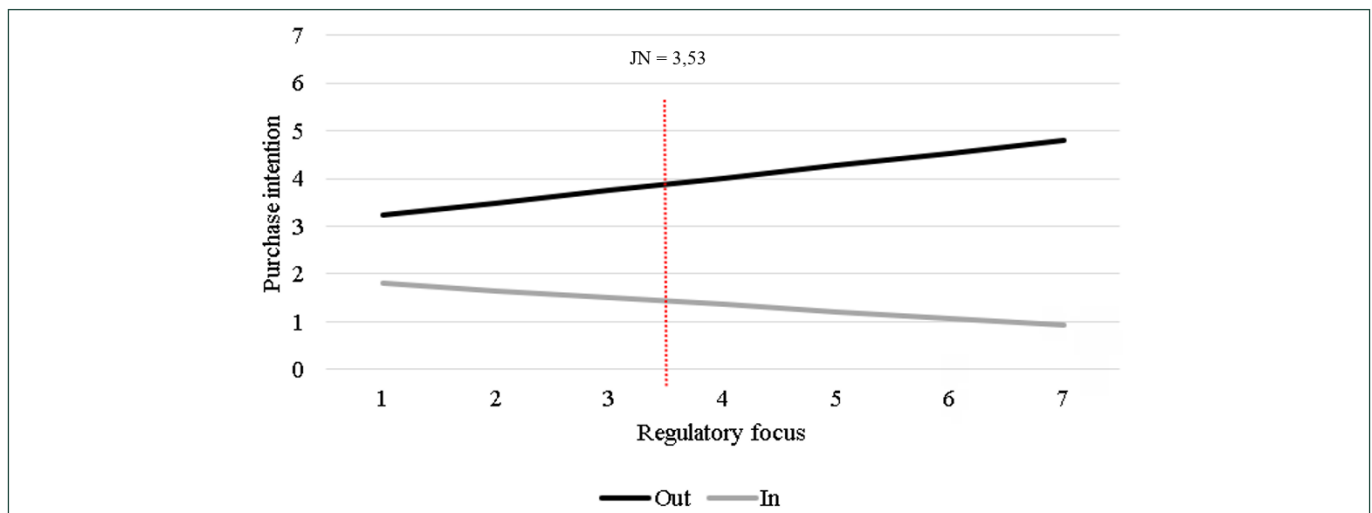
Before testing the hypotheses, we examined the distributions among respondents based on stimuli. Specifically, 145 (71.4%) respondents viewed the prevention condition, while 53 (26.1%) viewed the promotion condition. For the out-of-stock stimulus, 126 respondents (62.1%) viewed the empty gondola, and 77 respondents (37.9%) viewed the full gondola.

Additionally, we analyzed the potential influence of extraneous variables (Hernandez et al., 2014; Tabachnick & Fidell, 2007). We conducted Student's t-tests to assess differences between the groups (0 = empty shelf versus 1 = full) in the frequency of purchasing light bulbs ($M_{\text{empty}} = 3.65$, $M_{\text{full}} = 3.64$, $t_{(201)} = 0.877$, $p > 0.10$), frequency of visiting retail stores ($M_{\text{empty}} = 2.69$, $M_{\text{full}} = 2.57$, $t_{(201)} = 0.953$, $p > 0.10$), and general purchasing frequency ($M_{\text{empty}} = 2.40$, $M_{\text{full}} = 2.39$, $t_{(201)} = 0.897$, $p > 0.10$). No significant differences were found, and these covariates were not included in the hypothesis analyses. Furthermore, the manipulation was effective, as participants perceived a difference in the

volume of products on the shelves ($M_{\text{empty}} = 2.40$, $M_{\text{full}} = 4.40$, $t_{(201)} = -7.785$, $p < 0.01$).

Using Student's t-test, we performed a mean difference test between the groups for purchase intention ($M_{\text{empty}} = 3.94$, $M_{\text{full}} = 4.39$, $t_{(201)} = -1.797$, $p < 0.10$), with significance approaching marginal levels.

Next, we tested the hypotheses using SPSS software (version 23) and the PROCESS macro (Preacher & Hayes, 2008) model 1, with bootstrap of 10,000 repetitions. In this study, the direct effect of out-of-stock on purchase intention ($\beta = -1.019$, $se = 0.531$, 95% CI [-2.067; 0.029], $t = -1.918$, $p < 0.10$) was non-significant. However, the moderating effect was confirmed ($\beta = -0.407$, $se = 0.132$, 95% CI [-0.667; -0.148], $t = -3.097$, $p < 0.01$). Therefore, consistent with our findings from Study 1, we again observed that individuals with a more promotional (versus preventive) regulatory focus showed greater intention to purchase when exposed to an out-of-stock condition (versus full shelf). The Johnson–Neyman analysis result ($M = 3.53$) indicated a moderation effect for 63.5% of respondents (Figure 9).



