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Dual-Process framing in smart tourism booking behavior: Cognitive–Emotional Tourism Readiness (CETR) scale development and validation

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Abstract

This paper introduces the Cognitive-Emotional Tourism Readiness (CETR) Scale, enabling researchers to understand different responses to framed booking messages as a function of their cognitive-affective schemas. Grounded in dual-process perspectives of intuitive and deliberative reasoning, the study conceptualizes booking responses as outcomes of both affective and cognitive engagement routes. CETR consists of three variables—emotional openness, travel planning confidence, and cognitive-affective switching fluency—representing the user's ability to engage with persuasive booking contexts. The scale was constructed through an item generation process with expert review and finalized into a 20-item questionnaire. To examine the behavioral relevance of CETR, a scenario-based experiment was conducted that embedded it in framed booking tasks, comparing emotional and rational framing styles with three outcomes relating to intention, urgency, and willingness to pay. Results supported emotional framing for higher engagement. Furthermore, when CETR traits were combined, they significantly predicted the strength of individual responses. Moderation effects were statistically insignificant, but the Emotional Framing–High CETR group showed descriptively stronger behavioral responses; trait–message congruence overall was not statistically confirmed. Practically, CETR introduces a scalable, non-invasive approach to user-sensitive content personalization that enables a transition from generic persuasion to ethically grounded personalization—tailored by dispositional cognitive-affective readiness.

1. Introduction

Tourists interacting with smart booking platforms are influenced by how content is framed, whether through emotional appeals or rational content. In the case of tourists interacting with smart interfaces, which include either emotionally arousing or rational content, they primarily derive their behavior from the manner in which the message is presented, as decision-making is more considerably influenced by message framing than by the most objective offer attributes (Mohamad et al., 2021; Gursoy et al., 2022). Emotional framing triggers feelings of urgency, excitement, and sensory appeal, while rational framing helps bring clarity, logic, and comparative advantage to travelers (Hong et al., 2024; Kim et al., 2024).

Although there is an increasing focus on personalized tourism experiences, most of the current research fail to consider the impact of individual cognitive-emotional differences on the reaction to the use of emotional vs. rational content in tourism marketing (Feng et al., 2022). Because of such a discrepancy in knowledge, tourists' reactions to the framed messages are inconsistent: the same promotional message might lead one person to have a higher intention to book, whereas it might lead another to show less interest (Zhang et al., 2023; Pham et al., 2025). This paper introduces the CETR scale to fill this gap by offering a tool for segmenting tourists based on their readiness to engage with emotional or rational framing.

While there has been an emerging emphasis on personalization, adaptive communication has received increased attention and relevant studies in consumer research (Yang et al., 2024). However, the tourism literature contains no integrated framework to depict how individuals respond differently to emotional or rational content (Xinlin et al., 2025). Previous research has looked at these constructs through the lens of impulsivity, affective involvement, and cognitive elaboration one by one and has not yielded a combined and experimentally grounded framework (Hsu et al., 2022). More importantly, there is no measure specifically developed to ascertain how tourist decision-making may differ as a function of readiness to process framed information; hence, stifling theoretical development and applied intervention (Azimi et al., 2025; Godovykh & Tasci, 2025). The present study brings the CETR scale to the fore, a multidimensional concept that integrates three theoretically distinct but, in reality, closely related personality traits:

emotional openness, travel planning confidence, and cognitive–affective switching, thereby closing the gap between these traits.

Conceptually, the research combines two theoretical perspectives, namely Dual-Process Theory (DPT) and the Elaboration Likelihood Model (ELM), to examine the extent to which cognitive and emotional processes influence booking behavior. Both DPT and ELM provide a structure for the destination to understand how tourists handle information from booking platforms. Typically, emotional appeals (System 1) lead to quick, intuitive decisions (e.g., immediate booking due to urgency), whereas rational framing (System 2) calls for deliberative reasoning that is more appropriate for decisions such as pricing comparisons or service quality evaluations in tourism (Cheng et al., 2024; Herjanto et al., 2025). According to this dual-route perspective, emotions usually activate the intuitive brain. Still, they can also be deeply elaborated if involvement or diagnosticity is high, whereas reasoned arguments can also sometimes be processed by the brain as a shortcut. The difference here is that emotional and rational framings are considered tendencies within dual-process dynamics, rather than being two fixed identities.

Theoretically, this research consolidates affective and cognitive notions of personality with established framing theory to create an integrated conceptual model that contributes to the fields of tourism psychology and persuasive communication research. Methodologically, the CETR scale is an instrument anchored in psychometric rigor and is a validated tool that can be applied to trait-based segmentation research in booking studies. Empirically, the study demonstrates how readiness characteristics can influence the degree of framing effects and their societal orientation, thereby enabling the testing of moderation and congruency hypotheses within a single conceptual framework. From a practical perspective, this research demonstrates that the CETR scale provides tourism platforms with the ability to personalize communication, enhancing user experience while respecting privacy. By aligning emotional vs. rational appeals to user traits, tourism platforms can increase booking conversions and customer satisfaction, making this a powerful tool for the tourism industry (Yang et al., 2024). Overall, this study contributes to tourism and hospitality research by introducing and validating the CETR scale as a trait-based segmentation tool and by empirically demonstrating how emotional and rational framing shape booking intention, urgency and willingness to pay in smart booking contexts. The next sections present the theoretical background, describe the CETR scale development and experimental method, report the empirical findings and conclude with theoretical and practical implications.

2. Cognitive–Affective foundations of booking readiness

2.1. Framing and behavioral outcomes in tourism

Emotional framing (exclusivity, comfort, experiential value) helps to increase the level of booking through the activation of the spontaneous, affect-based reactions, while rational framing (transparency, pricing logic, policy detail) is usually associated with the more thorough, deliberative evaluation (Xie et al., 2023; Junfeng & Ning, 2025). The struggle between using cognitive and emotional frames to present the issue might have an effect on that factor of the hypotheses, in addition to influencing the speed of the booking and the user’s willingness to pay as well (Liu et al., 2023; Tiwari et al., 2023). The application of an emotional frame of reference is capable of speeding up the person's decision-making and, thereby, increasing the person's perceived value, mainly in cases when the mobile is on and there is a lack of time (Chi et al., 2024; Farshbafiyan Hosseininezhad et al., 2025). This gap in financial value, combined with the increased intention and urgency in the emotional framing condition, demonstrates a consistent pattern suggesting a similarly affective-driven response.

