Economic Rationality under Cognitive Limitations: The Effect of Sequential Elimination

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Abstract

We investigate the effect of *sequential elimination*—a choice procedure whereby options are eliminated one by one until only one remains—on economic rationality. Using a tractable framework of *limited attention*, in which individuals consider only a subset of available options, we derive the hypothesis that this procedure improves choice consistency with preference maximization under cognitive constraints, relative to direct choice from menus. We test this hypothesis in a controlled experiment guided by the framework and find causal evidence of such an improvement among individuals with lower cognitive ability. Additional evidence from attentional heterogeneity and a minimum-time constraint treatment supports limited attention as the operative channel. Further analysis indicates that the improvement stems from deliberate, preference-based eliminations.

JEL codes: C90, D81, D91, G11, I31.

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1 Introduction

The standard principle of economic rationality requires individual behavior to be consistent with preference maximization. A fundamental limitation, however, is that individuals often face cognitive constraints that hinder them from selecting their best options (Simon, 1957; Selten, 1990). This yields important welfare implications for individuals with severe constraints, who are systematically more prone to choice inconsistencies and often less able to bear the associated economic costs.[1] These concerns are especially salient in high-stakes markets with large menus—such as bank loans (Honka, Hortaçsu, and Vitorino, 2017), health services (Gaynor, Propper, and Seiler, 2016), and insurance plans (Abaluck and Gruber, 2016; Abaluck and Adams-Prassl, 2021)—where deviations from rational choice are documented. Despite seminal work establishing the role of choice procedures in navigating cognitive boundaries (Simon, 1955, 1976), their potential to improve economic rationality remains largely underexplored.

We provide the first experimental evidence that a simple choice procedure systematically improves choice consistency among individuals facing cognitive constraints. Building on research linking such constraints to lower attentional capacity (e.g., Cowan et al., 2006; Unsworth, 2015), we derive testable implications from a framework of *limited attention*, in which a decision maker (DM) with standard preferences considers only a subset of available options (e.g., Masatlioglu, Nakajima, and Ozbay, 2012; Lleras et al., 2017).[2]

Within this framework, we compare choice consistency across two distinct choice procedures. The first is the *direct procedure*, in which the DM chooses directly from menus. This procedure serves as a benchmark for decision-making under limited attention, whereby overlooking the best options results in choice inconsistencies. We then examine *sequential elimination*, where the DM eliminates options one by one until only one survives. This analysis draws on a synthesis of experimental evidence from marketing

[1] See Section 6 for a review of evidence linking cognitive ability and choice consistency (e.g., Burks et al., 2009; Kim et al., 2018; Echenique, Imai, and Saito, 2023).

[2] In this paper, preferences are defined as complete, transitive, and monotone; formal details are provided in Section 2. We abstract from other cognitive channels (such as imprecise optimization and belief distortions) to focus on limited attention, given its prominence in large-menu settings and its tractability for generating testable predictions from choice data under these preference assumptions.

and psychology—and, more recently, economics—showing that both *sequential* (Besedeš et al., 2015) and *elimination-based* (e.g., Yaniv and Schul, 1997, 2000; Sokolova and Krishna, 2016) procedures mitigate choice overload. While sequential elimination appears to integrate their merits, its normative implications for economic rationality and the underlying mechanisms have yet to be established.

We characterize this procedure under a parsimonious condition, the *minimum attention property*, which requires that the DM consider at least two options when faced with a menu of multiple options. Motivated by converging evidence from the cognitive sciences and economics, this condition ensures that sequential elimination yields choice consistency with preference maximization. Eye-tracking studies, for instance, show that individuals attend to at least two options during decision-making (Krajbich and Rangel, 2011; Reutskaja et al., 2011). Field findings corroborate this pattern with estimates of the number of considered options (Honka, Hortaçsu, and Vitorino, 2017; Barseghyan, Molinari, and Thirkettle, 2021). More fundamentally, cognitive research demonstrates that adult attention spans extend beyond two objects, providing further support for this property (see, e.g., Cowan, 2001, for a review).

Intuitively, our theoretical result holds because in each elimination round, one of the best options survives—either by being overlooked or by beating the other considered options. In essence, rather than choosing directly from an overwhelming menu, the DM implements a sequence of elimination decisions, each consistent with their preferences and within their cognitive constraints. Building on this mechanism, we hypothesize that sequential elimination improves choice consistency relative to the direct procedure among individuals with cognitive limitations.

To test this hypothesis, we conduct a controlled experiment guided by the framework, assessing economic rationality using twenty-four decision problems involving risk, adapted from Kim et al. (2018). Each problem presents eleven distinct options in randomized order, with each option representing a lottery with an equal probability of yielding one of two monetary prizes. Given the simplicity of each option, the core challenge lies in considering all options across every problem, thereby providing a setting to isolate a sequential elimination effect operating through attentional constraints.

Economic rationality in our setting of finite choice sets is evaluated using a necessary and sufficient criterion adapted from Nishimura, Ok, and Quah (2017), who characterize choice consistency with preference maximization in general settings. We refer to this criterion as *GARP*, as it resembles the standard Generalized Axiom of Revealed Preference (Afriat, 1967; Varian, 1982). Our principal measure is a binary indicator for choice consistency (i.e., absence of GARP violations). To capture the extent of deviations from economic rationality, we complement this with count measures, including the Houtman–Maks index (HMI, Houtman and Maks, 1985) and the number of GARP violations, where higher values indicate greater deviations and HMI is typically interpreted as reflecting choice mistakes.

In the experiment, participants are randomly assigned to either the *Direct Procedure* or *Sequential Elimination* treatments, which implement the corresponding choice procedures with meticulously controlled instructions and user interfaces.[3] To capture heterogeneity, we measure cognitive ability using IQ scores from the International Cognitive Ability Resource (ICAR) test (Condon and Revelle, 2014), with *low-IQ* participants (those scoring at or below the sample median) serving as a primary proxy for individuals with cognitive limitations.

Our main experimental results show that Sequential Elimination significantly improves the economic rationality of low-IQ participants relative to the Direct Procedure. Their choice consistency rises by 15.4 percentage points, or 30.8%, relative to the Direct Procedure. Similar patterns emerge across complementary measures: HMI and the number of GARP violations decline by 30.8% and 46.0%, respectively. Improvements are even more pronounced for variants of these measures that impose first-order stochastic dominance (FSD), a stricter normative criterion in decision-making under risk (e.g., Choi et al., 2014; Polisson, Quah, and Renou, 2020). Meanwhile, *high-IQ* participants (those scoring above the sample median) exhibit high levels of rationality, with negligible differences across treatments. We also find a positive, albeit suggestive, effect of Sequential Elimination in the overall sample. Estimated effects remain qualitatively

[3] See Section 3.2 for details of the experimental treatments. Throughout this paper, where initially capitalized, the terms Direct Procedure and Sequential Elimination refer to the respective experimental treatments; otherwise, they indicate their respective conceptual meanings.

consistent in regression analyses incorporating a rich set of control variables. Collectively, these findings support our hypothesis.

Additional evidence aligns with the interpretation that limited attention is a key channel driving the effect of Sequential Elimination. Beyond IQ, our experiment leverages the inattention subscale of the Adult ADHD Self-Report Scale (ASRS), which provides a more direct proxy for attentional constraints. Importantly, *low-attention* participants (those with inattention scores at or above the sample median) overlap only partially with low-IQ participants, enabling a sharper test of the hypothesis related to attention. We find that the treatment yields meaningful improvements among low-attention participants relative to the Direct Procedure, most clearly in choice consistency and HMI. The patterns across attention groups mirror those across IQ groups, providing convergent evidence in line with the framework.

Probing the choice process, we find that Sequential Elimination increases response time modestly relative to the Direct Procedure, which may reflect enhanced deliberation and could alternatively account for the observed improvements in rationality. To isolate this channel, we implement a third treatment, *the Minimum-Time Procedure*, that imposes a minimum-time constraint on each decision. Response time is, as expected, substantially higher in this treatment than in the other two. Despite this, we do not find a statistically significant effect of the Minimum-Time Procedure on choice consistency among low-IQ participants relative to the Direct Procedure. By contrast, this effect is significant among low-attention participants, suggesting that the Minimum-Time Procedure enhances their utilization of underlying cognitive ability amid broader attentional constraints. These findings also point to underlying differences in what the IQ and inattention measures capture, despite their general alignment.

Nevertheless, we find that the Minimum-Time Procedure enhances economic rationality, as indicated by the count measures among low-IQ participants. We interpret this as evidence that while an external time constraint helps to curb choice mistakes under cognitive limitations by extending deliberation, it remains insufficient to address choice inconsistency. Importantly, regression analysis controlling for response time shows that the effect of the Minimum-Time Procedure is materially attenuated, while that of Sequential Elimination remains virtually unchanged. While longer response times are generally associated with improvements in several count measures, these gains are particularly pronounced among high-IQ participants under Sequential Elimination. These findings suggest that the two treatments operate through distinct mechanisms, with Sequential Elimination's effect driven by its procedural structure. Moreover, the benefits of increased response time depend on both the underlying choice procedure and cognitive ability.

A closer inspection of elimination behavior based on option features provides further insight into the mechanism. FSD-dominated options are eliminated early, with Sequential Elimination yielding a marginally significant reduction in their final selection. High-risk boundary options are also eliminated earlier, whereas low-risk middle options survive longer; yet, no systematic differences in their selection are detected across treatments. Moreover, elimination sequences deviate appreciably from the options' default order of presentation, a pattern similar across IQ groups. Overall, our findings indicate that eliminations follow a deliberate and preference-based pattern consistent with our framework, providing a solid behavioral foundation for economic rationality.

The remainder of the paper is organized as follows. Section 2 introduces the framework from which the hypothesis is derived. Section 3 details the experimental design. Section 4 presents the main results. Section 5 provides further analysis. Section 6 situates the findings within the related literature, and Section 7 offers concluding remarks.

2 Framework

Let X be a nonempty finite subset of $\mathbb{R}^n_+$, consisting of *options* denoted by x, y, and z, each representing a bundle of n goods. Let $\mathcal{X}$ be a nonempty set of nonempty subsets of X; this is the set of *menus* with typical elements A, B. A *choice function* c assigns to each $A \in \mathcal{X}$ a unique element $c(A) \in A$, interpreted as the option chosen from A. Let $\succeq$ be a complete, transitive, and monotone *preference relation* on X.[4]

We study a DM with cognitive limitations. When faced with a menu A, the

[4]For $x, y \in \mathbb{R}^n_+$, we write $x \geq y$ if $x_k \geq y_k$ for all $k = 1, \ldots, n$; and $x \gg y$ if $x_k > y_k$ for all $k = 1, \ldots, n$. A preference relation $\succeq$ is monotone if $x \geq y$ implies $x \succeq y$ and $x \gg y$ implies $x \succeq y$ but not $y \succeq x$ (also known as weak monotonicity).

DM considers a subset of options, $\gamma(A)$, known as the *consideration set*. Formally, a *consideration set mapping* γ assigns to every $A \in \mathcal{X}$ a subset $\gamma(A) \subseteq A$. The mapping γ is said to satisfy the minimum attention property if $|\gamma(A)| \geq \min\{|A|, 2\}$ for all $A \in \mathcal{X}$; that is, the DM considers at least two options unless the menu is a singleton. It is said to exhibit *full consideration* if $\gamma(A) = A$ for all $A \in \mathcal{X}$. In the remainder of this section, we examine choice behavior arising from consideration set mappings satisfying the minimum attention property, with full consideration serving as a special case.

2.1 Direct Procedure

In the direct procedure, the DM chooses an option that is preferred to all others in their consideration set within a menu. The following definition is adapted from Masatlioglu, Nakajima, and Ozbay (2012).

Definition 1. A choice function c is a *direct choice* if there exist a preference relation $\succeq$ and a consideration set mapping γ satisfying the minimum attention property such that for all $A \in \mathcal{X}$, $c(A)$ is the $\succeq$-best element in $\gamma(A)$. Further, c is a *direct choice with full consideration* if γ exhibits full consideration.

We assess economic rationality using a criterion adapted from Nishimura, Ok, and Quah (2017).[5] For any $x, y \in X$, we write $xR^D y$ ($xR^S y$, respectively) if there exist menus $A, B \in \mathcal{X}$ and an alternative $z \in A$ such that $c(A) = x$, $c(B) = y$, and $z \geq y$ ($z \gg y$, respectively). Let R denote the transitive closure of R^D; that is, we write xRy if there exists a sequence $z_1, \ldots, z_k$ such that $xR^D z_1$, $z_1 R^D z_2, \ldots, z_k R^D y$. We refer to this criterion as GARP. Formally,

Definition 2 (GARP)**.** A choice function c is said to satisfy GARP if, for any $x, y \in X$, xRy implies that $yR^S x$ does not hold.

Unless the DM considers every available option under the direct procedure, their choices do not necessarily satisfy GARP, as the following example shows. Consider

[5] Our setting involves finite choice menus rather than classical consumption spaces. Theorem 1 of Nishimura, Ok, and Quah (2017), which extends Afriat (1967), applies to any preference relation and choice function, imposing no domain restrictions. Cosaert and Demuynck (2015) also show in their Theorem 2 that this adapted criterion (in their formulation) is necessary and sufficient for choice consistency with utility maximization.

two menus, $A = \{x, y, z\}$ and $B = \{u, v, w\}$ with $z \gg u$ and $w \gg x$. Suppose that the DM's preferences are described by $z \succeq w \succeq x \succeq u \succeq v \succeq y$ and their consideration sets are $\gamma(A) = \{x, y\}$ and $\gamma(B) = \{u, v\}$. Consequently, the DM's choices under the direct procedure are $c(A) = x$ and $c(B) = u$. In this case, we have xRu but $uR^S x$, and we say that the ordered pair (x, u) constitutes a violation of GARP.

How does the number of GARP violations depend on the size of consideration sets under the direct procedure? Consider a different case where the DM has full consideration. In this case, their choices under the direct procedure are $\tilde{c}(A) = z$ and $\tilde{c}(B) = w$, satisfying GARP. Intuitively, the number of GARP violations weakly decreases as consideration sets expand, since the DM does not make worse choices by attending to additional options. Furthermore, choices are equivalently rationalized by the direct procedure with full consideration and by standard preference maximization.

The following remark summarizes the above discussion and will be useful later for formulating our hypothesis.