Source: Elaborated by the authors.

Figure 9. Moderation of Study 2.

Discussion of results — Study 2

Study 2 reaffirmed the findings of Study 1, adding robustness by demonstrating that the regulatory profile continues to moderate the relationship between out-of-stock situations and consumers' intention to purchase products. Once again, the results support H1, indicating that consumers with a promotional focus exhibit higher purchase intentions compared to those with a preventive focus when exposed to out-of-stock conditions.

In this study, participants were placed into promotional or preventive states through storytelling stimuli.

This experimental approach highlighted how situational factors can temporarily shape consumers' regulatory focus. Individuals exposed to stimuli emphasizing vigilance and problem avoidance showed lower behavioral intentions to purchase and less favorable evaluations of the retailer. These findings align with the theoretical principles proposed by Lee and Aaker (2004), who emphasize that prevention-focused individuals are more sensitive to risk and failure cues in their environment, intensifying their negative responses.

Conversely, consumers exposed to narratives that encouraged goal achievement and positive outcomes (promotional focus) maintained higher purchase intentions even in the face of stockouts. These results suggest that regulatory focus influences not only purchase intentions but also how consumers perceive and interpret adversity in retail settings.

The results advance the understanding of the impact of regulatory focus in stockout contexts by showing that it is not merely a stable trait but can also be influenced by external stimuli. This finding offers new theoretical perspectives by emphasizing the flexibility of regulatory focus and its interaction with retail conditions. In particular, the ability to temporarily manipulate regulatory focus through simple narratives reinforces the practical and academic relevance of the theory presented by Lee and Aaker (2004).

Managerially, the findings of Study 2 have significant practical implications. For example, in stockout situations, point-of-sale messaging can be used to activate a promotional focus in consumers by emphasizing alternatives, discounts, or future benefits. Conversely, prevention-focused consumers may respond better to communications that highlight reliability and assurances of restocking. Additionally, persuasive narratives can be incorporated into advertising campaigns or digital retail environments to positively influence consumer behavior in adverse situations.

Study 3

The objective of Study 3 was to examine the effect of out-of-stock situations on purchase intention among individuals with different regulatory profiles (preventive versus promotional). This study utilized a simple factorial design between subjects, incorporating two regulatory profiles (preventive versus promotional), with the regulatory profiles being assessed.

Data for this study were collected in a laboratory setting with participants recruited through the researchers' social networks. Individuals were invited to participate voluntarily in the study, which involved visiting the research laboratory without compensation. The study utilized an eye-tracking platform (Eye Tracking Web: <https://www.realeye.io/pt>). Through the computer's webcam, the RealEye platform tracked participants' eye movements with an accuracy of (approximately) 110 pixels.

Data collection occurred in two phases. In the first phase, participants positioned themselves in front of the computer for eye-tracking calibration. During calibration and subsequent testing, participants were instructed to keep their heads still. After calibration, participants viewed an image for 20 seconds, a duration determined during initial pretesting to be adequate.

In the second phase, following image viewing and eye tracking, participants were informed that they could move their heads. They were then automatically directed to the QuestionPro platform. After agreeing to participate, respondents accessed the platform to complete the study questionnaire.

Manipulation

In this study, manipulation was achieved through a single image depicting a shelf with a high level of out-of-stock, featuring crackers (Figure 10).

For Study 3, we used a virtual shelf of cookies. Products like cookies are often purchased impulsively (Streicher et al., 2021), making them ideal for investigating how consumers with different regulatory profiles allocate visual attention to shelves with stockouts. Using a scenario involving lower-value, unplanned purchases helps test the generalizability of the findings in contexts with lower financial commitment.



Source: Elaborated by the authors.

Figure 10. Stimulus Study 3 — Image presented for collection via eye tracking.

Before seeing the image, participants read a story-telling narrative similar to that used in Study 1. They were instructed to analyze the image and were subsequently automatically directed to QuestionPro for data collection. The variables used in this study were identical to those in Study 1.