In the literature on framing, main effects that depend on the frame occur frequently. Still, we know very little about such a case in the study of tourism when certain users might be more influenced by either emotional or rational

arguments (Feng et al., 2022). These methods are too limiting when assessing features such as impulsiveness or valuation that may differ considerably between user groups having different psychological profiles (Xu et al., 2025). Such framing effects are compatible with dual-process theories that describe how people evaluate messages. According to this theory, a rational argument is usually deliberated with a central route of the elaboration, while an emotional argument can lead to a faster, affect-driven response, which is generally of the intuitive or peripheral route. Nevertheless, an affective cue can also be elaborated at the center if it is a diagnostic or personally relevant one, while a rational piece of information can be processed by a heuristic when the person is under low involvement. Thus, framing outcomes depend on both the content and the user's cognitive-affective readiness rather than on fixed route identities (Dedeoğlu et al., 2021).

Most empirical research of digital travel environments is condition-centric, which means they usually neglect the users' predispositions. As a result, the effect of the interventions is different depending on the user's characteristics. For example, an impulsive user is more likely to react to an emotional stimulus, while a more deliberative planner would be rationally persuaded (Verma et al., 2023; Kim et al., 2024). This finding implies that a significant gap exists, which is the lack of a trait-based segmentation framework that accounts for different levels of user responsiveness to emotional versus rational communication (Yang et al., 2024). To personalize smart tourism platforms effectively, researchers need to understand cognitive–affective dispositions rather than just average effects, as these dispositions determine the sensitivity to framing in the case of booking decisions (Ashraf et al., 2024; Xu et al., 2025).

2.2. Readiness traits in booking

Tourism decision-making involves a combination of feelings and evaluations; however, existing literature has analyzed feelings towards emotional responsiveness and planning propensity independently of each other, without a conceptual connection (Huang & Zhang, 2024; Phakdee-Auksorn et al., 2025). The first core component of CETR is emotional openness, which reflects how readily individuals perceive and engage with emotional cues in persuasive booking messages (Omo-Obas & Anning-Dorson, 2023). Communications that are rich in experience and emotionally appealing will influence more those kinds of travelers who require greater emotional openness (Tao et al., 2024). The second area of concern, travel planning confidence, refers to a personally reported level of skill in planning, comparing, and booking travel (Huang et al., 2024). The notion is also associated with the strength of one's cognitive processes, particularly in cases where logical reasoning is at the center or serves as a foundation (Yang et al., 2022). Consumer psychology and tourism behavior research have studied both traits individually, but their relationship remains largely unexplored. The CETR construct moves the model of cognitive and emotional preparedness further by acting as a multidimensional construct for framed booking environments.

The third dimension—cognitive-affective switching—captures flexibility to transition between affective and deliberative evaluation as stimuli and context change (Ma & Li, 2023; Lindberg & Stemmer, 2022; Stylos, 2022). When combined, the three dimensions offer ample opportunities to comprehend how tourists interpret persuasive travel messages. While limited scales may isolate emotionality or planning skill, CETR provides a trait composite that corresponds to the two-process nature of dual-processed tourism choices, thus including both intuitive (System 1) and deliberative (System 2) pathways, which align with the bases of DPT and ELM. These three traits, when combined, constitute the basis of the CETR scale—a psychometrically validated instrument that reflects the variance of individuals in cognitive–affective readiness to respond to framed booking messages in smart tourism contexts.

2.3. Trait–Framing: gaps and CETR contributions

Framing effects depend on the individual's personality, which subsequently affects the way the person reads and understands the given argument (Stylos, 2022; Farshbafiyan Hosseininezhad et al., 2025). The impact of framing on decisions depends on factors such as people's involvement, their regulatory focus, and whether they have a need for

cognition (Zhao et al., 2023; Guerreiro et al., 2024). High involvement generally promotes greater elaboration, while promotion focus can increase responsiveness to positive affective appeals (Feng et al., 2022). Some individuals prefer holistic processing, whereas others avoid elaboration in tourism decision-making scenarios; in particular, booking travel likely incorporates both emotional cues and deliberative cues (Li et al., 2025). In these contexts, trait-based moderators may enable us to understand better why, in some situations, certain users are more positively inclined towards emotional framing, while others require deliberative reassurances to convert interest into action (Lindberg & Stemmer, 2022).

Trait–message congruence—referring to the alignment between a user's dispositional style and the framing—functions differently from typical moderation and is capable of maximizing results (Šegota, 2024; Su & Li, 2024). As an example, emotionally oriented consumers will be more affected by the use of affective appeals in the communication. Congruence is essential in the case of adaptive tourism platforms, as it enables the stylistic personalization of messages that correspond to users' traits of readiness (mood, affect, cognitive orientation), thereby significantly increasing the level of engagement and conversions (Yang et al., 2024). The CETR scale is a multidimensional, psychometrically robust model that can also serve as a source for examining moderation and congruence effects. This study uses the CETR scale to test two mechanisms: (1) whether CETR moderates the effect of framing on behavior, and (2) whether alignment between CETR traits and framing style improves behavioral outcomes in smart tourism environments. Both mechanisms are grounded in dual-process logic, examining whether intuitive and deliberative routes of persuasion operate differently across readiness profiles.

The key thematic strands of prior tourism-framing research, which have been discussed in detail, are synthesized in Table 1. Moreover, it elucidates the open-ended conceptual and methodological challenges associated with these themes, thereby demonstrating how the present research and the CETR scale address these gaps from a dual-process perspective.

Table 1
Summary of key themes, gaps, and CETR scale contributions.

Theme	Example Studies	Common Approaches	Recurring Gaps	Contribution of this study (CETR Scale)
Framing effects on tourism decisions	Liu & Mair, 2023; Xie et al., 2023; He et al., 2024.	Tests emotional vs. rational framing effects on intentions and value perception.	User-trait differences are largely ignored; emotion and rational routes are treated as mutually exclusive.	Introducing CETR as a measure for cognitive–affective readiness and pointing out the clarification of dual-process interaction (ELM + DPT).
Personalization and smart-tourism interfaces	Yang et al., 2024; Koo et al., 2025.	Focus on personalizing UX with AI-driven recommendations.	Missing a psychologically grounded and ethically sound trait basis as a foundation for personalization.	Offers a validated trait scale that can ethically and non-invasively be used for the personalization of message framing.
Dual-process and ELM applications in tourism	Dedeoğlu et al., 2021; Stylos, 2022; Kim et al., 2024.	Explain the influence of the message on people by using central/peripheral or System 1/System 2 reasoning.	Oversimplifies emotion = peripheral and rational = central relationships.	Re-specifies DPT (architecture) and ELM (mechanism) to allow cross-route processing when diagnosticity is high.
Trait moderation of framing effects	Feng et al., 2022; Verma et al., 2023; Zhao et al., 2023.	Considers involvement, regulatory focus, or personality as moderators.	No integrated, psychometrically validated trait specific to framed booking.	Develops and validates CETR (20 items) as a robust measure for trait-based moderation analysis.
Trait–message congruence (fit) models	Šegota, 2024; Su & Li, 2024.	Tests alignment between message framing and user mindset on behavior.	"Fit" is typically inferred without direct measurement of readiness.	Operationalizes trait–message congruence via CETR × framing interaction profiles; reports nuanced, non-linear effects.

