

## Article

# Regulatory Fit to Enhance User Engagement with an App Promoting Healthy and Sustainable Eating. An Experimental Study to Match Regulatory Concern and Anticipated Emotions

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**Abstract:** Mobile apps can effectively promote healthy and sustainable eating, but their success depends on initial user engagement. This study aimed to increase initial user engagement by tailoring app descriptions to users' regulatory focus (prevention versus promotion). Four conditions were created by combining two types of messages: regulatory concern (safety versus growth) and anticipated emotion (positive versus negative). The safety message emphasized the protection of health and the environment, while the growth message emphasized the improvement of well-being and environmental conservation. The message with the positive anticipated emotion described satisfaction with using the app, while the message with the negative anticipated emotion described dissatisfaction with not using the app. Participants' attitudes, desires, and intentions, as well as downloads of the app were measured to assess the effectiveness of the message. Promotion-focused individuals showed greater desire and were more likely to download the app when the message matched their focus (growth + positive anticipated emotions) than when it did not (safety + negative anticipated emotions). Conversely, prevention-focused individuals did not show increased engagement with regulatory congruent messages. These results suggest that tailoring app descriptions to users' regulatory focus may increase initial engagement among promotion-focused individuals. Further research is needed to investigate methods to increase engagement among prevention-focused individuals.

**Keywords:** sustainable eating; nutritional app; regulatory fit; anticipated emotions; tailoring; user engagement



**Citation:** Carfora, V.; Festa, S.; Pompili, S.; Azzena, I.; Guidetti, M.; Scaglioni, G.; Carraro, L.; Lenzi, M.; Scatolon, A.; Cavazza, N.; et al. Regulatory Fit to Enhance User Engagement with an App Promoting Healthy and Sustainable Eating. An Experimental Study to Match Regulatory Concern and Anticipated Emotions. *Sustainability* **2024**, *16*, 6388. <https://doi.org/10.3390/su16156388>

Academic Editors: Dario Donno and Giuliana Vinci

Received: 30 May 2024  
Revised: 15 July 2024  
Accepted: 22 July 2024  
Published: 25 July 2024



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## 1. Introduction

A growing body of research suggests that a healthy and sustainable diet not only influences the well-being and health of individuals but also profoundly impacts global sustainability goals. Alternative diets, such as plant-based and Mediterranean diets, are associated with lower incidence of type II diabetes, coronary heart disease, and other chronic non-communicable diseases, thus increasing life expectancy [1]. At the same time, diets that favor plant-based foods over animal products consume less natural resources, such as land and water, and support biodiversity [2]. To improve the effectiveness of these dietary recommendations, many researchers are focusing on tailoring dietary recommendations to individual

needs and preferences [3]. This approach explores various aspects of personalization to ensure that dietary recommendations are more relevant and effective for each individual [4].

In this context, digital tools, especially mobile applications, are proving to be a promising platform that can facilitate a customized approach. Research suggests that mobile apps can effectively communicate nutrition messages and facilitate behavior change strategies [5]. However, the effectiveness of such interventions is often described as modest or insufficient [6]. On the one hand, low engagement is often observed with smartphone apps, which contributes to their unsuitability for long-term behavior change [7]. On the other hand, high user engagement is associated with a significant improvement in dietary behavior [8].

Overall, the successful use of apps that promote dietary change depends crucially on users downloading and using the apps in the first place [9]. Therefore, it is important to understand how to increase this initial engagement with effective communication strategies. However, there is a research gap regarding whether initial engagement with these apps can be increased by tailoring descriptions of their content, i.e., by adapting the way the app is initially presented to users (e.g., the information provided in the app stores) to their psychological characteristics.

The present study, therefore, aimed to determine how different descriptions of an app designed to promote adherence to a healthy and sustainable diet might influence users' initial engagement, taking into account their psychological characteristics. Specifically, the present study tested whether the use of regulatory concerns (i.e., growth and safety needs) and anticipated emotions (i.e., anticipation of future affective reactions due to the consequences of actions yet to be performed) could increase users' initial engagement (i.e., positive attitude towards the app, desire and intention to use it, and eventually downloading the app) as a function of their regulatory focus (i.e., individual orientation towards achieving positive outcomes or avoiding negative outcomes). Regulatory concerns and anticipated emotions have been selected for their potential in promoting healthy and sustainable eating. Indeed, a regulatory focus is central to facilitating complex decision-making processes and modifying long-standing habits, such as those involving healthy and sustainable eating [10]. Anticipated emotions, by supporting delayed gratification, are critical in promoting sustainable eating, as its benefits generally manifest over the long term [11]. This research topic represents a new area of research that could potentially fill a large gap in the literature on digital interventions for dietary behavior change.

## 2. Theoretical Background

### 2.1. Message Framing

As part of studies to promote healthy and sustainable nutrition, researchers have analyzed and compared the effectiveness of different message framings. Message framing refers to the evidence that recipients react differently to different but objectively equivalent descriptions of the same facts [12], e.g., to messages that emphasize the positive or negative consequences of a behavior [13]. One approach to the study and application of message framing is the self-regulatory model of message framing [14], which is based on the principles of self-regulation of behavior [15,16]. This model refers to four levels of message framing. Previous research has extensively explored the first and second levels, particularly in the promotion of sustainable behaviors.

The first level refers to the messages framed in terms of various *hedonic consequences* that are positive (i.e., gain messages, e.g., "If you choose sustainable food, you will protect the environment") or negative (i.e., loss messages, e.g., "If you do not choose sustainable food, you will harm the environment") consequences of the behavior in question. In a meta-analysis of the relationship between message framing and message processing, O'Keefe and Jensen [17] found that gain messages are more appealing than loss messages. Gain messages appear to be more effective than loss messages in promoting preventive behaviors, including healthy eating [18]. Consistent with this previous evidence, in the case of messages focused on promoting healthy or sustainable food choices, some studies showed that loss messages were least persuasive in promoting meat reduction [19,20], while

positive messages were more effective in promoting fruit and vegetable consumption [21,22] and reducing sugar-sweetened beverages [23] compared to loss messages. Following the second level of the self-regulatory model of message framing [14], i.e., *outcome sensitivity*, messages can be further differentiated depending on how pleasure and pain are defined. Gain messages focus on pleasure and describe the presence of pleasure (e.g., “If you choose sustainable food options, you will protect the environment”). Non-loss messages emphasize the absence of pain (e.g., “If you choose sustainable food options, you will avoid damaging the environment”). Loss messages highlight the pain when not engaging in a particular behavior (e.g., “If you do not choose sustainable food options, you will contribute to environmental damage”). Non-gain messages describe the absence of pleasure when not engaging in a particular behavior (e.g., “If you do not choose sustainable food options, you will miss the opportunity to protect the environment”). Based on this classification, past research found that health gain messages are more persuasive than the corresponding non-loss messages [24]. This was also confirmed for healthy food choices, at least for people with low eating self-efficacy [25]. Finally, as for the fourth level, different *strategies* may be used for pursuing the recommended behavior (*goal-pursuit strategies*), and people in different regulatory orientations prefer different means of goal pursuit, that is eager approach means or vigilant avoidance means.

However, there is limited literature on the effects of the third level; thus, the present study aimed to provide new insights and expand understanding in this area. This study focused on the third level of framing, which is based on regulatory concerns [14]. Accordingly, the effects of message framing can be further differentiated into messages that focus on growth or safety concerns. Growth messages describe outcomes that may impact recipients’ self-actualization needs and aspirations (e.g., “If you choose healthy foods, you will fulfill your nurturance need”). Safety messages describe outcomes that impact recipients’ safety needs (e.g., “If you choose healthy foods, you will fulfill your need for safety”).

To date, only two studies have compared these messages [26,27]. In the case of environmental protection, Bertolotti and Catellani [26] found that people agreed most with a policy message about renewable energy when it was framed in terms of achieving growth-related outcomes. In addition, their study showed that people agreed most with a message about greenhouse gas emissions when it was framed in terms of avoiding safety-related outcomes. Another study compared the effectiveness of growth and safety messages in the case of promoting reduced red meat consumption [27]. This study showed that individuals who read the health message (i.e., the safety message) were less likely to eat red meat than participants who read the well-being message (i.e., the growth message).

The results of these studies seem to indicate that the effectiveness of growth versus safety messages may be very different depending on whether the target behavior is to be avoided or adopted. In the case of behaviors that are encouraged, such as the use of renewable energy, growth messages that emphasize the achievement of positive outcomes are more persuasive. In contrast, for behaviors that are to be avoided, such as greenhouse gas emissions and the consumption of red meat, safety messages seem to be more effective. To extend knowledge about this level of message framing, the present study tested the persuasiveness of safety and growth messages in promoting the use of an app designed to help users eat healthily and sustainably.

## 2.2. Cognitive and Affective Argumentation

What all the above types of messages have in common is that they rely on rational information and logical argumentation to persuade. This type of argumentation is defined as cognitive (e.g., describing the environmental consequences of a sustainable diet) and contrasts with affective (e.g., describing the emotional consequences of a sustainable diet), which instead uses emotional appeals to influence behavior. The use of emotions to influence healthy and sustainable eating is important as many studies have confirmed that positive and negative emotions are particularly influential on eating behavior [28], including sustainable eating choices [29]. Since the benefits of eating sustainably generally

manifest over the long term and its effects are not directly visible, anticipated emotions might facilitate an emotional connection with future benefits or harms resulting from eating choices. Although most studies in this area have relied on cognitive arguments, there is evidence that the use of emotional content can be particularly effective in promoting dietary change [30,31], especially when the emotional content is combined with cognitive information [32–34]. This dual approach may increase message receptivity and motivate behavior change more effectively than purely cognitive strategies. For this reason, the present study investigated whether combined messages that elicit both cognitive and affective arguments can influence recipients' engagement when downloading an app to support healthy and sustainable eating.

