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Falling into Temptation: The Role of Emotional Regulation in the Relationship Between Anxiety, Impulsive Traits, Food Motivation and Impulsivity in Food Purchasing

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Abstract

Food-related impulsivity is described in literature as a regulatory response to negative emotions. However, it is unclear whether emotional regulation can mediate the relationship between psychological traits and eating motivations and impulsivity in food purchasing. This article analyzes the influence of impulsive traits, anxiety, and eating motivations on impulsivity in food purchasing considering the mediating role of emotional regulation. A convenience sample was accessed during the COVID-19 pandemic, consisting of Brazilians, mostly female, with high income, average age of 35 years, and average BMI of 25.87. The hypotheses were tested using Structural Equation Modeling with the Partial Least Squares method (PLS-SEM). The results show that individuals with a tendency to impulsive purchases and with greater difficulty in regulating emotions tend to be more impulsive in food purchasing. The tendency to impulsivity and trait anxiety seem to impair emotional self-control, while adopting functional goals can contribute to self-control. Furthermore, individuals with a higher tendency toward impulsivity appear to cope worse with their emotions when they do not have health goals. The segregation of trait and state anxiety and the inclusion of the emotion regulation construct offer theoretical contributions to the literature. This study also discusses managerial and well-being implications for consumers.

Keywords: Anxiety, Emotion regulation, Impulsivity in Food Purchase.

Caindo em Tentação: O Papel da Regulação Emocional na Relação Entre Ansiedade, Determinantes da Impulsividade e Compra de Alimentos

Resumo

Este artigo analisa a influência dos traços de impulsividade, ansiedade e motivações alimentares na impulsividade alimentar, considerando o papel mediador da regulação emocional. Foi desenvolvido e avaliado um modelo conceptual de hipóteses, utilizando a modelação de equações estruturais. Os resultados mostram que os indivíduos com tendência para compras impulsivas e com maior dificuldade em controlar impulsos emocionais tendem a ser mais impulsivos nas compras de alimentos. A tendência para a impulsividade e os traços de ansiedade parecem comprometer o autocontrolo emocional, enquanto o estabelecimento de objetivos funcionais pode contribuir para o autocontrolo. Além disso, indivíduos com maior tendência para a impulsividade parecem lidar pior com as suas emoções, quando não mantêm objetivos dietéticos ativos relacionados com a saúde. A segregação de estados e traços de ansiedade, bem como a inclusão do construto de regulação emocional, oferecem contributos teóricos para a literatura sobre compras impulsivas. Este estudo também discute implicações de gestão e bem-estar para os consumidores.

Palavras-chave: Ansiedade, regulação emocional, impulsividade na compra de alimentos.

INTRODUCTION

Why do individuals "fall into temptation"? Despite awareness of negative consequences, people often make deleterious food consumption choices. This behavior aligns with the concept of impulsive buying, characterized by unique mechanisms influencing decision-making (Iyer et al., 2020; Rook, 1987; Rook & Fisher, 1995). Internal factors, such as personality traits and motivations, affect food-related decisions, but the ability to regulate emotions appears pivotal (Fenton-O'Creevy et al., 2018) there is disagreement about whether this is functional or dysfunctional and the extent to which it causes financial harm. This paper draws on data from a U.K. national survey sample (N = 109,472, particularly in eating behavior (Pivarunas & Conner, 2015). The Covid-19 pandemic has exacerbated emotionally driven eating, leading to loss of control and increased food intake, especially among those experiencing

heightened psychological distress (Ramalho et al., 2022; Yoldas Ilktac et al., 2022).

Food-related impulsivity is widely recognized as a regulatory response to negative emotions (Müller, 2024; Tice et al., 2001). Emotional instability factors, such as anxiety, and impulsivity are linked to deficits in emotion regulation (Gratz & Roemer, 2004). Research has connected negative emotional states at the time of purchase with increased impulsivity (Islam et al., 2021; Silvera et al., 2008; Sofi, 2020; Thompson & Prendergast, 2015). Impulsivity and difficulties in emotional regulation are strong predictors of unhealthy eating behaviors, particularly those involving highly palatable, calorie-dense foods (Müller, 2024; Pivarunas & Conner, 2015; Tice et al., 2001).

Impulsive purchases are shaped by physical and psychological traits, motivations (e.g., utilitarian or hedonic), and consumer resources (e.g., time and money constraints), mediated by mood states and self-control (Iyer et al., 2020). However, the literature reveals inconsistencies regarding the relationship between affects (emotions) and impulse buying due to a confusion between the potentially discreet influences of momentary emotional state and affection as a personality trait, respectively (Thompson & Prendergast, 2015). Considering that the impulsive buying literature has sought to understand psychological effects and specific emotions (Sofi, 2020), it seems relevant to segment anxiety as a psychological trait determinant of impulsivity and anxiety as an emotional state, whose role is transitory.

Self-control is another critical factor in understanding impulsivity (Vohs & Faber, 2007), but its interplay with emotions remains underexplored (Iyer et al., 2020). Specifically, whether emotional regulation (Gross, 2014; S.-Y. Lee et al., 2020) mediates the relationship between psychological traits, motivations, and impulsive food purchasing requires further investigation. Additionally, studies increasingly focus on the combined effects of determinants of impulsivity (Iyer et al., 2020).