3. Dual-Process framework for smart booking decisions

3.1. Theoretical integration and cognitive foundations

Tourist choices in smart-travel systems are the result of the combined operation of emotional impulses and reasoned evaluation (Zhang et al., 2023). The ELM, based on DPT's model of the fast (System 1) and the slow (System 2) thinking, along with a communication-route perspective, differentiates between low- and high-effort elaboration, thus enabling emotional or rational cues to function through both routes depending on the level of involvement (Stylos, 2022; Cheng et al., 2024). Users predisposed to affective stimuli may react intuitively, whereas others prefer analytical appeals requiring deliberation (He et al., 2024; Phakdee-Auksorn et al., 2025); together the two theories justify using framing manipulations to examine how CETR traits shape these differential responses. The CETR Scale—developed in this study—conceptualizes users' readiness to process framed information and functions as a trait-based moderator of emotional versus rational booking appeals.

3.2. CETR-Based dual-route booking model

The research was designed to test the impact of emotional and rational booking frames included in a simulated smart-travel interface on three outcomes—booking intention, urgency, and willingness to pay (WTP)—with CETR as the moderating trait explaining variation in responses. Framing Type (emotional vs. rational) is the independent variable, and CETR is the trait-based moderator. In digital contexts, framing effects leverage users' automatic emotional reactions, with greater effects in situations where users are cued affectively (Figure 1). Within DPT, emotionally charged clues lead people to use fast heuristic (System 1) operations. In contrast, ELM suggests that such cues can also be subjected to a high-effort elaboration if they are considered a source of information (Stylos, 2022). A study in the field of tourism has revealed that emotionally charged content helps to persuade the audience and to make products more attractive (Feng et al., 2022). When travel offers are emotionally presented, consumers who see these messages are more inclined to decide in a positive way without further considering the information or using logical comparison (Cheng et al., 2024).

Five hypotheses based on DPT and ELM were considered to test the interaction effect of framing type and CETR on booking behavior:

H1. Emotional framing leads to a higher booking intention than that of rational framing.

H2: CETR moderates framing effects on booking intention, such that emotional appeals are more persuasive for users high in CETR.

In order to keep the concepts consistent, H3-H5 were considered as investigative expansions of the CETR confirmation instead of robust theoretical predictions.

H3: CETR moderates the effect of framing on booking urgency, with emotional framing eliciting greater urgency among individuals high in CETR.

H4: CETR moderates the effect of framing on willingness to pay, with emotional framing associated with higher WTP among individuals high in CETR.

H5: Booking outcomes are higher when framing style matches the individual's CETR profile.

4. Methodology

Both the scale development and the experiment serve the same purpose: to validate CETR and test its relevance within framed booking decisions.

4.1. CETR scale development and validation

The CETR scale was conceptually derived from the dual-process framework introduced earlier, reflecting how users process framed booking information through intuitive and deliberative pathways. A scenario-based experiment incorporated emotional and rational booking frames through a smart-tourism interface. The two booking scenarios were used to illustrate the framing conditions, in which one set of items for the user was of an affective nature (e.g., comfort, exclusivity, and urgency), while the other set consisted of rational details (e.g., transparency, pricing, and safety). Willing to participate, the subjects were randomly allocated to one of the conditions, after which they completed the CETR scale and the outcome items and provided demographic information.

Following established psychometric practice, the CETR scale was developed and validated through a structured process anchored in the dual-process framework. An initial pool of 24 items representing the three theoretical

domains—emotional openness, travel-planning confidence, and cognitive–affective switching—was reviewed by five academic experts in tourism psychology and measurement. Each expert independently rated item relevance and clarity on a four-point scale to compute the Content Validity Index (CVI); items scoring < 0.80 or judged redundant were removed, yielding 20 items (6, 7, 7 across domains). The final questionnaire also comprised single-item outcome measures for intention to book, feeling of urgency, and willingness to pay. The scale validation was carried out in two phases: Subsample A (n = 200) was analyzed by exploratory factor analysis (EFA), while Subsample B (n = 200) was analyzed by confirmatory factor analysis (CFA). Reliability and construct validity were assessed using Cronbach's α and Average Variance Extracted (AVE).

4.2. Sampling and analytical procedures

The finalized questionnaire was administered to 400 adult participants recruited through volunteer and convenience sampling. Participants were randomly assigned at the start of the survey to either an emotional or a rational framing condition. The survey was conducted online using a simulated smart-booking interface to enhance ecological validity. Identification of individuals demanded that they be 18 years old or older, have made at least one leisure trip within the last 12–24 months, and have prior experience in the use of digital travel-booking platforms (e.g., OTAs, hotel, or airline websites). Quotas were being regularly checked and followed to achieve an equal distribution of the assignment among different framing groups. The research was conducted in compliance with the standard ethical principles applicable to online surveys and included use of informed consent, participant anonymity, and voluntary participation. All procedures were carried out in accordance with the ethical principles of the Declaration of Helsinki. The study involved an anonymous, minimal-risk online survey of adults and did not require formal approval from an ethics committee under the applicable institutional guidelines. Informed consent was obtained electronically; participants read the study information on the first page of the questionnaire and provided written consent by proceeding with the survey. The data analysis was conducted in two phases: First, psychometric validation of the CETR scale was performed by split-sample EFA and CFA. Second, testing of H1–H5 through moderated regression models was done.

5. Results

The results are reported in a unified sequence beginning with CETR validation followed by framing effects and trait-based patterns.

