



Cognitive Reflection and Resistance to Urgency-Based Persuasive Messages

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Abstract: Urgency-based persuasive messages frequently encourage individuals to make rapid decisions by emphasizing limited time, immediate consequences, or the need for prompt action. Such messages are common in commercial, digital, social, and informational environments and may influence decision-making by reducing the opportunity for deliberate evaluation. Cognitive reflection represents the tendency to reconsider an initial response and engage in more deliberate reasoning before reaching a decision. The present experimental research article examines the relationship between cognitive reflection and resistance to urgency-based persuasive messages. The proposed study investigates whether individuals demonstrating stronger cognitive reflection are less likely to accept persuasive claims presented with heightened urgency. A controlled experimental framework is developed in which participants are exposed to persuasive messages containing different levels of urgency and subsequently evaluated on message acceptance, deliberation time, perceived credibility, and resistance to persuasive pressure. Cognitive reflection is considered an individual-level cognitive characteristic that may influence how participants evaluate persuasive information when rapid responding is encouraged. The proposed framework distinguishes between immediate acceptance and more deliberate evaluation of persuasive messages. Simulated experimental outcomes, where used, will be explicitly identified as illustrative rather than empirical participant findings. The study contributes to research in cognitive psychology, persuasion, behavioral decision-making, and judgment by examining whether reflective reasoning can moderate responses to urgency-based persuasive communication. The framework may also provide a basis for understanding decision quality in environments where persuasive messages intentionally emphasize time pressure.

Keywords: Cognitive Reflection; Persuasive Messages; Urgency; Persuasion Resistance; Decision-Making; Deliberative Reasoning; Message Evaluation; Cognitive Control

1. Introduction

1.1 Background

Persuasive communication is an important component of contemporary social and informational environments. Individuals routinely encounter messages designed to influence their attitudes, preferences, intentions, and decisions. Such messages may appear in advertising, digital platforms, public communication, organizational settings, and interpersonal interactions. Although persuasion can provide useful information and encourage appropriate action, the way in which a message is presented can substantially influence how recipients evaluate and respond to it.

One particularly influential presentation strategy is the use of urgency. Urgency-based persuasive messages communicate that a decision should be made quickly or that an opportunity may disappear if action is delayed. Expressions emphasizing limited availability, restricted time, immediate consequences, or rapid response requirements can create a perception that deliberation is costly. Under such conditions, individuals may rely more heavily on initial impressions or readily available cues rather than conducting an extensive evaluation of the message.

Cognitive reflection is relevant to this process because it concerns the tendency to reconsider an initial response when a more deliberate evaluation may produce a different conclusion. Reflective reasoning requires individuals to pause, evaluate available information, and determine whether an immediately appealing response is justified. This process may be particularly important when persuasive communication is designed to encourage rapid action. The relationship between cognitive reflection and persuasion is therefore theoretically important. If urgency reduces opportunities for deliberation, individuals with stronger reflective tendencies may be more likely to resist immediate persuasive pressure. They may examine the evidence presented in the message, question the significance of the stated urgency, and distinguish between informational content and persuasive framing.

However, cognitive reflection should not be interpreted as a guarantee of resistance to persuasion. Reflective individuals may still accept persuasive messages when the underlying information is credible, relevant, and sufficiently convincing. The important question is whether reflection changes the way urgency influences evaluation and decision-making.

1.2 Problem Statement

Urgency-based persuasive communication creates a specific decision-making challenge because it combines informational content with temporal pressure. When individuals are encouraged to respond immediately, they may have less opportunity to examine assumptions, compare alternatives, or question the basis of the persuasive claim.

Existing research on persuasion has examined message characteristics, cognitive processing, heuristic evaluation, and individual differences in reasoning. However, further experimental investigation is needed to understand how cognitive reflection interacts specifically with urgency-based persuasive framing.

A further issue concerns the distinction between persuasive acceptance and persuasive resistance. An individual may initially respond positively to an urgent message but subsequently reconsider the decision after receiving sufficient time for reflection. Measuring only the final decision may therefore provide limited information about the cognitive processes underlying the response.

The present research addresses this problem by examining cognitive reflection alongside multiple indicators of persuasive response, including message acceptance intention, deliberation time, credibility evaluation, and resistance to urgency-based pressure.

1.3 Research Motivation

The motivation for this research arises from the increasing frequency of persuasive communication that encourages rapid decision-making. Digital environments can present individuals with messages that combine persuasive claims with countdowns, limited-time framing, immediate calls to action, or other forms of temporal pressure.

Understanding the role of cognitive reflection in these situations has both theoretical and practical importance. From a cognitive perspective, the research can clarify how reflective reasoning operates when individuals encounter messages designed to reduce deliberation. From a behavioral perspective, it can help explain why individuals differ in their responses to identical persuasive communications.

The study therefore focuses on the interaction between cognitive reflection and urgency intensity rather than assuming that urgency automatically produces persuasion. The central research question is whether greater cognitive reflection is associated with greater resistance to persuasive pressure, particularly when messages emphasize immediate action.

The proposed experimental framework is intended to distinguish rapid acceptance from deliberate evaluation and to examine whether cognitive reflection provides a measurable basis for resisting persuasive urgency.

2. Literature Review

2.1 Cognitive Reflection and Deliberative Reasoning

Cognitive reflection refers to the ability or disposition to reconsider an initially compelling response and to engage in further reasoning before arriving at a judgment or decision. Frederick (2005) introduced the Cognitive Reflection Test (CRT) to assess the tendency to resist reporting an intuitively appealing but incorrect response and instead engage in additional deliberation. Subsequent research has shown that cognitive reflection is associated with performance on a range of judgment and decision-making tasks involving heuristics and biases (Toplak et al., 2011).

The concept of cognitive reflection is consistent with dual-process accounts of reasoning, which distinguish relatively rapid and autonomous forms of processing from more deliberative forms of reasoning that place greater demands on working memory and cognitive control (Evans, 2008; Evans & Stanovich, 2013). These perspectives do not imply that intuitive processing is inherently inaccurate or that deliberative processing is always superior. Rather, they suggest that different forms of processing may be recruited depending on characteristics of the task, available cognitive resources, motivation, and the need to reconsider an initial response.

This distinction is particularly relevant to persuasive communication. Persuasive judgments can be influenced both by the substantive quality of message arguments and by peripheral or heuristic cues associated with the communication context (Chaiken, 1980; Petty & Cacioppo, 1986). When individuals engage in greater elaboration, they may devote more attention to the quality and implications of message content, whereas reduced elaboration can increase the relative influence of readily accessible contextual cues.