Remark 1. *Let c, $\tilde{c}$ be two direct choices, the following statements are true:*
(i) c does not necessarily satisfy GARP.
(ii) The number of GARP violations in c is weakly greater than that in $\tilde{c}$ if c ($\tilde{c}$, respectively) is a direct choice with a preference relation $\succeq$ and a consideration set mapping γ ($\tilde{\gamma}$, respectively) such that $\gamma(A) \subseteq \tilde{\gamma}(A)$ for all $A \in \mathcal{X}$.
(iii) c satisfies GARP if and only if c is a direct choice with full consideration.

2.2 Sequential Elimination

Remark 1 thus motivates an alternative procedure that achieves choice consistency without requiring full consideration. We propose sequential elimination, in which the DM eliminates options one by one until only one survives as the choice. To illustrate, suppose again that the DM faces the menu A. Under this procedure, reaching a final choice requires two rounds of elimination. In the first round, the DM eliminates $e_1(A) = y$. In the second round, facing the remaining menu $A \setminus \{y\} = \{x, z\}$, the DM eliminates $e_2(A) = x$, leaving z as the final choice.

Formally, an elimination function e assigns to every $A \in \mathcal{X}$ a sequence

$e(A) = (e_1(A), \ldots, e_{|A|}(A)) \in X^{|A|}$ such that $\bigcup_{r=1}^{|A|}\{e_r(A)\} = A$. The sequence $e(A)$ fully describes the DM's elimination behavior: when $|A| \geq 2$, the DM eliminates $e_1(A), \ldots, e_{|A|-1}(A)$ sequentially and ultimately selects $e_{|A|}(A)$; when $|A| = 1$, the DM bypasses elimination and chooses the sole element. For all $A \in \mathcal{X}$ and $r = 1, \ldots, |A|$, let $A_r = \bigcup_{s=r}^{|A|}\{e_s(A)\}$ denote the remaining menu prior to the rth round of elimination. We propose the following model of sequential elimination.

Definition 3. A choice function c is a *choice by sequential elimination* if there exist a preference relation $\succeq$, a consideration set mapping γ satisfying the minimum attention property, and an elimination function e such that for all $A \in \mathcal{X}$ and $r = 1, \ldots, |A|$,

(i) $e_r(A) \in \gamma(A_r)$;

(ii) $\{x \in \gamma(A_r) \mid x \succeq e_r(A),\ x \neq e_r(A)\} \neq \emptyset$ if $|A_r| \geq 2$;

(iii) $e_{|A|}(A) = c(A)$.

The first two conditions of Definition 3 state that the DM eliminates an option from their consideration set whenever they prefer another option within that set. The minimum attention property ensures that, whenever the remaining menu contains more than one option, the DM considers at least two, so that each elimination is grounded in a binary comparison of options according to their preferences. This prevents singleton consideration sets when multiple options remain, which could result in arbitrary eliminations that might discard the best available option. The third condition links an elimination data set to a choice data set by designating the last remaining option as the choice.

The following proposition characterizes individual choice behavior under sequential elimination. Proofs are in Appendix A.1.

Proposition 1. *Let c be a choice function. c satisfies GARP if and only if c is a choice by sequential elimination.*

The "if" direction of the proposition establishes that the DM's choices are consistent with preference maximization under sequential elimination. Thanks to the minimum attention property, one of the best options in a menu survives each round of elimination via one of two cases. Either the DM does not attend to the option, leaving it on the menu, or they consider it, which beats all other options in their consideration set. In other words, sequential elimination mitigates limited attention by decomposing a demanding preference maximization problem into a series of elimination subproblems, each manageable within the DM's cognitive constraints. This implies that cognitive heterogeneity plays a muted role in shaping choice consistency under sequential elimination.

The "only if" direction indicates that any consistent choice behavior can be represented as a choice by sequential elimination, implying that the underlying procedure is not uniquely identified from such choice data. This result is not strictly needed to derive the empirical hypothesis below, but is useful for discussing its falsifiability.

2.3 Testable implication

Violations of GARP may arise from sources outside the framework, including non-standard preferences such as incompleteness (Ok, 2002) or intransitivity (Mandler, 2005), behavioral biases (DellaVigna, 2009), limited experience (List and Millimet, 2008), and socioeconomic heterogeneity (e.g., Choi et al., 2014; Fisman et al., 2015; Echenique, Imai, and Saito, 2023). Accordingly, comparing choice consistency across procedures under exogenous assignment is more informative than assessing each in isolation, as it differences out these confounds. We thus propose the following hypothesis, implied by Remark 1 and Proposition 1.

Hypothesis 1. *Sequential elimination improves choice consistency relative to the direct procedure among individuals with cognitive limitations.*

The hypothesis is falsifiable through two patterns of null treatment differences. First, both procedures might exhibit comparably high levels of choice consistency. This could arise if most participants have sufficiently high cognitive ability to engage in full consideration, rendering the choice procedures inconsequential for their choice consistency, as implied by Remark 1(iii) and Proposition 1. A less likely alternative is that participants apply sequential elimination irrespective of the experimental manipulation.

Second, both procedures might yield uniformly low levels of choice consistency, suggesting that deviations stem primarily from the alternative sources outlined above, or, in edge cases, from a failure of the minimum attention property. For example, under incomplete preferences, eliminations do not resolve the underlying indeterminacy in binary comparisons and may therefore be arbitrary; consequently, the revealed preference relation need not be complete. In this light, the effect of sequential elimination relative to the direct procedure serves as an indirect test of whether cognitive constraints (operating via limited attention), rather than alternative sources, drive observed deviations from rationality.

3 Experimental design

Our experiment is structured as follows. Upon starting the experiment, participants are randomly assigned to one of three treatments: Sequential Elimination, Direct Procedure, or Minimum-Time Procedure. They engage in economic decision-making under their assigned treatment, followed by a set of cognitive tests. The experiment concludes with a survey that elicits attitudes toward inconsistency and the ASRS, alongside demographic information (age, gender, and education). The experimental design is described below, in detail, with instructions and screenshots provided in Appendix B.1.

3.1 Rationality measures

Our experiment features twenty-five risky decision problems, of which twenty-four are adapted from Kim et al. (2018) to assess economic rationality, and one serves as a comprehension check.[6] Each decision problem consists of eleven distinct options presented in randomized order. Every option, denoted as (x_1, x_2), yields either x_1 or x_2 tokens with equal probability. These twenty-four problems are derived from unique budget lines, each characterized by a specific price–endowment combination. Guided by our framework, this design embodies a primary challenge of limited attention, requiring participants to consider all options across each problem, while any given binary comparison remains highly tractable. The list of decision problems is provided in Appendix Table B.3; graphical representations of a decision problem and a GARP

[6]The comprehension check problem presents eleven strictly increasing options ranging from $(0,0)$ to $(111,111)$. Choosing any option other than the strictly dominant $(111,111)$ indicates a lack of comprehension.

violation in two-dimensional space appear in Appendix Figure B.7.

Our principal measure is choice consistency, a binary indicator equal to 1 if a participant's choices are consistent with preference maximization (i.e., no GARP violations) and 0 otherwise. To provide a more granular assessment of deviations from rationality, we also employ HMI, defined as the minimum number of observations that must be removed to restore consistency among the remaining choices; these removed observations are typically interpreted as choice mistakes.

As robustness measures, we additionally report the number of GARP violations, following approaches used in the literature (e.g., Harbaugh, Krause, and Berry, 2001; Andreoni and Miller, 2002). A lower HMI and fewer GARP violations indicate higher levels of economic rationality. We further construct FSD-compliant measures—FSD-consistency, FSD-HMI, and the number of FSD-GARP violations—which impose first-order stochastic dominance, a regularity condition stricter than monotonicity (see Appendix A.2 for formal definitions). These measures are otherwise identical in construction and interpretation to their monotonicity-only counterparts. Together, these measures offer complementary assessments of economic rationality, varying in stringency and granularity.

3.2 Treatment variations

All treatments employ nearly identical interfaces and instructions, differing only in the imposed choice procedure. In each decision problem, participants choose an option from a vertical list displayed on the left side of the screen. Each treatment begins with a practice trial.

Sequential Elimination. Participants make their choice by sequentially eliminating options they do not prefer until only one option remains. To eliminate an option, they click on it, moving it to a *Trash* box on the right side of the screen. To reduce errors from trembles or unfamiliarity, eliminated options can be reinstated at any time before submission.

Direct Procedure. Participants make their choice after sequentially examining all options. To mark an option as examined, they click on it, moving it to a *Choice List* on the right side of the screen. After all options are in the Choice List, they select their preferred option from that list.[7]

Minimum-Time Procedure. Participants make their choice directly from the initial list of options but are required to spend at least 35 seconds on each decision problem before submission. This time constraint is calibrated to match the average time spent under Sequential Elimination in the pilot study (33.66 seconds), thereby isolating the role of response time. A timer on the right side of the screen displays the elapsed time for each problem.

While alternative implementations are possible, this controlled design provides a cleaner way to isolate the core mechanisms driving choice behavior. The Direct Procedure represents a setting in which participants engage with all available options prior to a direct choice, thereby providing a full-exposure benchmark comparable to Sequential Elimination. An uncontrolled design—such as asking participants to select directly from the list—may confound interpretation with alternative channels, most notably satisficing (Simon, 1955; Caplin, Dean, and Martin, 2011), whereby participants stop searching upon encountering a satisfactory option rather than fully evaluating the menu. Our Direct Procedure mitigates this channel, allowing inconsistent choices to be attributed to cognitive limitations in processing all options, in line with the framework, rather than to satisficing motives such as effort or regret reduction.

3.3 Additional measures

Our measure of cognitive ability is the IQ score obtained from the ICAR test, which comprises five matrix reasoning and five three-dimensional rotation tasks that primarily reflect analytical reasoning and problem-solving abilities. The IQ score serves as a broad proxy encompassing multiple cognitive dimensions relevant to economic decision-making, given its inherent links to attention and working memory (Unsworth et al., 2014). We supplement this proxy with targeted measures of selective attention (the ability to focus on relevant information while suppressing distractions) using the Stroop task (Stroop, 1935), and working memory (the capacity for temporary storage

[7] To minimize potential naming effects, this treatment is introduced as *Sequential Examination* in the experiment.

and maintenance of information) using the Sternberg task (Sternberg, 1966).[8]

Beyond the cognitive measures above, we incorporate the ASRS instrument (v1.1), which comprises two nine-item subscales measuring inattention and hyperactivity-impulsivity, with higher scores indicating more pronounced tendencies on each dimension. We focus on the inattention subscale, which captures everyday attentional patterns, such as difficulty sustaining attention during effortful tasks, distractibility, and difficulty initiating or completing tasks. As such, it complements the IQ measure by providing a self-reported proxy of attentional constraints. In the experiment, the two subscales are presented on consecutive screens, and we embed a validation item within the second (hyperactivity-impulsivity) screen to verify instruction following.

Finally, we elicit attitudes toward inconsistency using a decision scenario illustrating the attraction effect, a canonical form of context-dependent inconsistency (Huber, Payne, and Puto, 1982). Participants rate how at ease they are with the inconsistency on a scale from 0 (least at ease) to 10 (most at ease), with higher values indicating a weaker aversion to inconsistency. This is included as a control for intrinsically non-standard preferences.

3.4 Implementation and sample

The experiment was conducted online via the Qualtrics platform in December 2025 and pre-registered on the AEA Registry (AEARCTR-0016087). A pilot study informed the power calculations and minimum detectable effects reported in the pre-registration. Participants were recruited from Prolific and restricted to those with an approval rating of at least 95% and a minimum of 10 prior submissions. During the initial instructions, participants were required to pass three comprehension questions about the decision task, each within two attempts. Upon completion, participants received a participation fee of £1 and an additional payment of up to £14.60, contingent on their decisions and performance in the cognitive tests. The mean completion time was 42 minutes, with an average payout of £8.14.

Our sample comprises 616 participants (52.3% female), with 201–212 observations

[8] In the Stroop task, participants identify the print color of incongruent words, requiring inhibition of automatic responses. In the Sternberg task, participants memorize short number sequences and indicate whether a subsequently presented number was included. Scores represent the number of correct responses on each task.

per treatment.[9] By design, individual characteristics—including cognitive measures, attitudes toward inconsistency, and demographics—are balanced across treatment groups. The average age in the sample is approximately 43 years. Nearly all participants (99.5%) had completed at least secondary education, and 69.0% had attained an undergraduate degree or higher at the time of the experiment. Descriptive statistics and balance checks are reported in Appendix Table C.1, with corresponding histograms in Appendix Figure C.1.

4 Main results

4.1 Empirical proxies and participant classification

We first establish the validity of the cognitive measures to set the stage for the analysis of treatment effects. IQ emerges as the most robust predictor of economic rationality, exhibiting significant correlations across all measures (e.g., Pearson $r = 0.11$ with choice consistency). While we observe a statistically significant, albeit modest, positive correlation among IQ, selective attention, and working memory, the latter two show only occasionally significant correlations with rationality. This is likely because they capture narrower, domain-specific cognitive functions rather than the integrated processing ability required for decision-making. Furthermore, the self-reported ASRS inattention subscale reveals a negligible correlation with both the rationality measures and IQ, despite maintaining a significant relationship with selective attention. A detailed correlation heatmap is provided in Appendix Figure D.1.

Given these patterns, we test Hypothesis 1, as pre-registered, on low-IQ participants—defined as those with scores at or below the sample median—as our primary proxy for individuals with cognitive limitations.[10] This group constitutes 53.9% of the sample and is evenly distributed across treatments (Appendix Table C.2, Panel A).

[9] A total of 662 participants (52.7% female; 218–225 per treatment) completed the experiment. Forty-six participants who failed the decision-problem comprehension check were excluded from the analysis; of these, two were additionally ineligible for compensation due to failing the ASRS validation item, as specified in the initial instructions.

[10] The sample's IQ scores range from 0 to 9, with the first and third quartiles at 3 and 6, respectively. The mean IQ is approximately 4.51, with a median of 4 and a standard deviation of about 2.14. Thus, splitting the sample by either the mean or the median yields identical low-IQ and high-IQ groups.

Analogously, we define low-attention participants as those with ASRS inattention scores at or above the sample median, and high-attention participants as those below. As pre-registered, low-attention participants serve as a secondary proxy in testing the hypothesis; they constitute 57.1% of the sample and are balanced across treatments (Panel B). Notably, the low-attention group consists of 53.7% low-IQ and 46.3% high-IQ individuals (Panel C). This composition allows us to at least partially disentangle the role of attention from that of cognitive ability, providing additional insight into the underlying mechanisms.