5.1. CETR scale validation and construct integrity

After the conceptual rationale for empirical validation, the integration of the three theoretical domains forming the CETR scale was at first the internal consistency of the domains that was evaluated (Table 2). The internal consistency of the item responses for each construct was evaluated by Cronbach's alpha coefficients for the three constructs: emotional openness, travel planning confidence, and cognitive-affective switching. The three constructs have demonstrated very high alpha coefficients (from 0.966 to 0.967), which are significantly higher than the standard level of reliability (0.70). These very high coefficients indicate the theoretical accuracy of item development and the strict expert-guided refinement process applied during the scale development stage. Though reliability coefficients over 0.95 may suggest redundancies, such values are not very far from the norm when (a) items are deliberately targeted to a narrowly defined trait construct, (b) the expert-led refinement removes any ambiguity, and (c) the constructs are theoretically interrelated and not orthogonal. Robust item-total correlations (0.86–0.92), which confirm item uniqueness despite internal coherence, further support the high values. High coefficients are acceptable in initial scale development when content validity has been established through expert review and item–total correlations confirm unique contributions (Clark & Watson, 1995).

The different high correlations observed indicate that the various items made a significant contribution to their respective constructs without being duplicative. The content validity screening (CVI) reduced the scale from an initial 24 items, equally divided among three constructs, to 20 items, with six items for emotional openness and seven items for each of the other two domains. The outcomes demonstrate that the CETR scale retains a considerable degree of internal consistency and is not redundant. Additionally, AVE values for all domains exceeded the 0.50 threshold, indicating that the scale was structurally robust and, therefore, a step towards factorial validation was appropriate.

Table 2
Construct reliability and validity.

Construct	No. of Items	Cronbach's α	Item–Total Correlation (Min–Max)	AVE
Emotional Openness	6	0.966	0.87–0.9	0.86
Travel Planning Confidence	7	0.966	0.86–0.89	0.83
Cognitive–Affective Switching	7	0.967	0.86–0.92	0.84

Item–construct relationship strength for single items was also scrutinized by means of both exploratory and confirmatory factor loadings (Table 3). Additionally, each item showed very high factor loadings in both the exploratory and confirmatory factor analyses, with the former ranging from 0.893 to 0.938 and the latter from 0.875 to 0.935. These values are above the usual thresholds of 0.60 for EFA and 0.50 for CFA, and therefore, they demonstrate strong relationships between the items and the constructs. The high and stable loadings mirror the intentional item formulation, as well as the strict expert screening, ensuring that each item uniquely contributes to its latent domain without the occurrence of redundancy or cross-dimensional interference. The nonexistence of weak or borderline items thus strengthens the structural core of the CETR's three subscales as three separate yet theoretically interconnected components of the CETR construct. Essentially, a very close value between EFA and CFA results indicates that the factors are the same across different methods of analysis, thereby providing robust confirmation that the model is accurate. The strong factor loadings, usually, indicate that the item pool was tightly and non-redundantly designed for accurate trait measurement, which is the right approach in the early stages of scale development (Clark & Watson, 1995). These results confirm that the CETR instrument has a psychometrically sound factorial structure and is suitable for subsequent behavioral analysis.

Table 3
Factor loadings and structural summary (EFA and CFA).

Item No.	Construct	EFA Loading	CFA Standardized Loading
Item 1	Emotional Openness	0.929	0.916
Item 2	Emotional Openness	0.932	0.925
Item 3	Emotional Openness	0.929	0.914
Item 4	Emotional Openness	0.927	0.919
Item 5	Emotional Openness	0.911	0.890
Item 6	Emotional Openness	0.911	0.892
Item 7	Planning Confidence	0.91	0.895
Item 8	Planning Confidence	0.899	0.879
Item 9	Planning Confidence	0.916	0.903
Item 10	Planning Confidence	0.917	0.907
Item 11	Planning Confidence	0.907	0.889
Item 12	Planning Confidence	0.912	0.899
Item 13	Planning Confidence	0.915	0.901
Item 14	Cognitive–Affective Switching	0.893	0.875
Item 15	Cognitive–Affective Switching	0.901	0.881
Item 16	Cognitive–Affective Switching	0.938	0.935
Item 17	Cognitive–Affective Switching	0.919	0.910
Item 18	Cognitive–Affective Switching	0.909	0.896
Item 19	Cognitive–Affective Switching	0.906	0.894
Item 20	Cognitive–Affective Switching	0.918	0.906

The internal consistency analysis and factorial validation confirm that the CETR scale is a psychometrically sound measure for use as a moderating variable in assessing experimentally framed booking scenarios that differ either emotionally or rationally within digital choice environments. Given the early-stage focus of CETR as a trait construct, model fit indices were not emphasized, as EFA/CFA loadings and AVE sufficiently establish structural integrity. These psychometric results support CETR as a useful measure for future work examining framed persuasion, personalized tourism systems, or cognitive–affective segmentation.

5.2. Framing effects on booking behavior

This section assesses how message framing influenced important behavioral outcomes across the booking task. Participants were assigned randomly to two groups; one group was given emotionally framed messages, while the other group received logically framed travel offers. Moreover, the products were designed to stimulate either an intuitive (System 1) or a deliberative (System 2) decision-making process, aligning with ELM's description of peripheral and central processing routes (Cheng et al., 2024) (Table 4). More specifically, three outcomes were

evaluated in terms of their motivational, time-related, and cost implications. Of the three outcomes, booking intention represents a primary indicator of user response and is likely to be more directly influenced by message framing.

Across all outcome variables, emotional framing resulted in higher means, indicating that participants were more engaged when affective cues were available. In addition, the emotional condition (M = 4.08, SD = 0.62) significantly increased the booking intention as compared to the rational frame (M = 3.64, SD = 0.58), thus confirming that participants were more willing to make a booking. Also, the emotional condition (M = 3.64, SD = 0.68) showed more instances of booking urgency than the rational frame (M = 3.24, SD = 0.71 The emotional framing usually led to an increased sense of the necessity for an immediate action, and the slight reduction in standard deviation indicates that more participants' reactions were close to this higher average; therefore, the affective message not only attracted stronger but also more consistent behavioral responses. Participants who were emotionally influenced were ready to pay a significantly higher amount (M = 468.36€, SD = 53.26) than those in the rational frame (M = 406.66€, SD = 50.74), which is an unequivocal demonstration that the value of the product/service was greater for the instrumental emotional engagement effect. The findings provide evidence for the dual-process model; emotionally sensitive individuals seemed to use fast, intuitive thinking more often, and thus they experienced higher motivational salience, perceived urgency, and personal value than those receiving rational cues, which made them feel that they were more deliberative or articulate and less emotional in their judgment (Stylos, 2022).

Table 4
Descriptive statistics by framing type.