This study examines how impulsivity and anxiety traits, alongside food motivations, influence impulsive food purchasing, with emotional regulation as a mediating factor. Conducted during the Covid-19 pandemic, this research addresses theoretical gaps by exploring how impulsivity and anxiety traits interact with emotional self-control and how pre-existing food motivations moderate this relationship. Furthermore, it evaluates how emotional self-control impacts transient anxiety states and impulsive food purchasing.

1. EMOTIONS

Emotions involve person-situation transactions that capture attention. These transactions hold meaning for the individual based on their active and relevant goals, eliciting coordinated yet flexible responses from multiple systems that critically alter the ongoing person-situation interaction (Gross, 2014). Generally, when individuals experience emotional distress, they tend to succumb to immediate impulses (such as consuming drugs, making expensive purchases, or eating high-calorie foods) to alleviate discomfort, prioritizing short-term emotional regulation over long-term benefits (Rook & Gardner, 1993; Tice et al., 2001). However, anxiety state plays a distinct role by prompting a more acute avoidance response and a focus on seeking safe outcomes, in contrast to other negative emotions such as sadness or anger (K. Lee et al., 2011).

1.1. Anxiety

Anxiety disorders encompass conditions characterized by excessive fear and anxiety. Fear is the emotional response to a real or perceived imminent threat, whereas anxiety relates to the anticipation of future threats (American Psychiatric Association, 2014). The literature distinguishes between State-Anxiety (SA), a momentary and transient condition, and Trait-Anxiety (TA), which is linked to personality and assumes a more stable and enduring nature (Caci et al ., 2003; Spielberger et al., 1970). Given the reported positive relationship between trait anxiety and its momentary manifestation (Caci et al., 2003), where SA is a natural consequence of TA (American Psychiatric Association, 2014), including in marketing studies (Thompson & Prendergast, 2015), we propose the following hypothesis:

$\mathbf{H_1}$: Trait Anxiety has a **positive relationship** with State-Anxiety.

1.2. Difficulty in emotion regulation

Emotion regulation refers to the processes by which individuals manage their emotions—how they feel, experience, and express them (Gross, 2014). Gratz and Roemer (2004) propose a multidimensional model of emotion regulation, which includes the ability to control impulsive behavior. This dimension reflects individuals' difficulty in regulating impulsive actions when experiencing negative emotions. Difficulty in

Emotion Regulation (DER), or emotional dysregulation, arises from deficiencies in one or more of these dimensions (Esperidião-Antonio et al., 2008). For example, individuals may exhibit impulses driven by learned behaviors, innate tendencies, or habits. Emotion regulation essentially involves overriding such natural tendencies and replacing them with an alternative response or inhibiting the impulse altogether (Tice & Bratslavsky, 2000).

Considering that trait anxiety is associated with a heightened susceptibility to negative emotions (American Psychiatric Association, 2014; Caci et al., 2003) and that this psychological trait correlates with greater difficulty in emotion regulation (Cisler & Koster, 2010; Paivio & Greenberg, 1998), we propose the following hypothesis:

H_2: Trait-Anxiety maintains a **positive** relationship with Difficulty in Emotion Regulation.

2. IMPULSIVITY

Impulsive purchasing refers to consumers' tendency to make spontaneous, unreflective, and immediate purchases, often driven by proximity to a desired product, emotional triggers, and the potential for immediate gratification (Rook & Fisher, 1995). According to Iyer et al. (2020), impulsive purchases are influenced by three factors: psychological traits (e.g., the tendency toward impulsive buying), motivations (e.g., utilitarian or hedonic), and consumer resources (e.g., time and money constraints). These determinants interact with individuals' levels of self-control and mood states, mediating their impact on impulsive buying behavior.

Tice and Bratslavsky (2000) describe emotional self-regulation, or emotion regulation, as a form of self-control involving three components: standards, monitoring, and strength. In contexts such as food consumption, difficulty in emotion regulation can disrupt other self-control mechanisms. For instance, individuals may prioritize affective regulation through food over regulatory goals, such as hunger-satiety states or long-term dietary objectives (Herman & Polivy, 2011; Rook & Gardner, 1993; Tice et al., 2001).

In addition to emotion regulation, assumed as a construct that represents the emotional self-control of individuals (Tice & Bratslavsky, 2000), emotional states (circumstantial condition) also mediate impulsive behavior determinants and impulsive buying behavior (Iyer et al., 2020), especially negative emotions (Badgaiyan &

Verma, 2014; Sun & Wu, 2011), including in food purchasing contexts (Verplanken et al., 2005). Iyer et al. (2020) highlighted that emotions and self-control exert joint effects, potentially as simultaneous or serial mediators, with self-control influencing emotional states. Assuming a serial mediation where self-control affects emotional states and recognizing that DER modulates the intensity of anxiety, we propose the following hypothesis:

H_3: Difficulty in Emotion Regulation maintains a **positive** relationship with State-Anxiety.