4.2 Treatment effects by IQ

4.2.1 Descriptive evidence

We begin with the descriptive evidence for Hypothesis 1. Figure 1 reports mean rationality measures by treatment and IQ group. Binary outcomes are evaluated using chi-square tests and count outcomes using Mann–Whitney U tests; corresponding p-values for pairwise treatment comparisons are reported in Appendix Table D.1, and pairwise comparisons between IQ groups within each treatment in Appendix Table D.2.

In the top-left panel, choice consistency for low-IQ participants rises by 15.4 percentage points, or 30.8%, under Sequential Elimination relative to the Direct Procedure (0.654 vs. 0.500, $p = 0.020$). The middle- and bottom-left panels provide corroborating evidence, with HMI and GARP violations falling by 30.8% (0.692 vs. 1.000, $p = 0.021$) and 46.0% (7.570 vs. 14.017, $p = 0.011$), respectively.

The right panels further illustrate marked improvements in FSD-compliant measures, reinforcing this pattern. FSD-consistency increases by 50.9% (0.486 vs. 0.322, $p = 0.012$), while FSD-HMI and FSD-GARP violations decrease by 38.0% (1.393 vs. 2.246, $p = 0.003$) and 50.0% (27.561 vs. 55.127, $p = 0.001$), respectively. The empirical cumulative distributions of the count measures across treatments show pronounced upward shifts from the Direct Procedure to Sequential Elimination among low-IQ participants (Appendix Figure D.2). The findings provide strong support for the hypothesis.

High-IQ participants, in stark contrast, exhibit no statistically significant differences across treatments on any measure, consistent with the prediction that choice procedures

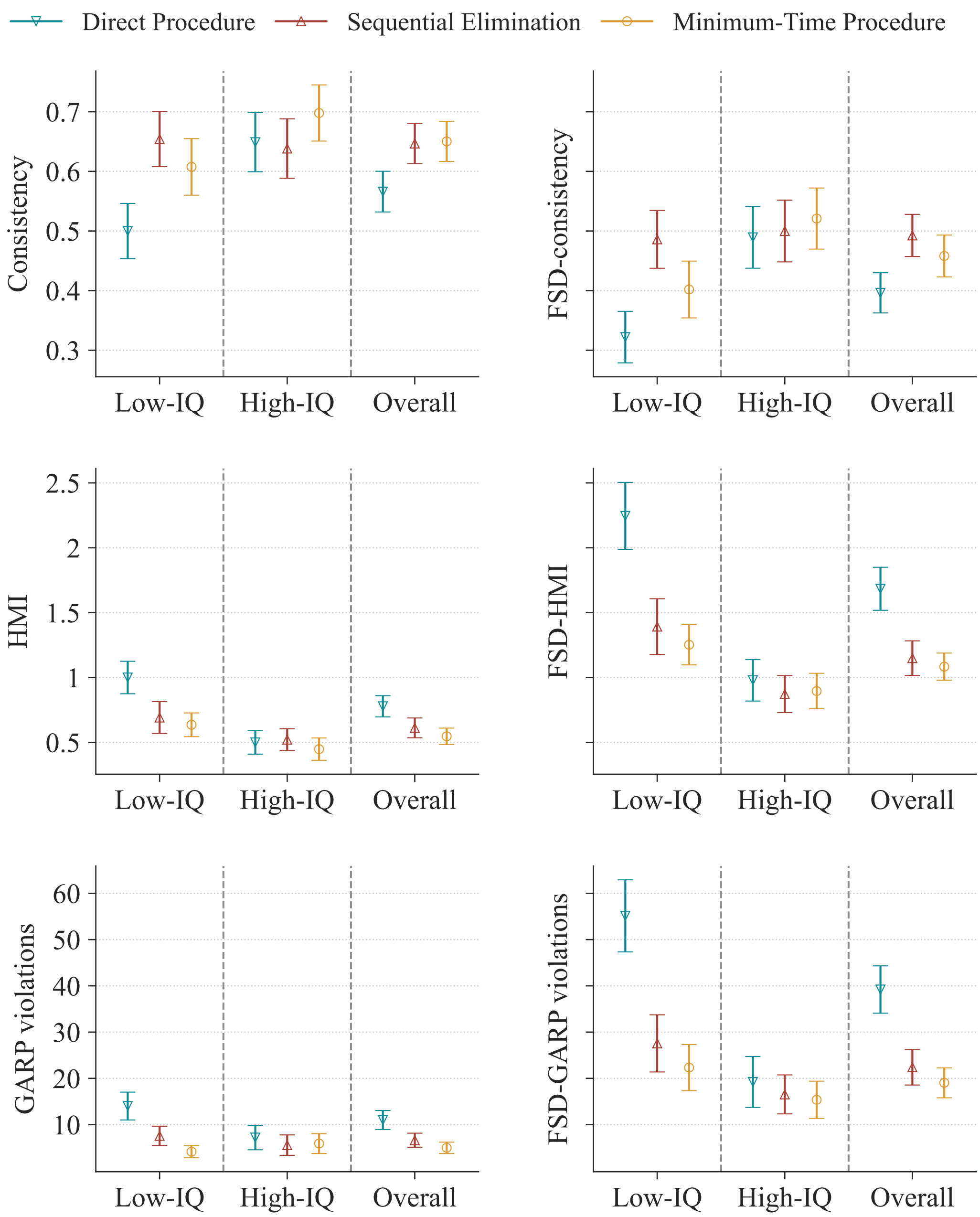

FIGURE 1. Economic rationality across treatments. Mean values of rationality measures for low-IQ, high-IQ, and overall participants in each treatment group are shown, with error bars representing standard errors.

are inconsequential for their rationality (Remark 1(iii) and Proposition 1). In the overall sample, there is suggestive evidence of improved rationality under Sequential Elimination; for example, choice consistency increases by 14.3% (0.647 vs. 0.566, $p = 0.093$), reflecting the sizable gains among low-IQ participants. High-IQ participants exhibit higher economic rationality than low-IQ participants under the Direct Procedure (e.g., 0.649 vs. 0.500 in choice consistency, $p = 0.030$), as predicted by Remark 1(ii) and documented in prior studies. This disparity, however, vanishes under Sequential Elimination (e.g., 0.654 vs. 0.638 in choice consistency, $p = 0.814$), reflecting the muted role of cognitive heterogeneity (Proposition 1).

Turning to the Minimum-Time Procedure among low-IQ participants, choice consistency is higher than under the Direct Procedure, though the difference falls short of conventional significance (0.607 vs. 0.500, $p = 0.106$), and similarly for FSD-consistency (0.402 vs. 0.322, $p = 0.213$). Nevertheless, effects emerge in HMI, which decreases by 36.4% at the margin of significance (0.636 vs. 1.000, $p = 0.052$); these are more pronounced in FSD-HMI (1.252 vs. 2.246, $p = 0.016$), and extend to GARP and FSD-GARP violations (4.150 vs. 14.017, $p = 0.014$ and 22.327 vs. 55.127, $p = 0.003$, respectively).[11] Pairwise comparisons between Sequential Elimination and the Minimum-Time Procedure reveal no statistically significant differences across IQ groups.

These patterns indicate that the Minimum-Time Procedure reduces choice mistakes but does not systematically improve choice consistency among low-IQ participants, consistent with the persistence of cognitive constraints (Remark 1(i)). One possible explanation is that low-IQ participants may underinvest in effort under the Direct Procedure, either due to reluctance or as a response to limited returns to deliberation. We shed further light on this by examining response time in Section 5.1. More broadly, despite improvements under both procedures, deviations from rationality persist to some degree across all treatments, pointing to additional sources of inconsistency beyond cognitive ability and choice procedures, as noted in the framework.

[11] Correspondingly, we also observe that the gap between high-IQ and low-IQ participants shrinks under the Minimum-Time Procedure, although it remains significant for some measures (Appendix Table D.2).

4.2.2 Regression results

We now estimate the effects of Sequential Elimination and the Minimum-Time Procedure, each relative to the Direct Procedure, controlling for inattention (ASRS), selective attention, working memory, attitudes toward inconsistency, and demographics (age, gender, and education). We report average marginal effects to aid interpretation. In Table 1, Columns 1 and 4 report the effects from logistic regressions on binary measures, while the remaining columns provide results for count measures using negative binomial regressions.[12] The corresponding regression coefficients and full specifications are reported in Appendix Table D.3, yielding similar qualitative conclusions.

The estimates align with the descriptive patterns. As shown in Column 1, Sequential Elimination leads to a 14.2 percentage point higher probability of choice consistency among low-IQ participants ($se = 0.064$), reinforcing support for the hypothesis. Columns 2 and 3 report reductions in HMI by 0.283 ($se = 0.166$) and GARP violations by 7.183 ($se = 3.807$), albeit at the margin of significance. The improvements are more pronounced for FSD-compliant measures; for example, the probability of FSD-consistency increases by 16.5 percentage points ($se = 0.065$, Column 4) and FSD-HMI decreases by 0.812 ($se = 0.317$, Column 5).

The results also confirm null effects of Sequential Elimination for high-IQ participants. We find no significant interaction between the treatment and the high-IQ indicator across all measures, nor with the continuous IQ variable (Appendix Tables D.3 and D.4). In the overall sample, effects broadly parallel those for low-IQ participants, emerging with a suggestive increase in consistency (8.7 percentage points, $se = 0.048$) and significant improvements in FSD-compliant measures.

As for the Minimum-Time Procedure, the estimates show a positive but marginally significant increase in choice consistency among low-IQ participants (10.9 percentage points, $se = 0.065$), which further attenuates for FSD-consistency (7.9 percentage points, $se = 0.065$). Nevertheless, the procedure shows clear improvements in choice mistakes,

[12] Negative binomial regressions are particularly suitable for count data with skewed distributions (Cameron and Trivedi, 2013). The variance is specified as $\mathrm{Var}(y) = \mu + \alpha\mu^2$, where y is the dependent variable, μ is its mean, and α is the dispersion parameter. This specification, known as the *NB2* model, is preferred over the Poisson model as it accommodates deviations from the assumption of equal mean and variance.

TABLE 1. Average marginal effects of choice procedures on economic rationality by IQ group.

				FSD-compliant		
	Consistency (1)	HMI (2)	GARP violations (3)	Consistency (4)	HMI (5)	GARP violations (6)
Sequential Elimination						
Low-IQ participants	0.142	-0.283	-7.183	0.165	-0.812	-29.534
	(0.064)	(0.166)	(3.807)	(0.065)	(0.317)	(10.238)
High-IQ participants	0.021	-0.028	-1.814	0.032	-0.139	-2.422
	(0.071)	(0.132)	(3.407)	(0.073)	(0.211)	(6.876)
Overall	0.087	-0.170	-4.829	0.103	-0.510	-17.536
	(0.048)	(0.110)	(2.579)	(0.049)	(0.198)	(6.520)
Minimum-Time Procedure						
Low-IQ participants	0.109	-0.340	-10.438	0.079	-0.942	-33.053
	(0.065)	(0.145)	(3.507)	(0.065)	(0.286)	(9.969)
High-IQ participants	0.054	-0.055	-0.378	0.034	-0.069	-2.780
	(0.070)	(0.137)	(3.457)	(0.072)	(0.217)	(6.827)
Overall	0.084	-0.214	-6.027	0.058	-0.550	-19.657
	(0.048)	(0.102)	(2.482)	(0.048)	(0.186)	(6.310)
Observations	616	616	616	616	616	616

Note: This table reports the average marginal effects of Sequential Elimination and the Minimum-Time Procedure on economic rationality relative to the Direct Procedure by IQ group. Columns 1 and 4 present average marginal effects from logistic regressions, while the remaining columns present those from negative binomial regressions. All specifications include a treatment–High-IQ interaction, controls for inattention (ASRS), selective attention, working memory, attitude toward inconsistency, age, gender, education, and a constant. Robust standard errors are reported in parentheses.

as indicated by significant reductions in count measures, e.g., HMI falling by 0.340 (se = 0.145). These reductions persist in the overall sample, whereas effects among high-IQ participants remain trivial.

Collectively, the evidence indicates economically meaningful improvements attributed to Sequential Elimination and the Minimum-Time Procedure. The emergence of an overall, albeit tentative, effect suggests that these treatments may also extend to the broader population or to subgroups not fully captured by the IQ measure. Building on this, we next examine treatment heterogeneity stratified by ASRS inattention, providing a sharper test of the mechanism through which Sequential Elimination operates.

4.3 Treatment effects by attention

We extend the analysis to treatment effects by attention group, focusing on regression results with the full set of controls. Table 2 reports corresponding average marginal effects of Sequential Elimination and Minimum-Time, each relative to the Direct Procedure. These estimates are qualitatively consistent with the descriptive patterns (Appendix Figures D.3 and D.4), non-parametric evidence (Appendix Table D.5), and corresponding regression coefficients (Appendix Table D.6).

The effects among low-attention participants closely mirror those for low-IQ participants. Sequential Elimination increases choice consistency by 19.5 percentage points ($se = 0.063$) and reduces HMI by 0.398 ($se = 0.142$), corroborating Hypothesis 1. The effects remain robust in FSD-HMI and are marginally significant for FSD-GARP violations; for the remaining measures, the estimates are directionally consistent but approach, without attaining, statistical significance.[13] Conversely, effects among high-attention participants are muted and show no systematic improvements, except for marginally significant gains in FSD-compliant measures, which likely reflect group composition, as a majority (55.8%) consists of low-IQ participants who demonstrate strong treatment effects.

The Minimum-Time Procedure follows a similar pattern. It significantly increases choice consistency among low-attention participants by 16.7 percentage points ($se = 0.065$) and reduces HMI by 0.310 ($se = 0.149$), with no statistically detectable effects on the robustness measures. Notably, the effect on choice consistency contrasts with that observed for low-IQ participants. One interpretation is that low-attention participants without time constraints, particularly high-IQ individuals, may not fully utilize available cognitive resources due to broader attentional constraints, such as difficulty sustaining attention or susceptibility to distraction. That is, these constraints, which may arise even with higher cognitive ability, appear more responsive to deliberation-enhancing interventions.

[13] Low-attention and low-IQ participants display rationality outcomes that are not statistically different (Appendix Table D.7), although the former tend to perform somewhat better. The higher-IQ composition of the low-attention group may partly account for the lack of statistical significance in the more demanding robustness measures, as higher baseline rationality leaves less room for detectable improvements.