Among emotion-based messages, there is a growing interest in messages that evoke anticipated emotions, i.e., the anticipation of future affective states based on the consequences of actions yet to be performed [35]. Put simply, people tend to perform actions that are associated with positive anticipated emotions such as happiness, satisfaction, and pride and avoid actions that are associated with negative anticipated emotions such as regret, guilt, and dissatisfaction. This appears to be particularly true for food choices [25,36,37]. However, to date, all studies that have examined the effectiveness of communication that elicits anticipated emotions have focused only on negative affective reactions, particularly regret and guilt. To address this gap, this study compared the effectiveness of growth/security messages in combination with positive or negative anticipated emotions.

### *2.3. Matching Messages to the Regulatory Focus of the User*

To specify the conditions under which the regulatory level of message framing would be more effective according to the self-regulatory model of message framing [14], this research drew attention to one of the best-studied dispositional differences in people's responses to favorable and unfavorable outcomes, namely individual regulatory focus. Regulatory focus theory [15,16] posits that people regulate their behavior according to an individual orientation to achieve positive outcomes (promotion focus) or avoid negative outcomes (prevention focus). Recipients with different regulatory orientations react differently to the design of messages. This means that if the messages are tailored to people's regulatory focus, they feel confirmed in their actions by the resulting regulatory fit, and their motivation is strengthened [38–40]. By aligning their choices with their motivational goals, regulatory focus can help individuals navigate the complexities of decisions involved in sustainable eating. In addition, it can nurture individuals' motivation to change consolidated eating habits by leveraging the novelty and benefits of new eating habits (if they have a promotion focus) or the health and environmental benefits of avoiding unsustainable eating choices (for those with a prevention focus). This motivational tailoring of messages can be used as a technique in which the characteristics of a message (e.g., the type of arguments used) are systematically changed to match the qualitative differences in the motivational basis of people's thoughts and actions [41].

About growth and safety messages, previous studies have found that individuals with a promotion focus are motivated by accomplishments and the achievement of goals, which they view as aspirations or desires [42,43]. For example, a study by Joireman et al. [44] documented that more promotion-focused individuals are more likely to report eating healthy to feel good about themselves. This orientation would make them more receptive to the growth concern [45–47] and thus to growth messages [26].

People with a prevention focus emphasize responsibility and safety, which they often associate with avoiding negative outcomes [43,48]. This orientation would make them more receptive to the safety approach [45–47,49] and thus to safety messages. For example, in the case of reducing meat consumption, it was found that people with a predominant prevention focus showed greater engagement and lower intention to eat red meat after reading health messages (i.e., safety messages) than after reading well-being messages (i.e., growth messages) [27]. Similarly, environmental avoidance messages (i.e., safety messages) have been shown to be

effective in increasing the acceptance of artificial meat among prevention-focused individuals [50], as have safety messages related to environmental policies [26].

The role of regulatory focus as a motivational predisposition interacting with the effects of anticipated emotions has attracted attention in psychology [51] and is particularly relevant in the case of the sustainable consumption literature [52]. On the one hand, promotion-focused individuals seem to be susceptible to positive emotions, which increases their engagement when they anticipate these affective reactions related to the consequences of their behavior [53,54]. For example, a recent study [52] has shown that promotion focus enhances the impact of anticipated positive emotions on the formation of a sustained consumption intention. The influence of anticipated positive emotions on the intention to consume sustainably was stronger in individuals with a high promotion focus than those with a low promotion focus. Furthermore, promotion-focused individuals tended to attenuate the influence of anticipated negative emotions, as their focus on achievement may have overshadowed the potential negative consequences of not engaging in the behavior [51,52]. Messages that elicit negative anticipated emotions are therefore expected to be less effective with this group [55]. On the other hand, people with a high prevention orientation were less influenced by expected positive emotions when forming their intention to consume sustainably but reacted more strongly to expected negative emotions [52]. However, the interaction between promotion/prevention focus and anticipated positive/negative emotions has not yet been investigated for messages promoting a healthy and sustainable diet or for promoting the use of mobile nutrition apps.

### 3. The Present Study

Building on the theoretical framework described above, this study aimed to empirically test the impact of regulatory focus theory on message framing in the context of promoting the use of an app to support healthy and sustainable eating. Specifically, the study examined the relationship between regulatory focus (promotion versus prevention) and the impact of messages combining regulatory concerns (growth versus safety) and anticipated emotions (positive versus negative) by using a mixed factorial design.

In this study, two independent variables were manipulated: the reference to regulatory concerns (safety versus growth) and anticipated emotions (positive versus negative anticipated affective reactions). In terms of regulatory concerns, the *growth message* encouraged users to use the proposed app to improve overall well-being and environmental protection. It emphasized how using the app can lead to greater independence in food choices and creativity in meal preparation and a better understanding of the impact of one's diet on the environment. This content addresses the "growth" regulatory concern by emphasizing personal development and self-fulfillment through positive lifestyle changes. In contrast, the *safety message* advocated using the app to protect one's health and the environment by being more responsible and careful with one's diet. It emphasized the benefits of informed food choices and their positive impact on personal health and the environment. This approach is in line with the regulatory concern of "safety" and focuses on protective and preventive dimensions.

To examine the influence of growth and safety messages based on participants' regulatory focus, in line with previous studies [26,27,42,43,48], the present study tested the following hypotheses.

**Hypothesis 1a (H1a):** *Compared to the safety message, the growth message is more effective for individuals with a high promotion focus.*

**Hypothesis 1b (H1b):** *Compared to the growth message, the safety message is more effective for individuals with a high prevention focus.*

In addition, both the growth and the safety messages were combined with the elicitation of positive and negative anticipated emotions. The *positive anticipated emotion* message described the satisfaction and personal gratification one could experience by using the



app. In contrast, the *negative anticipated emotion* message evoked emotional dissatisfaction and personal regret that could be experienced if the app was not used. Following recent scientific findings [52–54], the present study tested the following hypotheses about the effects of messages eliciting positive and negative anticipated emotions depending on participants' regulatory focus.

**Hypothesis 2a (H2a):** *Compared to the negative anticipated emotion message, the positive anticipated emotion message is more effective for individuals with a high promotion focus.*

**Hypothesis 2b (H2b):** *Compared to the positive anticipated emotion message, the negative anticipated emotion message is more effective for individuals with a high prevention focus.*

The regulatory fit is also based on the principle of message congruence. As a recent meta-analysis shows [41], congruent messages (i.e., messages that are congruent with people's underlying motivations) are more effective than incongruent messages (i.e., messages that conflict with people's underlying motivations). To test regulatory fit, it is important to assess congruence in terms of how well the messages combine informational and emotional components to match or mismatch people's regulatory focus. This served as the basis for the design of this study, which examined the congruence between regulatory concern and emotional valence, and tested whether there is a synergistic effect when regulatory focus and emotional valence are congruent.

**Hypothesis 3a (H3a):** *Compared to the incongruent message (safety + negative anticipated emotion message), the congruent message (growth + positive anticipated emotion message) is more effective for people with a high promotion focus.*

**Hypothesis 3b (H3b):** *Compared to the incongruent message (growth + positive anticipated emotion message), the congruent message (safety + negative anticipated emotion message) is more effective for people with a high prevention focus.*

This study examined the impact of each message on participants' attitudes towards the app and their desire to use it, as well as on their future intentions to use and actually download the app. Following the Model of Goal-Directed Behavior (MGB; [56]), attitude toward a behavior was defined as the person's positive or negative evaluation of performing that behavior. These evaluations are crucial because they significantly influence a person's desire to engage in the behavior. In this model, desire was conceptualized as a person's emotional motivation to perform a particular action and serves as a direct mediator between attitude and intention. Intention was understood as the planned effort that the individual is willing to exert to perform the behavior. Intention directly precedes and mediates the transition from desire to actual behavior. Based on this theoretical framework, the present study verified the following Hypotheses 4 and 5:

**Hypothesis 4a (H4a):** *The interaction between high promotion focus and growth concern positively predicts participants' positive attitude toward app usage, which in turn affects the desire to use the app, future intention to use the app, and ultimately app download.*

**Hypothesis 4b (H4b):** *The interaction between high promotion focus and positive anticipated emotions positively predicts participants' positive attitude toward app usage, which in turn affects the desire to use the app, future intention to use the app, and ultimately app download.*

**Hypothesis 4c (H4c):** *The interaction between high promotion focus and growth + positive anticipated emotion message positively predicts participants' positive attitude toward app usage, which in turn affects the desire to use the app, future intention to use the app and ultimately app download.*

**Hypothesis 5a (H5a):** *The interaction between high prevention focus and safety concern positively predicts participants' positive attitude toward app use, which in turn affects desire to use the app, future intention to use the app, and ultimately app download.*

**Hypothesis 5b (H5b):** *The interaction between high prevention focus and negative anticipated emotions positively predicts participants' positive attitude toward app use, which in turn affects desire to use the app, future intention to use the app, and ultimately app download.*

**Hypothesis 5c (H5c):** *The interaction between high prevention focus and the exposure to security + negative anticipated emotion message positively predicts participants' positive attitude toward app use, which in turn affects desire to use the app, future intention to use the app, and ultimately app download.*

## 4. Materials and Methods

### 4.1. Procedure

The present study was conducted after obtaining ethical approval from the International University of Rome (ID 01/2024—18 April 2024). In April 2024, the researchers asked university students to invite Italian adults aged between 18 and 80 years to participate in a study as volunteers. To invite the participants, the students received an invitation letter containing a link to the questionnaire. Neither students nor participants received any compensation.