Framing Type	Booking Intention (M)	Booking Intention (SD)	Booking Urgency (M)	Booking Urgency (SD)	WTP in Euros (M)	WTP in Euros (SD)
Emotional	4.08	0.62	3.64	0.68	468.36	53.26
Rational	3.64	0.58	3.24	0.71	406.66	50.74

To expand on these descriptive trends, Fig. 2 illustrates the changing differences in framing conditions towards the three behavioral outcomes. In particular, the top panel, depicting booking intention and urgency, shows significantly larger differences between participants in the emotional framing conditions. Emotional framing not only appeared to enhance motivation to act but also underlined the importance of acting quickly. This finding supports earlier inferences that affective stimuli lead to quick, automatic, and/or unconscious decisions, requiring less cognitive effort (He et al., 2024). Similar trends in economic behavior were also revealed by the lower panel, which, in fact, shows that the participants' willingness to pay for emotional framing has increased. This gap in financial value, combined with the increased intention and urgency in the emotional framing condition, demonstrates a consistent pattern suggesting a similarly affective-driven response. All of this suggests that emotional framing would facilitate actionable readiness behaviors across cognitive, emotional, and economic contexts, with effect sizes greater than those of rational messaging. However, whether these behaviors are influenced by individually based characteristics (i.e., predispositions, tendencies) remains a logical possibility, which leads us to consider the moderating role of the CETR in the next section.

5.3. Moderating role of CETR in framing–behavior dynamics

After identifying direct effects of message framing on behavioral outcomes, this study examined the moderating effects of an individual's cognitive-emotional readiness. CETR was tested as a dispositional construct that incorporates dimensions of emotional responsiveness, confidence for future planning, and potential for cognitive-affective switching, to consider how user characteristics influence responses to framed offers to book. CETR was

expected to influence the effects of framing on salient behavioral outcomes differentially. A series of moderated regression models was performed to estimate the interaction between Framing Type (i.e., emotional vs. rational) and CETR level (high vs. low) on one of the three outcome variables. This analysis allows for the calculation of conditional effects, where the convincing influence of the frame changes for different user profiles.

The interpretation of the regression results in Table 5 is multifaceted, given the framework that cognitive-emotional readiness could condition the effects of framing. The main effect of Framing and CETR was significant for all three outcomes, which means that an emotional frame had a positive effect on booking intention, urgency, and WTP. Additionally, those who scored higher on CETR appeared to have stronger behavioral engagement. Notably, the interaction terms were non-significant, and in most cases negative; CETR adds to decision responsivity but does not significantly alter the communicative impact of framing in the current sample. These findings do not undermine the validity of the CETR scale. Rather, the fact that moderation was non-significant may be a function of restrictions on trait-related moderation (due to the certain nature of the controlled booking conditions), which made individual differences more independent than interactive. Overall, these findings reaffirm the effect of emotive framing (H1), demonstrate that CETR was independently relevant, and clarify that moderation-based hypotheses (H2-H4) are not supported in the present data.

Table 5
Moderated regression results for CETR × framing interactions on booking outcomes.

Outcome Variable	Predictor	β	p-value
Booking Intention	Intercept	**3.515**	**0.0**
Booking Intention	Framing	**0.467**	**0.0**
Booking Intention	CETR	**0.259**	**0.0022**
Booking Intention	Framing × CETR	-0.046	0.6963
Booking Urgency	Intercept	**3.146**	**0.0**
Booking Urgency	Framing	**0.471**	**0.0**
Booking Urgency	CETR	**0.195**	**0.0481**
Booking Urgency	Framing × CETR	-0.145	0.2982
Willingness to Pay	Intercept	**397.961**	**0.0**
Willingness to Pay	Framing	**63.6**	**0.0**
Willingness to Pay	CETR	**17.936**	**0.0142**
Willingness to Pay	Framing × CETR	-3.303	0.749

5.4. Framing–Trait congruence effects

Building on the prior moderation analysis, this section explores a more refined behavioral mechanism: the alignment between individual cognitive-emotional readiness and message framing styles. Specifically, the CETR construct, previously validated as a stable psychological trait, was used to categorize participants into two alignment profiles. Congruent participants were those whose CETR level aligned with the framing choice (high CETR who received emotional framing, or low CETR who received rational framing). Incongruent participants show the opposite pattern, demonstrating that they are incongruent with the internal readiness (CETR level) and the external types of stimuli.

Such a classification enables us to verify the interaction effect of message design and user characteristics on behavioral outcomes, as opposed to considering main effects only (Su & Li, 2024).

The results shown in Table 6 and Fig. 3 illustrate the different behaviors of the groups with congruent and incongruent alignment. Participants in the incongruent condition had slightly higher mean scores on all three effect measures; however, these differences were not statistically significant. In fact, booking intention behavior of incongruent participants was 3.88 on average, while booking intention behavior of congruent participants was 3.84. The same pattern was visible for booking urgency (3.49 vs 3.39) and WTP (439.85 vs. 435.08) as well. While none of these differences were statistically significant, the consistently higher mean scores contradict the trait–message fit hypothesis (H5). One possible interpretation is that the incongruent message framing might have caused the cognitive process to work in compensation, thus resulting in increased attention or elaboration. Such changes in behavior can be indicative of a more thoughtful decision-making process, especially for those individuals who are less likely to respond intuitively to the type of message given. The results here do not contradict the CETR construct, but rather, they reveal the complexity of the interaction between dispositional characteristics and the framing in real-life contexts. Although H5 lacked statistical evidence, the research further explains the nonlinear effects of personalization and the complex interactions between characteristics and message content in persuasion.

Table 6
Mean booking outcomes by framing–trait congruence group.

Congruence Group	Booking Intention (M)	Booking Intention (SD)	n (Booking Intention)	Booking Urgency (M)	Booking Urgency (SD)	n (Booking Urgency)	WTP (M)	WTP (SD)	n (WTP)
Congruent	3.84	0.7	196	3.39	0.77	196	435.08	64.49	196
Incongruent	3.88	0.58	204	3.49	0.67	204	439.85	56.33	204

5.5. Behavioral indicators and framing dynamics

In this section, the focus is shifted from verifying the hypothesis to exploring the behavior of different user profiles. Rather than focusing on statistical interactions, this section interprets the three booking outcomes as behavioral indicators of motivational readiness, time sensitivity, and perceived economic value. Based on the previous evaluation with inferential models, the three outcomes were also analyzed through statistical modeling frameworks. The main focus was on the observed user responses to their motivational readiness. The average scores across associated traits and framing conditions were used to demonstrate how internal readiness (a measure of CETR) is contemporaneously patterned with the framing of an external message to engender behavior as a propensity in real-time. This approach provides a more individualized understanding of how personalization strategies can engage user behaviors based on cognitive–affective dispositions.