TABLE 2. Average marginal effects of choice procedures on economic rationality by attention group.

				FSD-compliant		
	Consistency (1)	HMI (2)	GARP violations (3)	Consistency (4)	HMI (5)	GARP violations (6)
Sequential Elimination						
Low-attention participants	0.195	-0.398	-4.922	0.092	-0.504	-15.572
	(0.063)	(0.142)	(3.726)	(0.065)	(0.248)	(8.154)
High-attention participants	-0.040	0.102	-3.984	0.122	-0.518	-14.391
	(0.070)	(0.169)	(2.900)	(0.072)	(0.284)	(8.643)
Overall	0.095	-0.187	-4.535	0.105	-0.510	-15.071
	(0.047)	(0.110)	(2.484)	(0.048)	(0.189)	(5.913)
Minimum-Time Procedure						
Low-attention participants	0.167	-0.310	-5.079	0.027	-0.408	-12.311
	(0.065)	(0.149)	(3.782)	(0.064)	(0.255)	(9.445)
High-attention participants	-0.005	-0.132	-4.451	0.117	-0.661	-16.184
	(0.071)	(0.141)	(3.084)	(0.073)	(0.266)	(8.582)
Overall	0.094	-0.235	-4.820	0.066	-0.516	-13.954
	(0.048)	(0.104)	(2.457)	(0.048)	(0.186)	(6.258)
Observations	616	616	616	616	616	616

Note: This table reports the average marginal effects of Sequential Elimination and the Minimum-Time Procedure on economic rationality relative to the Direct Procedure by attention group. Columns 1 and 4 present average marginal effects from logistic regressions, while the remaining columns present those from negative binomial regressions. All specifications include a treatment–high-attention interaction, controls for IQ, selective attention, working memory, attitude toward inconsistency, age, gender, education, and a constant, as well as a constant term. Robust standard errors are reported in parentheses.

Taken together, the heterogeneity analyses by IQ and attention help clarify the underlying mechanisms.[14] Sequential Elimination restructures the choice process, reducing cognitive (particularly attentional) demands, whereas the Minimum-Time Procedure extends the choice process, enhancing the utilization of cognitive resources. The differential patterns across IQ and attention subgroups further underscore the complementarity of these measures: while IQ captures general cognitive ability, the inattention measure captures additional attentional dimensions that can be ameliorated by Sequential Elimination.

[14]The results remain consistent when evaluated using the full ASRS, as reported in Appendix Table D.8.

5 Further analysis

In this section, we provide exploratory analyses to deepen our understanding of how sequential elimination operates. We begin by examining how response time varies across procedures and relates to economic rationality, then analyze patterns of elimination behavior and choices, and finally draw on suggestive pilot evidence to inform the descriptive and normative roles of these procedures.

5.1 Response time

On average, response time per decision problem is 22.4 seconds under the Direct Procedure and 26.4 seconds under Sequential Elimination—modestly higher under the latter—yet both remain substantially below the 40.5 seconds observed under the Minimum-Time Procedure, which exceeds the 35-second minimum constraint. High-IQ participants tend to deliberate longer than low-IQ participants under the Direct Procedure and Sequential Elimination, but this gap vanishes under the Minimum-Time Procedure, indicating that the constraint binds uniformly across groups (Appendix Table D.9). Regression results in Appendix Table D.10 confirm these patterns.

A prevailing view in the cognitive sciences holds that longer response times are associated with higher decision accuracy (see, e.g., Heitz, 2014, for a review). However, an important strand of the literature documents exceptions, where some choices are made quickly and accurately due to intuitive reasoning (Rubinstein, 2007, 2013). The effects of the Minimum-Time Procedure are in line with the former view, as reflected in the reduction in mistakes. Longer response times under Sequential Elimination can arise as a mechanical consequence of executing multiple elimination rounds and may also reflect active engagement with the procedure. The key question is whether its effect operates primarily through increased time per se—that is, inducing longer deliberation—or whether its procedural structure enables participants to utilize their deliberation time more effectively.

To address this, we augment the main specification in Table 1 by controlling for response time. Table 3 shows that, overall, longer response times are associated with

TABLE 3. Average marginal effects of response time and choice procedures on economic rationality.

				FSD-compliant		
	Consistency (1)	HMI (2)	GARP violations (3)	Consistency (4)	HMI (5)	GARP violations (6)
Response time	0.001	-0.008	-0.184	0.003	-0.021	-0.281
	(0.002)	(0.004)	(0.070)	(0.002)	(0.007)	(0.212)
Sequential Elimination						
Low-IQ participants	0.137	-0.236	-5.953	0.157	-0.665	-27.161
	(0.064)	(0.156)	(3.106)	(0.067)	(0.292)	(9.721)
High-IQ participants	0.014	-0.000	-2.267	0.013	-0.102	-3.140
	(0.071)	(0.124)	(3.043)	(0.073)	(0.203)	(6.818)
Overall	0.081	-0.134	-4.403	0.090	-0.418	-16.703
	(0.048)	(0.105)	(2.196)	(0.049)	(0.189)	(6.309)
Minimum-Time Procedure						
Low-IQ participants	0.083	-0.141	-6.213	0.014	-0.421	-25.724
	(0.076)	(0.177)	(3.409)	(0.072)	(0.347)	(11.623)
High-IQ participants	0.034	0.058	2.142	-0.021	0.178	-0.888
	(0.075)	(0.153)	(4.157)	(0.077)	(0.266)	(7.663)
Overall	0.061	-0.055	-2.701	-0.002	-0.158	-14.911
	(0.058)	(0.131)	(2.760)	(0.057)	(0.254)	(7.761)

Note: This table reports the average marginal effects of response time, Sequential Elimination, and the Minimum-Time Procedure on economic rationality. Response time is averaged across decision problems at the individual level. Treatment effects are reported by IQ group. Columns 1 and 4 present average marginal effects from logistic regressions, while the remaining columns present those from negative binomial regressions. All specifications include controls for inattention (ASRS), selective attention, working memory, attitude toward inconsistency, age, gender, education, and a constant. Robust standard errors are reported in parentheses.

improvements in several count measures, though not in choice consistency or FSD-consistency, echoing the effects of the Minimum-Time Procedure shown in the main results. Importantly, the estimated effects of Sequential Elimination among low-IQ participants remain similar in both magnitude and significance (compared to Table 1), whereas those of the Minimum-Time Procedure are materially attenuated. This finding indicates that response time is a primary driver of the Minimum-Time Procedure's effect, but not of Sequential Elimination's, pointing to a distinct procedural mechanism underlying the latter, as established by Proposition 1.

Specifications additionally incorporating a triple interaction between response time, Sequential Elimination, and the high-IQ indicator reveal potential heterogeneity in the relationship between response time and economic rationality. Table 4 reports average marginal effects conditional on treatment and IQ groups, finding no strong evidence of such a relationship among low-IQ participants across either treatment.[15] This points to a saturation interpretation under which Sequential Elimination and the Minimum-Time Procedure already deliver considerable improvements through their respective mechanisms, leaving limited gains from additional deliberation. Drawing on response times under the Minimum-Time Procedure, we infer that meaningful improvements in the Direct Procedure require substantially longer deliberation for low-IQ participants. This may discourage additional time investment at the margin, consistent with their relatively low response time under the Direct Procedure.

Among high-IQ participants, a discernible association between response time and rationality emerges under Sequential Elimination, with statistically significant effects for HMI, FSD-consistency, and FSD-HMI. This heterogeneity appears to drive the overall association, suggesting that these participants are better able to utilize longer response times when supported by Sequential Elimination, despite already high baseline rationality.

We further decompose response time into two components to distinguish deliberation across stages of the choice process: *time to last click* is defined as the interval until the last click on any option, and *time after last click* as the interval from that point until final submission. We find that time to last click closely tracks total response time under the Direct Procedure and Sequential Elimination (see Appendix Table D.9 for means and Appendix Table D.10 for regression results). Under the Minimum-Time Procedure, time to last click accounts for only about 40% of total response time, with the remainder likely reflecting passive waiting. Nevertheless, mean response time exceeds the imposed minimum by a non-negligible extent, suggesting some deliberation during this interval.

To understand their roles, we estimate regressions using these components in place of total response time. The results are qualitatively similar, including treatment effects

[15] If anything, there is isolated evidence of a significantly positive association between response time and FSD-consistency under the Minimum-Time Procedure among low-IQ participants, though this does not extend to other measures.

TABLE 4. Average marginal effects of response time on economic rationality by treatment and IQ group.

				FSD-compliant		
	Consistency (1)	HMI (2)	GARP violations (3)	Consistency (4)	HMI (5)	GARP violations (6)
Direct Procedure & Low-IQ	0.001	-0.005	-0.221	0.001	-0.027	-0.679
	(0.005)	(0.009)	(0.135)	(0.004)	(0.017)	(0.558)
Direct Procedure & High-IQ	0.003	-0.007	-0.050	0.003	0.000	0.232
	(0.005)	(0.009)	(0.130)	(0.005)	(0.014)	(0.359)
Sequential Elimination & Low-IQ	-0.002	-0.005	-0.221	0.001	-0.015	-0.585
	(0.003)	(0.007)	(0.113)	(0.003)	(0.012)	(0.358)
Sequential Elimination & High-IQ	0.006	-0.016	-0.178	0.008	-0.031	-0.322
	(0.004)	(0.007)	(0.113)	(0.003)	(0.011)	(0.245)
Minimum-Time Procedure & Low-IQ	0.004	-0.004	-0.004	0.011	-0.049	-0.183
	(0.007)	(0.016)	(0.128)	(0.004)	(0.054)	(0.819)
Minimum-Time Procedure & High-IQ	-0.006	0.002	-0.101	-0.007	-0.009	-0.124
	(0.004)	(0.006)	(0.183)	(0.006)	(0.014)	(0.328)

Note: This table reports the average marginal effects of response time on economic rationality, conditional on IQ group and treatment, based on specifications including a triple interaction. Response time is averaged across decision problems at the individual level. Columns 1 and 4 present average marginal effects from logistic regressions, while the remaining columns present those from negative binomial regressions. All specifications include controls for inattention (ASRS), selective attention, working memory, attitude toward inconsistency, age, gender, education, and a constant. Robust standard errors are reported in parentheses.

(Appendix Table D.11). Both components are negatively and significantly associated with FSD-HMI, while associations with other measures vary in significance but remain directionally consistent with improved outcomes (e.g., FSD-consistency is significantly associated with time after the last click, but not time to the last click). One interpretation is that the extended time after the last click reflects continued deliberation prior to submission, potentially capturing the costly contemplation that helps resolve residual preference uncertainty (Ergin and Sarver, 2010), thereby facilitating consistency across decision problems.

Complementing the main results, these findings suggest that longer response time alone is not sufficient to improve decision-making. Rather, effective deliberation can be facilitated by external interventions, either an adequately long time constraint or a streamlined structure such as sequential elimination, with the latter potentially synergistic with higher cognitive ability. More generally, the relationship between response time and economic rationality depends on the choice procedure, highlighting the endogeneity of response time in decision-making.

5.2 Elimination behavior

Central to Hypothesis 1 is that options are eliminated according to preferences. A natural concern is that participants may determine their choices at the outset and subsequently eliminate options perfunctorily to comply with the procedure. In that case, the effect of sequential elimination would not be attributable to the mitigation of cognitive constraints. To scrutinize such possibilities, we analyze behavioral patterns within elimination sequences. Throughout, we focus on final elimination sequences to capture participants' most deliberate decisions and enable comparability with examination sequences under the Direct Procedure.

We classify options into three main categories based on their intrinsic features: FSD-dominated, boundary, and middle options. By definition, FSD-dominated options are inferior. Boundary and middle options may be viewed as heuristic alternatives: the former offer the highest expected value but entail greater risk, while the latter provide minimal uncertainty but moderate expected values.[16]

Figure 2 plots the share of each type across the Sequential Elimination rounds, revealing systematic patterns. FSD-dominated and boundary options are predominantly eliminated in early rounds, whereas middle options persist longer. For example, among low-IQ participants (left panel), the first elimination concentrates on FSD-dominated (43.1%) and boundary options (50.0%). These shares drop sharply in subsequent rounds. Conversely, the elimination of middle options begins low (3.6%) and increases steadily, ultimately accounting for a considerable portion (36.5%) of final choices. This trajectory is similar for high-IQ participants (middle panel) and the overall sample (right panel).

To validate these patterns, we compare the positions of each option type in decision sequences across treatments.[17] As a benchmark, the Direct Procedure shows no systematic differences, with all types centering around the midpoint (i.e., position 6; Appendix Table D.12, Columns 1–3). Under Sequential Elimination, mean positions of FSD-

[16] FSD-dominated and boundary options are not mutually exclusive; by construction, one of the boundary options is also FSD-dominated by the other.

[17] More precisely, the position refers to the order in which an option is eliminated (Sequential Elimination) or examined (Direct Procedure), with lower values indicating earlier behavior. Because choice sets contain multiple FSD-dominated and boundary options, we calculate the mean sequence position for these types per participant-decision observation. The middle option is unique per choice set, so its position is taken directly.

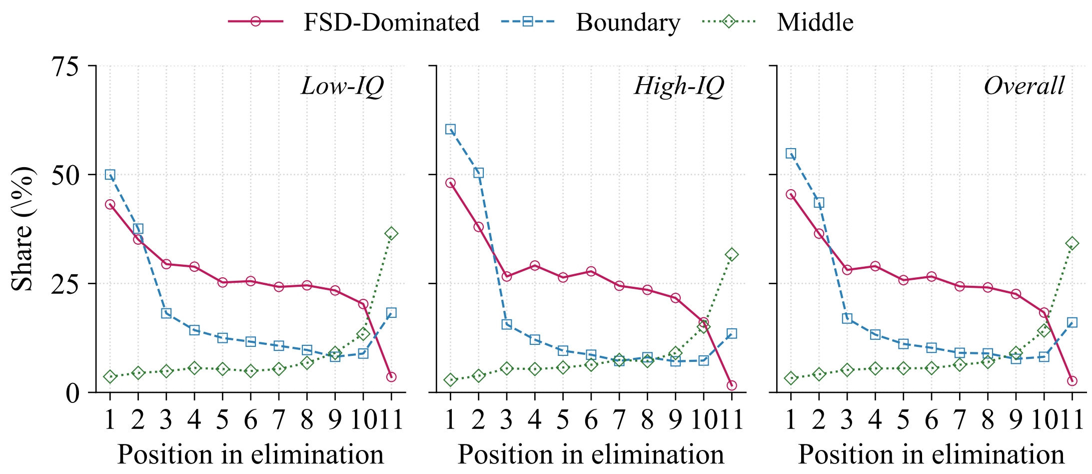

FIGURE 2. Elimination behavior across positions under Sequential Elimination. Each panel reports the share of FSD-dominated, boundary, and middle options at each position in the final elimination sequences, for low-IQ participants (left panel), high-IQ participants (middle panel), and the overall sample (right panel). The final position (11) corresponds to the chosen option.

dominated and boundary options are below the midpoint (4.807 and 4.129), while those of middle options are above (8.103), in line with the trajectories in Figure 2. These means remain stable across IQ groups. These treatment differences are confirmed by the regression results in Table 5 (Columns 1–3), which also show a significant negative interaction (0.288, se = 0.122) between Sequential Elimination and high-IQ for FSD-dominated options. In other words, high-IQ participants exhibit a stronger tendency to identify and discard objectively inferior options, consistent with their greater rationality.