2.1. Determinants of Impulsivity

The types of food motivation, along with subjective norms—social pressures influencing individuals to adopt behaviors based on their social relationships—are key components of impulse purchasing (Iyer et al., 2020). In this context, the literature identifies three primary dietary goals for consumers: functional, hedonic and social (symbolic) goals. Functional goals focus on improving health or reducing health risks through food consumption. Hedonic goals prioritize the sensory enjoyment and pleasure derived from eating. Social (symbolic) goals emphasize social relationships and consumer identity expressed through food (Bublitz et al., 2013).

In hedonic terms, impulse buying is a complex phenomenon, often accompanied by emotional conflicts. Individuals engaging in impulse purchases tend to give less consideration to future consequences (Rook, 1987). Punj (2011) proposed that individuals strive to balance pleasure-seeking and self-regulation. As internal motivation increases, so does the likelihood of impulsive buying. However, while hedonic motivations often downplay future consequences, functional eating goals encourage long-term awareness, focusing on health-related outcomes. This dynamic can help individuals override immediate cravings for pleasurable foods (Tice & Bratslavsky, 2000).

Social goals, similarly, are shaped by situational factors and past experiences. For instance, consumers' prior impulse purchases often serve as internalized social norms for evaluating the desirability of future impulse purchases (Rook & Fisher, 1995). The search for personality expressiveness in consumption leads to impulsive purchases (Sofi, 2020) and, as food is also an expression of consumers' identity, social norms affect situational self-control (Roth et al., 2001). For example, individuals may adjust their food intake based on the presence of opposite-sex members (Bublitz et

al., 2013), while young people are more strongly influenced by peer behavior (Duarte et al., 2013). When alone, however, individuals are more likely to disregard social norms and behave impulsively (Roth et al., 2001; Sofi, 2020).

Consumers' motives—whether internal (hedonic or utilitarian) or external (social)—reflect their enthusiasm toward specific goals, shaping beliefs about food consumption, such as using food for emotional relief during negative states (Iyer et al., 2020). Since motivations differentially affect self-control, their relationships with DER also vary. Functional goals foster greater self-control, while hedonic and social goals focus on situational factors, reducing self-control. Based on this, we propose the following hypotheses:

H_4a: Functional Motivation maintains a **negative** relationship with Difficulty in Emotion Regulation.

H_4b: Hedonic Motivation has a **positive** relationship with Difficulty in Emotion Regulation.

H_4c: Social Motivation has a **positive** relationship with Difficulty in Emotion Regulation.

Another determinant of impulsive buying behavior is the Tendency to Purchase Impulsively (TPI), defined as the degree to which an individual exhibits unintentional, immediate, and thoughtless purchasing tendencies (Rook & Fisher, 1995). TPI is considered an antecedent of impulsive buying behavior, with its effects mediated by individuals' self-control mechanisms (Iyer et al., 2020; Rook & Gardner, 1993). Unlike impulsive buying behavior, TPI represents a relatively stable consumer trait that may or may not translate into observable actions (Sun & Wu, 2011).

While TPI often provokes intense emotional desires and sudden, irresistible urges to purchase immediately (Tice et al., 2001), individuals typically attempt self-control to resist such impulses (Muraven & Baumeister, 2000; Tice & Bratslavsky, 2000; Vohs & Faber, 2007). Given that Difficulty in Emotion Regulation (DER) reflects challenges in managing emotions, we propose the following hypothesis:

H_5: the Tendency to Purchase Impulsively maintains a **positive** relationship with Difficulty in Emotion Regulation.

2.2. Impulsivity in Food Purchase

In this study, Impulsivity in Food Purchase (IFP) refers to impulsive behaviors in food-related contexts triggered by external stimuli, such as marketing cues. Highly

palatable foods, particularly those high in fat and sugar, are readily available and commonly associated with impulsive purchases in supermarkets (Narasimhan et al., 1996). Impulsive consumers are especially vulnerable to these food categories (Verplanken et al., 2005). Another widely utilized strategy by retailers is price discounts, which have been identified as a significant driver of impulsive buying (Islam et al., 2021; Vohs & Faber, 2007). Marketing stimuli, including price discounts, product placement, and attractive displays, are recognized as effective external triggers for impulsive purchases (Iyer et al., 2020).

In this study, the IFP scenario involves a context combining financial rewards (price discounts) with the desire for a palatable, sweet, high-fat food (ice cream). Research indicates that individuals with high impulsivity traits are more likely to engage in impulsive buying behaviors, as buying represents the behavioral manifestation of these psychological traits (Islam et al., 2021; Rook & Fisher, 1995; Rook & Gardner, 1993; Sun & Wu, 2011). Based on this, we propose the following hypothesis:

H_6: the Tendency to Purchase Impulsively maintains a **positive** relationship with Impulsivity in Food Purchase.

The literature suggests that individuals with difficulties managing emotions are more likely to eat in response to emotional cues, as eating may serve as their primary means of effectively regulating emotions (Pidgeon et al., 2013; Tice & Bratslavsky, 2000). This tendency is particularly evident in the consumption of sweet or high-fat foods, which can reduce cortisol levels and alleviate perceived stress (Konttinen et al., 2010; Pivarunas & Conner, 2015).