Consistent directional behavioral gradients are observed across all four framing-trait groups (see Table 7 and Fig. 4). The Emotional Framing, High CETR group, had the highest overall means across all outcomes, which reflects the general notion that individuals with high cognitive-emotional readiness are more responsive to affective framing. This revelation supports the dual-pathway and ELM, which suggest that the efficacy of the message is determined by the user's level of intuitive or analytical readiness (Stylos, 2022; Cheng et al., 2024). A moderate reduction in the immediate and value outcomes appears when emotional framing is extended to low-CETR users who, while still outperforming rationally framed groups, exhibit a decline in immediacy and valuation. The Rational Framing, with High CETRs, indicates moderate outcomes, suggesting that even highly prepared users may struggle to engage legitimately without affective congruence. The lowest scores are in the Rational Framing, Low CETR group, where there is insufficient user disposition or stimulus salience to elicit motivated responses. While differences are not statistically

tested here, their directional consistency supports the trait–framing alignment hypothesis. These findings have application to tourism interfaces where adaptive content can be designed not only for surface-level preferences but also for more substantive user traits. Systems that dynamically adjust the tone of messages to the user's processing style may increase engagement, accelerate booking behaviors, and enhance value perception, without requiring granular personalization.

Table 7
Mean behavioral outcomes by framing × CETR group.

Group	Booking Intention (M)	Booking Urgency (M)	WTP (€) (M)
Emotional Framing, High CETR	4.19	3.67	476.19
Emotional Framing, Low CETR	3.98	3.62	461.56
Rational Framing, High CETR	3.77	3.34	415.9
Rational Framing, Low CETR	3.51	3.15	397.96

6. Conclusion and discussion

6.1. Framing effects and trait-driven booking responses

The findings are interpreted with respect to the dual-process framing framework and the role of CETR within booking decisions. The behavioral findings of this study confirm that emotionally framed booking content activates higher levels of consumer engagement across motivational, temporal, and economic outcomes; participants in the emotional framing condition had significantly higher booking intention, urgency, and WTP than those who viewed the rational framing conditions. According to dual-process theory, affective content is typically better at evoking intuitive responses leveraged by System 1, enabling quick responses and stronger subjective valuations (Stylos, 2022). The ELM gave a comparable example regarding the frame: emotional frame-handling along the periphery of the brain led to peripheral-route processing, whereas more rational central-route processing resulted from logical framing (Cheng et al., 2024).

Although the rational framing influenced the responses to a lesser extent, the responses were in line with the idea that people considered the options; thus, reasoning-based content remains useful for those focused on planning. Moreover, the manner in which people present their thoughts determines the types of activities they can envision themselves undertaking in a smart tourism environment. The pivotal influences of these variables reveal that how people mentally frame their thoughts should be regarded as a cognitive process from the perspectives of persuasion and decision readiness, particularly in scenarios involving smart tourism interfaces. Nevertheless, the moderation effects were not forceful, which indicated that CETR mainly acted as an overall readiness characteristic, rather than a significant moderator of framing responses in this research.

However, the framing effects varied by users. Individual difference attributes (CETR scale) were strong and independent predictors of booking intention, with individuals with higher CETR scores showing stronger responses regardless of the framing information. The congruence analysis revealed a meaningful behavioral pattern: the peak behavioral outcomes occurred when framing conditions were matched with dispositional readiness, e.g., emotional framing with high-CETR profiles, which indicates that it is possible to weaken generic messages by matching them to cognitive–affective characteristics (Su & Li, 2024). These patterns exemplify the pertinent challenges of aligning messaging with content, beyond user characteristics or previous behavior, to psychological traits that influence how individuals think about and ultimately process persuasive messages. Overall, the results support a trait-focused,

adaptive tourism messaging approach that emphasizes the framing logic of tourism messaging while being sensitive to individual differences.

6.2. Implications: From traits to tourism strategy

This research makes a theoretical contribution by incorporating cognitive–affective trait profiles into mainstream models of message framing and persuasion. Dual-process models of persuasion, such as ELM and DPT, have documented different pathways through which individuals process information, yet have seldom considered stable dispositional traits as active determinants of framing receptivity. CETR is a multidimensional construct of readiness, grounding this study beyond framing theory into the realm of trait–message congruence. Furthermore, the results suggest a revitalized logic of personalization that prioritizes intrinsic psychological orientation over purely extrinsic factors. With this fundamental shift, researchers can now go farther than just predicting in general that people will use either their emotional or their analytical side for processing. They can actually determine the circumstances in which either an emotional or a rational argument aligns with the consumer's unique cognitive-affective structure (Pham et al., 2025).

This study makes a methodological contribution by simultaneously developing both the scale and experimental framing in a single simulation-based task. The CETR scale underwent scholarly development through theory mapping, content validity testing, and psychometric evaluation. It was developed into an internally consistent, coherent measure consisting of 20 items. This measure provides researchers and practitioners with a tangible way to distinguish between users according to cognitive–emotional readiness. Tourism platforms may utilize the confirmed CETR framework as a major content strategy lever for developing messaging that aligns with the user's cognitive style of processing and hence, potentially leading to increased conversion rates and decreased psychological friction, from a managerial point of view. Unlike many personalization systems that rely on clickstreams, eye-tracking, or covert inferences, CETR enables visible, voluntary psychological segmentation based on validated self-report profiles.

The results, in general, provide implications for both theory and practice. From a theoretical point of view, the research explains the role of emotional and rational signals in influencing the decision to book; thus, the identification of CETR as a personality trait that determines the level of the response rather than a strong interaction effect. In practice, the results suggest that tourism platforms can emphasise emotional framing to increase intention, urgency, and perceived value, while using CETR-based profiles to support transparent, respectful personalization. These implications point toward adaptive interface strategies that align message tone with users’ cognitive-affective processing styles, creating more effective and ethically responsible smart tourism environments (Xinlin et al., 2025).

6.3. Limitations and future research

While the results of this research offer compelling proof for the connection between the framing styles and trait-based readiness, it is necessary to acknowledge a few limitations. The behavioral outcomes were mainly evaluated through self-reporting, and the actual behavior was not observed; therefore, it is possible that there has been a response bias or that the intention has been exaggerated. Second, this study was conducted in a simulated environment that attempted to reflect actual smart booking platforms, considered ecologically valid; however, it lacks elements that are ever-present in a live decision environment. Third, although we surveyed a sample considered representative of the demographic across regions and ages, generalizability beyond a more generalized or non-European population is limited. Although the above limitations do not counter the principal contributions of this study, they do recommend continued research into how the processes of framing and personalization based on traits operate among a more representative sample of populations and contexts, especially those booking, that also have greater risks, price variability, or culturally contingent affect cues.