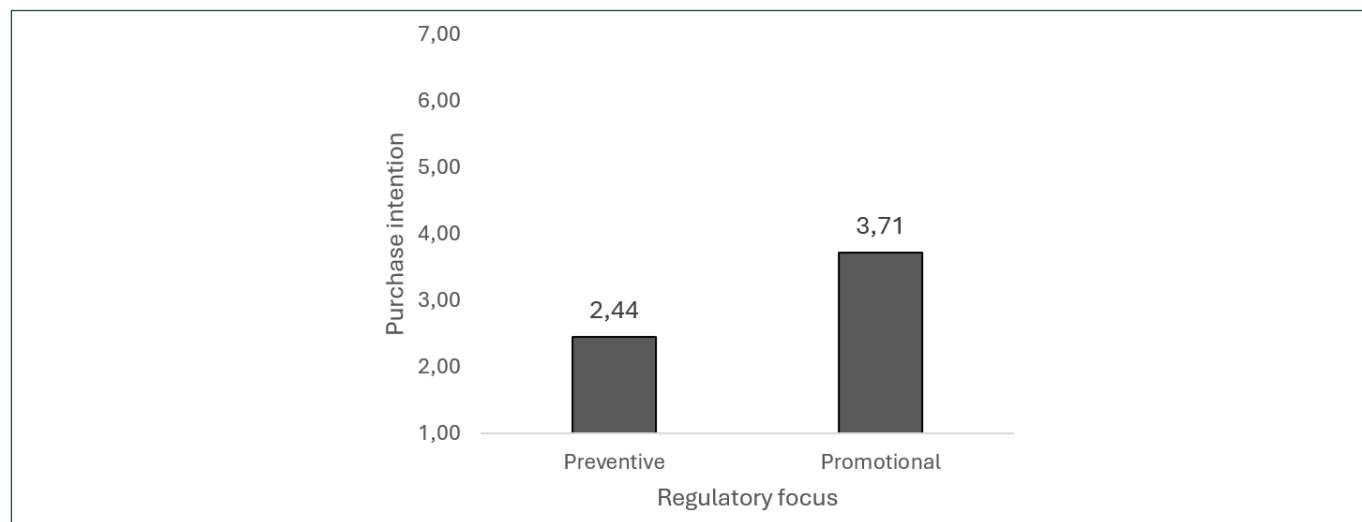
Analysis of results — Study 3

The final sample of this study consisted of 65 respondents, with 41 (63.1%) being women. The average age of the sample was 38.3 ($\sigma = 9.92$) years, with 46 (70.8%) having higher education. Among the respondents, 28 (43.1%) reported an income between BRL 1,820.00 and BRL 7,278.00.

Before testing the hypotheses, we examined the distribution of respondents based on stimulus and regulatory profiles. Regulatory focus was categorized into two groups: preventive (0) and promotional (1). The categorization used the median ($Md = 5$), where scores ranged from 0 (completely preventive) to 9 (completely promotional). Thus, individuals scoring below 5 were categorized as 0 (preventive), and those scoring 5 and above were categorized as 1 (promotional). The final sample contained 49.2% preventive ($n = 32$) individuals (0) and 50.8% promotional ($n = 33$) individuals (1).

Furthermore, we again examined the potential influence of extraneous variables (Hernandez et al., 2014; Tabachnick & Fidell, 2007). This time, we tested whether there were differences between the groups (0 = preventive versus 1 = promotional) for the frequency of purchasing crackers ($M_{preventive} = 2.91$, $M_{promotional} = 3.08$, $t_{(63)} = 0.941$, $p > 0.10$), general goods shopping frequency ($M_{preventive} = 3.19$, $M_{promotional} = 3.12$, $t_{(63)} = 0.342$, $p > 0.10$), and supermarket visit frequency ($M_{preventive} = 2.97$, $M_{promotional} = 2.88$, $t_{(63)} = 0.521$, $p > 0.10$). Again, no covariates showed significant differences between the groups and thus were not included in the hypothesis analyses. Furthermore, the manipulation of the out-of-stock level appeared effective, as indicated by similar means to previous studies ($M = 1.31$; $sd = 0.610$). Additionally, we did not observe significant differences in the perception of supply ("the supply of products in this store is at 100%") ($M_{preventive} = 1.28$, $M_{promotional} = 1.33$, $t_{(63)} = 0.342$, $p > 0.10$).

We tested the hypotheses of this study using the Student's t-test. Specifically, we performed a test to compare the means between the groups (preventive versus promotional) for purchase intention ($M_{preventive} = 2.44$, $M_{promotional} = 3.71$, $t_{(63)} = -5.09$, $p < 0.01$). This analysis confirmed H1, indicating that promotional individuals had greater purchase intentions compared to preventive individuals.