Since food can act as a source of emotional relief (Tice et al., 2001) and impulsive consumption of palatable foods is often triggered by stress (Konttinen et al., 2010; Pivarunas & Conner, 2015; Verplanken et al., 2005), it is anticipated that, in a context of reward, individuals with greater Difficulty in Emotion Regulation (DER) will exhibit higher levels of impulsivity due to these external stimuli. Thus, we propose:

H_7: Difficulty in Emotion Regulation maintains a **positive** relationship with Impulsivity in Food Purchase.

The relationship between State-Anxiety (SA) and food impulsivity is more nuanced. On one hand, impulsive purchases often stem from sudden urges combined with intense emotional desires for immediate gratification (Tice et al., 2001). Negative emotions such as anxiety are often associated with emotional eating (Crockett et al., 2015) in part because individuals seek balance or "to feel better" through food (Herman & Polivy, 2011; Pidgeon et al., 2013).

On the other hand, SA, characterized by a diffuse sense of threat, induces feelings of suspense, tension, and apprehension (Arkin & Ruck, 2007). This state is associated with hypervigilance, cautious behavior, and self-preservation tendencies (American Psychiatric Association, 2014; Cisler & Koster, 2010). Empirical marketing studies indicate that anxious consumers often minimize risks and prefer safer options (K. Lee et al., 2011). Psychological aspects of SA, such as hypervigilance, defensive behavior, and avoidance, function as suppressors of impulsive or unpredictable actionsv (Cisler & Koster, 2010). Therefore, we hypothesize:

H_8: State-Anxiety maintains a **negative** relationship with Impulsivity in Food Purchase.

3. METHOD

3.1. Participants

The sample was composed by an online survey. The data collection was carried out in social network forums with the student population and food-themed forums. We chose to carry out the collection in a short period (72 hours, between April 24 and 27, 2020) to avoid very sudden changes in the scenario. Participants were asked to agree to an Informed Consent (IC), which explained the research interests, the condition of voluntary participation, and the possibility of abandoning the questionnaire at any time. Incomplete questionnaires that did not agree with the IC or individuals outside the requested age range (20 to 59 years due to BMI calculation) were invalidated.

We used the software *G*Power*, version 3.1.9.2, to define a minimum a priori sample. The collected sample (n=234) was 2.4 times greater than the software recommendation, according to the established parameters (significance: 5%, effect size=0.15, test power=0.80, and maximum number of predictors of a construct=6), as instructed by Ringle, Silva and Bido (2014). The participants who made up the sample were Brazilian, mostly female (70.9%), predominantly single (58%), with a mean age of 35 years (σ: 10.4 years), income household income of 6,583 Reais (σ: 4,932 reais), and an average BMI of 25.87 (σ: 4.63).

3.2. Design and instruments

Priming. Before starting the instruments, respondents accessed a priming text with the aim of eliciting the pandemic context. The priming effect can be understood as an unconscious stimulus to which an individual is exposed and that influences his or her response to a subsequent stimulus (Bargh, 2006). This priming was intended to highlight the respondents' state of anxiety due to the COVID-19 pandemic. Two groups of respondents were randomly assigned. Each group accessed a news story containing information about COVID-19, one with milder information and the other with more vehement information about the consequences of the pandemic. The priming texts did not imply significant differences in SA levels (mean difference = -0.11, 95% CI [-0.31, 0.09]), so we considered the participants as members of a single sample.

Tendency to purchase impulsively. Tendency to Purchase Impulsively was measured by the *Buying Impulsiveness Scale* (BIS) of Rook and Fisher (1995), translated in and validated to the Brazilian context (Aquino et al., 2020) with a mean age of 35.8 years (SD = 12.8. The instrument is composed of nine items, with affirmative propositions about habitual behaviors in the consumption environment. The participants self-reported their agreement on a five-point scale. The higher the scores, the greater the levels of tendency to impulsivity. We adapted the scale, taking it from a generic impulse buying trend to a specific context of shopping in a supermarket.

Anxiety. To measure state and trait anxiety, the *State-Trait Anxiety Inventory* (STAI) of Spielberger, Gorsuch and Lushene (1970) was used in its reduced version (STAI-6) validated for Brazilian subjects (Fioravanti-Bastos et al., 2011). The STAI-6 is composed of two distinct scales. The first identifies the state and the second the trait of anxiety. We used only the subscales of present state of anxiety (three items), which measures the intensity of emotions, and of present trait anxiety (three items), which measures the occurrence of the trait, both anchored on four-point scales.

Emotion regulation. The construct Difficulty in Emotion Regulation (DER) was measured using the *Difficulties in Emotion Regulation Scale* (DERS) of Gratz and Roemer (2004), in its translated in and validated version to the Portuguese context (Coutinho et al., 2010). We selected the subscale referring to the domain 'difficulties in controlling impulsive behavior' when experiencing negative emotions (six items), whose answers are self-reports of agreement, anchored on a five-point scale. The higher the score, the greater the difficulty in emotion regulation. Brief changes were necessary in the propositions to adapt the content to the Brazilian public, but without any semantic changes.