We also consider potential contextual influences, in particular the default order of presentation. Expressing decision sequences in terms of the default index of each option, we compute the Spearman correlation between decision sequences and the corresponding default order for each decision problem.[18] On average, this correlation is high under the Direct Procedure (0.730) but, reassuringly, close to zero under Sequential Elimination (0.085). These differences, which exhibit identical patterns across IQ groups (Appendix Table D.12, Column 4) and are further confirmed by regression analysis in Table 5

[18]For example, a sequence [3, 1, 2, . . .] indicates that the participant first eliminates or examines the third option as displayed on the interface, followed by the first, and so on. The correlation is computed for each problem between this sequence and the default order [1,2,3,. . . ,11].

TABLE 5. Treatment differences in elimination and examination sequences under Sequential Elimination and the Direct Procedure.

	Mean position in decision sequence			Spearman correlation
	FSD-dominated	Boundary	Middle	
	(1)	(2)	(3)	(4)
Sequential Elimination	-1.167	-1.727	2.295	-0.599
	(0.086)	(0.206)	(0.222)	(0.051)
High-IQ	0.055	-0.055	0.111	0.076
	(0.076)	(0.116)	(0.138)	(0.065)
Sequential Elimination × high-IQ	-0.288	-0.572	-0.175	-0.098
	(0.122)	(0.296)	(0.306)	(0.075)
Controls	Yes	Yes	Yes	Yes
Decision problem fixed effects	Yes	Yes	Yes	Yes
Observations	9912	9912	9912	9912

Note: This table reports the linear regression results on the treatment differences in elimination and examination sequences under Sequential Elimination and the Direct Procedure. Columns 1–3 present estimates with the mean sequence position of FSD-dominated, boundary, and middle options as the dependent variable, respectively. Column 4 presents estimates with the Spearman correlation between decision sequences and the default presentation order as the dependent variable. Observations are at the participant–decision level. Controls include inattention (ASRS), selective attention, working memory, attitude toward inconsistency, age, gender, education, and decision order. All specifications include a constant. Standard errors clustered at the individual level are reported in parentheses.

(Column 4), provide strong evidence that elimination sequences are immune to default order. Overall, the findings indicate that elimination behavior is driven by deliberation and preferences, consistent with our framework.

5.3 Final choice patterns

Having established the deliberateness of eliminations, we examine whether this is reflected in final choices. Table 6 presents regression results on treatment differences in final choice patterns (see also Appendix Table D.13 for descriptive statistics). Column 1 shows that Sequential Elimination yields a marginally significant reduction in the probability of choosing FSD-dominated options, while the effect is stronger and statistically significant for the Minimum-Time Procedure. No such effects are detected for boundary or middle options (Columns 2 and 3), suggesting that the reduction is not offset by an increased propensity toward heuristic alternatives. High-IQ participants exhibit a significantly lower propensity to choose FSD-dominated options, consistent with their stronger tendency to eliminate such options early. The table also shows no significant treatment effect on the default-order position of chosen options (Column 4), i.e., no systematic tendency to select earlier (or later) options across treatments.[19]

In addition, we assess whether the treatment effects also operate by curbing stochastic choice, a channel consistent with deliberate, preference-based elimination. To this end, we exploit a structural feature of the design that permits inference despite the absence of repeated decisions. Specifically, eleven pairs of decision problems are symmetrically equivalent, containing options with reversed dimensions, referred to as “mirrored” option pairs (e.g., [168, 0] and [0, 168] in problems 1 and 10). Choosing mirrored options in concert within such pairs provides an indirect proxy for deterministic choice, although a failure to do so does not necessarily violate GARP.

Among low-IQ participants, this probability increases from 44.0% under the Direct Procedure to 51.7% under Sequential Elimination, while it is 50.5% and 48.4%, respectively, among high-IQ participants (Appendix Table D.13). Column 5 of Table 6 presents regression results on the treatment differences. Most notably, Sequential Elimination is associated with a marginally significant increase in this probability among low-IQ participants, whereas the Minimum-Time Procedure shows a negligible impact. The interaction term between Sequential Elimination and high-IQ is negative and marginally significant, suggesting attenuation of this effect among high-IQ participants. While tentative, the evidence is compatible with a parallel channel whereby Sequential Elimination reduces choice randomness, complementing rather than contradicting our main results.

5.4 Descriptive and normative implications

Our findings speak to a fundamental question in economics regarding the reconciliation of choice inconsistencies with preference maximization. While prior work has primarily examined how choice procedures *describe* these inconsistencies, we adopt a

[19] The default-order position of final choices averages close to 6 across treatments (Appendix Table D.13). This pattern is inconsistent with a limited-search satisficing account of deviations from rationality under the Direct Procedure, which would predict a stronger tendency to select options appearing earlier in the default order relative to Sequential Elimination.

TABLE 6. Effects of choice procedures on final choice patterns.

	FSD-dominated	Boundary	Middle	Default-order position	Mirrored choice
	(1)	(2)	(3)	(4)	(5)
Sequential Elimination	-0.476	0.488	-0.011	-0.017	0.315
	(0.255)	(0.310)	(0.198)	(0.015)	(0.161)
Minimum-Time Procedure	-0.880	-0.019	-0.247	-0.017	0.022
	(0.278)	(0.307)	(0.202)	(0.016)	(0.152)
High-IQ	-1.059	0.033	0.047	-0.029	0.250
	(0.364)	(0.330)	(0.198)	(0.018)	(0.155)
Sequential Elimination × High-IQ	0.285	-0.391	-0.213	0.031	-0.372
	(0.478)	(0.458)	(0.279)	(0.024)	(0.220)
Minimum-Time Procedure × High-IQ	0.723	0.526	-0.187	0.025	-0.021
	(0.457)	(0.439)	(0.287)	(0.024)	(0.217)
Controls	Yes	Yes	Yes	Yes	Yes
Decision problem fixed effects	Yes	Yes	Yes	Yes	Yes
Log α				-1.923	
				(0.025)	
Observations	14784	14784	14784	14784	6776

Note: This table reports the regression results on the effects of Sequential Elimination and the Minimum-Time Procedure on final choice patterns, relative to the Direct Procedure. Columns 1–3 and 5 present logit coefficients, with binary indicators for the corresponding choice features as dependent variables. Column 4 presents negative binomial estimates, with the default-order position of the chosen option as the dependent variable. Column 5 is estimated on the subsample of eleven symmetrically equivalent pairs of decision problems, in which each option has a mirrored counterpart with reversed dimensions. Observations are at the participant–decision level. Controls include inattention (ASRS), selective attention, working memory, attitude toward inconsistency, age, gender, education, and decision order. All specifications include a constant. Standard errors clustered at the individual level are reported in parentheses.

complementary perspective by studying how procedures can *shape* economic rationality. In doing so, we show that choice inconsistencies and the procedures proposed to characterize them need not be viewed as entrenched features of individual behavior.

We supplement the experimental results with preliminary pilot evidence, including a treatment in which participants choose between Sequential Elimination and the Direct Procedure after a trial of each. A large majority of low-IQ participants (82.1%) opt for Sequential Elimination, compared to 47.2% of high-IQ participants, a gap summarized by a significant negative correlation between IQ and preference for Sequential Elimination (Appendix Table D.14). This raises the possibility that participants perceive and respond to differential gains across procedures. Furthermore, participants who choose either procedure reveal levels of economic rationality that do not differ significantly from those of participants randomly assigned to that procedure (Appendix Table D.15). Although correlational, this evidence is consistent with the implication that the effectiveness of choice procedures is tied to their intrinsic structure rather than the manner of their implementation (Remark 1 and Proposition 1).

We thus argue that the normative appeal of choice procedures may reinforce their descriptive roles. The pilot provides suggestive evidence of such an alignment between preferences for Sequential Elimination and improvements in economic rationality.[20] In this light, choice procedures may organically improve decision-making and welfare among individuals facing cognitive constraints. Given the limited design of the pilot, these insights should be interpreted with caution, but they point to the importance of understanding the determinants of procedure choice, in particular individuals' awareness of their cognitive constraints and the extent to which they internalize the costs and benefits of alternative procedures.

6 Related Literature

This paper builds upon the growing literature on limited attention (or limited consideration) models, where DMs are typically assumed to choose directly from their consideration sets (e.g., Masatlioglu, Nakajima, and Ozbay, 2012; Dean, Özgür Kıbrıs, and Masatlioglu, 2017; Lleras et al., 2017). For instance, Eliaz and Spiegler (2011) examine the role of consideration sets in market competition. Models by Manzini and Mariotti (2014), Caplin, Dean, and Leahy (2019), and Cattaneo et al. (2020) propose that consideration sets arise stochastically. More closely related to our work, Dardanoni et al. (2020) attribute variation in consideration set sizes to cognitive heterogeneity, identifying its distribution within a population of DMs. Leveraging these insights, we introduce the minimum attention property as an alternative formulation of limited attention, thereby motivating the hypothesis on how procedural design can mitigate its impacts.

This paper also relates to elimination-based choice models. Early work by Tversky (1972) and Gigerenzer and Todd (1999) proposes models of elimination behaviors based

[20]One possible interpretation of this pattern is that Sequential Elimination acts as a commitment device for effort. Shorter response times among low-IQ participants under the Direct Procedure may suggest a reduced willingness or ability to sustain deliberation, making a more structured procedure appealing. We view this interpretation as conjectural and a direction for future research.

on distinctive attributes or environmental cues. Masatlioglu and Nakajima (2007) provide a descriptive model where the DM, whose preferences may be incomplete, selects all the remaining alternatives after eliminating those dominated by others according to menu-dependent criteria. Unlike their model, our sequential elimination imposes menu-independent eliminations that continue until a single option remains. Alternative models characterize elimination behaviors through multiple acyclic relations (Manzini and Mariotti, 2007), a checklist of desirable properties (Mandler, Manzini, and Mariotti, 2012), or a specific order of binary comparisons (Apesteguia and Ballester, 2013). While these approaches relax the assumption of standard preferences to accommodate observed choice inconsistencies, our study maintains this assumption to pursue a normative aim of improving economic rationality by mitigating cognitive limitations.[21]

Additionally, this paper draws on experimental evidence in marketing and psychology. An earlier literature documents systematic differences between choice and rejection tasks, though largely confined to binary choice settings (e.g., Shafir, 1993; Dhar and Wertenbroch, 2000). In larger choice set settings, Yaniv and Schul (1997, 2000) show that elimination-based approaches lead individuals to consider more options than direct or inclusion-based ones. More recently, Sokolova and Krishna (2016) show that rejection tasks can induce more effortful and deliberative processing compared to inclusion tasks, while Chan and Wang (2018) find that rejecting from larger choice sets, relative to smaller ones, is associated with higher decision confidence and, in turn, satisfaction. Extending to decision-making under risk, our work complements this literature by demonstrating the normative role of sequential elimination in improving economic rationality.

In economics, Besedeš et al. (2015) find that a *sequential tournament* procedure—where subjects first select from smaller sets of four options across four rounds, followed by a final round with the previously chosen options—leads to more optimal choices (those with the highest reward probabilities) than when choosing directly from larger sets of sixteen options. Their finding can be reconciled within our framework under the stronger

[21]These alternative models are therefore unlikely to account for behavior under Sequential Elimination, given the evidence of rationality improvements. Likewise, if participants were following these models in the Direct Procedure, their behavior would reflect fundamentally non-standard preferences rather than cognitive limitations; consequently, Sequential Elimination would not be expected to yield the rationality improvements observed in our data.

assumption that the DM can simultaneously compare at least four options. Further, our theoretical argument for sequential elimination extends to a specific sequential tournament involving rounds of only binary choices. That said, this may require prior ordering or randomization, which could be more costly or introduce context effects. In contrast, sequential elimination offers a more parsimonious approach, granting individuals autonomy over the process.

A considerable body of research has explored the determinants of economic rationality, indicating the roles of age (Harbaugh, Krause, and Berry, 2001), market experience (List and Millimet, 2008), and cognitive ability (Burks et al., 2009). Large-scale population studies find that levels of rationality tend to be lower among socioeconomically disadvantaged or older households (Echenique, Lee, and Shum, 2011; Choi et al., 2014), while elite law students (Fisman et al., 2015) and retirement-age households (Dean and Martin, 2016) exhibit higher levels. Recent findings by Echenique, Imai, and Saito (2023) strengthen evidence of a positive association between rationality and cognitive ability, alongside negative associations with age and unemployment. Moreover, Cappelen et al. (2023) document a pronounced rationality gap between elite students from developed and developing economies.

Finally, our work contributes to a relatively underexplored area of research on improving economic rationality, despite its central importance. In this vein, Kim et al. (2018) provide causal evidence from a field experiment in Malawi, demonstrating the role of education in such improvements, partly by enhancing cognitive ability. Banks, Carvalho, and Perez-Arce (2019), however, find no significant impact of a policy change in compulsory schooling in England on rationality among the affected groups. Notably, Halevy and Mayraz (2024) observe a strong preference for rule-based over case-by-case investment decisions, particularly when simpler rules are involved. We complement these studies by exploiting how simple choice procedures can mitigate the impacts of cognitive limitations to facilitate choice consistency.