Source: Elaborated by the authors.

Figure 11. Difference in means from Study 3.

Furthermore, we examined the difference in eye fixation times on the empty shelf (out-of-stock) versus the full shelf between groups (preventive versus promotional). Overall, participants presented similar average durations of image observation ($M_{preventive} = 1746$, $M_{promotional} = 1740$, $t_{(63)} = 0.642$, $p > 0.10$), approximately 17 seconds in total. When analyzing the average time of eye focus on the product between the groups ($M_{preventive} = 0.3390$, $M_{promotional} = 0.5842$, $t_{(63)} = -7.623$, $p = 0.01$), we

identified a significant difference. Specifically, promotional individuals tended to focus their gaze longer on the product compared to empty spaces. When examining the average time of eye fixation on the empty shelf (out-of-stock) between the groups ($M_{preventive} = 0.6609$, $M_{promotional} = 0.4157$, $t_{(63)} = 7.623$, $p < 0.01$), we observed that preventive individuals had longer fixation times on empty spaces. These findings contribute to explaining the moderating effects observed in Studies 1 and 2.



Source: The authors.

Figure 12. Heat map of observation time — Preventive individuals.



Source: The authors.

Figure 13. Heat map of observation time — Promotional individuals.

DISCUSSION OF GENERAL RESULTS

The three studies investigating the effects of consumers' regulatory focus in retail stockout contexts provide significant contributions to the understanding of purchasing behavior. By integrating regulatory focus theory into the context of product unavailability, this research advances the existing literature in two key ways: first, by demonstrating that regulatory profiles lead to differentiated responses in stockout situations, and second, by revealing that regulatory focus also influences consumers' visual attention allocation in these contexts, as evidenced through eye-tracking technology.

Specifically, the study found that promotion-focused consumers reinterpret stockouts as opportunities to explore alternatives or discounts, while prevention-focused consumers exhibit greater vigilance, amplifying

negative perceptions of the retailer. These findings offer new perspectives on how psychological traits shape purchasing decisions in situations of perceived scarcity, further expanding existing theoretical models.

In the first study, it was demonstrated that consumers' regulatory profiles play a crucial role in moderating reactions to out-of-stock situations. Individuals with a promotion focus exhibited greater resilience when confronted with empty shelves, maintaining relatively stable purchase intentions. These findings corroborate the conclusions of Higgins et al. (1997) and Förster and Higgins (2005), which suggest that promotion-focused consumers are goal-oriented and tend to see obstacles as opportunities. However, this study extends those findings by applying the theory to the specific context of out-of-stock situations, suggesting that the resilience

of these consumers manifests when products are unavailable, seeing such moments as opportunities to discover new items or positively deal with scarcity.

In the second study, manipulating regulatory focus before exposing participants to out-of-stock situations revealed that psychological preparation can significantly alter their perception of product availability. This finding reinforces the conclusions of [Ozuem et al. \(2017\)](#), who emphasized the importance of communication strategies to mitigate consumers' negative reactions to service failures, including stockouts. However, our study goes further by suggesting that not only communication, but also the prior activation of a promotion-focused mindset can effectively help consumers manage disappointment caused by product unavailability, particularly when their expectations are high.

The third study, using eye-tracking technology, provides new insights into how different regulatory focuses influence consumers' visual attention. Prevention-focused individuals tend to fixate more on empty spaces on shelves, potentially intensifying their negative perceptions of the shopping experience and decreasing their satisfaction with the retailer. These findings support those of [Lee and Aaker \(2004\)](#), who demonstrated that prevention-focused individuals are more vigilant regarding potential threats, such as service failures or product unavailability. However, our study delves deeper by showing that fixation on empty spaces may be a key factor in amplifying dissatisfaction in these consumers. In contrast, promotion-focused individuals direct more attention to available products, keeping them engaged even in stockout situations.

The application of regulatory focus theory in out-of-stock studies broadens the understanding of this theoretical framework, highlighting its relevance in consumer behavior in retail settings. By allowing researchers to explore how personality traits influence purchasing decisions beyond superficial emotional reactions, these studies offer a fresh perspective on the complexities of consumer behavior. Additionally, the experimental method adopted strengthens the validity of the findings, allowing for a detailed analysis of the interactions between regulatory focus and stockout situations. The decision to manipulate regulatory focus prior to exposure to stockout scenarios enhances the studies' applicability by simulating more realistic shopping conditions, thus increasing their external validity.