At the beginning of the questionnaire, participants were informed that the study aimed to investigate the psychosocial factors related to the use of digital technologies. Participants then gave their informed consent to take part in the study and indicated whether they were able to download a mobile app. Those who indicated that they did not know how to download mobile apps were informed about the existence of mobile apps that could support adherence to a healthy and sustainable diet. Subsequently, the selected participants completed a series of scales related to some psychosocial factors (e.g., regulatory focus; see Section 4.3 below). Only the measures relevant to the present study are presented in this paper.

Participants were then assigned to one of four message conditions, which differed in the type of app description to which participants were exposed (see Section 4.4). After exposure to the message manipulation, participants completed a series of scales related to their evaluation of the app (see Section 4.5). Finally, they were asked to indicate their gender, age, and level of education.

At the end of the compilation, all participants received more detailed information about the objectives of this study.

### 4.2. Participants

G\*Power was used to measure sample size adequacy. A sample size estimation was conducted for the moderated analyses, which aimed to test the differential effects of conditions depending on participants' regulatory focus on each dependent variable (attitude, desire, future intention to use, and app download). In line with the guidelines on effect size in social psychology [57] and the small effect size reported in previous research on messaging interventions [58], a small effect size was assumed,  $f^2 = 0.02$ , with  $\alpha = 0.05$ , power level = 0.80, number of predictors tested = 1 (interaction term), and total number of predictors = 4 (dummy for condition, moderator, and covariate). The expected sample size required for the regressions was approximately  $n = 395$ , with approximately 99 participants per group. An increase in the required sample size for the analysis was considered to account for a drop-out rate of approximately 18% ( $n = 465$ ).

Of the 465 participants who received the invitation letter and agreed to complete the questionnaire, 14 participants were excluded because they reported not knowing how to download apps; 32 participants did not complete the questionnaire; and 18 participants were excluded because they answered an attention check question incorrectly. The final sample consisted of 401 participants (mean age = 27.22, SD = 15.52; age range 18–76;  $F = 267$ ;  $M = 128$ ; non-binary = 3; not specified = 3; educational level: compulsory school = 17; diploma = 122; college attendance = 141; bachelor's = 57; master's = 64).

#### 4.3. Pre-Test

Before participants were exposed to any of the message conditions, their propensity for a promotion or prevention focus was assessed using the regulatory focus measure [27] on a five-point Likert scale (1 = “Not at all” to 5 = “Very much”; Table 1). Promotion focus was measured using 9 items (e.g., “My main goal at the moment is to achieve my outcomes and ambitions”; Cronbach’s  $\alpha = 0.88$ ). Prevention focus was measured using 9 items (e.g., “I often imagine myself experiencing bad things that I fear might happen to me”). Three items did not show sufficient factor loading for the prevention factor. Therefore, the factorial structure of the Prevention Focus subscale was modified and reduced from nine to six items (Cronbach’s  $\alpha = 0.83$ ).

**Table 1.** Items and Cronbach’s alpha coefficients for study variables at pre-test.

	Cronbach’s $\alpha$
Promotion Regulatory Focus (adapted from [27])	0.88
I frequently imagine how I will achieve my hopes and aspirations	
I often think about the person I would ideally like to be in the future	
I typically focus on the success I hope to achieve in the future	
I often think about how I will achieve success	
My major goal right now is to achieve my results and ambitions	
I see myself as someone who is primarily striving to reach my “ideal self”—to fulfill my hopes, wishes, and aspirations	
In general, I am focused on achieving positive outcomes in my life	
I often imagine myself experiencing good things that I hope will happen to me	
Overall, I am more oriented toward achieving success than preventing failure	
Prevention Regulatory Focus (adapted from [27])	0.83
In general, I am focused on preventing negative events in my life (R)	
I am anxious that I will fall short of my responsibilities and obligations	
I often think about the person I am afraid I might become in the future	
I often worry that I will fail to accomplish my goals	
I often imagine myself experiencing bad things that I fear might happen to me	
I frequently think about how I can prevent failures in my life (R)	
I am more focused toward preventing losses than I am toward achieving gains (R)	
My major goal right now is to avoid becoming a failure	
I see myself as someone who is primarily striving to become the self I “ought” to be—to fulfill my duties, responsibilities, and obligations	

Note. (R) indicates items removed because they did not show sufficient factor loading for the prevention factor.

#### 4.4. Message Condition

First, all participants read a description of the app functionality (“This app provides information on the characteristics of a healthy and sustainable diet, a food diary to track food choices, goal setting for a healthy and sustainable eating style, and feedback on personal progress. The app can customize all this content to your preferences and characteristics”). Participants were then randomly assigned to one of four message conditions: growth concern + positive anticipated emotion message (GP message), growth concern + negative anticipated emotion message (GN message), safety concern + positive anticipated emotion message (SP message), safety concern + negative anticipated emotion message (SN message).

Participants in the GP message read information about how using this app would increase their well-being and how satisfying it would be to make this choice. Participants in the GN message read information about how using this app would increase their well-being and how unsatisfying it would have been not to make this choice. Participants in the SP message read information about how using this app would improve their health and how satisfying it would be to make this choice. Participants in the SN message read information about how using this app would improve their health and how unsatisfactory it would have been not to make this choice (Table 2).



**Table 2.** The four types of messages.

Growth Concern + Positive Anticipated Emotion Message (GP Message)	Growth Concern + Negative Anticipated Emotion Message (GN Message)	Safety Concern + Positive Anticipated Emotion Message (SP Message)	Safety Concern + Negative Anticipated Emotion Message (GN Message)
<p>The content of this app can be a source of inspiration for many who want to embark on a food journey to achieve greater well-being, be more independent and creative with their diet, and become more aware of the impact of their food choices on the environment.</p> <p>If you use this app, you may feel satisfied that you have the opportunity to take care of your well-being, happy that you can better manage your food choices, and even proud that you have the opportunity to actively contribute to protecting the environment.</p>	<p>The content of this app can be a source of inspiration for many who want to embark on a food journey to achieve greater well-being, become more independent and creative with their diet, and become more aware of the impact of their food choices on the environment.</p> <p>If you don't use this app, you may feel dissatisfied because you missed the opportunity to take care of your well-being, anxious about having neglected to better manage your food choices, and even guilty because you missed the opportunity to actively contribute to protecting the environment.</p>	<p>The content of this app can be a useful source of recommendation for many who want to embark on a health-oriented food journey, be more responsible and careful with their diet, and be informed about the impact of their food choices on the environment.</p> <p>If you use this app, you may feel satisfied that you have the opportunity to take care of your well-being, happy that you can better manage your food choices, and even proud that you have the opportunity to actively contribute to protecting the environment.</p>	<p>The content of this app can be a useful source of recommendation for many who want to embark on a health-oriented food journey, be more responsible and careful with their diet, and be informed about the impact of their food choices on the environment.</p> <p>If you don't use this app, you may feel dissatisfied because you have missed the opportunity to take care of your well-being, anxious about having neglected to better manage your food choices, and even guilty because you missed the opportunity to actively contribute to protecting the environment.</p>

#### 4.5. Post-Test

Participants' attitude towards the use of the app was assessed using four items on a 7 seven-point semantic difference scale (e.g., "The use of this app is. . . 1 = "Negative"—7 = "Positive"; adapted from [59]). Cronbach's  $\alpha$  was 0.94.

Participants' desire to use the app was measured using three items (e.g., "I would like to use such an app"; adapted from Perugini and Bagozzi, [56]), which were rated on a seven-point Likert scale (1 = "Strongly disagree" to 7 = "Strongly agree"). Cronbach's  $\alpha$  was 0.96.

Participants indicated their future use intention using three items (e.g., "I am interested in downloading this app to explore its features"; adapted from Min et al. [59]), which were rated on a seven-point Likert scale (1 = "Strongly disagree" to 7 = "Strongly agree"). Cronbach's  $\alpha$  was 0.92.

Finally, participants were asked to decide whether they would like to download the app after completing the questionnaire ("After completing the questionnaire, I would like to be redirected to the app download page." 1 = "No"; 2 = "Yes").

All items for the post-test variables and Cronbach's  $\alpha$  are reported in Table 3.

**Table 3.** Items and Cronbach's alpha coefficients for study variables at pre-test.

	Cronbach's $\alpha$
<b>Attitude towards the Use of the App</b> adapted from [59])	0.94
The use of this app is. . .	
. . . negative–positive	
. . . a bad idea–a good idea	
. . . unfavorable–favorable	
<b>Desire to Use the App</b> (adapted from Perugini and Bagozzi [56])	0.96
I would like to use such an app	
I would like to be able to use this app as soon as possible	
I would be excited to start using this app	

Table 3. Cont.

	Cronbach's $\alpha$
<b>Future Use Intention</b> (adapted from Min et al. [59]). I am interested in downloading this app to explore its features I intend to use this app to make healthy and sustainable food choices I am very likely to use this app	0.92
<b>App Downloading</b> After completing the questionnaire, I would like to be redirected to the app download page	

Note. (R) indicates items that were removed because they did not show sufficient factor loading for the prevention factor.

#### 4.6. Data Analysis

The analyses were carried out using SPSS 25. Preliminary analyses included the calculation of reliability coefficients for the scales used in this study.