Cognitive reflection may therefore be relevant to persuasion because individuals who are more likely to reconsider an initial response may also be more likely to examine the reasoning underlying a persuasive claim before reaching a decision. However, reflective processing should not be equated with automatic rejection of persuasive messages. More extensive evaluation can lead to either acceptance or rejection depending on the strength, credibility, and implications of the information presented. Accordingly, the present study

conceptualizes cognitive reflection as a potential influence on the process of message evaluation, rather than as an inherently anti-persuasion characteristic (Frederick, 2005; Petty & Cacioppo, 1986).

2.2 Urgency-Based Persuasion and Decision Pressure

Urgency-based persuasive communication emphasizes the perceived need for rapid action. Such communication may use limited-time framing, restricted availability, immediate consequences, deadlines, or explicit requests to respond without delay. These cues can make the temporal dimension of a decision more salient and may increase the perceived cost of postponing a response. Scarcity- and influence-based perspectives similarly suggest that limited availability and contextual influence cues can affect judgments and behavioral responses, although their effects depend on the broader decision context (Cialdini, 2009; Cialdini & Goldstein, 2004).

Urgency should be distinguished from objective time pressure. A message can communicate urgency even when recipients are not subject to a strict experimental deadline, whereas objective time pressure directly limits the amount of time available for a decision. Nevertheless, both processes may influence how individuals allocate attention and cognitive resources during decision-making.

Empirical research on time pressure indicates that temporal constraints can alter information-processing strategies and decision behavior. Maule et al. (2000), for example, found that decision-making under time pressure was associated with changes in affective state and processing strategy, with effects depending partly on characteristics of the decision task. Similarly, Suri and Monroe (2003) demonstrated that time constraints can influence consumers' information processing and product evaluations, with effects varying according to processing motivation and available information.

These findings suggest that urgency should not be assumed to produce a uniform reduction in decision quality or an inevitable increase in persuasive acceptance. Instead, urgency may alter the conditions under which information is processed. Its influence is likely to depend on factors such as message quality, perceived credibility, motivation to process the information, and the cognitive resources available to the recipient (Maule et al., 2000; Suri & Monroe, 2003).

A further distinction concerns justified urgency versus persuasive urgency. Some communications involve genuinely time-sensitive circumstances in which rapid action may

be appropriate. In other cases, urgency may operate primarily as a framing device intended to encourage faster commitment. The present study therefore examines responses to urgency framing without assuming that urgency itself is necessarily deceptive or inappropriate.

2.3 Persuasion Resistance and Message Evaluation

Persuasion resistance refers broadly to psychological processes through which individuals respond to attempts to influence their attitudes, judgments, intentions, or behavior. Resistance is not a single process; it may involve scrutiny of message content, distrust of the persuasive source or motive, psychological reactance, counterargument generation, or maintenance of an existing position (Knowles & Linn, 2004).

Models of persuasion emphasize that responses to a message depend partly on the depth and nature of information processing. The heuristic-systematic model distinguishes relatively systematic evaluation of message-relevant information from greater reliance on heuristic cues, whereas the elaboration likelihood model similarly distinguishes persuasion occurring under relatively high versus low levels of elaboration (Chaiken, 1980; Petty & Cacioppo, 1986). These approaches suggest that persuasion cannot be understood solely from whether a recipient ultimately accepts or rejects a recommendation; the cognitive process leading to that outcome is also important.

Message credibility represents another relevant component of persuasive evaluation. Recipients may respond differently to the same recommendation depending on the perceived credibility of its source and on their confidence in their own message-related thoughts. Research on self-validation demonstrates that confidence in one's cognitive responses can influence the impact of those thoughts on subsequent attitudes, and source credibility can itself influence thought confidence (Petty et al., 2002; Briñol et al., 2004).

Cognitive reflection may contribute to this evaluative process by increasing the likelihood that an initially accessible response is reconsidered. However, greater reflection does not necessarily imply greater resistance. If a persuasive message contains strong, credible, and relevant evidence, deliberative processing may strengthen acceptance rather than reduce it. Conversely, when a message relies heavily on unsupported urgency cues, greater reflection may facilitate scrutiny of the relationship between the urgency claim and the substantive evidence.

For this reason, the present research treats persuasion resistance as a multidimensional process. Acceptance intention, deliberation time, perceived credibility, and responses to

persuasive pressure are considered separately rather than assuming that a single acceptance score fully represents resistance.

2.4 Cognitive Reflection Under Time Pressure

Time pressure represents an important contextual factor in reasoning and decision-making because deliberative processing requires both cognitive resources and an opportunity to engage those resources. Research on time-constrained decision-making indicates that limiting available decision time can alter information-search and processing strategies, although the direction and magnitude of these effects vary according to task characteristics and motivation (Maule et al., 2000; Suri & Monroe, 2003).

This issue is theoretically relevant to cognitive reflection. Cognitive reflection involves reconsideration of an initially compelling response, whereas urgency-based persuasive communication may encourage a person to reach a decision quickly. The two processes may therefore operate in tension: individuals may differ in their tendency to reconsider an initial judgment, while the communication environment may vary in the extent to which it encourages or constrains additional deliberation.

Dual-process perspectives provide a useful framework for understanding this possibility. Rapid autonomous processing can generate an initial response, whereas more deliberative processing may intervene when individuals have sufficient motivation, cognitive resources, and opportunity to reconsider that response (Evans, 2008; Evans & Stanovich, 2013). Cognitive reflection may consequently be particularly relevant when an initial judgment is intuitively attractive but additional analysis could change the conclusion (Frederick, 2005; Toplak et al., 2011).

However, it would be inappropriate to assume that high cognitive reflection completely protects individuals from urgency-based influence. Strong time pressure may constrain opportunities for extended evaluation, and reflective individuals may still accept an urgent message when its claims appear credible or when delaying action is perceived as genuinely costly. Likewise, low urgency does not guarantee systematic processing if recipients have little motivation to evaluate the information.

The relationship between cognitive reflection and urgency should therefore be examined as an interaction rather than as two independent determinants of persuasion. The central empirical question is whether individual differences in cognitive reflection modify the association between urgency intensity and persuasive response. This interaction-based

approach provides a more precise basis for testing whether reflective reasoning is associated with different patterns of message acceptance, credibility evaluation, and deliberation under varying levels of urgency.

3. Research Gap

Existing research has established important relationships between cognitive reflection, dual-process reasoning, persuasion, and decision-making. However, comparatively greater attention is needed to the specific interaction between cognitive reflection and urgency-based persuasive framing.

Much of the research on persuasion examines message quality, source characteristics, attitudes, or processing motivation, while studies of cognitive reflection frequently focus on reasoning and judgment tasks. Integrating these perspectives provides an opportunity to examine whether reflective reasoning influences resistance when persuasive communication actively encourages rapid decisions.