CONTRIBUTIONS AND LIMITATIONS

The results observed in these studies make significant contributions to the scientific literature by integrating regulatory focus theory with consumers' responses to stockout situations in retail environments. This integra-

tion helps elucidate the psychological mechanisms underlying consumers' reactions to product unavailability. Understanding these mechanisms can lead to the development of more precise consumer behavior models, predicting reactions across various retail contexts. This knowledge empowers academics and professionals to devise more effective strategies for managing and mitigating the impact of stockout occurrences.

One of the primary theoretical advancements provided by this study is the demonstration that regulatory focus moderates the relationship between stockout perception and purchase intention. Prevention-focused consumers are more negatively affected by stockout situations compared to those with a promotion focus, who perceive these instances as challenges or opportunities. This finding expands on the studies of [Grubor et al. \(2017\)](#), which suggest that customer satisfaction can be harmed by stockouts, by introducing regulatory focus as a moderating variable in this relationship.

From a managerial perspective, the studies provide practical insights that can be applied to the development of personalized marketing and inventory management strategies. For instance, retailers can adopt communication strategies that offer advance notice of product restocking to prevention-focused consumers, helping to alleviate their frustration. Furthermore, creating promotional stimuli in the store environment, such as upbeat music or signage highlighting promotions, can increase the engagement of promotion-focused consumers, making the shopping experience more enjoyable even in stockout situations.

Additionally, store layouts can be strategically designed to divert consumers' attention away from empty shelves by redirecting focus toward substitute products or nearby stocked items. This type of visual organization could reduce the negative perceptions of prevention-focused consumers and improve their satisfaction. The use of communication technologies, such as apps that send notifications about product availability, can be another effective way to engage these consumers, keeping them informed and satisfied.

Another important managerial contribution lies in the potential to use information about consumers' regulatory focus to segment promotional campaigns. Prevention-focused consumers may respond better to campaigns that emphasize security, reliability, and guarantees of future product availability. On the other hand, promotion-focused consumers may be more attracted to campaigns that promote the discovery of new products or opportunities for discounts on alternative items.

Moreover, our study supports the adoption of certain managerial practices. For instance, for prevention-focused consumers, who are more sensitive to

risk and failure, stores could adopt communication strategies that emphasize reliability and security. A possible approach would be sending alerts about restocking schedules via email, SMS, or mobile apps, reducing uncertainty for these consumers. Additionally, signage in physical stores or online could be used to reassure consumers about prompt restocking or to provide clear alternatives for unavailable products. Another practical strategy involves training customer service teams or configuring chatbots to address concerns quickly, offering reassurance and tailored solutions to prevention-focused consumers.

Conversely, promotion-focused consumers, who are more resilient to adversity and seek opportunities for gains, may respond better to strategies that emphasize benefits and exploration. For example, promoting available alternative products by highlighting their unique features or benefits can help maintain engagement with these consumers. Targeted campaigns that frame stockouts as opportunities to try new items or access exclusive discounts may also prove effective. Furthermore, offering in-store or online experiences, such as time-limited offers or early access to new products, can encourage positive behaviors among promotion-focused consumers.

These personalized strategies not only enhance customer satisfaction and loyalty but also support inventory management by mitigating the impact of negative evaluations caused by stockouts. By leveraging insights into regulatory focus, retailers can segment their customer base more effectively and develop communication approaches that resonate with distinct motivational profiles.

Evidently, despite the promising results, the studies have limitations that merit consideration. The sample, while diverse, remains constrained to experimental scenarios that may not fully replicate the complexity of real-world shopping contexts. Additionally, simulating stockout scenarios through images may not fully elicit the behavioral responses observed in real retail environments. As a suggestion, field experiments, though challenging to execute and control, could offer more authentic insights into this phenomenon. Furthermore, future research could expand the study to encompass a broader array of products and stockout scenarios, while exploring other psychological traits that may interact with regulatory focus, which would be advantageous.

Although the use of eye-tracking technology in Study 3 provided valuable insights into the visual attention patterns of consumers with different regulatory profiles, certain limitations must be acknowledged. First, the laboratory environment, while controlled, may not fully capture the complexity of real-world retail settings.