As with the preliminary analyses, analyses were conducted to assess homogeneity within the group. A multivariate analysis of variance (MANOVA) was used to confirm the homogeneity of the mean distribution between the conditions in terms of age, promotion focus, and prevention focus. The chi-square coefficient ( $\chi^2$ ) was used to verify the homogeneity of the conditions with respect to gender and educational level. A MANOVA was used to test for differences in participants' attitudes, desires, and future usage intentions between conditions. A logistic regression was used to test whether there was a significant difference between the conditions and participants' app downloads.

To test our hypotheses and research question, moderation and moderated serial mediation analyses were conducted.

## 5. Results

### 5.1. Preliminary Analyses

Table 4 shows the means and SDs for the different conditions. To test whether randomization was successful, a MANOVA was used to test whether there were differences between conditions in age, promotion focus, and prevention focus. The results showed no significant main effect of message conditions on these variables (all  $p > 0.36$ ). In addition, the chi-square showed no significant differences between the conditions in terms of gender and education level (all  $p > 0.54$ ). These results indicate that the randomization was appropriate and that the message conditions were comparable to the baseline variables.

Table 4. Means and standard deviations of study variables across conditions.

	GP Message ( $n = 78$ )	GN Message ( $n = 82$ )	SP Message ( $n = 81$ )	SN Message ( $n = 75$ )
	M (SD)	M (SD)	M (SD)	M (SD)
Promotion Focus	3.29 (0.73)	3.50 (0.77)	3.37 (0.80)	3.44 (0.71)
Prevention Focus	2.94 (0.79)	3.03 (0.78)	3.01 (0.72)	2.92 (0.72)
Attitude towards Using the App	4.73 (1.60)	4.62 (1.68)	4.70 (1.10)	4.40 (1.77)
Desire to Use the App	3.84 (1.61)	3.54 (1.58)	3.72 (1.52)	3.60 (1.48)
Future Usage Intention	4.13 (1.56)	3.85 (1.57)	4.05 (1.49)	3.96 (1.42)
App Download	1.46 (0.50)	1.40 (0.49)	1.36 (0.48)	1.38 (0.49)

GP = growth concern + positive anticipated emotion message, GN = growth concern + negative anticipated emotion message, SP = safety concern + positive anticipated emotion message, SN = safety concern + negative anticipated emotion message.

The results showed positive correlations between promotion focus and prevention focus and between all the dependent variables (attitude, desire, future use intention, and

app download). The multicollinearity tests showed that there was no multicollinearity between these variables.

Then, the effects of the message conditions on the linear dependent variables were analyzed using a MANOVA. The results showed that the message conditions had no significant effect on participants' attitudes, desires, and future usage intentions (all  $p > 0.59$ ; all  $\eta^2 < 0.01$ ). Next, the same MANOVA was conducted, adding promotion and prevention focus as covariates, and found no significant effect (all  $p > 0.37$ ; all  $\eta^2 < 0.01$ ). The multinomial logistic regression revealed that message conditions did not significantly impact the participants' app download (all  $p > 0.40$ ; Coxsnell  $< 0.01$ ).

## 5.2. Main Analyses

### 5.2.1. The Moderating Role of Promotion Focus

Four moderation analyses were conducted to test H1a, which concerns the moderating role of participants' promotion focus. These analyses were conducted using the PROCESS macro for SPSS (Model 1; [60]). Growth concern versus safety concern was included as an independent variable (dummy coding: GP message = 1; GN message = 1; SP message = 2; SN message = 2), promotion focus as a moderator, and prevention focus as a covariate. Attitude, desire, future intention to use, and app download were included as dependent variables. The analyses yielded no significant results ( $p > 0.25$ ), which did not confirm H1a.

Then, four moderation analyses were conducted to test H2a. Positive anticipated emotions versus negative anticipated emotions was used as the independent variable (dummy coding: GP message = 1; GN message = 2; SP message = 1; SN message = 2), promotion focus as a moderator, prevention focus as the covariate. Again, attitude, desire, future intention to use, and app download were included as the dependent variables (Model 1 of the PROCESS macro for SPSS) [60]. As above, the analysis found no significant results ( $p > 0.19$ ), which did not support H2a.

Next, four moderation analyses were conducted to test H3a (i.e., the interaction between promotion focus and the congruence/incongruence of the message). GP message versus SN message was included as an independent variable (dummy coding: GP message = 1; SN message = 2); promotion focus as a moderator; prevention focus as a covariate; and attitude, desire, future intention to use, or app download as dependent variables (Model 1 of the PROCESS macro for SPSS) [60]. The analyses revealed a significant moderation effect only when desire was considered as the dependent variable. Specifically, the message condition (GP versus SN message) slightly predicted participants' desire to use the app. Participants' desire was positively predicted by their promotion focus, but not by their prevention focus. For participants with a high promotion focus, the message condition had a significant conditional effect, showing that those exposed to the GP message had a higher desire to use the app than those exposed to the SN message. No significant conditional effects were found for participants with low or medium promotion focus (Table 5; Figure 1).

To investigate H4, a moderated serial mediation analysis was conducted using the PROCESS Model CUSTOM in SPSS. GP message versus SN message (dummy coding: GP message = 1; SN message = 2) was included as an independent variable, promotion focus as a moderator, prevention focus as a covariate, attitude as a first mediator, desire as a second mediator, future intention to use as a third mediator, and app download as a dependent variable (Model COSTUM of the PROCESS macro for SPSS).

The analysis showed that neither the type of message (GP message versus SN message), the level of promotion focus, nor the level of prevention focus significantly predicted participants' attitudes towards the app.

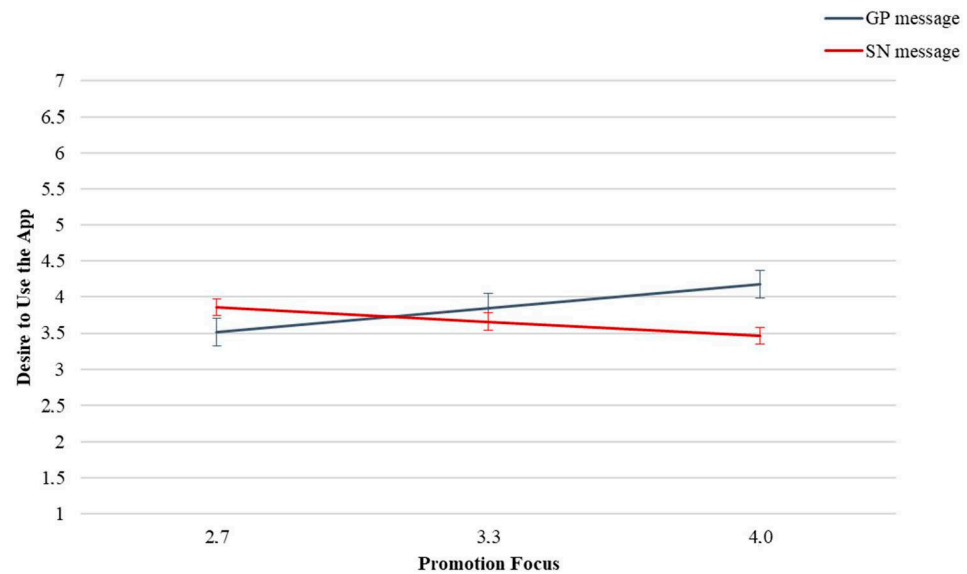
Regarding participants' desires, the results showed that the GP message significantly increased the participants' desire to use the app compared to the SN message. There was a significant positive relationship between attitude and desire, emphasizing that a more positive attitude towards the app was strongly associated with an increased desire to use it. In addition, the significant interaction between message conditions and promotion focus indicated that the growth concern + positive anticipated emotion message was

better received by participants with a high promotion focus. In contrast, the effect of the prevention focus on desire was not significant.