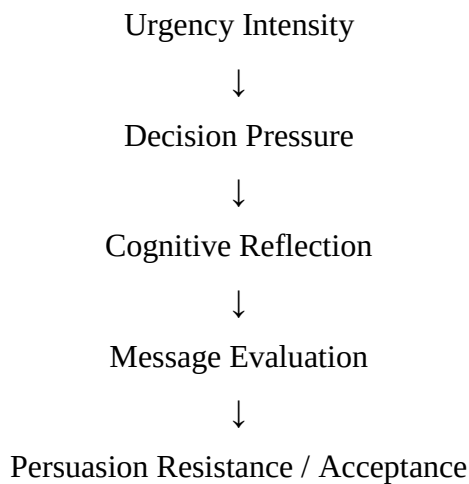
A second gap concerns measurement. Persuasive resistance cannot be adequately represented by acceptance intention alone. Deliberation time, perceived credibility, confidence, and the extent to which urgency influences the final decision can provide complementary indicators of the underlying response process.

A third gap concerns the distinction between genuine information processing and response to urgency cues. The proposed study addresses this issue by manipulating urgency while examining whether cognitive reflection changes participants' evaluation of the same underlying persuasive message.

4. Novelty / Proposed Contribution

The primary contribution of this research is the integration of cognitive reflection and urgency-based persuasion within a controlled experimental framework. Rather than examining persuasion or reflective reasoning independently, the study investigates how these processes interact when individuals encounter messages designed to encourage immediate action.

The proposed conceptual framework is:



The study further proposes a multidimensional assessment of persuasive response through message acceptance intention, deliberation time, perceived credibility, decision confidence, and resistance to urgency.

This approach may clarify whether cognitive reflection is associated with greater resistance to persuasive pressure and whether the relationship changes as urgency intensity increases. It also provides a basis for distinguishing deliberate acceptance of credible information from acceptance driven primarily by urgency cues.

5. Research Objectives / Research Questions

The primary objective of this experimental research is to examine whether cognitive reflection influences resistance to urgency-based persuasive messages. The study focuses on how individuals evaluate persuasive information when messages emphasize immediate action and whether reflective reasoning is associated with greater willingness to pause, assess message content, and reconsider an initial response.

The research further examines whether urgency intensity changes the relationship between cognitive reflection and persuasive decision-making. By measuring acceptance intention, deliberation time, perceived credibility, and resistance to persuasive pressure, the study aims to provide a multidimensional assessment of how individuals respond when persuasive communication creates a sense of time pressure.

The specific research objectives are:

- To examine the relationship between cognitive reflection and resistance to urgency-based persuasive messages.

- To determine whether increasing message urgency influences acceptance intention and decision-making behaviour.
- To examine whether cognitive reflection is associated with longer and more deliberate evaluation of urgent persuasive messages.
- To assess the relationship between urgency intensity and perceived message credibility.
- To examine whether cognitive reflection moderates the influence of urgency on persuasive acceptance.

Research Questions

RQ1: How does cognitive reflection relate to resistance to urgency-based persuasive messages?

RQ2: Does increased urgency influence individuals' acceptance of persuasive messages?

RQ3: Do individuals with stronger reflective tendencies spend more time evaluating urgency-based messages?

RQ4: How does urgency intensity influence perceived credibility of persuasive messages?

RQ5: Does cognitive reflection alter the relationship between urgency intensity and persuasive acceptance?

6. Methodology

6.1 Research Design

The proposed study will employ a randomized, between-participants experimental design to investigate whether cognitive reflection moderates responses to urgency-based persuasive communication.

The experimental factor will be message urgency, manipulated at three levels:

1. Low urgency
2. Moderate urgency
3. High urgency

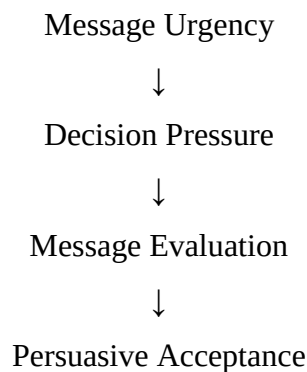
Participants will be randomly assigned in approximately equal numbers to one of the three urgency conditions. The substantive persuasive proposition will remain constant across conditions, while the strength of the urgency framing will vary systematically.

Cognitive reflection will be measured as a continuous individual-difference variable rather than manipulated experimentally or divided into arbitrary high- and low-reflection groups.

This approach preserves information in the original measure and permits direct examination of whether cognitive reflection moderates the effect of urgency on persuasive responses.

The primary outcome will be persuasive acceptance intention. Secondary outcomes will include message credibility, deliberation time, psychological resistance/reactance, and perceived urgency. Decision confidence will be treated as an exploratory outcome.

The principal conceptual model is:



With Cognitive Reflection acting as a potential moderator of the relationship between urgency and persuasive acceptance.

The primary hypothesis will therefore concern the interaction between urgency condition and cognitive reflection, rather than assuming that either variable independently determines persuasive response.

6.2 Participants, Sample Size, and Allocation

Participants will be adults aged 18 years or older who are able to read and understand the language in which the study materials are administered. Participation will require informed consent and successful completion of the experimental procedure.

Prespecified exclusion criteria will include duplicate participation, withdrawal before completion of the experimental manipulation, major technical failure affecting stimulus presentation or response recording, failure to complete the primary outcome measure, and failure of prespecified attention or data-quality checks.

Participants will not be excluded on the basis of their cognitive-reflection score or because they respond in a manner inconsistent with the study hypotheses.

Sample-Size Planning

Sample size will be determined using an a priori power analysis focused on the primary moderation hypothesis.

Urgency will be represented by two coded predictors, cognitive reflection will be entered as a continuous predictor, and the urgency $\times$ cognitive-reflection moderation effect will therefore be represented by two interaction terms.

For planning purposes, an incremental multiple-regression framework may be used in G*Power 3.1 (Faul et al., 2009), with:

- two interaction terms tested;
- five principal predictors in the moderation model;
- $\alpha = .05$;
- statistical power = .80; and
- a provisional small-to-moderate incremental interaction effect of $f^2 = .05$.

Under these planning assumptions, approximately 196 analyzable participants would be required. To allow approximately 15% for incomplete responses, prespecified exclusions, and technical losses, the study will provisionally aim to recruit approximately 230 participants.

Because direct prior evidence for the exact urgency $\times$ cognitive-reflection interaction is limited, $f^2 = .05$ will be treated as a planning assumption rather than as an empirically established effect size. The final sample-size calculation will be confirmed before recruitment using the prespecified statistical model and the smallest effect size considered theoretically meaningful.

G*Power 3.1 supports power analyses for correlation and multiple-regression models.

Participants will be allocated to the three urgency conditions using computer-generated random assignment. The allocation procedure will be implemented automatically by the experimental platform wherever feasible.

6.3 Experimental Materials and Measures

6.3.1 Cognitive Reflection

Cognitive reflection will be assessed using the seven-item expanded Cognitive Reflection Test (**CRT**) described by Toplak et al. (2014).