Future research can expand on this work in various ways. Academically, research should investigate the longevity of CETR scores and their relationship to repeated or multi-phase travel decisions. Future research might explore how CETR interacts with broader personality traits or motivational factors to refine user segmentation models. In addition, the cross-cultural validity of the CETR scale is important because emotional and cognitive readiness might present itself differently in different tourism markets. From a practical perspective, CETR-like profiles may be useful for hospitality managers and tourism platform designers seeking to align recommendation strategies with users' cognitive–affective traits. Policymakers and designers of interface specifications may consider how ethical personalization, based on dispositional transparency and psychological congruence, presents opportunities for utilizing AI-based tourism systems. The model's framing around shielding the trait attention provides us not only with technical personalization but also with a way to re-establish decision environments that align with cognitive respect and affective alignment.

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Figures

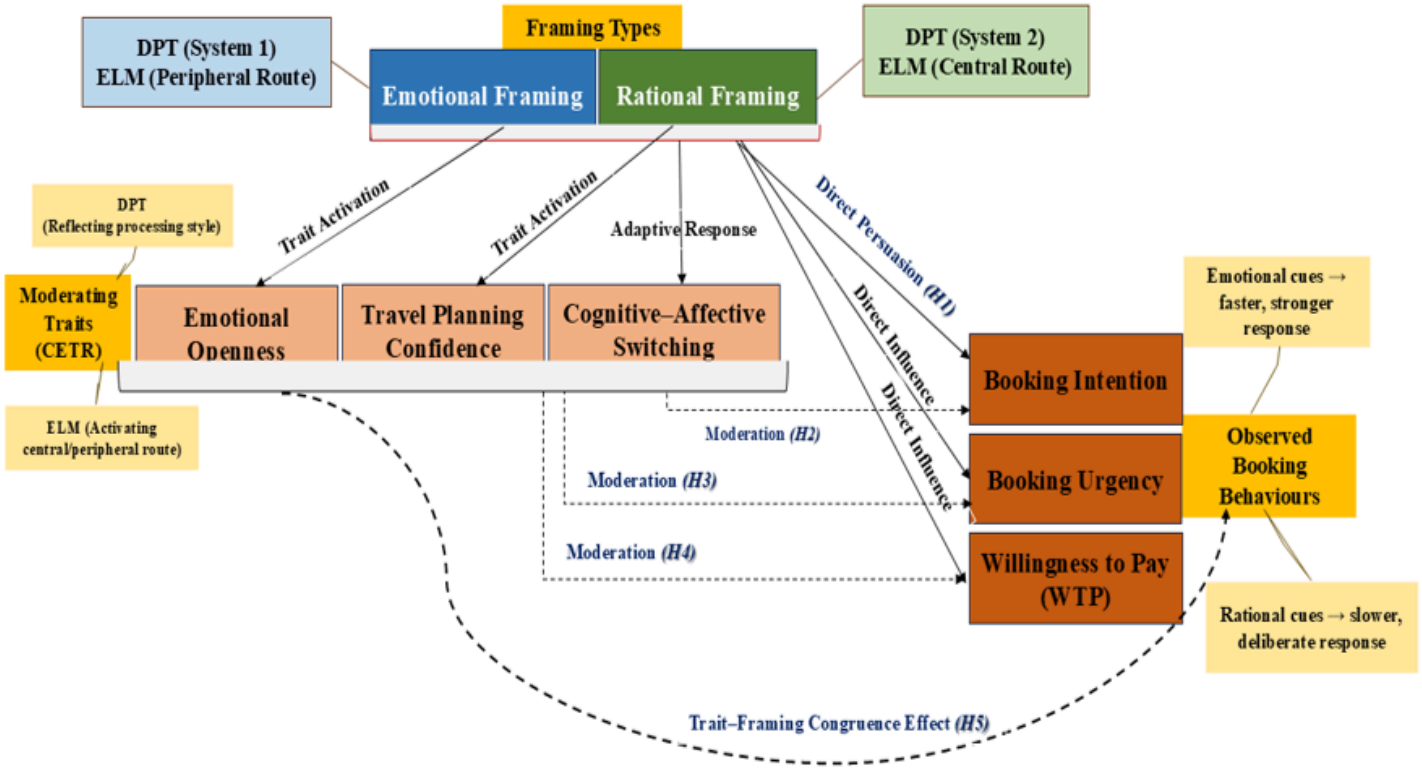


Figure 1

Dual-process model of CETR-based framing effects in smart-booking decisions..

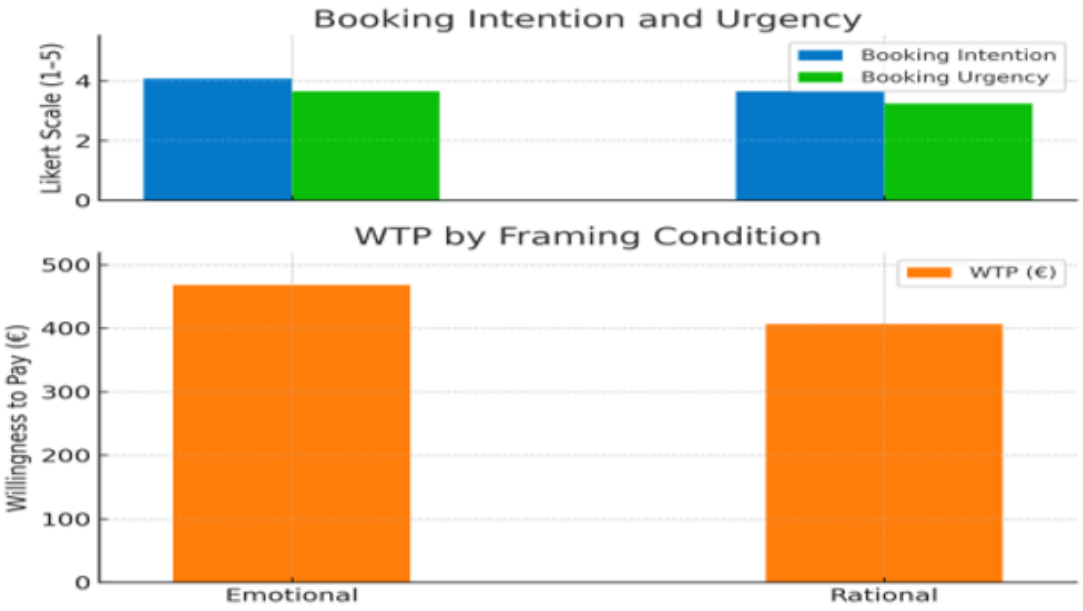


Figure 2

Framing effects on booking outcomes across emotional and rational conditions.