Motivations. To measure the types of food motivations, we developed three items (one for each type of motivation) based on the food goals defined by Bublitz (2013). Through self-reported responses of agreement on a five-point scale, individuals expressed their levels of functional motivation ("I maintain dietary goals consonant with my health objectives"), hedonic ("I maintain eating habits privileging the gustatory pleasure and the experience of consuming food"), and social ("I maintain eating habits taking into account people close to me and people who are references for me").

Impulsivity in Food Purchase. The instrument Impulse Purchase in Context (Campos & Lins, 2021), which is an adapted approach based on the BIS scale (Rook & Fisher, 1995), aims to measure impulsive purchases in specific contexts. It was used for our IFP construct. The instrument has three items anchored on a five-point agreement scale. The higher the scores, the greater the levels of impulsivity in purchasing in rewarding contexts. An impulsivity-promoting scenario was created from external reward appeals (we used price and food type). We indicated to respondents a promotion of a regular pot of ice cream, that is, not diet/light (to show a deleterious food option), with an 80% discount.

Control Variables. Finally, control variables relevant to the phenomenon were collected to characterize the sample and measure the invariance of relationships in sociodemographic terms, according to the literature. We asked respondents for gender, age, marital status, family income, weight and height, the latter for the purpose of calculating BMI.

3.3. Analysis procedures

In order to evaluate the measurement and test the hypotheses of the proposed theoretical model, the analysis of the collected data was carried out using Structural Equation Modeling (SEM). Due to the exploratory nature of the proposed model, we adopted the method *Partial Least Squares Path Modeling* (PLS-PM) (Hair Jr. et al., 2010). T statistics was used, and the confidence intervals were estimated by bootstrapping from 5,000 re-samplings with *Bias-corrected and Accelerated* (BCa) correction. To assess the presence of outliers or items with little variability, the unimodal nature of histograms generated by bootstrapping was analyzed (Bido & Da Silva, 2019). The measurement model was evaluated based on the convergent and discriminant validity, in addition to the reliability and multicollinearity of constructs.

4. RESULTS

4.1. Adequacy of the measurement model

Table 1 shows that the internal consistency of the scales, assessed by composite reliability (CC), obtained good adequacy indexes (CC>0.8). The convergent validity, verified through the average variance extracted (AVE), showed a good fit for the constructs (AVE≥50%). Five items of the TPI construct were excluded from the model in order to improve the AVE (Bido & Da Silva, 2019). These items had loads were lower than 0.7, but their exclusions did not represent significant improvements in AVE. The motivation items (functional, hedonic, and social) are unique and do not make up a scale. Therefore, their factorial loads are not shown presented in Table 1.

Table 1

Item factor loadings, convergent validity, and internal consistency

Construct	Load	T statistics
State Anxiety - SA (AVE: 0.74; CC: 0.90)		
I'm tense.	0.895	48.821*
I feel nervous.	0.893	49.238*
I'm worried.	0.790	21.420*
Trait Anxiety - TA (AVE: 0.67; CC: 0.86)		
I worry too much about unimportant things.	0.767	17.436*
I get tense and upset when I think about my problems at the moment.	0.813	26.251*
I feel nervous and restless.	0.876	54.723*
Tendency to Purchase Impulsively - TPI (AVE: 0.51; CC: 0.81)		
I should buy things without thinking.	0.599	5.137*
"I see it. I buy it"; this statement could describe me in this situation.	0.862	24.853*
"Buy now and think about it later"; this statement could describe me.	0.676	6.510*
I would carefully plan most of my purchases (*reverse*).	0.702	9.150*
Difficulty in Emotion Regulation - DER (AVE: 0.58; CC: 0.89)		
I experience my emotions overwhelmingly and out of control.	0.662	11.744*
When I'm "down." I'm out of control.	0.815	29.822*
When I'm "down." I feel out of control.	0.779	19.472*
When I'm "down." I feel like I can stay in control of my behaviors (*reverse*).	0.688	14.395*
When I'm "down". I have difficulty controlling my behaviors.	0.811	32.881*
When I'm "down". I lose control of my behaviors.	0.796	23.988*
Impulsivity in Food Purchase - IFP (AVE: 0.78; CC: 0.91)		
I would feel like buying the ice cream on the spur of the moment.	0.889	32.816*
I would be willing to buy ice cream spontaneously.	0.841	24.450*
I would be willing to buy ice cream as soon as I saw the sale.	0.909	50.606*

Note: *Significance: $p < 0.001$. ***Source:*** Prepared by the authors.

Table 2 shows means and dispersions per construct, as well as correlations. According to the Fornell and Larcker criterion, it appears that there is discriminant validity in the developed model considering that the square roots of the extracted average variances (diagonally highlighted) are considerably higher than the correlations between latent variables.