**Table 5.** Moderated mediation regression output on app download as the dependent variable.

	B	se	T	p	95%CI	F	df	p	R <sup>2</sup>
<b>DV = Attitude</b>						2.45	4161	0.77	0.01
GP versus SN	−0.53	1.36	−0.39	0.69	[−3.21, 2.15]				
Promotion Focus	−0.03	0.65	−0.05	0.96	[−0.32, 1.26]				
GP versus SN * Promotion Focus	0.06	0.40	0.15	0.88	[−0.73, 0.85]				
Prevention Focus	0.04	0.18	0.20	0.854	[−0.31, 0.39]				
<b>DV = Desire</b>						4.59	5161	0.01	0.12
GP versus SN	2.49	1.17	2.12	0.03	[0.17, 4.80]				
Attitude	0.27	0.07	3.95	0.001	[0.13, 0.40]				
Promotion Focus	1.31	0.56	2.341	0.02	[0.19, 2.42]				
GP versus SN * Promotion Focus	−0.80	0.34	−2.33	0.02	[−1.48, −0.12]				
Prevention Focus	−0.19	0.15	−1.23	0.22	[−0.49, 0.12]				
<b>Conditional Effects of Message Condition on Desire at Different Levels of Promotion Focus</b>									
	<b>Promotion Focus</b>	<b>Effect</b>	<b>Boot SE</b>	<b>t</b>	<b>95%CI</b>				
	2.67	0.34	0.32	1.06	[−0.30, 0.99]				
	3.33	−0.28	0.24	−0.82	[−0.65, 0.27]				
	4.00	−0.81	0.34	−2.21	[−1.38, −0.08]				
	<b>B</b>	<b>se</b>	<b>T</b>	<b>p</b>	<b>95%CI</b>	<b>F</b>	<b>df</b>	<b>p</b>	<b>R<sup>2</sup></b>
<b>DV = Future Usage Intention</b>						132.53	6160	0.001	0.82
GP versus SN	0.08	0.10	0.84	0.40	[−0.11, 0.28]				
Attitude	0.28	0.14	2.07	0.04	[0.01, 0.55]				
Desire	0.87	0.03	26.52	0.001	[0.80, 0.93]				
Promotion Focus	0.24	0.21	1.12	0.26	[−0.18, 0.66]				
GP versus SN * Promotion Focus	−0.07	0.04	−1.85	0.06	[−0.15, 0.00]				
Prevention Focus	0.11	0.06	1.730.08	0.07	[−0.01, 0.25]				
<b>Conditional Effects of Message Condition on Desire at Different Levels of Promotion Focus</b>									
	<b>Promotion Focus</b>	<b>Effect</b>	<b>Boot SE</b>	<b>t</b>	<b>95%CI</b>				
	2.67	0.08	0.04	2.12	[0.00, 0.16]				
	3.33	0.03	0.03	1.09	[−0.02, 0.10]				
	4.00	−0.01	0.04	−0.41	[−1.10, 0.06]				
	<b>B</b>	<b>se</b>	<b>Z</b>	<b>p</b>	<b>95%CI</b>	<b>F</b>	<b>df</b>	<b>p</b>	<b>Mc Fadden</b>
<b>DV = App Download</b>							7	0.001	0.39
GP versus SN	1.54	2.26	0.68	0.49	[−2.88, 5.97]				
Attitude	−0.04	0.13	−0.33	0.74	[−0.30, 0.21]				
Desire	0.39	0.32	1.21	0.22	[−0.24, 1.02]				
Future Usage Intention	1.14	0.37	3.10	0.001	[0.42, 1.86]				
GP versus SN * Promotion Focus	−0.50	0.65	−0.77	0.44	[−1.80, 0.78]				
Prevention Focus	−0.36	0.29	−1.25	0.21	[−0.93, 0.21]				
<b>Significant Conditional and Unconditional Indirect Effects of Message Conditions on App Download</b>									
<b>Mediators: GP versus SN -&gt; Desire -&gt; Future Usage Intention -&gt; App Download</b>									
	<b>Promotion Focus</b>	<b>Effect</b>	<b>BootSE</b>	<b>95%CI</b>					
	2.67	0.34	0.47	[−0.45, 1.46]					
	3.33	−0.19	0.30	[−0.90, 0.32]					
	4.00	0.72	0.50	[−2.03, −0.11]					
<b>Index of Moderated Mediation</b>	<b>Index</b>	<b>BootSE</b>	<b>Boot95%CI</b>						
	−0.80	0.56	[−2.25, −0.10]						

GP = growth concern + positive anticipated emotion message, SN = safety concern + negative anticipated emotion message.



**Figure 1.** Scatterplot of moderated effect of growth concern + positive anticipated emotions versus safety concern + negative anticipated emotions by promotion focus on desire to use the app. GP = growth concern + positive anticipated emotion message, SN = safety concern + negative anticipated emotion message.

The participants' future usage intentions were not significantly influenced by the message conditions. A more positive attitude towards the app and the desire to use it contributed significantly to a stronger intention to use it. Promotion focus had no effect on future intention to use, but its interaction with message conditions was marginally significant, suggesting that the GP message was less well received by participants with a low promotion focus compared to the SN message. In contrast, the effect of prevention focus on desire was not significant.

Finally, participants' download of the app was not predicted by the message conditions, their attitude toward the app, or their desire to use the app. Similarly, neither the promotion and prevention focus nor the interaction between the message conditions and the promotion focus had a significant effect on participants' app download. As expected, participants' future usage intentions significantly predicted actual app download. H4c was partially supported. The initial part of the hypothesis, which hypothesized a significant influence of the interaction between message conditions and promotion focus on attitudes toward app use, was not supported. However, even when participants with high promotion focus showed a positive attitude towards the app regardless of the message they received, their desire to use the app increased significantly when they read the GP message as opposed to the SN message. This increased desire predicted their future intention to use the app and, in turn, their actual app download.

### 5.2.2. Interaction between Prevention Focus and Message Conditions

Four moderation analyses were conducted to test H1b, which referred to the moderating role of participants' prevention focus. These analyses were conducted using the PROCESS macro for SPSS (Model 1; [60]). Growth concern versus safety concern was included as an independent variable (dummy coding: GP message = 1; GN message = 1; SP message = 2; SN message = 2), prevention focus as a moderator, and promotion focus as a covariate. Attitude, desire, future intention to use the app, and app download were included as dependent variables. The analyses showed no significant effects for any of the predictors, which did not confirm H1b ( $p < 0.25$ ).

Then, four moderation analyses were conducted to test H2b. Positive anticipated emotions versus negative anticipated emotions was used as independent variable (dummy coding: GP message = 1; GN message = 2; SP message = 1; SN message = 2), prevention



focus as a moderator, and promotion focus as the covariate. As above, attitude, desire, future intention to use, and app download were the dependent variables (Model 1 of the PROCESS macro for SPSS) [60]. Again, no significant effect emerged. Thus, H2b was not supported ( $p > 0.20$ ).

Next, four moderation analyses were conducted to test H3b, by including GP message versus SN message as an independent variable (dummy coding: GP message = 1; SN message = 2); focus prevention as a moderator; promotion focus as a covariate; and attitude, desire, future intention to use, or app download as dependent variables (Model 1 of PROCESS macro for SPSS) [60]. In this case, no significant effects emerged ( $p > 0.25$ ). Therefore, hypothesis 4 on indirect effects was not tested.

## 6. Discussion

Our study examined the concept of regulatory fit, which states that messages are more persuasive when they match the motivational orientation of the recipient [38–40]. Specifically, the results of this study examined the effects of the interplay between regulatory focus (promotion versus prevention focus), message framing based on regulatory concerns (growth versus safety), and anticipated emotions (positive versus negative) on users' initial engagement with an app promoting healthy and sustainable eating. Initial user engagement was measured by attitude towards using the app, desire and intention to use the app, and actual download of the app.

Our results supported the phenomenon of regulatory fit: the expected regulatory fit did occur only when both the rational (i.e., regulatory concerns: growth versus safety) and emotional content (i.e., anticipated emotions: positive versus negative) matched the recipient's promotion focus, and it did not when these two components were analyzed in isolation. Promotion-focused individuals showed a greater desire to use the app when exposed to the congruent message (i.e., growth concern + positive anticipated emotion message) than when exposed to the incongruent message (i.e., safety concern + negative anticipated emotion message). This finding is consistent with regulatory focus theory, which states that promotion-focused individuals are motivated by the achievement of desired goals [16,61]. Furthermore, it supports previous studies showing the importance of hedonic motivations in the use of digital tools [62,63], including downloading apps [64,65]. Interestingly, this congruence effect had no direct impact on the recipients' attitude towards using the app or their behavior. However, a strong usage desire predicted a strong intention to engage with the app and, consequently, the actual download of the app. This observation suggests that while regulatory fit does not necessarily change underlying attitudes, it can effectively motivate action by reinforcing an emotional motivation (i.e., promotion-focused receivers' desire to use the app). Therefore, this emotional activation serves as a primary trigger for subsequent decision-making processes that initiate a more deliberative cognitive evaluation and planning phase. Regulatory fit appears to activate a System 1 type of processing, i.e., rapid thinking based on instinct and emotion [66], which then leads to cognitive deliberation via a System 2 type of processing, i.e., deliberate and conscious thinking, and thus to increased planning of future actions (i.e., future usage intention) [66]. A similar result was provided by a study on consumers' decision-making processes when downloading mobile apps, which found that hedonic motivation (i.e., gratifications sought) positively predicted both heuristic and systematic information processing in the evaluation of downloading a mobile app [67].

Finally, this study found that participants did not respond differently to the two regulatory concerns: the elicitation of different valences of anticipated emotions and their combinations as a function of how much they focus on prevention. This result can be interpreted by considering that the messages designed to convey safety and elicit anticipated negative emotions inherently stimulate new short-term (downloading the app) and long-term behaviors (maintaining a healthy and sustainable diet). Therefore, the messages may have been perceived by prevention-oriented individuals, who are typically concerned with avoiding negative consequences and maintaining safety, as a prompt for

change and proactive behavior, which could put them at risk. Indeed, prevention-oriented consumers perceive greater risk in online environments [68], are more attentive to the associated risks (e.g., privacy violation), and have an aversion to highly personalized online content [69]. Another interpretation is that prevention-oriented individuals may not have perceived the difference between the two frames because both frames were seen as external attempts to influence their behavior. This resistance to external persuasion attempts could dampen the effect of regulatory fit as the focus shifts from the content of the message to the perceived intention. This interpretation is supported by previous studies showing that individuals who focus on prevention are more resistant to persuasion [70,71].

### 6.1. Practical Implications

Smartphone technology is expected to dominate the future promotion of healthy and sustainable behavior. Marketers and advertisers will find it necessary to integrate apps to be competitive and increase user engagement from the first moment they read the app description in the app store. One strategy to increase initial engagement could be to tailor app descriptions and content to users' psychological characteristics involved in healthy and sustainable eating choices. The results of this research highlight the need for differentiated user segmentation and personalized content strategies, particularly regarding the different responses observed between promotion-focused and prevention-focused individuals. App developers and marketers should collect data to recognize the motivational orientation of users and adapt app descriptions accordingly. For users who are motivated by achievements and gains, the emphasis can be on the idea of growth and the positive feelings associated with using the app. This could emphasize how the app facilitates the achievement of well-being goals, improves the quality of lifestyle, increases independence and creativity in dietary choices, and promotes a positive emotional mood (i.e., satisfaction, happiness, and pride).