Factors such as environmental distractions, dynamic shopping behaviors, and decision-making under time pressure are not accounted for in the experimental design. These differences may limit the external validity of the results, as the visual attention patterns observed in the lab may not accurately reflect those in a natural shopping context. Second, the reliance on static images as stimuli may not engage participants' visual attention in the same way as interacting with actual shelves or products. Future research could address these limitations by incorporating field studies or virtual reality simulations to enhance the ecological validity of the findings. We believe this study significantly enhances understanding of how consumers' regulatory focus influences their responses to stockout occurrences in retail settings. Recognizing that academic studies do not aim to exhaust a topic entirely, we assert that this study contributes toward addressing this knowledge gap.

REFERENCES

- Abramson, C. I. (2023). Why the study of comparative psychology is important to neuroscientists. *Frontiers in Behavioral Neuroscience*, 16, 1095033. <http://dx.doi.org/10.3389/fnbeh.2022.1095033>
- Allen, M. S., Iliescu, D., & Greiff, S. (2022). Single item measures in psychological science. *European Journal of Psychological Assessment*, 38(1), 1-5. <https://doi.org/10.1027/1015-5759/a000699>
- Andaur, J. M. R., Ruz, G. A., & Goycoolea, M. (2021). Predicting out-of-stock using machine learning: an application in a retail packaged foods manufacturing company. *Electronics*, 10(22), 2787. <http://dx.doi.org/10.3390/electronics10222787>
- Atalay, A. S., Bodur, H. O., & Rasolofoarison, D. (2012). Shining in the center: Central gaze cascade effect on product choice. *Journal of Consumer Research*, 39(4), 848-866. <https://doi.org/10.1086/665984>
- Barton, B., Zlatevska, N., & Oppewal, H. (2022). Scarcity tactics in marketing: A meta-analysis of product scarcity effects on consumer purchase intentions. *Journal of Retailing*, 98(4), 741-758. <https://doi.org/10.1016/j.jretai.2022.06.003>
- Benrqay, Y. (2021). An examination of the effects of cross-docking on retail out of stock. *International Journal of Retail & Distribution Management*, 49(5), 636-651. <https://doi.org/10.1108/IJRDM-06-2020-0216>
- Chammas, C. B., & Hernandez, J. M. C. (2024). Development and validation of the general regulatory focus measure forced choice scale (GRFM-FC). *Curr Psychol* (2024). <https://doi.org/10.1007/s12144-024-05970-1>
- Chandon, P., Hutchinson, J. W., Bradlow, E. T., & Young, S. H. (2009). Does in-store marketing work? Effects of the number and position of shelf facings on brand attention and evaluation at the point of purchase. *Journal of Marketing*, 73(6), 1-17. <https://doi.org/10.1509/jmkg.73.6.1>
- Christy, A., Gandhi, G. M., & Vaithyasubramanian, S. (2015). Cluster based outlier detection algorithm for healthcare data. *Procedia Computer Science*, 50, 209-215. <https://doi.org/10.1016/j.procs.2015.04.058>
- Che, H., Chen, X., & Chen, Y. (2012). Investigating effects of out-of-stock on consumer stockkeeping unit choice. *Journal of Marketing Research*, 49(4), 502-513. <https://doi.org/10.1509/jmr.09.0528>
- Derryberry, D., & Reed, M. A. (1998). Anxiety and attentional focusing: Trait, state and hemispheric influences. *Personality and individual differences*, 25(4), 745-761. [https://doi.org/10.1016/S0191-8869\(98\)00117-2](https://doi.org/10.1016/S0191-8869(98)00117-2)
- Fatimah, S., Lee, H. W., Ferris, D. L., & Young, H. R. (2024). A regulatory focus theory perspective on the dynamics between action and power. *Journal of Applied Psychology*, 109(9), 1397-1407. <https://doi.org/10.1037/apl0001198>
- Fitzsimons, G. J. (2000). Consumer response to stockouts. *Journal of Consumer Research*, 27(2), 249-266. <https://doi.org/10.1086/314323>
- Fisher, G. (2021). Intertemporal choices are causally influenced by fluctuations in visual attention. *Management Science*, 67(8), 4961-4981. <https://doi.org/10.1287/mnsc.2020.3732>
- Friedman, E., Johnson, S., & Mitton, T. (2003). Propping and tunneling. *Journal of Comparative Economics*, 31(4), 732-750.