The expanded measure combines the three original CRT problems introduced by Frederick (2005) with four additional reflection problems developed to broaden assessment of the tendency to override an initially compelling response and engage in further reasoning.

Each item will be scored:

1 = correct reflective response

0 = incorrect response

Scores will therefore range from 0 to 7 with higher scores indicating greater performance on the cognitive-reflection measure.

The CRT score will be retained as a continuous variable in all primary analyses. Participants will not be categorized into artificial “high CRT” and “low CRT” groups.

Because some CRT items have become widely known, participants may additionally be asked whether they have previously encountered any of the items. Item familiarity will be reported and, if necessary, examined in a prespecified sensitivity analysis.

Internal consistency of the seven CRT items will be estimated in the study sample and reported alongside the descriptive statistics.

Frederick introduced the original three-item CRT as a measure of the tendency to resist reporting the first response that comes to mind, while Toplak et al. later developed the expanded version.

6.3.2 Persuasive Message Stimuli

The experimental stimuli will consist of standardized persuasive messages communicating the same underlying recommendation.

The three versions will be matched as closely as possible in substantive content, argument quality, source information, approximate length, readability, and presentation format. The principal intended difference will be the strength of the urgency framing.

a) Low-Urgency Condition

The message will communicate the recommendation without emphasizing an immediate deadline or substantial cost of delaying the decision.

b) Moderate-Urgency Condition

The message will communicate that relatively prompt action may be useful or beneficial while allowing meaningful opportunity for deliberation.

c) High-Urgency Condition

The message will emphasize immediate or near-immediate action and communicate substantially stronger temporal pressure than the other conditions.

The manipulation will alter urgency framing rather than the substantive evidence supporting the recommendation.

6.3.3 Stimulus Pretest

Before the main experiment, the persuasive-message versions will be pretested in an independent sample.

The pretest will assess whether the three versions differ in perceived urgency in the intended direction while remaining reasonably comparable on potentially confounding characteristics such as clarity, comprehensibility, substantive argument strength, and message length.

If unintended differences are identified, the stimuli will be revised before the main experiment.

This procedure is intended to reduce the possibility that apparent urgency effects are actually attributable to uncontrolled differences in message quality or comprehensibility.

6.3.4 Persuasive Acceptance Intention

Persuasive acceptance intention will constitute the primary dependent variable.

Participants will respond to a preregistered multi-item measure assessing the extent to which they would accept, follow, or act on the recommendation contained in the persuasive message.

Responses will be recorded using a consistent Likert-type response scale, such as a 7-point scale.

The items will be combined only if their measurement properties support construction of a composite score. Internal consistency will be reported using an appropriate reliability estimate.

Higher scores will indicate greater persuasive acceptance.

Importantly, lower acceptance will not automatically be transformed into a separate percentage-based “resistance score.”

6.3.5 Psychological Resistance and Reactance

Persuasion resistance will be treated as a distinct psychological process, rather than mathematically defined as:

100 – Persuasive Acceptance

That formula will not be used.

As a secondary measure of resistance to persuasive pressure, the study may assess message-induced psychological reactance using the framework developed by Dillard and Shen (2005).

Their approach conceptualizes reactance to persuasive communication through responses including perceived threat to freedom, anger, and negative cognition.

Where this measure is used, its components will be scored according to the relevant published procedure and reported separately or combined only where theoretically and psychometrically justified.

Persuasive acceptance and psychological reactance will therefore be treated as related but non-identical outcomes.

6.3.6 Perceived Message Credibility

Perceived message credibility will be assessed using the message-credibility approach developed by Appelman and Sundar (2016).

Their validated measure assesses perceived message credibility using three indicators relating to the perceived accuracy, authenticity, and believability of the content.

Participants will rate the persuasive message using the response format selected for the study, and the resulting credibility score will be calculated according to the prespecified procedure.

Because the original scale was developed particularly in a news-message context, its use in the present persuasive-message paradigm will be described as an application to the current context, and its internal consistency will be evaluated in the study sample.

6.3.7 Deliberation Time

Deliberation time will be recorded automatically by the experimental platform.

Timing will begin when the complete persuasive message becomes available for evaluation and will end when the participant submits the primary decision response.

Deliberation time will be expressed in seconds.

Longer deliberation time will be interpreted as indicating **more time spent before responding**, not automatically as superior reasoning or greater decision quality.

Extremely short or long response times will be examined according to prespecified data-quality criteria. Valid observations will not be removed solely because they are statistically unusual.

Because response-time variables commonly show positive skew, the distribution will be examined before analysis and transformed or modeled using an appropriate distribution if necessary.

6.3.8 Decision Confidence

Decision confidence will be treated as an exploratory measure.

After providing the primary decision response, participants will indicate how confident they are in that decision using a prespecified Likert-type rating scale.

Higher scores will indicate greater subjective confidence.

Decision confidence will not be interpreted as an objective measure of decision accuracy because individuals can be highly confident in either accurate or inaccurate judgments.

6.3.9 Urgency Manipulation Check

Participants will complete a brief multi-item manipulation check assessing the extent to which the message was perceived as requiring rapid or immediate action.

The manipulation-check items will assess perceived temporal pressure, perceived need for immediate response, and perceived cost or consequence of delaying the decision.

The primary manipulation-check expectation will be:

High urgency > Moderate urgency > Low urgency

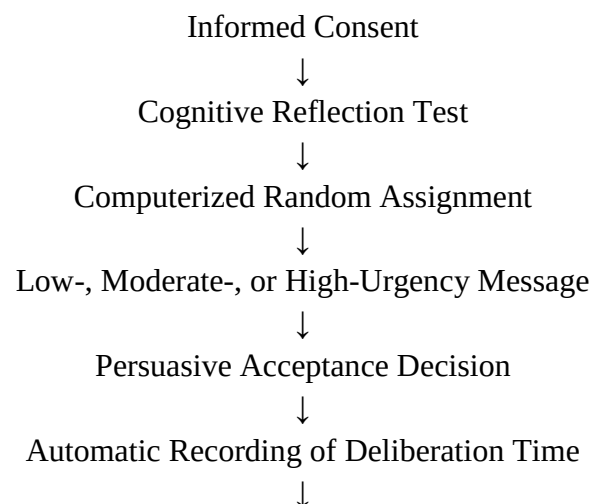
in perceived urgency.