Conversely, these results suggest that the regulatory level of framing combined with the manipulation of emotional valence may not be as effective for users focused on prevention. Instead of the typical strategy that emphasizes how the app can help maintain health and prevent negative emotions, future research should find a more effective approach. For example, the app could be presented as a tool for maintaining current health status and environmental safety without demanding significant behavioral changes, such as a more sustainable and healthier diet. This could help mitigate the risks associated with new behaviors and better match their preferences for stability and risk avoidance. In addition, app developers and marketers might consider whether integrating real-time feedback mechanisms tailored to users' regulatory focus can help maintain engagement regardless of the initial impact of the app description. Features such as personalized progress trackers, customizable meal plans, or interactive forums can provide ongoing motivation and support. For example, users who focus on promotion will appreciate features that celebrate milestones and achievements, while users who focus on prevention will appreciate features that protect them and minimize risk. In developing effective strategies for marketing and improving apps based on users' regulatory focus, a nuanced approach that integrates indirect data collection before the app is downloaded and direct feedback mechanisms after the download is critical. Before the app is downloaded, marketers can analyze user interaction with advertising content on various platforms. This includes tracking interactions such as clicks, likes, shares, and comments on different types of messages—one that emphasizes profits, growth, and positive emotions, and another that emphasizes safety and risk avoidance as well as negative emotions. Engagement metrics can provide initial insights into the prevailing regulatory focus of the potential user base. Subsequently, A/B testing on landing pages or ads with differently framed messages can provide further clues to the motivational orientations that influence user behavior by observing which message framing leads to more traffic and downloads. Once the app is downloaded, an optional short questionnaire during the onboarding process can help to directly assess users' regulatory focus. By observing how users interact with the app's features, you can

refine understanding over time. Encouraging users to provide feedback on the app's utility and motivation via ratings or direct feedback tools will also provide qualitative insights into how well the app is meeting users' motivational needs. Through this integrated approach, app developers and marketers can not only make their initial marketing strategies more effective but also continuously adapt the app's content and features to users' evolving motivations, improving user engagement and loyalty. This method emphasizes the importance of a dynamic user experience in sustaining the use of an app and fostering a deeper connection between the app and its users.

### *6.2. Limitations and Future Research*

As with all studies, the limitations of this study point to topics for future research. The results of this investigation suggest that regulatory fit through congruent messages is only effective for promotion-focused individuals. Importantly, the design of this study aimed to manipulate the combined effect of rational and emotional components in each message, rather than designing them individually. This reflects a realistic approach to message design in which different influences are integrated to drive behavior. It should be noted, however, that a similar effect of regulatory fit was not observed in the study among prevention-focused individuals, suggesting a different sensitivity or susceptibility to the content used. Future research could be improved by isolating cognitive and affective contents to examine their individual and relative effects in more detail. Such an approach would allow researchers to analyze the contribution of regulatory concerns and emotional expectations to compliance in more detail. This would provide deeper insights into how each component influences engagement and behavioral outcomes as a function of different motivational orientations.

In addition, the messages in this study informed people about the opportunity to download an app that encourages compliance with a healthy and sustainable diet. Although the message was framed with regulatory concerns and anticipated emotions, future studies should explore other forms of framing to test regulatory fit based on individual predispositions, such as values-based or identity-based motivations [72,73]. In addition, future research should investigate the effects of situational variables, such as social context or temporal distance, on the effectiveness of app promotion messages [74,75]. Extending these findings, it would also be beneficial to investigate how different levels of users' digital literacy affect their response to app-based interventions [76]. This research could help tailor app descriptions more effectively to different psychological characteristics, which could increase the acceptance of apps and their sustained use.

Moreover, this study was conducted in Italy, i.e., in a specific demographic and cultural context, which might limit the generalizability of the results to other populations [77]. Future research on this topic should consider country-specific target groups when implementing messages based on the regulatory focus of users. Cultures strongly promote the self-image that forms the basis for regulatory focus [78]. People raised in Western cultures tend to have an independent, competitive, and autonomous self-image, which leads them to generally focus on promotion. Future research should therefore include adapting messages to the cultural norms that influence regulatory focus, conducting cross-cultural studies to compare the effectiveness of promotion and prevention-focused messages in different cultural contexts, and adapting strategies that align with the dominant regulatory focus of specific cultural groups to increase the effectiveness of health communication and marketing initiatives.

Finally, this intervention was relatively brief, which may limit understanding of the long-term impact of messages on app downloads and subsequent engagement. Over a longer period, user interaction with the app might decrease after the initial download, suggesting that the initial engagement triggered by the messages might not translate into sustained use. Longer-term follow-up would therefore be invaluable and provide deeper insights into the durability and effectiveness of the observed effects over time. Such studies

could help us understand whether the initial motivation to download the app leads to lasting behavioral changes or whether it merely sparks a temporary interest.

## 7. Conclusions

This study confirms the concept of regulatory fit and emphasizes that messages aligned with the recipient's motivational orientation can significantly influence user engagement with an app promoting healthy and sustainable eating. The present results show that promotion-focused individuals expressed a greater desire to use the app when the message was congruent with their focus and linked growth concerns with positive anticipated emotions. Interestingly, regulatory fit effectively motivated action by increasing desire, leading to greater intentions and actual app downloads. This finding is consistent with regulatory focus theory, which states that promotion-focused individuals are motivated by achieving desired goals and supports previous research on the importance of hedonic motivations in digital tool use. This study also found that prevention-focused individuals did not respond differently to different regulatory concerns or emotional valence, likely due to their inherent resistance to external persuasion and greater perceived risk in online environments (e.g., privacy concern). This resistance dampens the effect of regulatory fit as the focus shifts from the content of the message to its perceived intent.

The limitations of the study highlight areas for future research, such as isolating rational and emotional message components, exploring different forms of framing, and examining the effects of situational variables and digital literacy on app-based interventions. In addition, cross-cultural studies could shed light on how cultural norms influence the regulatory focus and effectiveness of promotion- versus prevention-focused messages. In practice, the present findings suggest that app developers and marketers should tailor app descriptions and content to users' psychological characteristics to increase initial engagement. For users who are promotion-focused, emphasizing growth concerns and positive emotions may be effective, while users who are prevention-focused may respond better to messages focused on maintaining health and safety without demanding significant behavior change.

**Author Contributions:** Conceptualization, V.C., S.F. and S.P.; methodology, V.C., S.F., S.P., M.G., G.S., L.C., M.L., A.S., P.C. and N.C.; formal analysis, V.C. and S.F.; investigation, V.C., S.F., S.P. and L.C.; data curation, V.C. and S.F.; writing—original draft preparation, V.C. and S.F.; writing—review and editing, V.C., S.F., I.A., P.C., M.G., L.C., A.S. and G.S.; visualization, V.C.; supervision, V.C. and P.C.; project administration, V.C.; funding acquisition, V.C., M.G., L.C., M.L. and N.C. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research was funded by European Union—NextGenerationEU, Italian Ministry of University and Research, Italiadomani-Piano nazionale di ripresa e resilienza, Project PRIN PNRR 2022 DEMETRA <-> ARTEMED: Adapting, Revising, and Tailoring Evidence-based interventions to enhance Mediterranean Diet adherence, grant number CUPD53D23020480001.

**Institutional Review Board Statement:** This study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of Università degli Studi Internazionali di Roma (protocol code 01/2024 and date of approval 18 April 2024).

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** The data presented in this study are available from the corresponding author on request.

**Conflicts of Interest:** The authors declare no conflicts of interest.

## References

1. Fresán, U.; Sabaté, J.; Martínez-Gonzalez, M.A.; Segovia-Siapco, G.; de la Fuente-Arrillaga, C.; Bes-Rastrollo, M. Adherence to the 2015 Dietary Guidelines for Americans and mortality risk in a Mediterranean cohort: The SUN project. *Prev. Med.* **2019**, *118*, 317–324. [[CrossRef](#)] [[PubMed](#)]