Table 2
Discriminant validity and descriptive statistics of latent variables

Latent Variable	Mean	Standard deviation	AVE and Correlations							
			SA	TA	FM	HM	SM	TPI	DER	IFP
SA	2.41	0.81	**0.86**							
TA	2.30	0.73	0.49	**0.82**						
FM	3.08	1.32	-0.14	-0.22	**1.00**					
HM	3.53	1.18	0.03	0.03	0.05	**1.00**				
SM	2.67	1.24	0.07	0.05	0.20	0.21	**1.00**			
TPI	1.60	0.69	0.01	0.08	-0.17	0.17	0.04	**0.72**		
DER	2.13	0.74	0.32	0.54	-0.24	0.04	0.08	0.18	**0.76**	
IFP	3.43	1.30	0.02	0.14	-0.18	0.07	0.02	0.21	0.18	**0.88**

Note: *Captions:* SA (State Anxiety), TA (Trait Anxiety), FM (Functional Motivation), HM (Hedonic Motivation), SM (Social Motivation), TPI (Tendency to Purchase Impulsively), DER (Difficulty in Emotion Regulation), and IFP (Impulsivity in Food Purchase).
Source: Prepared by the authors.

Given the convergent and discriminant validities and the good internal consistency of the model, we performed the analysis of path coefficients of the theoretical structural model.

4.2. Analysis of path coefficients of hypothesized relationships

Table 3 shows the relationships of the theoretical structural model, with hypotheses and sub-hypotheses. The hypotheses H_1, H_2, H_4a, H_6, and H_7 were true, considering the p-values associated with the coefficients (β) and the directions (signs) of the relationships. We consider H_5 partially true due to its marginally significant coefficient ($p \leq 0.07$). Although functional motivation is significant to explain emo-

tion regulation (H_4a), motivations related to hedonism (H_4b) and social norms (H_4c) were not confirmed. The state anxiety (SA) was not significant both as an antecedent of IFP (H_8) and as a mediator between DER and IFP (H_3).

Table 3

Analysis of hypothesized relationships in the theoretical model

Structural Path	Coef. β	T value	Hypothesis	Situation
TA → SA (+)	0.441	6.581*	H_1	True
TA → DER (+)	0.494	8.100*	H_2	True
DER → SA (+)	0.085	1.295 (n.s.)	H_3	False
FM → DER (-)	-0.130	2.116**	H_4a	True
HM → DER (+)	0.002	0.027 (n.s.)	H_4b	False
SM → DER (+)	0.078	1.410 (n.s.)	H_4c	False
TPI → DER (+)	0.115	1.804***	H_5	Partially True
TPI → IFP (+)	0.187	3.323*	H_6	True
DER → IFP (+)	0.153	2.236**	H_7	True
SA → IFP (-)	-0.034	0.477 (n.s.)	H_8	False

Note: Significances: *p-value ≤ 0.01; **p-value ≤ 0.05; ***p-value ≤ 0.07; and (ns) not significant.
Source: Prepared by the authors

To improve the theoretical understanding of the phenomenon and refine the understanding of the relationships between constructs, we propose a new structural model considering only significant relationships. We excluded the hedonic and social motivation variables. We chose to also exclude the SA construct considering that it does not maintain a significant relationship with IFP.

4.3. Final Structural Model Proposition

We estimated a final structural model (see Table 4) with all structural parameters significant or marginally significant (p=0.067). We included control variables looking for moderating effects in the model but found no significant relationships. However, we verified a significant interaction between the constructs FM and TPI, negatively affecting the DER.

Our model revealed that the TA, TPI and FM constructs have a high explanatory power of DER (33%) and that the TPI and DER have a low explanatory power

(0.06%) of IFP, according to the fitting criteria (R^2 adjusted) (Cohen, 1988). The relative importance of structural coefficients was estimated by the magnitude of the effect (f^2). Given Cohen's references (1988), only the relationship between TA and DER can be considered large ($f^2 > 0.35$), and the others had a small effect ($f^2 > 0.02$). As for the moderating effect, the interaction between TPI and FM on the DER can be classified as medium in size, according to the criterion $f^2 > 0.01$ (Hair Jr. et al., 2017).