- Förster, J., & Higgins, E. T. (2005). How global versus local perception fits regulatory focus. *Psychological Science*, 16(8), 631-636. <https://doi.org/10.1111/j.1467-9280.2005.01586.x>
- Förster, J., Friedman, R. S., Özel, A., & Denzler, M. (2006). Enactment of approach and avoidance behavior influences the scope of perceptual and conceptual attention. *Journal of Experimental Social Psychology*, 42(2), 133-146. <https://doi.org/10.1016/j.jesp.2005.02.004>
- Grubor, A., Milicevic, N., & Djokic, N. (2017). The impact of store satisfaction on consumer responses in out-of-stock situations. *Revista Brasileira de Gestão de Negócios*, 19, 520-537. <https://doi.org/10.7819/rbgn.v0i0.2436>
- Hayes, A. F., & Montoya, A. K. (2017). A tutorial on testing, visualizing, and probing an interaction involving a multicategorical variable in linear regression analysis. *Communication Methods and Measures*, 11(1), 1-30. <https://doi.org/10.1080/19312458.2016.1271116>
- He, Y., & Oppewal, H. (2018). See how much we've sold already! Effects of displaying sales and stock level information on consumers' online product choices. *Journal of Retailing*, 94(1), 45-57. <https://doi.org/10.1016/j.jretai.2017.10.002>
- Hernandez, J. M., Basso, K., & Brandão, M. M. (2014). Pesquisa experimental em marketing. *Revista Brasileira de Marketing*, 13(2), 98-117. <http://dx.doi.org/10.5585/remark.v13i2.2692>
- Higgins, E. T., Shah, J., & Friedman, R. (1997). Emotional responses to goal attainment: strength of regulatory focus as moderator. *Journal of personality and social psychology*, 72(3), 515-525. <https://doi.org/10.1037//0022-3514.72.3.515>
- Higgins, E. T. (2012). Regulatory focus theory. *Handbook of Theories of Social Psychology* (pp. 483-504). Sage. <https://psycnet.apa.org/doi/10.4135/9781446249215.n24>
- Hoang, D., & Breugelmans, E. (2023). "Sorry, the product you ordered is out of stock": Effects of substitution policy in online grocery retailing. *Journal of Retailing*, 99(1), 26-45. <https://doi.org/10.1016/j.jretai.2022.06.006>
- Huang, Y., & Zhang, Y. C. (2016). The out-of-stock (OOS) effect on choice shares of available options. *Journal of Retailing*, 92(1), 13-24. <https://doi.org/10.1016/j.jretai.2015.07.001>
- Hüttermann, S., & Memmert, D. (2015). The influence of motivational and mood states on visual attention: A quantification of systematic differences and casual changes in subjects' focus of attention. *Cognition and Emotion*, 29(3), 471-483. <https://doi.org/10.1080/02699931.2014.920767>
- Hüttermann, S., Memmert, D., & Nerb, J. (2019). Individual differences in attentional capability are linked to creative decision making. *Journal of Applied Social Psychology*, 49(3), 159-167. <https://doi.org/10.1111/jasp.12572>
- Isaacowitz, D. M., Wadlinger, H. A., Goren, D., & Wilson, H. R. (2006). Is there an age-related positivity effect in visual attention? A comparison of two methodologies. *Emotion*, 6(3), 511-516. <https://doi.org/10.1037/1528-3542.6.3.511>
- Jing, X., & Lewis, M. (2011). Stockouts in online retailing. *Journal of Marketing Research*, 48(2), 342-354. <https://doi.org/10.1509/jmk.48.2.342>
- Kalantary, M. R., Hejazi, S. R., & Khosroshahi, H. (2023). Pricing for different return policies in an online marketplace considering appeasement during a post-return out-of-stock. *International Journal of Production Economics*, 266, 109039. <https://doi.org/10.1016/j.ijpe.2023.109039>
- Ku, H. H., Kuo, C. C., & Kuo, T. W. (2012). The effect of scarcity on the purchase intentions of prevention and promotion motivated consumers. *Psychology & Marketing*, 29(8), 541-548. <https://doi.org/10.1002/mar.20541>
- Kumar, M. E., Sharma, D. P., & Tapar, A. V. (2021). Out-of-stock justifications and consumers' behavioral outcomes-exploring the role of product type and sales level information in out-of-stock situations. *Journal of Retailing and Consumer Services*, 60, 102458. <https://doi.org/10.1016/j.jretconser.2021.102458>