2. Kesse-Guyot, E.; Rebouillat, P.; Brunin, J.; Langevin, B.; Allès, B.; Touvier, M.; Hercberg, S.; Fouillet, H.; Huneau, J.F.; Mariotti, F.; et al. Environmental and nutritional analysis of the EAT-Lancet diet at the individual level: Insights from the NutriNet-Santé study. *J. Clean. Prod.* **2021**, *296*, 126555. [[CrossRef](#)]
3. Serra-Majem, L.; Tomaino, L.; Dernini, S.; Berry, E.M.; Lairon, D.; Ngo de la Cruz, J.; Bach-Faig, A.; Donini, L.M.; Medina, F.X.; Belahsen, R.; et al. Updating the Mediterranean diet pyramid towards sustainability: Focus on environmental concerns. *Int. J. Environ. Res. Public Health* **2020**, *17*, 8758. [[CrossRef](#)] [[PubMed](#)]
4. Salas-Groves, E.; Galyean, S.; Alcorn, M.; Childress, A. Behavior change effectiveness using nutrition apps in people with chronic diseases: Scoping review. *JMIR mHealth uHealth* **2023**, *11*, e41235. [[CrossRef](#)]
5. Seid, A.; Fufa, D.D.; Bitew, Z.W. The use of internet-based smartphone apps consistently improved consumers' healthy eating behaviors: A systematic review of randomized controlled trials. *Front. Digit. Health* **2024**, *6*, 1282570. [[CrossRef](#)] [[PubMed](#)]
6. Milne-Ives, M.; Lam, C.; De Cock, C.; Van Velthoven, M.H.; Meinert, E. Mobile apps for health behavior change in physical activity, diet, drug and alcohol use, and mental health: Systematic review. *JMIR mHealth uHealth* **2020**, *8*, e17046. [[CrossRef](#)]
7. Perski, O.; Blandford, A.; West, R.; Michie, S. Conceptualising engagement with digital behaviour change interventions: A systematic review using principles from critical interpretive synthesis. *Transl. Behav. Med.* **2017**, *7*, 254–267. [[CrossRef](#)]
8. Caon, M.; Prinelli, F.; Angelini, L.; Carrino, S.; Mugellini, E.; Orte, S.; Serrano, J.C.; Atkinson, S.; Martin, A.; Adorni, F. PEGASO e-Diary: User engagement and dietary behavior change of a mobile food record for adolescents. *Front. Nutr.* **2022**, *9*, 727480. [[CrossRef](#)] [[PubMed](#)]
9. Delaney, T.; McLaughlin, M.; Hall, A.; Yoong, S.L.; Brown, A.; O'Brien, K.; Dray, J.; Barnes, C.; Hollis, J.; Wyse, R.; et al. Associations between digital health intervention engagement and dietary intake: A systematic review. *Nutrients* **2021**, *13*, 3281. [[CrossRef](#)]
10. Burtscher, M.J.; Meyer, B. Promoting good decisions: How regulatory focus affects group information processing and decision-making. *Group Process. Intergroup Relat.* **2014**, *17*, 663–681. [[CrossRef](#)]
11. Martini, M.; La Barbera, F.; Schmidt, S.; Rollero, C.; Fedi, A. Differentiating emotions in the theory of planned behaviour: Evidence of improved prediction in relation to sustainable food consumerism. *Br. Food J.* **2024**, *126*, 698–714. [[CrossRef](#)]
12. Kühnberger, A. The Influence of Framing on Risky Decisions: A Meta-Analysis. *Organ. Behav. Hum. Decis. Process.* **1998**, *75*, 23–55. [[CrossRef](#)] [[PubMed](#)]
13. Rothman, A.J.; Bartels, R.D.; Wlaschin, J.; Salovey, P. The strategic use of gain-and loss-framed messages to promote healthy behavior: How theory can inform practice. *J. Commun.* **2006**, *56* (Suppl. S1), S202–S220. [[CrossRef](#)]
14. Cesario, J.; Corker, K.S.; Jelinek, S. A self-regulatory framework for message framing. *J. Exp. Soc. Psychol.* **2013**, *49*, 238–249. [[CrossRef](#)]
15. Higgins, E.T. Promotion and prevention: Regulatory focus as a motivational principle. In *Advances in Experimental Social Psychology*; Academic Press: Cambridge, MA, USA, 1998; Volume 30, pp. 1–46.
16. Higgins, E.T. Beyond pleasure and pain. *Am. Psychol.* **1997**, *52*, 1280. [[CrossRef](#)] [[PubMed](#)]
17. O'Keefe, D.J.; Jensen, J.D. Do Loss-Framed Persuasive Messages Engender Greater Message Processing than do Gain-Framed Messages? A Meta-Analytic Review. *Commun. Stud.* **2008**, *59*, 51–67. [[CrossRef](#)]
18. Gallagher, K.M.; Updegraff, J.A. Health message framing effects on attitudes, intentions, and behavior: A meta-analytic review. *Ann. Behav. Med.* **2012**, *43*, 101–116. [[CrossRef](#)] [[PubMed](#)]
19. Carfora, V.; Di Massimo, F.; Rastelli, R.; Catellani, P.; Piastra, M. Dialogue management in conversational agents through psychology of persuasion and machine learning. *Multimed. Tools Appl.* **2020**, *79*, 35949–35971. [[CrossRef](#)]
20. Di Massimo, F.; Carfora, V.; Catellani, P.; Piastra, M. Applying Psychology of Persuasion to Conversational Agents through Reinforcement Learning: An Exploratory Study. *CLiC-it* **2019**.
21. Binder, A.; Naderer, B.; Matthes, J. The effects of gain- and loss-framed nutritional messages on children's healthy eating behaviour. *Public Health Nutr.* **2020**, *23*, 1726–1734. [[CrossRef](#)]
22. Collins, E.I.; Thomas, J.M.; Robinson, E.; Aveyard, P.; Jebb, S.A.; Herman, C.P.; Higgs, S. Two observational studies examining the effect of a social norm and a health message on the purchase of vegetables in student canteen settings. *Appetite* **2019**, *132*, 122–130. [[CrossRef](#)] [[PubMed](#)]
23. Zahid, A.; Reicks, M. Gain-Framed Messages Were Related to Higher Motivation Scores for Sugar-Sweetened Beverage Parenting Practices than Loss-Framed Messages. *Nutrients* **2018**, *10*, 625. [[CrossRef](#)]
24. Praxmarer-Carus, S.; Wolkenstoerfer, S.; Dijkstra, A. Outcome presence and regulatory fit: Competing explanations for the advantage of gains and losses over non-gains and non-losses. *J. Consum. Behav.* **2021**, *21*, 310–327. [[CrossRef](#)]
25. Carfora, V.; Morandi, M.; Catellani, P. The effect of message framing in promoting the Mediterranean diet: The moderating role of eating self-efficacy. *Foods* **2022**, *11*, 1454. [[CrossRef](#)] [[PubMed](#)]
26. Bertolotti, M.; Catellani, P. Effects of Message Framing in Policy Communication on Climate Change. *Eur. J. Soc. Psychol.* **2014**, *44*, 474–486. [[CrossRef](#)]
27. Bertolotti, M.; Carfora, V.; Catellani, P. Regulatory focus and the effect of nutritional messages on health and well-being: The case of red meat intake. *Appl. Psychol. Health Well-Being* **2020**, *12*, 212–230. [[CrossRef](#)] [[PubMed](#)]
28. Evers, C.; Dingemans, A.; Junghans, A.F.; Boevé, A. Feeling bad or feeling good, does emotion affect your consumption of food? A meta-analysis of the experimental evidence. *Neurosci. Biobehav. Rev.* **2018**, *92*, 195–208. [[CrossRef](#)]
29. Onwezen, M.C.; Verain, M.C.; Dagevos, H. Positive emotions explain increased intention to consume five types of alternative proteins. *Food Qual. Prefer.* **2022**, *96*, 104446. [[CrossRef](#)]