Table 4
Final structural model

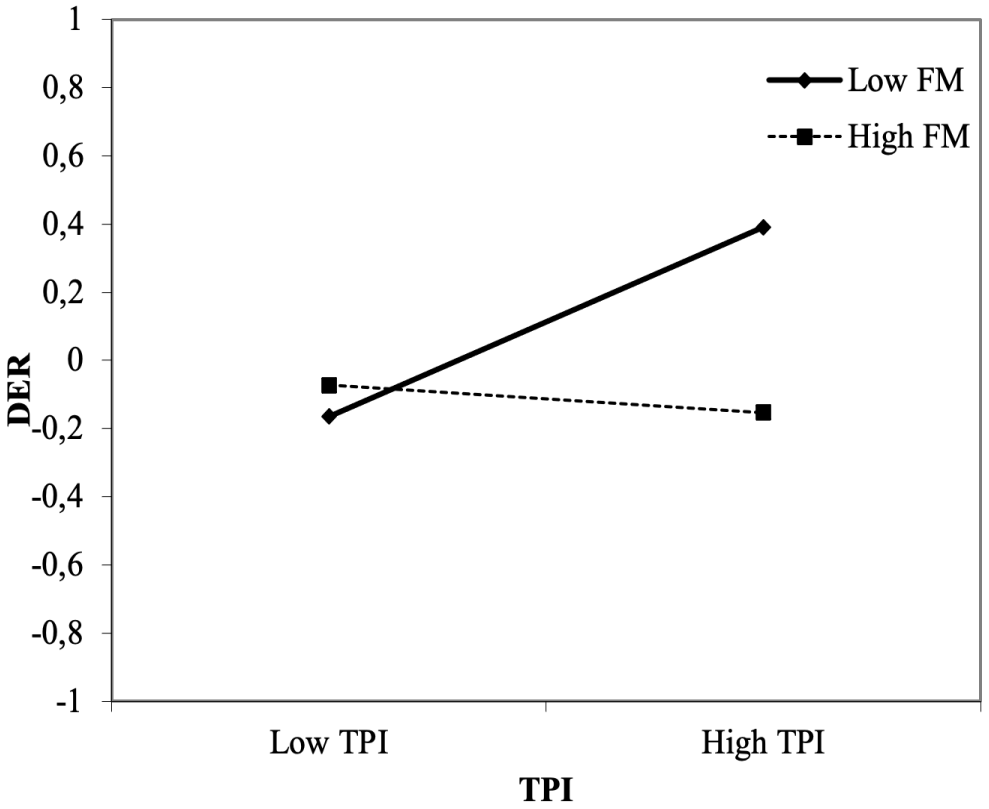
Structural Path	Coef. β	T value	VIF	f^2	Adjusted R^2
TPI → DER	0.119	2.055*	1.031	0.021	**0.330**
TA → DER	0.501	8.710*	1.054	**0.362**	
FM → DER	-0.113	1.821**	1.077	0.018	
TPI*FM → DER	-0.159	2.228*	1.000	0.034	
TPI → IFP	0.189	0.544*	1.033	0.037	0.058
DER → IFP	0.144	3.387*	1.033	0.021	

Note: Significances: *p-value ≤ 0.01, and **p-value ≤ 0.07.
Source: Prepared by the authors.

In addition to the direct relationships between TPI and FM with DER, we found that there is a significant interaction (moderation) between TPI and FM that affects the decrease in DER. As Figure 2 shows, whose variables were standardized via *z-score*, higher levels of FM (one standard deviation above the mean) do not change the DER level of individuals for any TPI level. The sharp slope of the line for lower FM levels (one standard deviation below the mean) denotes a greater effect of the interaction between FM and TPI, with a positive impact on the DER. This means that individuals who have a high tendency to impulsive purchases and to maintain low levels of functional goals must have a greater difficulty controlling impulses related to emotions.

Figure 1

Moderating effect of Functional Motivation (FM) on the relationship between Tendency to Purchase Impulsively (TPI) and Difficulty in Emotion Regulation (DER).



Source: Prepared by the authors based on the "two-way linear interaction effects" worksheet of Dawson (2014).

We discuss in the following section the relevance of the findings of this study and their theoretical and practical implications.

5. DISCUSSION

Our findings reveal that trait anxiety and the tendency to purchase impulsively (TPI) are significant determinants that positively influence the difficulty in emotion regulation (DER), while functional motivations exert a negative effect on DER. Both TPI and DER were identified as predictors of impulsivity in food purchases (IFP). Interestingly, hedonic and social motivations, as well as state anxiety (SA), showed no significant influence on DER or IFP.

As hypothesized, emotion regulation mediates the relationship between psychological traits and motivations with impulsive food buying. The determinants demonstrated a high explanatory power for DER, with trait anxiety exerting a particularly strong negative influence on emotional self-control. This aligns with prior studies highlighting the impact of this psychological trait (Cisler & Koster, 2010; Paivio & Greenberg, 1998). Similarly, TPI and functional motivations showed direct positive and negative effects, respectively, consistent with existing literature (Iyer et al., 2020). These results reinforce the relevance of DER as a construct in consumer behavior studies, particularly regarding the self-control dimension in impulsive buying behavior (S.-Y. Lee et al., 2020).

While personality traits such as anxiety are often linked to impulsive behaviors (Badgaiyan & Verma, 2014; Islam et al., 2021; Sun & Wu, 2011; Thompson & Prendergast, 2015), including food purchases (Verplanken et al. 2005), our results did not find DER to significantly predict SA, nor did SA significantly explain IFP. This inconclusiveness may stem from the ambiguous consequences of anxiety. While some studies suggest that individuals use food to alleviate perceived stress (Konttinen et al., 2010; Pivarunas & Conner, 2015), others highlight the anxiety-driven tendency toward cautious and avoidance behaviorv (Cisler & Koster, 2010).

TPI emerged as a stronger predictor of IFP than DER, highlighting its critical role in impulsive buying. This is consistent with prior research demonstrating the profound influence of impulsive tendencies on self-control and impulsive behaviors (Islam et al., 2021; Rook & Fisher, 1995; Tice & Bratslavsky, 2000; Vohs & Faber, 2007). Although the explanatory power of our latent variable for IFP was modest (adjusted R^2), this outcome aligns with our choice of a parsimonious model focusing primarily on anxiety and emotional self-control. As noted by Iyer et al. (2020), impulsive purchases are influenced by numerous internal and external factors, which were outside the scope of this study.