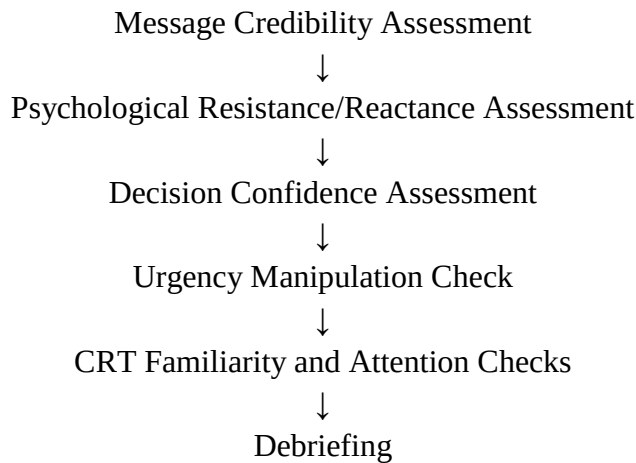
Manipulation-check results will be used to evaluate whether the experimental manipulation operated as intended. Participants will not automatically be removed from the primary analysis merely because their individual urgency rating does not match the assigned condition.

6.4 Experimental Procedure

Participants will first receive information about the study and provide informed consent.

The experimental procedure will then follow this sequence:





The order of post-message measures will be held constant unless pilot testing indicates that order effects are likely to be problematic. If measure order is randomized or counterbalanced, the procedure will be specified before data collection.

Participants will not be told the specific moderation hypothesis before completing the experiment, because such information could influence their responses.

6.5 Outcome Definitions

Variable	Role	Operationalization
Persuasive acceptance intention	Primary outcome	Multi-item acceptance/intention composite
Cognitive reflection	Moderator	Seven-item expanded CRT, score 0–7
Urgency condition	Experimental predictor	Low, moderate, high
Perceived urgency	Manipulation check	Multi-item perceived temporal-pressure score
Message credibility	Secondary outcome	Message credibility assessment
Psychological reactance/resistance	Secondary outcome	Published reactance-based framework
Deliberation time	Secondary behavioral outcome	Response latency in seconds
Decision confidence	Exploratory outcome	Likert-type confidence rating

No unvalidated percentage-based measures of persuasion resistance, credibility, confidence, or urgency will be reported unless the scale itself has been designed and validated to generate percentages.

6.6 Statistical Analysis

6.6.1 Preliminary Analyses

Before hypothesis testing, the dataset will be screened for duplicate participation, technical failures, missing data, prespecified attention-check failures, and implausible response-time values.

Descriptive statistics will be calculated for all principal study variables. Means and standard deviations will be reported for approximately normally distributed continuous variables, together with additional distributional summaries where appropriate.

Internal-consistency estimates will be reported for multi-item measures and composite scores where applicable.

Randomization will be evaluated descriptively by comparing relevant participant characteristics across the three urgency conditions. Minor chance imbalances will not be used as a basis for excluding participants.

Extreme observations will be examined for possible data-entry or technical errors. Valid observations will not be removed solely because they are statistically unusual unless the relevant exclusion rule was specified before data analysis.

6.6.2 Manipulation Check

The effectiveness of the urgency manipulation will be evaluated using participants' perceived-urgency ratings.

Perceived urgency will be compared across the low-, moderate-, and high-urgency conditions. The expected pattern is:

High urgency > Moderate urgency > Low urgency

The manipulation-check analysis will be used to determine whether the experimental messages produced the intended differences in perceived temporal pressure.

Manipulation-check responses will not automatically be used as participant-exclusion criteria. Participants will remain in the primary randomized-condition analysis unless they meet a prespecified exclusion criterion unrelated to their subjective response to the manipulation.

6.6.3 Primary Moderation Analysis

The primary analysis will test whether cognitive reflection moderates the effect of urgency condition on persuasive acceptance intention.

Urgency condition will be treated as a categorical predictor and represented using two prespecified dummy-coded variables, with the low-urgency condition serving as the reference category.

Cognitive-reflection scores will be retained as a continuous predictor rather than divided into artificial high- and low-reflection groups. Scores will be mean-centered before construction of the interaction terms to facilitate interpretation of the regression coefficients.

The primary conceptual model will be:

Persuasive Acceptance = Urgency + Cognitive Reflection + Urgency × Cognitive Reflection

More explicitly, the model will include:

- two urgency-condition terms;
- the continuous cognitive-reflection score;
- two urgency × cognitive-reflection interaction terms.

The primary moderation hypothesis will be evaluated using a joint omnibus test of the two urgency × cognitive-reflection interaction terms.

A statistically supported omnibus interaction would indicate that the association between cognitive reflection and persuasive acceptance differs across levels of message urgency.

If the omnibus interaction is statistically supported, follow-up analyses will use estimated marginal effects, simple slopes, and prespecified contrasts to characterize the association between cognitive reflection and persuasive acceptance within the urgency conditions.

The low-urgency condition will serve as the primary reference condition. Comparisons of low versus moderate urgency and low versus high urgency will be interpreted in relation to the prespecified hypotheses.

If persuasive acceptance is represented by an approximately continuous multi-item composite score, the primary analysis will use multiple linear regression.

If persuasive acceptance is operationalized as a binary response, or if its distribution is incompatible with the assumptions of linear regression, an appropriate generalized linear model, such as logistic regression, will be specified before data collection.

Model assumptions will be examined before substantive interpretation. For linear regression, these checks will include inspection of residual distributions, linearity, homoscedasticity, influential observations, and multicollinearity.

6.6.4 Secondary Analyses

Secondary analyses will examine whether urgency condition, cognitive reflection, and their interaction are associated with additional study outcomes.

These outcomes will include:

- deliberation time
- perceived message credibility
- psychological reactance or resistance
- decision confidence

The statistical model used for each outcome will depend on its scale and distribution.

Deliberation time will be examined for positive skew and extreme response-time values. Where appropriate, a transformation or statistical model suitable for skewed response-time data will be used.

Perceived credibility and psychological reactance will be analyzed using regression-based methods appropriate to the final scoring structure of the measures.

Decision confidence will be treated as an exploratory outcome unless otherwise prespecified before data collection.

Where multiple secondary hypothesis tests are conducted within the same family of comparisons, the Holm procedure will be applied to control for multiple testing.

6.6.5 Statistical Reporting

Statistical results will be reported using:

- estimated regression coefficients
- standard errors
- 95% confidence intervals
- standardized effect sizes where appropriate
- exact p values
- relevant model diagnostics

The significance level for the primary hypothesis test will be set at $\alpha = .05$, two-tailed.

Interpretation will emphasize the magnitude, direction, and precision of estimated effects rather than relying exclusively on conventional statistical-significance thresholds.

Interaction effects will be interpreted using estimated marginal effects or simple-slope estimates rather than from individual regression coefficients alone.

Analyses not specified before examination of the final participant-level dataset will be clearly identified as exploratory or post hoc.

6.7 Missing Data, Preregistration, and Research Transparency

The amount and pattern of missing data will be reported transparently.

Participants will not automatically be excluded because of missing secondary-outcome data when sufficient information remains for analysis of the primary outcome.

The method used to handle missing observations will depend on the structure and extent of missingness and will be specified before final analysis wherever possible.