- Lastner, M. M., Folse, J. A. G., Mangus, S. M., & Fennell, P. (2016). The road to recovery: Overcoming service failures through positive emotions. *Journal of Business Research*, 69(10), 4278-4286. <https://doi.org/10.1016/j.jbusres.2016.04.002>
- Lee, A. Y., & Aaker, J. L. (2004). Bringing the frame into focus: The influence of regulatory fit on processing fluency and persuasion. *Journal of Personality and Social Psychology*, 86, 205-218. <https://doi.org/10.1037/0022-3514.86.2.205>
- Lee, K., Choi, J., & Li, Y. J. (2014). Regulatory focus as a predictor of attitudes toward partitioned and combined pricing. *Journal of Consumer Psychology*, 24(3), 355-362. <https://doi.org/10.1016/j.jcps.2014.01.001>
- Lichtenthaler, P. W., & Fischbach, A. (2019). A meta-analysis on promotion-and prevention-focused job crafting. *European Journal of Work and Organizational Psychology*, 28(1), 30-50. <https://psycnet.apa.org/doi/10.1080/1359432X.2018.1527767>
- Lopes, E. L., & Herrero, E. (2018). Pull from here and stretch from there: An experimental study on the effects of out-of-stock in retail (p. 1-18). In *8rd EMA - Encontro de Marketing da ANPAD*, Porto Alegre, RS, Brasil. https://arquivo.anpad.org.br/eventos.php?cod_evento_edicao=92
- Lopes, E. L., & Veiga, R. T. (2019). Increasing purchasing intention of eco-efficient products: The role of the advertising communication strategy and the branding strategy. *Journal of Brand Management*, 26(5), 550-566. <https://doi.org/10.1057/s41262-019-00150-0>
- MacLin, M. K. (2024). Basic Experimental Design in Psychology: The Logic of Experimental Design. In *Experimental Design in Psychology* (pp. 36-48). Routledge.
- Monga, A. S. B., & Williams, J. D. (2016). Cross-cultural styles of thinking and their influence on consumer behavior. *Current Opinion in Psychology*, 10, 65-69.
- Morris, M., & Peng, K. (1994). Culture and causes: American and Chinese attributions for social and physical events. *Journal of Personality and Social Psychology*, 67(6), 949-971. <https://doi.org/10.1037/0022-3514.67.6.949>
- Nisbett, R. E., Peng, K., Choi, I., & Norenzayan, A. (2001). Culture and systems of thought: Holistic versus analytic cognition. *Psychological review*, 108(2), 291-310. <https://doi.org/10.1037/0033-295X.108.2.291>
- Ozuem, W., Patel, A., Howell, K. E., & Lancaster, G. (2017). An exploration of consumers' response to online service recovery initiatives. *International Journal of Market Research*, 59(1), 97-115. <https://doi.org/10.2501/IJMR-2016-048>
- Peterson, R. A., Kim, Y., & Jeong, J. (2020). Out-of-stock, sold out, or unavailable? Framing a product outage in online retailing. *Psychology & marketing*, 37(3), 428-440. <https://doi.org/10.1002/mar.21309>
- Petrou, P., Demerouti, E., & Schaufeli, W. B. (2018). Crafting the change: The role of employee job crafting behaviors for successful organizational change. *Journal of management*, 44(5), 1766-1792. <https://psycnet.apa.org/doi/10.1177/0149206315624961>
- Pizzi, G., & Scarpi, D. (2013). When out-of-stock products DO backfire: Managing disclosure time and justification wording. *Journal of Retailing*, 89(3), 352-359. <https://doi.org/10.1016/j.jretai.2012.12.003>
- Preacher, K. J., & Hayes, A. F. (2008). Contemporary approaches to assessing mediation in communication research. In A. F. Hayes, M. D., Slater, & L. B. Snyder (Eds.), *The Sage sourcebook of advanced data analysis methods for communication research*. Sage.
- Schary, P. B., & Becker, B. W. (1978). The impact of stock-out on market share: Temporal effects. *Journal of Business Logistics*, 1(1).
- Streicher, M. C., Estes, Z., & Büttner, O. B. (2021). Exploratory shopping: Attention affects in-store exploration and unplanned purchasing. *Journal of Consumer Research*, 48(1), 51-76. <https://doi.org/10.1093/jcr/ucaa054>
- Tabachnick, B. G., & Fidell, L. S. (2007). *Experimental designs using ANOVA* (Vol. 724). Thomson/Brooks/Cole.
- Vriend, T., Hamstra, M. R., Said, R., Janssen, O., Jordan, J., & Nijstad, B. A. (2023). Regulatory focus theory: Disentangling goals and strategies. *Applied Psychology*, 72(1), 231-267. <https://doi.org/10.1111/apps.12376>

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