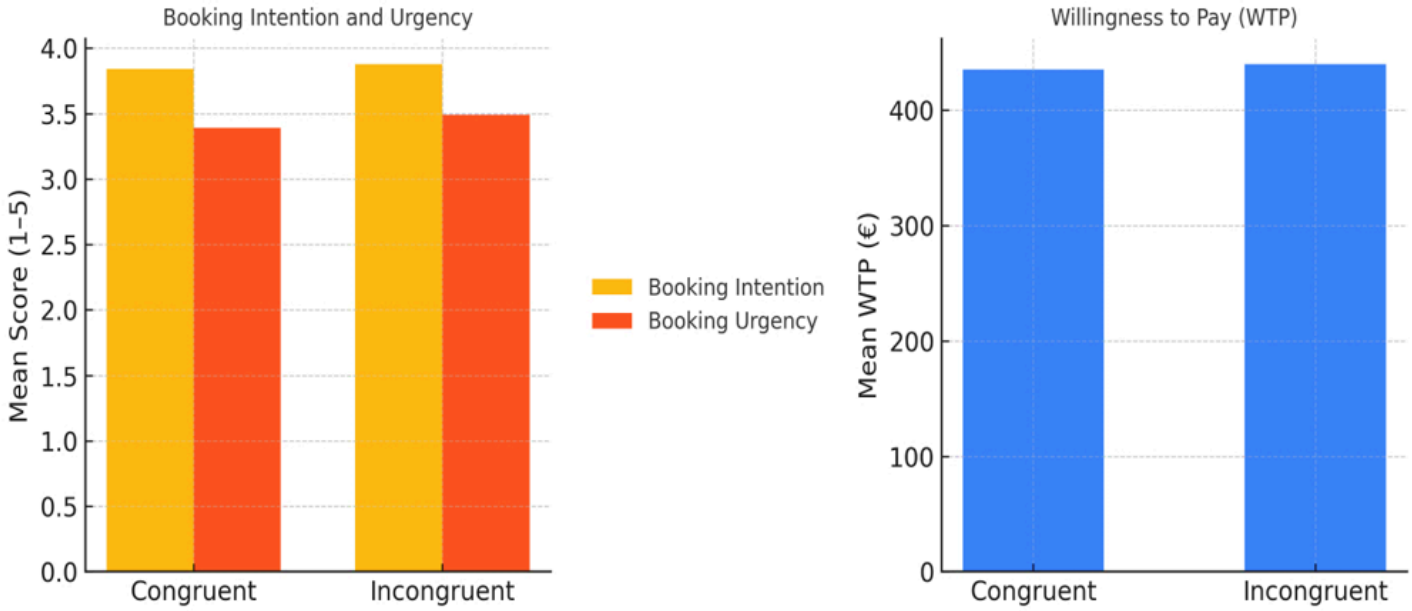


Figure 3

Booking outcomes by framing–trait congruence.

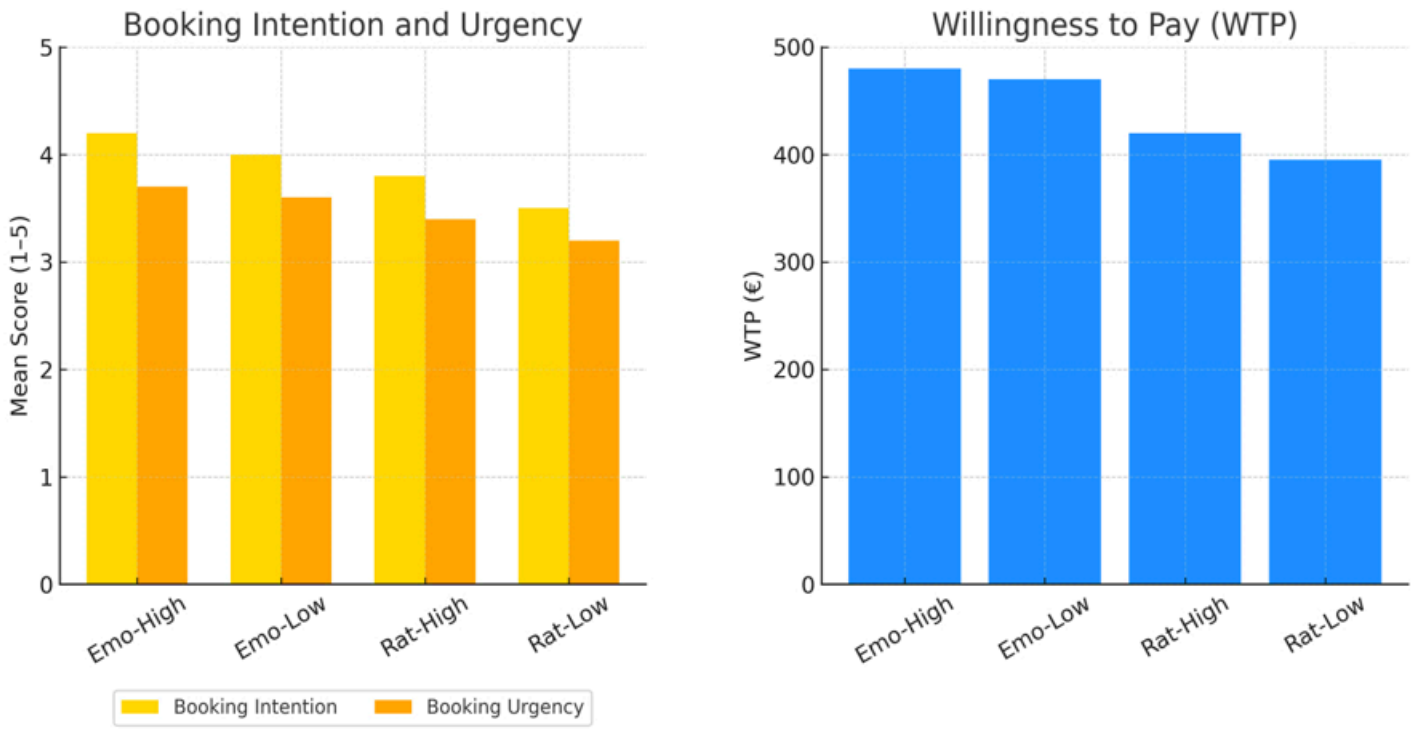


Figure 4

Behavioral outcomes by framing × CETR group.