7 Concluding Remarks

This paper demonstrates that sequential elimination, an intuitive choice procedure grounded in economics and the cognitive sciences, can improve economic rationality. Guided by a tractable framework, we obtain causal evidence for a sequential elimination effect among participants with lower cognitive ability and those facing greater attentional constraints, in a randomized controlled experiment involving risky decision-making. The improvement is consistent with a mechanism that mitigates limited attention through deliberate, preference-based eliminations.

While imposing a minimum-time constraint also reduces choice mistakes, this approach requires precise calibration in practice, with parameters that are likely costly to obtain and may vary across settings and populations. Sequential elimination operates without such calibration, requiring in principle that the choice set be finite, a condition satisfied in most decisions. Moreover, attention assessments such as the ASRS enhance the procedure's practical appeal by facilitating low-cost identification of the target population. Complementing this, the minimum-attention property provides a self-assessment criterion for evaluating the procedure's suitability among individuals who struggle with binary comparisons. Together, these features underscore the potential of sequential elimination as a scalable intervention.

Given these advantages, sequential elimination is well suited for implementation in a wide range of high-stakes settings, such as financial or healthcare decision-making. Offering it as an optional decision aid arguably imposes minimal welfare costs, as the decision to adopt it ultimately lies with the individual. While the present design serves as a proof of concept, future iterations could be tailored to diverse cognitive profiles, for example by allowing individuals to switch to a direct choice once the number of remaining alternatives falls below a given threshold. Future research could explore such hybrid models to enhance procedural efficiency.

Beyond decision-making under risk, examining the robustness of sequential elimination across other domains—such as consumer goods, intertemporal choices, and altruistic choices—would be valuable. Field studies of sequential elimination also present a promising avenue. Looking ahead, these efforts may catalyze the development of new choice procedures that deliver substantive welfare gains across a broader population.

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Supplemental Appendix

A Theoretical details

A.1 Proof of Proposition 1

Let c be a choice function. Consider the following conditions:

[1] c satisfies GARP.

[2] There exists a preference relation $\succeq$ on X such that for all $A \in \mathcal{X}$, $c(A) \in \{x \in A \mid x \succeq y,\ \forall y \in A\}$.

[3] c is a choice by sequential elimination.

By Theorem 1 of Nishimura, Ok, and Quah (2017), [1] holds if and only if [2] holds. Therefore, we show that [3] holds if and only if [2] holds.

[3] implies [2]. Suppose that [3] is true. Let $\succeq$, γ, and e be the preference relation, consideration set mapping satisfying the minimum attention property, and elimination function that satisfy the conditions in Definition 3. Suppose, by contradiction, that there exists some A such that $c(A) = e_{|A|} \notin \{x \in A \mid x \succeq y,\ \forall y \in A\}$. Since $\succeq$ is complete and transitive, $\{x \in A \mid x \succeq y,\ \forall y \in A\} \neq \emptyset$. Then there must exist some $r \in \{1, ..., |A|-1\}$ such that $e_r(A) \in \{x \in A \mid x \succeq y,\ \forall y \in A\}$. Consequently, $\{x \in A_r \mid x \succeq e_r(A), x \neq e_r(A)\} = \emptyset$, which implies that $\{x \in \gamma(A_r) \mid x \succeq e_r(A), x \neq e_r(A)\} = \emptyset$, leading to a contradiction to Definition 3(ii). Therefore, we have that for all $A \in \mathcal{X}$, $c(A) \in \{x \in A \mid x \succeq y,\ \forall y \in A\}$.

[2] implies [3]. Suppose that [2] is true. Define $\gamma(A) = A$ for all $A \in \mathcal{X}$, which clearly satisfies the minimum attention property. Given c, construct an elimination function e such that for all $A \in \mathcal{X}$: if $|A| \geq 2$, then $e(A) = (e_1(A), ..., e_{|A|-1}(A), c(A))$ with $\bigcup_{r=1}^{|A|}\{A_r\} = A$; if $|A| = 1$, then $e_1(A) = c(A)$. For all A and $r = 1, ..., |A|$, we have $e_r(A) \in \gamma(A_r)$ (Definition 3 (i)); $\{x \in \gamma(A_r) \mid x \succeq e_r(A), x \neq e_r(A)\} \neq \emptyset$ if $|A_r| \geq 2$ (Definition 3 (ii)); and $e_{|A|}(A) = c(A)$ (Definition 3 (iii)). Thus, c is a choice by sequential elimination.

A.2 Consistency in compliance with FSD

Given that the choice options in our experiment involve only two states of equal probabilities, we focus on $X \in \mathbb{R}^2_+$ and let $\mathcal{X}$ be a nonempty set of nonempty subsets of X. For any two options $x, y \in X$ defined by $x = (x_1, x_2)$ and $y = (y_1, y_2)$, we denote $x \geq_F y$ if $(x_1, x_2) \geq (y_1, y_2)$ or $(x_2, x_1) \geq (y_1, y_2)$; and $x >_F y$ if $x \geq_F y$ but the two options are distinct.

A preference relation $\succeq$ is said to be *first-order stochastically monotone* if $x \geq_F y$ implies $x \succeq y$ and $x >_F y$ implies $x \succeq y$ but not $y \succeq x$. For any x, y, we write $xR^D_F y$ ($xR^S_F y$, respectively) if there exist some $A, B \in \mathcal{X}$ and $z \in A$ such that $c(A) = x$, $c(B) = y$, and $z \geq_F y$ ($z >_F y$, respectively). Let R_F denote the transitive closure of R^D_F. The FSD-GARP criterion is formally defined as follows.

Definition 4 (FSD-GARP)**.** A choice function c is said to satisfy FSD-GARP if, for any $x, y \in X$, $xR_F y$ implies that $yR^S_F x$ does not hold.

Any first-order stochastically monotone preference relation $\succeq$ on X and any choice function c on $\mathcal{X}$ fall within the primitives of Nishimura, Ok, and Quah (2017). By applying their Theorem 1, a choice function c satisfies FSD-GARP if and only if there exists a first-order stochastically monotone preference relation $\succeq$ on X such that for all $A \in \mathcal{X}$, $c(A) \in \{x \in A \mid x \succeq y, \ \forall y \in A\}$. Moreover, we say that an ordered pair (x, y) constitutes a violation of FSD-GARP if $xR_F y$ and $yR^S_F x$. By the same logic as in the proofs of Proposition 1, a choice function c satisfies FSD-GARP if and only if c is a choice by sequential elimination with a first-order stochastically monotone preference relation, or equivalently, c is consistent with maximizing such a preference relation.

B Experimental design details

B.1 Experimental Instructions

B.1.1 Introduction

Welcome to our study on decision-making.

The study consists of three parts. In Part 1, you will make a series of economic decisions. In Part 2, you will complete tasks measuring cognitive skills. In Part 3, you will respond to a short questionnaire about attention and everyday behaviour. Detailed instructions will be provided at the beginning of each part.

You will receive a £1 participation fee upon completing the study. Additionally, you may earn up to £14.60, depending partly on your decisions and partly on chance. You will be paid within five working days after completing the study.

During the study, we will use experimental tokens instead of pounds. The total number of tokens you earn will be converted into pounds at the following rate:

25 tokens = £1

Please read the instructions carefully. To ensure your understanding and the validity of the data collected, you will be asked comprehension questions at the start. You will have two chances to answer each question correctly. If you are unsuccessful on both attempts, you will not be able to proceed with the study.

During the study, you may also encounter questions or tasks designed to verify instruction-following and data quality. It is important that you respond to these carefully. If you fail multiple quality checks throughout the study, your submission will not be eligible for compensation.

Important: Once you have moved on to the next question, you **cannot** go back and change your choice. Do not close the web browser at any time!

B.1.2 Part 1

In this part of the study, you will make 25 economic decisions, all following the same format. In each decision problem, you will be asked to choose **one** option out of multiple options. An option [X, Y] indicates that you will receive either X tokens or Y tokens, with **equal** probability. For example, the option [24, 32] indicates that you will receive either 24 tokens or 32 tokens, each with a 50% probability.

You will earn real money based on your decisions. For each decision, carefully evaluate all available options and choose the one you prefer. There are no right or wrong answers. We are interested in studying your preferences.

At the end of the study, one of the 25 decisions will be randomly drawn by the computer, with each decision equally likely to be selected. You will earn tokens based on your choice in this drawn decision.

Please answer the following questions to confirm that you have understood the instructions.

1. For an option [X, Y], which one of the following statements is correct?

I will earn both X tokens and Y tokens at the same time; I will earn either X tokens or Y tokens with the same probability; I will be more likely to earn X tokens than to earn Y tokens.

2. Which one of the following statements is **not** correct?

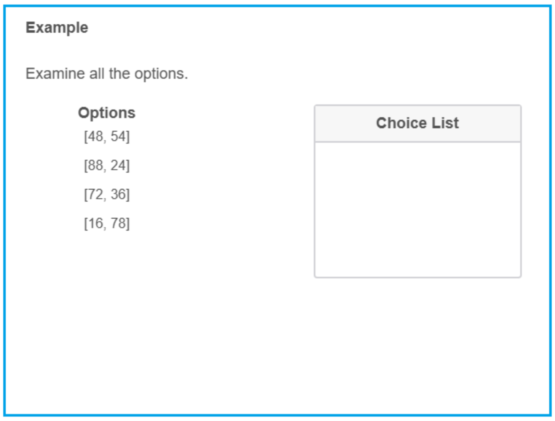
I will select the decision problem for payment myself; Only one decision problem will be drawn for payment; The decision problem for payment will be randomly drawn by the computer.

When you are ready, click on 'Next' to proceed.

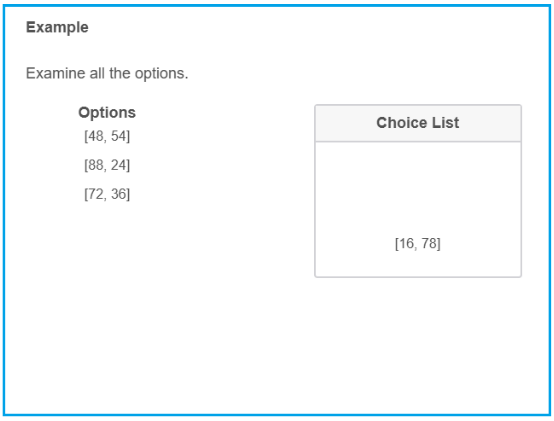
B.1.2.1 Direct Procedure

You will make decisions by a procedure called **sequential examination**. You will be asked to **examine** each option one by one by clicking on it. After examining all options, you will be asked to **choose** the single option that you **prefer** by clicking on it.

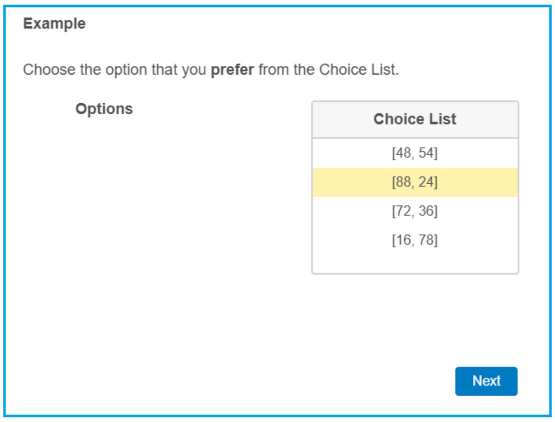
Below, you can see an example of a decision problem. A list of options appears on the left side of the screen. A **Choice List** on the right side of the screen displays the options you examined.



For example, in the screen below, to mark the option [16, 78] as examined, you click on it, which moves it to the Choice List.



Examine all available options. Once all are in the Choice List, choose your preferred option. Your choice will be highlighted in yellow. For example, in the screen below, suppose you chose [88, 24]. You can click on 'Next' to confirm this choice and proceed to the next problem.



Regarding payment, suppose you choose [88, 24]. If you are paid according to this choice, you will receive either 88 tokens or 24 tokens, each with a 50% probability.

To familiarise yourself with the procedure, you will first complete one practice problem. This will not affect your payment. After that, you will be asked to complete all the problems.

Please answer the following question to confirm your understanding of the instructions.

How is your choice determined in each decision problem?

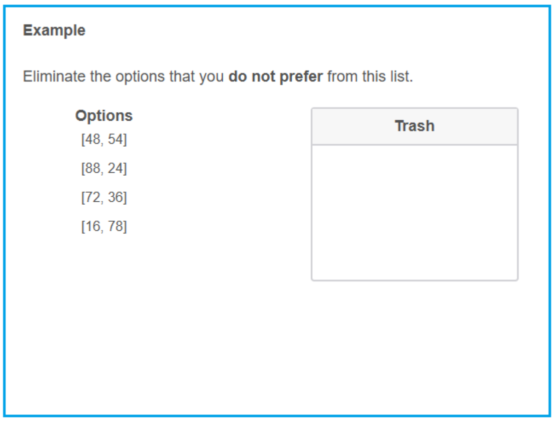
By the option that appears at the top of the Choice List; By the option that appears at the bottom of the Choice List; By clicking on my preferred option in the Choice List.

When you are ready, click on 'Next' to proceed.

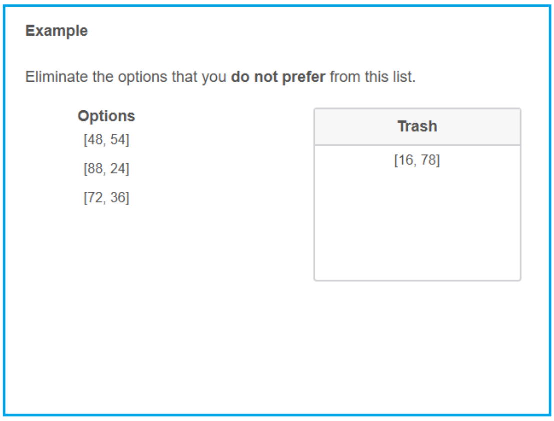
B.1.2.2 Sequential Elimination

You will make decisions by a procedure called **sequential elimination**. You will be asked to **eliminate** options one by one by clicking on those you **do not prefer**, until only one option remains. The **last remaining option** is your choice in the decision problem.