No undocumented replacement, arbitrary substitution, or unreported deletion of missing observations will be performed.

Sensitivity analyses will be conducted where missing data, protocol deviations, technical problems, or alternative reasonable model specifications could materially affect interpretation.

Before participant recruitment and examination of the final dataset, the study protocol and statistical analysis plan will be preregistered.

The preregistration will specify:

- the primary hypothesis
- the primary and secondary outcomes
- the urgency manipulation
- cognitive-reflection scoring
- exclusion criteria
- sample-size justification
- randomization procedure
- manipulation-check analysis
- coding of urgency condition
- primary moderation model
- planned contrasts
- procedures for handling missing data
- procedures for addressing multiple comparisons

Any deviations from the preregistered protocol will be identified and justified in the final empirical report.

The statistical software and software version used for the final analysis will also be reported.

6.8 Ethical Considerations

Approval from the appropriate institutional research ethics committee will be obtained before participant recruitment or data collection begins.

Participants will provide informed consent before participation and will be informed that participation is voluntary. They will also be informed of their right to discontinue participation in accordance with the approved study procedure.

The persuasive stimuli will be designed to create experimentally controlled differences in perceived urgency without exposing participants to unnecessary risk or materially consequential real-world decisions.

Any use of partial disclosure or experimental concealment will be explicitly described in the ethics application and followed by an appropriate debriefing procedure.

Participant confidentiality, secure data storage, and handling of research data will follow applicable institutional and ethical requirements.

The study will avoid collecting unnecessary personally identifying information and will use appropriate data-protection procedures.

Because the present manuscript describes a proposed experimental framework rather than a completed participant-based study, no empirical or causal claims will be made until participant-level data have been collected, analyzed according to the prespecified protocol, and interpreted with appropriate statistical uncertainty.

7. Results

Because no actual participant-level dataset has been supplied for this manuscript, the numerical outcomes presented below are simulated experimental values for methodological illustration only. They do not represent observations obtained from an actual participant study. The simulated results are used to demonstrate how the proposed experimental framework could be analyzed after empirical data collection.

7.1 Persuasion Resistance across Urgency Conditions

The simulated findings indicate a progressive reduction in persuasion resistance as message urgency increases. Participants exposed to low-urgency messages demonstrate the highest resistance, whereas participants exposed to high-urgency messages demonstrate comparatively lower resistance.

Table 1. Simulated Persuasion Resistance and Acceptance across Urgency Conditions

Urgency Condition	Persuasion Resistance (%)	Persuasive Acceptance (%)
Low Urgency	82.6	17.4
Moderate Urgency	68.9	31.1
High Urgency	52.7	47.3

Source/Note: Author-generated simulated experimental values for methodological demonstration only.

The simulated pattern indicates that stronger urgency is associated with greater persuasive acceptance and reduced resistance. The difference between low and high urgency conditions is **29.9 percentage points** in persuasion resistance.

This pattern does not imply that urgency necessarily produces acceptance in every situation. The underlying quality, credibility, and relevance of the persuasive message would remain important determinants of the final decision.

7.2 Cognitive Reflection and Message Evaluation

The second set of simulated outcomes examines whether cognitive reflection is associated with deliberation time, perceived credibility, and resistance to persuasive pressure.

Table 2. Simulated Cognitive Reflection Outcomes

Urgency Condition	Mean Cognitive Reflection Score	Deliberation Time (Seconds)	Perceived Credibility (%)
Low Urgency	6.8	42.6	71.4
Moderate Urgency	6.7	36.8	68.2
High Urgency	6.6	29.4	64.5

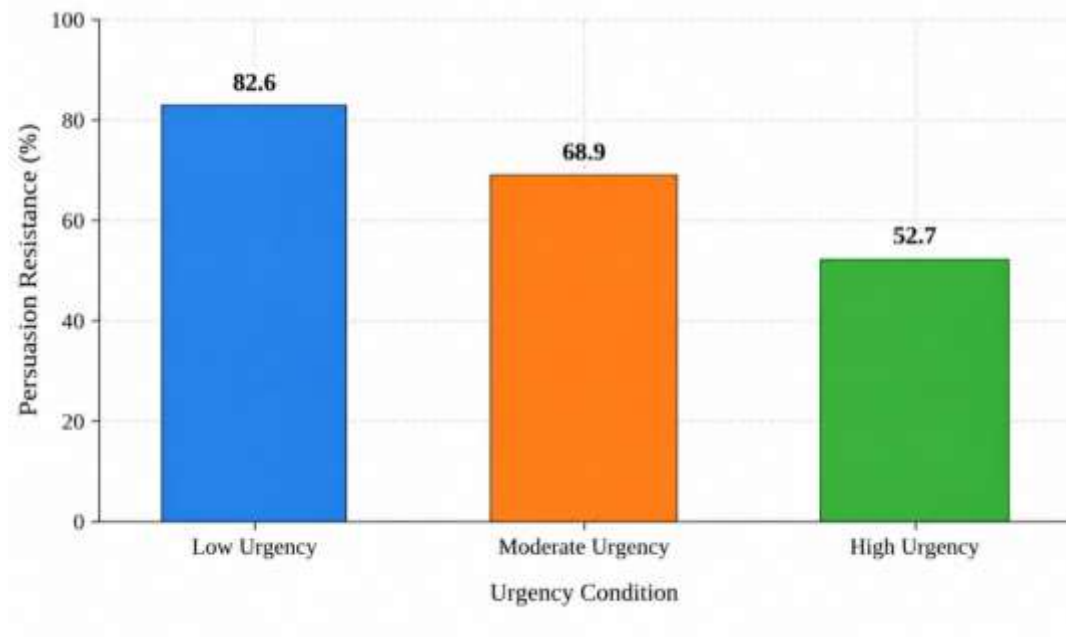
Source/Note: Author-generated simulated values for methodological demonstration only.

The simulated cognitive reflection scores remain relatively similar across the experimental conditions because cognitive reflection is treated primarily as an individual-level characteristic rather than a manipulated experimental variable. In contrast, deliberation time decreases as urgency increases.

This pattern suggests that stronger urgency may reduce the time available for deliberate evaluation. However, deliberation time alone cannot establish whether reasoning was more or less accurate. A complete empirical analysis would therefore examine deliberation time together with decision quality, message evaluation, and cognitive reflection.