30. Carfora, V.; Caso, D.; Conner, M. Randomized controlled trial of a messaging intervention to increase fruit and vegetable intake in adolescents: Affective versus instrumental messages. *Br. J. Health Psychol.* **2016**, *21*, 937–955. [[CrossRef](#)]
31. Wang, J.; Yang, X.; He, Z.; Wang, J.; Bao, J.; Gao, J. The impact of positive emotional appeals on the green purchase behavior. *Front. Psychol.* **2022**, *13*, 716027.
32. Caldwell, K.; Fields, S.; Lench, H.C.; Lazarus, T. Prompts to regulate emotions improve the impact of health messages on eating intentions and behavior. *Motiv. Emot.* **2018**, *42*, 267–275. [[CrossRef](#)]
33. Carfora, V.; Caso, D.; Palumbo, F.; Conner, M. Promoting water intake. The persuasiveness of a messaging intervention based on anticipated negative affective reactions and self-monitoring. *Appetite* **2018**, *130*, 236–246. [[CrossRef](#)] [[PubMed](#)]
34. Carfora, V.; Bertolotti, M.; Catellani, P. Informational and emotional daily messages to reduce red and processed meat consumption. *Appetite* **2019**, *141*, 104331. [[CrossRef](#)] [[PubMed](#)]
35. Carrera, P.; Caballero, A.; Munoz, D. Future-Oriented Emotions in the Prediction of Binge-Drinking Intention and Expectation: The Role of Anticipated and Anticipatory Emotions. *Scand. J. Psychol.* **2012**, *53*, 273–279. [[CrossRef](#)] [[PubMed](#)]
36. De Pelsmaeker, S.; Schouteten, J.J.; Gellynck, X.; Delbaere, C.; De Clercq, N.; Hegyi, A.; Kuti, T.; Depypere, F.; Dewettinck, K. Do anticipated emotions influence behavioural intention and behaviour to consume filled chocolates? *Br. Food J.* **2017**, *119*, 1983–1998. [[CrossRef](#)]
37. Pérez-Villarreal, H.H.; Martínez-Ruiz, M.P.; Izquierdo-Yusta, A. Testing model of purchase intention for fast food in Mexico: How do consumers react to food values, positive anticipated emotions, attitude toward the brand, and attitude toward eating hamburgers? *Foods* **2019**, *8*, 369. [[CrossRef](#)]
38. Avnet, T.; Higgins, E.T. How regulatory fit affects value in consumer choices and opinions. *JMR J. Mark. Res.* **2006**, *43*, 1–10. [[CrossRef](#)]
39. Higgins, E.T. Making a good decision: Value from fit. *Am. Psychol.* **2000**, *55*, 1217–1230. [[CrossRef](#)]
40. Hong, J.; Lee, A.Y. Be fit and be strong: Mastering self-regulation through regulatory fit. *J. Consum. Res.* **2008**, *34*, 682–695. [[CrossRef](#)]
41. Joyal-Desmarais, K.; Scharmer, A.K.; Madzellan, M.K.; See, J.V.; Rothman, A.J.; Snyder, M. Appealing to motivation to change attitudes, intentions, and behavior: A systematic review and meta-analysis of 702 experimental tests of the effects of motivational message matching on persuasion. *Psychol. Bull.* **2022**, *148*, 465. [[CrossRef](#)]
42. Chan, R.Y. Do chief information officers matter for sustainable development? Impact of their regulatory focus on green information technology strategies and corporate performance. *Bus. Strategy Environ.* **2021**, *30*, 2523–2534. [[CrossRef](#)]
43. Watling, C.; Driessen, E.; van der Vleuten, C.P.; Vanstone, M.; Lingard, L. Understanding responses to feedback: The potential and limitations of regulatory focus theory. *Med. Educ.* **2012**, *46*, 593–603. [[CrossRef](#)] [[PubMed](#)]
44. Joireman, J.; Shaffer, M.J.; Balliet, D.; Strathman, A. Promotion Orientation Explains Why Future-Oriented People Exercise and Eat Healthy: Evidence from the Two-Factor Consideration of Future Consequences-14 Scale. *Personal. Soc. Psychol. Bull.* **2012**, *38*, 1272–1287. [[CrossRef](#)] [[PubMed](#)]
45. Amodio, D.M.; Shah, J.Y.; Sigelman, J.; Brazy, P.C.; Harmon-Jones, E. Implicit regulatory focus associated with asymmetrical frontal cortical activity. *J. Exp. Soc. Psychol.* **2004**, *40*, 225–232. [[CrossRef](#)]
46. Cesario, J.; Higgins, E.T.; Scholer, A.A. Regulatory Fit and Persuasion: Basic Principles and Remaining Questions. *Soc. Personal. Psychol. Compass* **2008**, *2*, 444–463. [[CrossRef](#)]
47. Scholer, A.A.; Higgins, E.T. Too much of a good thing? Trade-offs in promotion and prevention focus. In *The Oxford Handbook of Human Motivation*; Ryan, R., Ed.; Oxford University Press: Oxford, UK, 2012; pp. 65–84.
48. Zhao, S.; Chen, P.; Zhu, Y.; Wei, F.; Liu, F. Usage, pleasure, price, and feeling: A study on shopping orientation and consumer outcome. *Front. Psychol.* **2022**, *13*, 823890.
49. Sassenberg, K.; Vliek, M. Self-regulation strategies and regulatory fit. In *Social Psychology in Action: Evidence-Based Interventions from Theory to Practice*; Sassenberg, K., Vliek, M.L.W., Eds.; Springer: Cham, Switzerland, 2019; pp. 51–64.
50. Zhang, J.; Shi, H.; Sheng, J. The effects of message framing on novel food introduction: Evidence from the artificial meat products in China. *Food Policy* **2022**, *112*, 102361. [[CrossRef](#)]
51. Leone, L.; Perugini, M.; Bagozzi, R. Emotions and decision making: Regulatory focus moderates the influence of anticipated emotions on action evaluations. *Cogn. Emot.* **2005**, *19*, 1175–1198. [[CrossRef](#)]
52. Maduku, D.K. How environmental concerns influence consumers' anticipated emotions towards sustainable consumption: The moderating role of regulatory focus. *J. Retail. Consum. Serv.* **2024**, *76*, 103593. [[CrossRef](#)]
53. Codini, A.P.; Minihero, G.; Bonera, M. Why not promote promotion for green consumption? The controversial role of regulatory focus. *Eur. Bus. Rev.* **2018**, *30*, 554–570. [[CrossRef](#)]
54. Zou, L.W.; Chan, R.Y. Why and when do consumers perform green behaviors? An examination of regulatory focus and ethical ideology. *J. Bus. Res.* **2019**, *94*, 113–127. [[CrossRef](#)]
55. Leder, S.; Florack, A.; Keller, J. Self-regulation and protective health behaviour: How regulatory focus and anticipated regret are related to vaccination decisions. *Psychol. Health* **2015**, *30*, 165–188. [[CrossRef](#)] [[PubMed](#)]
56. Perugini, M.; Bagozzi, R.P. The role of desires and anticipated emotions in goal-directed behaviours: Broadening and deepening the theory of planned behaviour. *Br. J. Soc. Psychol.* **2001**, *40*, 79–98. [[CrossRef](#)] [[PubMed](#)]
57. Lovakov, A.; Agadullina, E.R. Empirically derived guidelines for effect size interpretation in social psychology. *Eur. J. Soc. Psychol.* **2021**, *51*, 485–504. [[CrossRef](#)]

58. Pope, J.P.; Pelletier, L.; Guertin, C. Starting off on the best foot: A review of message framing and message tailoring, and recommendations for the comprehensive messaging strategy for sustained behavior change. *Health Commun.* **2018**, *33*, 1068–1077. [[CrossRef](#)] [[PubMed](#)]
59. Min, S.; So, K.K.F.; Jeong, M. Consumer Adoption of the Uber Mobile Application: Insights from Diffusion of Innovation Theory and Technology Acceptance Model. In *Future of Tourism Marketing*; Routledge: Abingdon, UK, 2021; pp. 2–15.
60. Hayes, A.F.; Preacher, K.J. Conditional process modeling: Using structural equation modeling to examine contingent causal processes. In *Structural Equation Modeling: A Second Course*, 2nd ed.; Hancock, G.R., Mueller, R.O., Eds.; IAP Information Age Publishing: Charlotte, NC, USA, 2013; pp. 219–266.
61. Mühlberger, C.; Endrejat, P.; Möller, J.; Herrmann, D.; Kauffeld, S.; Jonas, E. Focus meets motivation: When regulatory focus aligns with approach/avoidance motivation in creative processes. *Front. Psychol.* **2022**, *13*, 807875. [[CrossRef](#)]
62. Gan, C. Gratifications for using social media: A comparative analysis of Sina Weibo and WeChat in China. *Inf. Dev.* **2018**, *34*, 139–147. [[CrossRef](#)]
63. Huang, T.; Bao, Z.; Li, Y. Why do players purchase in mobile social network games? An examination of customer engagement and of uses and gratifications theory. *Program* **2017**, *51*, 259–277. [[CrossRef](#)]
64. Alnawas, I.; Aburub, F. The effect of benefits generated from interacting with branded mobile apps on consumer satisfaction and purchase intentions. *J. Retail. Consum. Serv.* **2016**, *31*, 313–322. [[CrossRef](#)]
65. Verkijika, S.F. Factors influencing the adoption of mobile commerce applications in Cameroon. *Telematics Inform.* **2018**, *35*, 1665–1674. [[CrossRef](#)]
66. Kahneman, D. *Thinking, Fast and Slow*; Farrar, Straus and Giroux: New York, NY, USA, 2011.
67. Zhang, C.; Ha, L.; Liu, X.; Wang, Y. The role of regulatory focus in decision making of mobile app download: A study of Chinese college students. *Telematics Inform.* **2018**, *35*, 2107–2117. [[CrossRef](#)]
68. Van Noord, G.; Kerkhof, P.; Fennis, B.M. Online versus conventional shopping: Consumers' risk perception and regulatory focus. *Cyberpsychology Behav.* **2007**, *10*, 807875. [[CrossRef](#)]
69. Kim, W.; Ryoo, Y.; Lee, S.; Lee, J.A. Chatbot advertising as a double-edged sword: The roles of regulatory focus and privacy concerns. *J. Advert.* **2023**, *52*, 504–522. [[CrossRef](#)]
70. Kirmani, A.; Zhu, R. Vigilant against manipulation: The effect of regulatory focus on the use of persuasion knowledge. *J. Mark. Res.* **2007**, *44*, 688–701. [[CrossRef](#)]
71. Lee, S.; Lee, J.; Ahn, H. Deflecting resistance to persuasion: Exploring CSR message strategies on consumer evaluations. *J. Appl. Commun. Res.* **2020**, *48*, 393–412. [[CrossRef](#)]
72. Hsu, C.; Lin, J. Effect of perceived value and social influences on mobile app stickiness and in-app purchase intention. *Technol. Forecast. Soc. Change* **2016**, *108*, 42–53. [[CrossRef](#)]
73. Oyserman, D.; Fryberg, S.; Yoder, N. Identity-based motivation and health. *J. Pers. Soc. Psychol.* **2007**, *93*, 1011–1027. [[CrossRef](#)] [[PubMed](#)]
74. Choi, Y.K.; Seo, Y.; Yoon, S. E-WOM messaging on social media: Social ties, temporal distance, and message concreteness. *Internet Res.* **2017**, *27*, 495–505. [[CrossRef](#)]
75. Cho, H.; Lee, M.Y. The Effect of Message Construal Level, Temporal Distance and Consumer's SNS Self-efficacy on Consumers' Attitude Toward SNS Fashion Advertisements. *Int. J. Hum. Ecol.* **2015**, *16*, 11–20. [[CrossRef](#)]
76. König, L.; Suhr, R. The Effectiveness of Publicly Available Web-Based Interventions in Promoting Health App Use, Digital Health Literacy, and Media Literacy: Pre-Post Evaluation Study. *J. Med. Internet Res.* **2023**, *25*, e46336. [[CrossRef](#)]
77. Yarkoni, T. The generalizability crisis. *Behav. Brain Sci.* **2022**, *45*, e1. [[CrossRef](#)] [[PubMed](#)]
78. Aaker, J.L.; Lee, A.Y. "I" Seek Pleasures and "We" Avoid Pains: The Role of Self-Regulatory Goals in Information Processing and Persuasion. *J. Consum. Res.* **2001**, *28*, 33–49. [[CrossRef](#)]

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