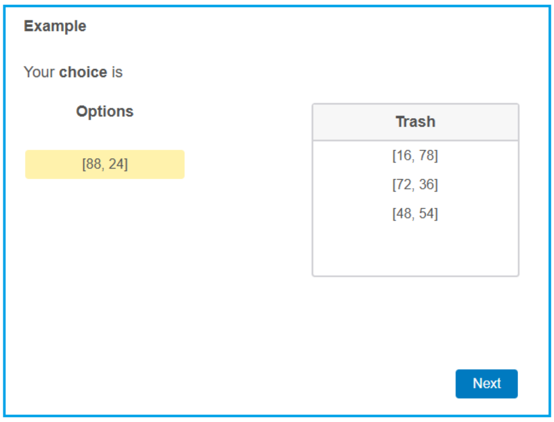
Below, you can see an example of a decision problem. A list of options appears on the left side of the screen. A **Trash** on the right side of the screen displays the options you eliminated.



For example, in the screen below, to eliminate the option [16, 78], you click on it, which moves it to the Trash. Note that you can recover options from the Trash by clicking on them. For instance, clicking on [16, 78] in the Trash will move it back to the Options list.



Eliminate options until only one option remains. Your choice will be highlighted in yellow. For example, in the screen below, suppose you eliminated [16, 78], [72, 36], and [48, 54]. As a result, the last remaining option, [88, 24], becomes your choice. You can click on 'Next' to confirm this choice and proceed to the next problem.



Regarding payment, suppose you choose [88, 24]. If you are paid according to this choice, you will receive either 88 tokens or 24 tokens, each with a 50% probability.

To familiarise yourself with the procedure, you will first complete one practice problem. This will not affect your payment. After that, you will be asked to complete all the problems.

Please answer the following question to confirm your understanding of the instructions.

How is your choice determined in each decision problem?

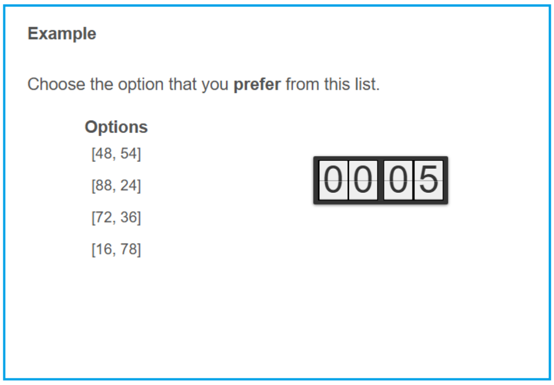
By clicking on my preferred option in the Trash; By clicking on my preferred option *in the Options list; By eliminating the options I do not prefer to the Trash, until only one remains in the Options list.*

When you are ready, click on 'Next' to proceed.

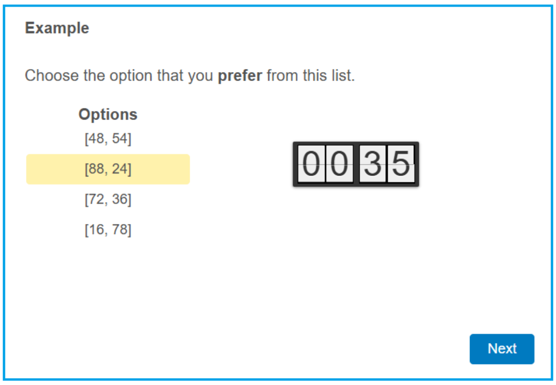
B.1.2.3 Minimum-Time Procedure

You will make decisions by a procedure where you must spend at least **35 seconds** on each decision problem. You will be asked to choose the single option that you prefer by clicking on it. The 'Next' button, which you use to submit your choice, will become available only after 35 seconds have elapsed since each problem appeared.

Below, you can see an example of a decision problem. A list of options appears on the left side of the screen. A **timer** on the right side of the screen displays the time elapsed since the problem appeared. In this example, only 5 seconds have elapsed, so 'Next' is not yet available.



Choose your preferred option from the list. Your choice will be highlighted in yellow. For example, in the screen below, suppose you chose [88, 24] and 35 seconds have elapsed. You can click on 'Next' to confirm this choice and proceed to the next problem.



Regarding payment, suppose you choose [88, 24]. If you are paid according to this choice, you will receive either 88 tokens or 24 tokens, each with a 50% probability.

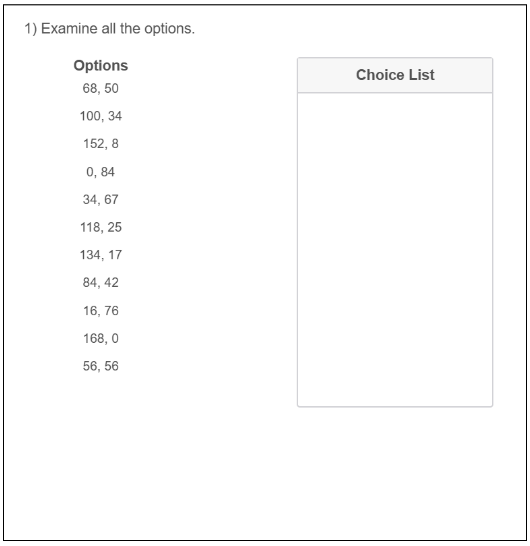
To familiarise yourself with the procedure, you will first complete one practice problem. This will not affect your payment. After that, you will be asked to complete all the problems.

Please answer the following question to confirm your understanding of the instructions.

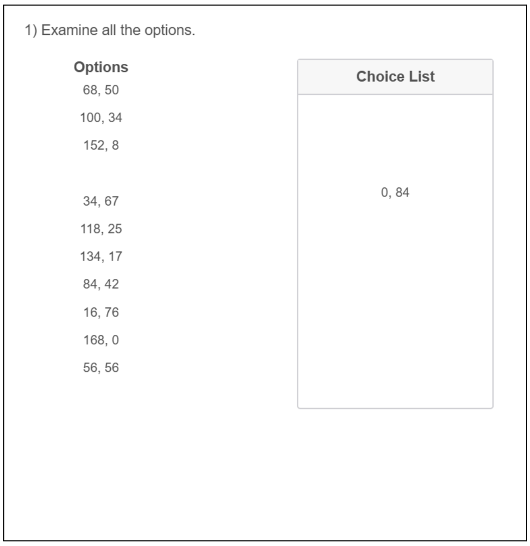
How are you allowed to submit your choice in each decision problem?

By submitting immediately after the problem appears; By waiting 5 seconds after the problem appears; By waiting 35 seconds after the problem appears.

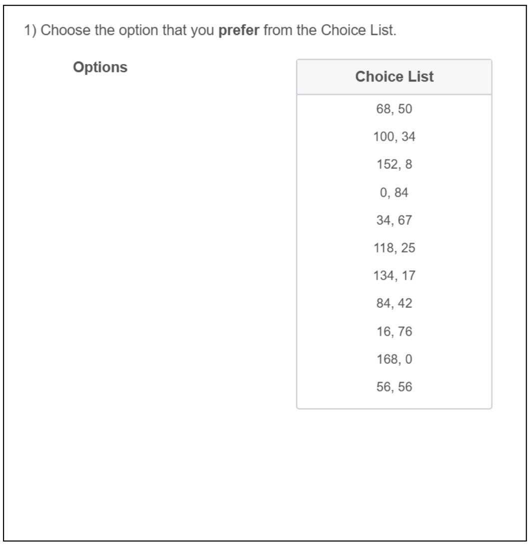
When you are ready, click on 'Next' to proceed.



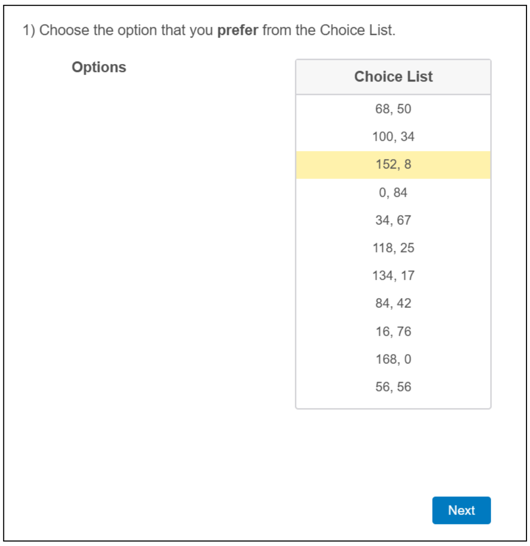
(a) Initial screen



(b) An option is examined

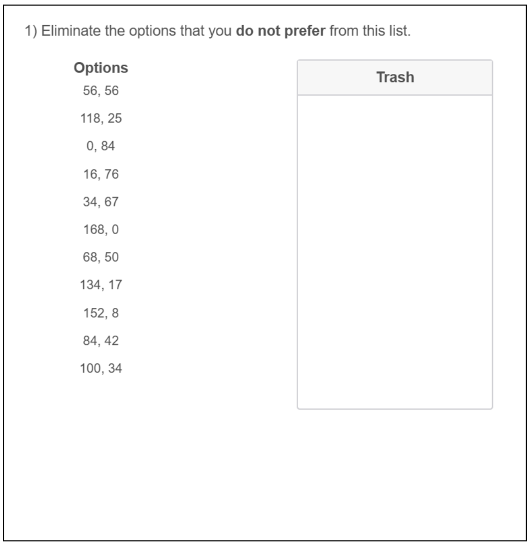


(c) All options are examined

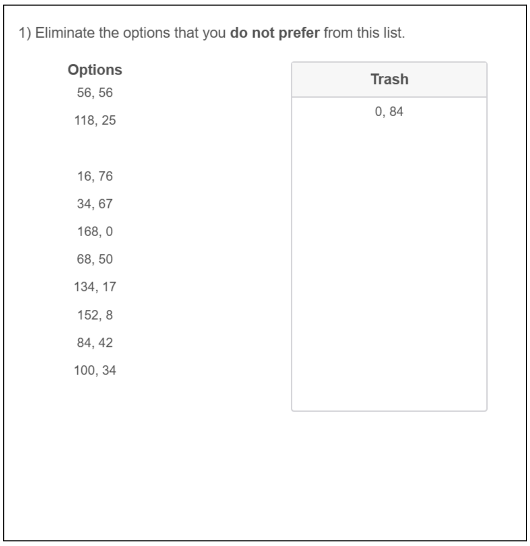


(d) A choice is made

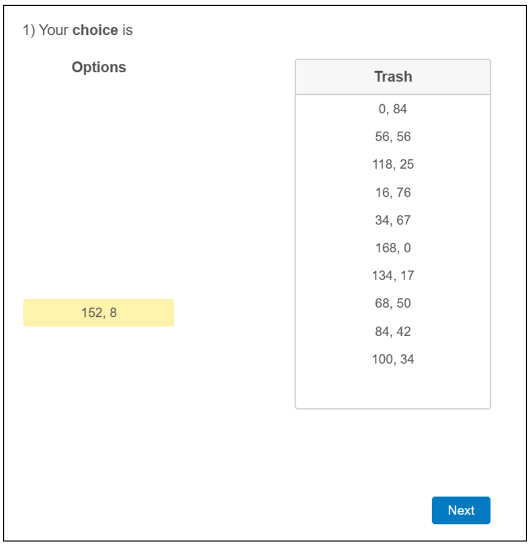
FIGURE B.1. Direct Procedure interface.



(a) Initial screen

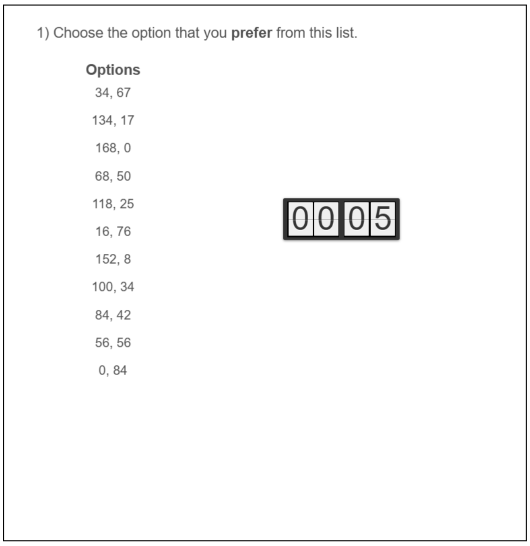


(b) An option is eliminated

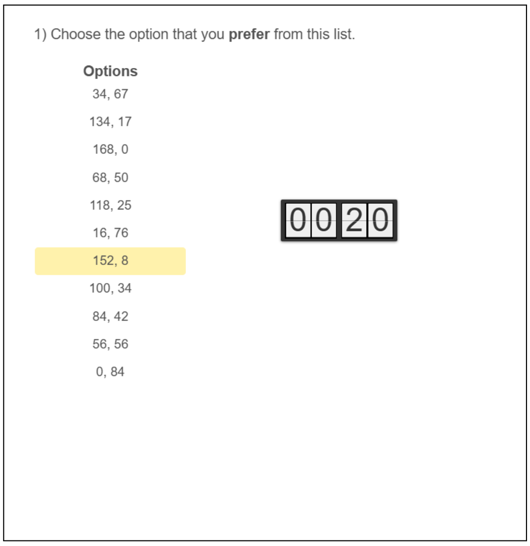


(c) A choice is made

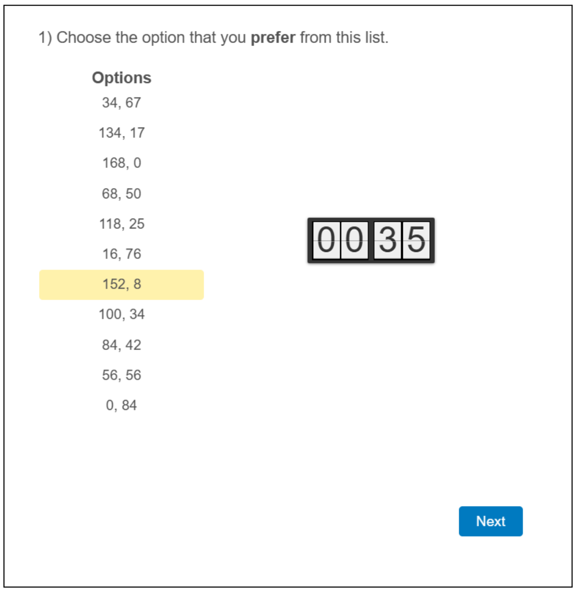
FIGURE B.2. Sequential Elimination interface.



(a) Initial screen



(b) A choice is made before 35 seconds



(c) A choice is made after 35 seconds

FIGURE B.3. Minimum-Time Procedure interface.