The attenuating effect of functional motivations on DER was confirmed. When individuals prioritize food quality and long-term health goals, they exhibit greater emotional self-control, thereby reducing impulsive tendencies. This finding aligns with research indicating that utilitarian objectives enhance self-control over snack consumption (Duarte et al., 2013; Tice et al., 2001), helping to suppress short-term desires in favor of long-term goals (Tice & Bratslavsky, 2000).

In contrast, hedonic and social motivations did not significantly influence DER. For hedonic motivations, this result may be explained by their stronger association with positive emotional states rather than negative ones, which are central to DER measurements (Gratz & Roemer, 2004; Iyer et al., 2020). Regarding social motivations, the research scenario may not have sufficiently activated participants' awareness of social beliefs, which are crucial for assessing their effects on emotion management (Roth et al., 2001).

Lastly, exploratory analyses revealed a significant interaction between TPI and functional motivations in predicting DER. While high functional motivations alone were insufficient to mitigate TPI's effect, individuals with low functional motivations appeared particularly vulnerable to the influence of TPI on emotional self-control. This suggests that, in the absence of strong long-term health goals, short-term impulses dominate, leading individuals to use food as an emotional regulator (Tice & Bratslavsky, 2000).

5.1. Theoretical and practical implications

In general, this article favored a better understanding of the relationships between anxiety, determinants of impulsivity, emotion regulation, and impulsivity in food purchase, contributing to discussions about food well-being. The marketing literature does not correctly discriminate affective states and traits. Therefore, this study contributes to the understanding of the effects of trait anxiety on the phenomenon of food impulsivity. The inclusion of emotion regulation as a construct capable of measuring individuals' self-control related to emotions may collaborate with future studies not only related to impulsivity but to all emotional outcomes in marketing decisions. Finally, the understanding that low levels of functional motivation can amplify the effects of the tendency to impulsive purchase contributes to the literature on impulsivity, especially to studies that have emotional self-control as their scope.

The practical implications underlying this work consider a managerial and a

social perspective focused on consumer well-being. Under a managerial lens, it is emphasized that price is an effective marketing stimulus, but impulsive purchase is determined by a set of psychological, social, and situational variables. Market research should, therefore, include in its objectives identifying customers with traits of tendency to impulsiveness and propensity to negative feelings. From a social point of view, professionals interested in the well-being of consumers may encourage the adoption of functional goals related to food and promote strategies that contribute to individuals' self-control. *Mindfulness*, for example, is a strategy that has shown good results on eating habits (Pidgeon et al., 2013).

5.2. Limitations and suggestions for future studies

This study faced several limitations related to the measurement of the Impulsive Buying Tendency (TPI) construct and the methodological design adopted. Measurement limitations were evident in the adaptation of the TPI scale, which exhibited issues with convergent validity and internal consistency. These shortcomings may have impacted the precision of the findings related to this construct. Methodological limitations stem from the sample composition and the data collection strategy. The sample was obtained through convenience sampling, which restricts the generalizability of the results. Furthermore, the sample was predominantly composed of higher-income women, limiting the ability to extrapolate findings to the broader population. Additionally, the observational cross-sectional design of the study precludes causal inferences, as it captures data at a single point in time without accounting for temporal relationships.

Given these limitations, future research should adopt more rigorous sampling procedures to ensure broader representativeness and generalizability. We recommend randomized controlled studies, preferably conducted in real-world settings, to test the causal relationships between the associations identified in this research. To enhance the accuracy of findings, future studies could incorporate objective measurements of state anxiety, such as monitoring salivary cortisol levels, which provide a more precise understanding of the impact of anxiety on impulsive purchasing behavior. Additionally, exploring other determinants could offer a more comprehensive explanation of impulsivity in food purchases, extending the scope of this research.

6. CONCLUSION

This article examined the influence of impulsivity traits, anxiety, and food motivations on food impulsivity, considering the mediating role of emotional self-control. The results indicate that individuals with a tendency toward impulsive purchases and greater difficulty controlling emotional impulses are more likely to make impulsive food purchases. Impulsivity and anxious personality traits appear to impair emotional self-control, while the establishment of functional goals may enhance self-control. Moreover, individuals with a higher tendency for impulsivity seem to struggle more with their emotions when they do not maintain health-related dietary goals. On the other hand, hedonic and social food motivations, as well as momentary states of anxiety, do not appear to affect impulsivity control in food purchases.

In summary, the figurative expression "falling into temptation," which we associate with impulsive food purchasing, seems to stem from a natural tendency to yield to impulses combined with failures in emotional self-control. Our findings suggest that even effective self-control strategies, such as setting health goals, may be more harmful (when not adopted) than mitigating the effects of impulsivity. Therefore, even for individuals with a healthy lifestyle, it is expected that, during conflicting moments, emotion regulation (an immediate solution) will be prioritized over other forms of self-control (which address long-term goals). However, individuals with a high tendency toward impulsivity are more likely to seek emotional regulation through food if they do not maintain utilitarian goals.

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