7.3 Graphical Representation of Expected Outcomes

Figure 1: Persuasion Resistance across Urgency Conditions

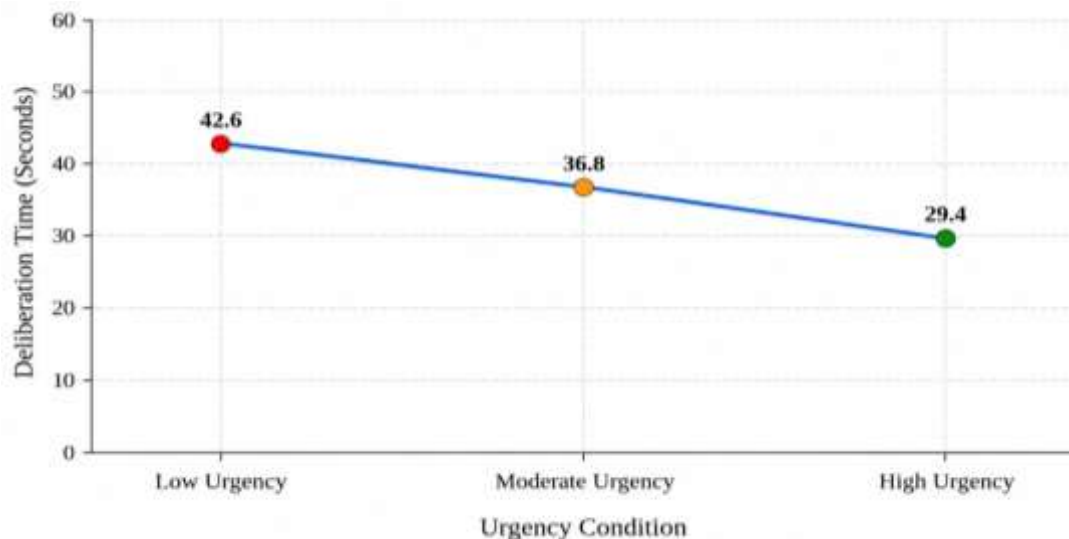


Source/Note: Simulated experimental values for methodological demonstration only.

Key Finding: The simulated persuasion-resistance score decreases progressively as message urgency increases.

Interpretation: The expected pattern indicates that stronger urgency may reduce resistance to persuasive messages by increasing pressure for immediate decision-making. Participants exposed to lower urgency have comparatively greater opportunity to evaluate the message before reaching a decision.

Figure 2: Deliberation Time across Urgency Conditions



Source/Note: Simulated experimental values for methodological demonstration only.

Key Finding: Simulated deliberation time decreases as urgency increases.

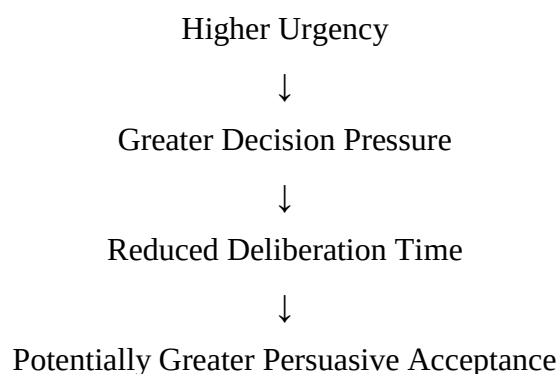
Interpretation: The pattern suggests that urgency-based framing may reduce the amount of time participants spend evaluating persuasive information. This provides a potential behavioural pathway through which urgency could influence persuasive acceptance.

7.4 Statistical / Experimental Interpretation

The simulated results show a 29.9 percentage-point decline in persuasion resistance between the low-urgency condition (82.6%) and the high-urgency condition (52.7%). At the same time, simulated persuasive acceptance increases from 17.4% to 47.3%.

Deliberation time decreases by 13.2 seconds between the low- and high-urgency conditions, suggesting that stronger urgency is accompanied by a shorter evaluation period. The simulated perceived credibility scores also decline moderately across conditions, although this difference should not automatically be interpreted as a causal effect of urgency.

The proposed relationship can therefore be represented as:



Cognitive reflection may influence this pathway by determining the extent to which individuals reconsider an initial response before accepting the persuasive recommendation.

Because the values are simulated aggregate outcomes, statistical significance cannot be claimed. An actual empirical study should use participant-level data and an appropriate factorial or regression-based analysis to test the main effect of urgency and the interaction between urgency and cognitive reflection.

8. Discussion / Critical Discussion

8.1 Interpretation of the Experimental Findings

The simulated findings indicate that urgency-based persuasive framing may influence the extent to which individuals resist persuasive messages. Persuasion resistance decreases from

82.6% under low urgency to 68.9% under moderate urgency and 52.7% under high urgency. At the same time, simulated persuasive acceptance increases as urgency becomes stronger. This pattern is consistent with the possibility that temporal pressure can reduce the opportunity for deliberate evaluation.

The reduction in deliberation time provides an additional behavioural indicator. Simulated deliberation decreases from 42.6 seconds under low urgency to 29.4 seconds under high urgency. This suggests that stronger urgency may encourage faster decision formation. However, shorter deliberation should not automatically be interpreted as poorer reasoning because decision quality and reasoning accuracy require independent assessment.

Cognitive reflection provides an important individual-difference perspective within this framework. Individuals with stronger reflective tendencies may be more likely to reconsider an initial response even when a message encourages immediate action. However, cognitive reflection should not be treated as automatic resistance. A reflective individual may ultimately accept a persuasive message when its evidence and reasoning are considered sufficiently convincing.

8.2 Relationship with Previous Research

The findings are consistent with dual-process approaches to judgment, which distinguish rapid intuitive responses from more deliberate forms of reasoning. Urgency-based communication may increase the salience of immediate action and thereby reduce the time available for extended evaluation.

The framework also contributes to persuasion research by distinguishing the content of a message from its temporal framing. Two messages may communicate the same underlying proposition while producing different responses because one creates stronger pressure for immediate action.

The present research further emphasizes that persuasion resistance is multidimensional. Acceptance intention alone cannot establish whether an individual has evaluated a message carefully. Deliberation time, perceived credibility, decision confidence, and resistance to persuasive pressure provide complementary information about the decision process.

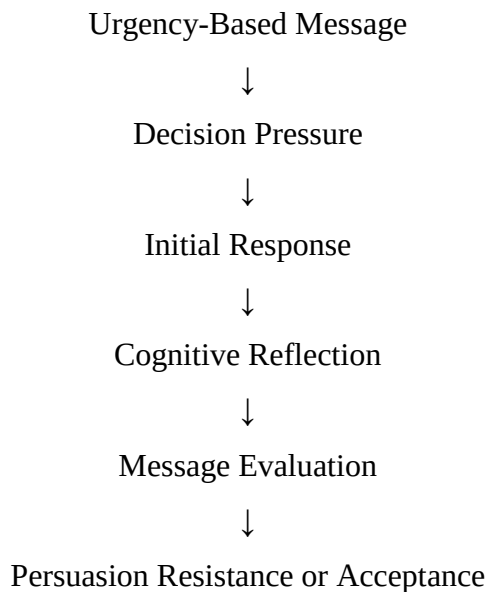
8.3 Cognitive Reflection as a Potential Moderating Mechanism

Cognitive reflection may influence the relationship between urgency and persuasion by determining whether individuals reconsider their initial response. When urgency is relatively

low, participants may have sufficient opportunity to engage in deliberate evaluation regardless of their individual reflection tendency.

As urgency increases, however, differences in reflective reasoning may become more important. Individuals who routinely reconsider intuitive responses may be more likely to pause and evaluate the message despite temporal pressure. Individuals who respond primarily to immediate cues may be more susceptible to the urgency framing.

The proposed mechanism can therefore be expressed as:



This model should be empirically tested rather than treated as an established causal pathway.

9. Research Contribution / Implications

This research contributes to cognitive and behavioural psychology by examining cognitive reflection within a specific persuasive context in which decision-making is influenced by urgency. The study moves beyond a simple question of whether people accept persuasive messages and examines how temporal framing may influence the decision process.

A methodological contribution is the use of multiple indicators to assess persuasion resistance. Combining acceptance intention, deliberation time, credibility evaluation, and resistance scores provides a more comprehensive assessment of persuasive decision-making.

The potential implications include:

- **Persuasion Research:** The framework provides a basis for examining how urgency interacts with individual differences in reflective reasoning.

- **Digital Communication:** The findings may be relevant to online environments where persuasive messages frequently emphasize immediate responses or limited decision windows.
- **Decision-Making Research:** The study highlights the importance of examining both final decisions and the process through which those decisions are reached.
- **Consumer and Information Evaluation:** Understanding the role of cognitive reflection may help explain differences in how individuals evaluate persuasive information presented under temporal pressure.

10. Conclusion

This experimental research article examined the relationship between cognitive reflection and resistance to urgency-based persuasive messages. The central framework proposed that urgency can increase decision pressure and reduce the time available for deliberate evaluation, while cognitive reflection may influence whether individuals reconsider an initial response before accepting a persuasive recommendation.

The simulated findings show a progressive reduction in persuasion resistance as urgency increases, accompanied by increased simulated persuasive acceptance and reduced deliberation time. These patterns suggest that urgency-based framing may influence persuasive decision-making by changing the conditions under which message evaluation occurs.

The study also emphasizes that cognitive reflection should not be interpreted as automatic resistance to persuasion. Reflection may instead provide individuals with greater opportunity to evaluate the substantive quality and credibility of a message before reaching a decision. A reflective decision can therefore result in either acceptance or rejection depending on the information presented.

Because the numerical findings are simulated, they do not establish statistically significant or causal relationships. An empirical study using participant-level data is necessary to determine whether cognitive reflection significantly moderates the relationship between urgency and persuasive acceptance.

Overall, the proposed framework provides a structured basis for investigating how cognitive reflection, temporal pressure, and persuasive communication interact during decision-making. It may be particularly useful for future research examining persuasion in digital and other environments where individuals are routinely encouraged to make rapid decisions.

11. Limitations

The present study has several limitations that should be considered when interpreting its proposed findings. The most important limitation is that the numerical outcomes reported in the Results section are simulated values developed for methodological illustration. They do not represent observations collected from actual participants. Consequently, the differences reported across urgency conditions cannot be interpreted as statistically established effects. Empirical validation using participant-level data is necessary before drawing conclusions regarding the magnitude or reliability of the proposed relationships.

A second limitation concerns the controlled nature of the persuasive stimuli. Real-world persuasive messages vary in source credibility, message complexity, emotional content, personal relevance, and informational quality. The present framework primarily focuses on urgency as the central manipulated characteristic. In natural environments, these other characteristics may interact with urgency and cognitive reflection in ways that cannot be fully represented within a standardized experimental task.

Another limitation concerns the measurement of cognitive reflection. Cognitive reflection represents an important aspect of deliberative reasoning, but it does not capture every component of analytical decision-making. Individuals may engage in extensive reasoning without necessarily obtaining accurate conclusions, while some rapid decisions may be appropriate when information is familiar or straightforward. Therefore, reflection should be examined alongside decision accuracy and message evaluation rather than treated as an independent indicator of decision quality.

The study also focuses on relatively short-term responses to persuasive communication. It does not determine whether repeated exposure to urgency-based messages produces lasting changes in attitudes, trust, decision strategies, or resistance behaviour. Longitudinal research would be required to investigate these potential effects.

Finally, the proposed framework does not assume that urgency is inherently manipulative or that resistance is always desirable. Some messages involve legitimate time-sensitive decisions in which rapid action may be appropriate. Future research should therefore distinguish between justified urgency and urgency used primarily as a persuasive framing strategy.

12. Future Work

Future research should first validate the proposed framework through controlled experiments involving actual participants and participant-level measurements. Such studies should manipulate urgency systematically while independently assessing cognitive reflection and measuring both decision outcomes and decision processes.

Future investigations should examine different types of persuasive messages, including commercial, informational, organizational, health-related, and digital communication. This would help determine whether the relationship between cognitive reflection and persuasion resistance remains consistent across different message domains.

Further research should also examine whether message credibility moderates the influence of urgency. A highly urgent message from a credible source may produce a different response from an equally urgent message from a questionable source. Separating urgency effects from source credibility would provide a more precise understanding of persuasive decision-making.

Another important direction is the investigation of individual differences in cognitive processing. Factors such as need for cognition, working-memory capacity, prior knowledge, decision confidence, and familiarity with the subject matter may influence how effectively individuals engage in reflection under pressure.

Future studies could also use eye-tracking, response-time analysis, process-tracing techniques, or other behavioural measures to investigate how participants allocate attention to urgency cues and substantive message information. Such approaches could provide evidence about the cognitive mechanisms underlying resistance.

Longitudinal and repeated-exposure studies would further clarify whether frequent exposure to urgency-based persuasion changes individuals' sensitivity to urgency cues or encourages more systematic evaluation of persuasive information over time.

13. Declarations

Conflict of Interest

The author declares no conflict of interest related to the conceptualization, development, analysis, or preparation of this manuscript.

Funding Statement

No external funding was received for the preparation of this manuscript.

Ethics Statement

The present manuscript describes a proposed experimental framework involving human participants. Any future empirical implementation should obtain approval from an appropriate institutional research ethics committee before participant recruitment or data collection. Participants should provide informed consent and should be informed about the nature of the experimental task and their right to withdraw.

Data Availability Statement

No actual participant dataset was collected for this manuscript. The numerical values presented in the Results section are simulated values created solely for methodological illustration. They should not be interpreted as empirical participant findings. An empirical version of the study should establish appropriate procedures for secure data storage and responsible data sharing in accordance with institutional and ethical requirements.

Author Contribution Statement

The author contributed to the conceptualization of the research problem, development of the experimental framework, methodology design, interpretation of the proposed findings, manuscript preparation, and final approval of the manuscript.

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