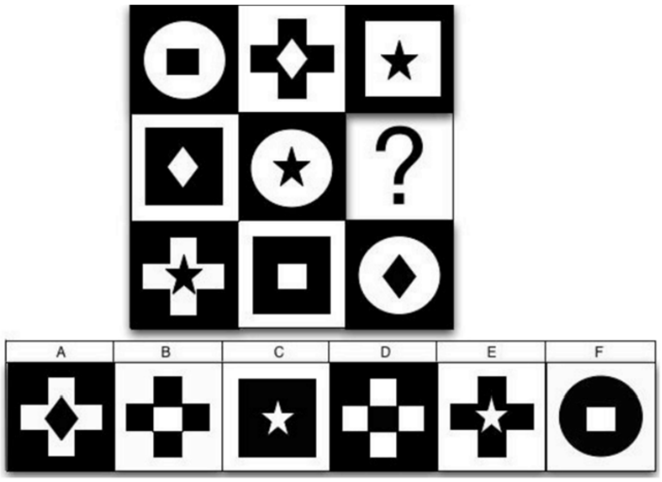
B.1.3 Part 2

This part consists of three tasks measuring cognitive skills. Your payment will depend on your performance in these tasks. Each task contains a different number of questions. At the end of the experiment, three questions will be randomly drawn from these tasks, each with an equal probability. You will earn 25 tokens for each correct answer among the drawn questions.

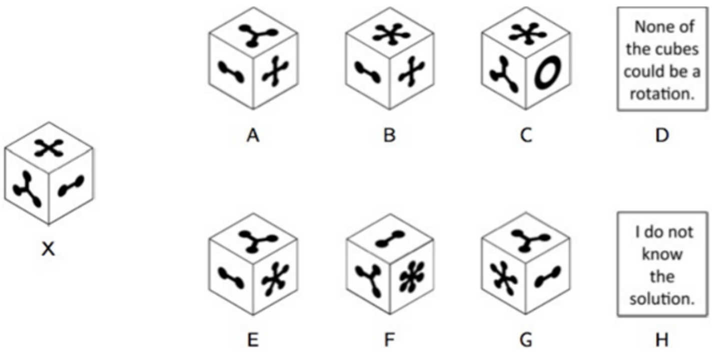
Task 1 (IQ). In this task, you are asked to answer 10 questions: five on matrix reasoning and five on three-dimensional rotation. Each question has one correct answer. You will have a maximum of 12 minutes to complete the task.

Task 2 (selective attention). This task measures your concentration. In each round, you are asked to identify the color of the word shown on the screen. The word itself is irrelevant—you can safely ignore it. To indicate the color of the word, please use the keys **r**, **g**, **b**, and **o** for red, green, blue, and orange, respectively. A plus sign will appear before each word; please keep your eyes on it. You will have only two seconds in each round. You will have two practice rounds, followed by 20 rounds to complete.

Task 3 (working memory). This task measures your working memory. In each round, you are asked to memorize a sequence of digits, ranging from four to eight digits. After the presentation, you are asked to indicate whether a certain digit was included in the sequence. Please press **y** if you think that the digit is in the sequence; otherwise, press **n**. If your answer is correct, a green circle will appear; otherwise, a red circle will appear. You are then asked to type in the entire sequence. You will have one practice round, followed by 10 rounds to complete.

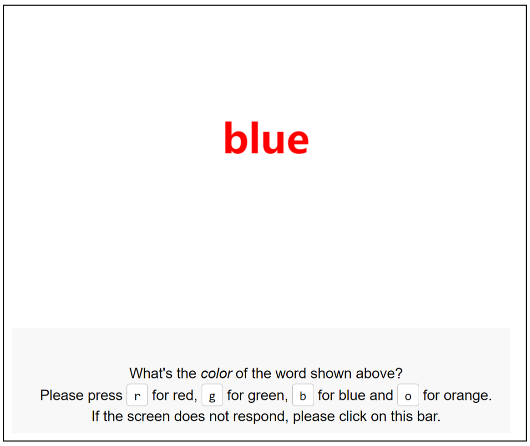


(a) Matrix reasoning problem

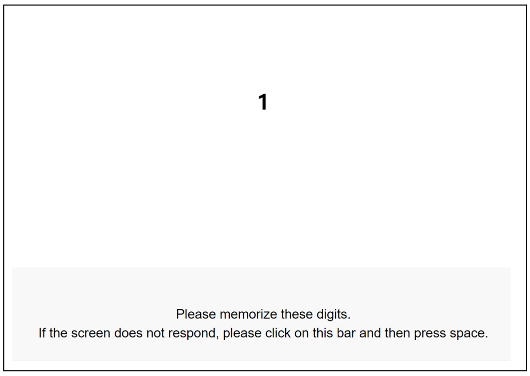


(b) Three-dimensional rotation problem

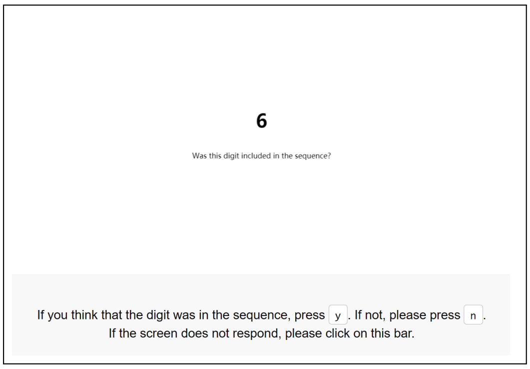
FIGURE B.4. Screenshots of Task 1.



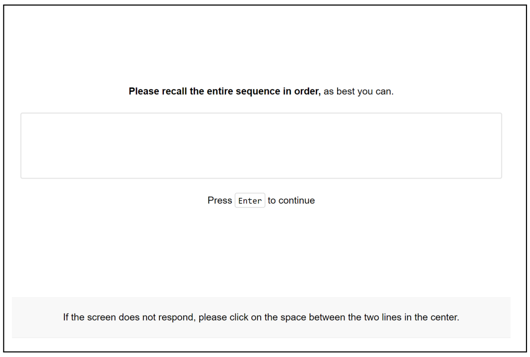
(a) Task 2



(b) Task 3 (memorization)



(c) Task 3 (recall 1)



(d) Task 3 (recall 2)

FIGURE B.5. Screenshots of Tasks 2 and 3.

B.1.4 Part 3

In this part, you will complete a self-report questionnaire consisting of three sets of questions about various scenarios. Please respond based on your own feelings in those situations. There are no right or wrong answers. We are interested in how you would feel.

Set A (attitude toward inconsistency). This question asks how you feel about a hypothetical choice scenario. Imagine that you are at a cinema and want to buy some popcorn. The cinema sells small tubs of popcorn for £3 and large ones for £7. In this scenario, you choose the small tub.

Now consider a different scenario. The cinema sells small tubs for £3, medium ones for £6.50 and large ones for £7. This time, you choose the large tub. In the first scenario, you prefer the small tub to the large one. In the second scenario, your choice suggests the opposite.

How at ease do you feel with your choices? Please rate this on the scale below. A rating of 0 means that you are not at all at ease with one or more of your choices and would very much like to make changes. A rating of 10 means that you are completely at ease and have no wish to change anything.

FIGURE B.6. Rating scale for attitudes toward inconsistency.

Set B (ASRS inattention subscale). This set of questions asks about your attention in everyday life. Please answer the questions below, rating yourself on each of the criteria shown. As you answer each question, select the response that best describes how you have felt and conducted yourself over the past 6 months.

TABLE B.1. ASRS inattention subscale.

No.	Item
1	How often do you make careless mistakes when you have to work on a boring or difficult project?
2	How often do you have difficulty keeping your attention when you are doing boring or repetitive work?
3	How often do you have difficulty concentrating on what people say to you, even when they are speaking to you directly?
4	How often do you have trouble wrapping up the final details of a project, once the challenging parts have been done?
5	How often do you have difficulty getting things in order when you have to do a task that requires organisation?
6	When you have a task that requires a lot of thought, how often do you avoid or delay getting started?
7	How often do you misplace or have difficulty finding things at home or at work?
8	How often are you distracted by activity or noise around you?
9	How often do you have problems remembering appointments or obligations?

Note: This table presents the 9-item inattention subscale from the ASRS version 1.1. Responses are recorded on a 5-point Likert scale: *never*, *rarely*, *sometimes*, *often*, and *very often*. Following the official guidelines, responses of *sometimes*, *often*, or *very often* are coded as one point for items 2, 3, 5, and 9. For the remaining items, only responses of *often* or *very often* are coded as one point.

Set C (ASRS hyperactivity–impulsivity subscale). This set of questions asks about your attention in everyday life. Please answer the questions below, rating yourself on each of the criteria shown. As you answer each question, select the response that best describes how you have felt and conducted yourself over the past 6 months.

TABLE B.2. ASRS hyperactivity-impulsivity subscale.

No.	Item
1	How often do you fidget or squirm with your hands or feet when you have to sit down for a long time?
2	How often do you leave your seat in meetings or other situations in which you are expected to remain seated?
3	How often do you feel restless or fidgety?
4	How often do you have difficulty unwinding and relaxing when you have time to yourself?
5	How often do you feel overly active and compelled to do things, like you were driven by a motor?
6	Please choose Very Often.
7	How often do you find yourself talking too much when you are in social situations?
8	When you're in a conversation, how often do you find yourself finishing the sentences of the people you are talking to, before they can finish them themselves?
9	How often do you have difficulty waiting your turn in situations when turn taking is required?
10	How often do you interrupt others when they are busy?

Note: This table presents the 9-item hyperactivity–impulsivity subscale from the ASRS version 1.1, with an additional instruction-following check (item 6). Responses are recorded on a 5-point Likert scale: *never*, *rarely*, *sometimes*, *often*, and *very often*. Following the official guidelines, responses of *sometimes*, *often*, or *very often* are coded as one point for items 2, 8, and 10. For the remaining items, only responses of *often* or *very often* are coded as one point.

Demographics.

What is your age?

[Text-entry box]

What is your gender identity?

Male; Female; Other.

What is the highest level of education you have completed?

No formal qualifications; Secondary education (e.g., GED/GCSE); High school diploma/A-levels; Technical/community college; Undergraduate degree (BA/BSc/other); Graduate degree (MA/MSc/MPhil/other); Doctorate degree (PhD/other).

If you are currently studying, what level is it?

I am not currently studying; Secondary education (e.g., GED/GCSE); High school diploma/A-levels; Technical/community college; Undergraduate degree (BA/BSc/other); Graduate degree (MA/MSc/MPhil/other); Doctorate degree (PhD/other).

B.2 Decision problems

TABLE B.3. List of options in decision problems.

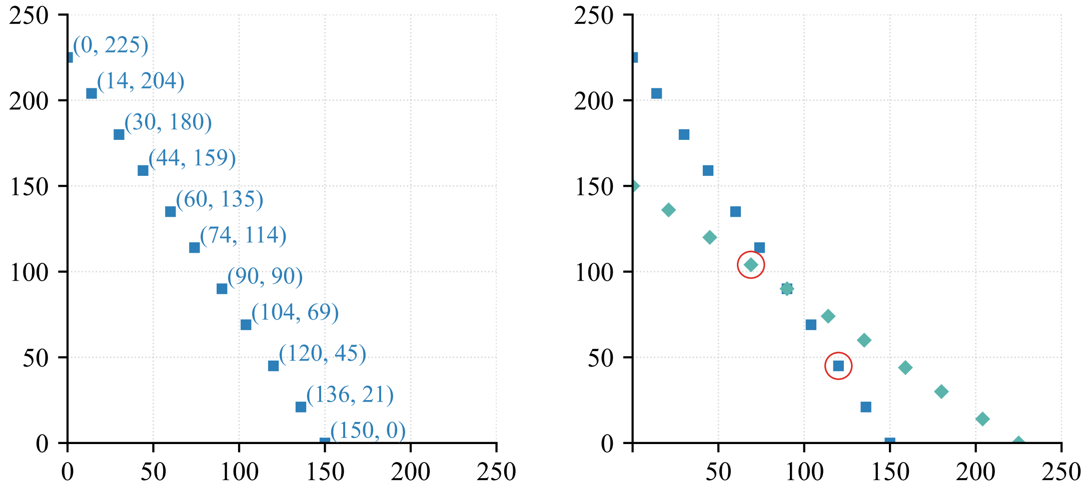
No.	Problem
1	[0, 84], [16, 76], [34, 67], [56, 56], [68, 50], [84, 42], [100, 34], [118, 25], [134, 17], [152, 8], [168, 0]
2	[0, 54], [20, 49], [44, 43], [68, 37], [88, 32], [108, 27], [132, 21], [152, 16], [172, 11], [196, 5], [216, 0]
3	[0, 225], [14, 204], [30, 180], [44, 159], [60, 135], [74, 114], [90, 90], [104, 69], [120, 45], [136, 21], [150, 0]
4	[0, 97], [18, 88], [36, 79], [50, 72], [64, 65], [92, 51], [112, 41], [134, 30], [154, 20], [176, 9], [194, 0]
5	[0, 108], [15, 96], [30, 84], [45, 72], [60, 60], [70, 52], [80, 44], [95, 32], [105, 24], [120, 12], [135, 0]
6	[0, 270], [6, 243], [12, 216], [18, 189], [24, 162], [30, 135], [36, 108], [42, 81], [48, 54], [54, 27], [60, 0]
7	[0, 150], [21, 136], [45, 120], [69, 104], [90, 90], [114, 74], [135, 60], [159, 44], [180, 30], [204, 14], [225, 0]
8	[0, 165], [17, 148], [33, 132], [50, 115], [66, 99], [83, 82], [100, 65], [116, 49], [133, 32], [149, 16], [165, 0]
9	[0, 102], [25, 92], [50, 82], [70, 74], [105, 60], [130, 50], [150, 42], [175, 32], [205, 20], [230, 10], [255, 0]
10	[0, 168], [8, 152], [17, 134], [25, 118], [34, 100], [42, 84], [50, 68], [56, 56], [67, 34], [76, 16], [84, 0]
11	[0, 216], [5, 196], [11, 172], [16, 152], [21, 132], [27, 108], [32, 88], [37, 68], [43, 44], [49, 20], [54, 0]
12	[0, 255], [10, 230], [20, 205], [32, 175], [42, 150], [50, 130], [60, 105], [74, 70], [82, 50], [92, 25], [102, 0]
13	[0, 90], [33, 79], [66, 68], [90, 60], [111, 53], [135, 45], [162, 36], [189, 27], [216, 18], [243, 9], [270, 0]

Note: Each option, denoted as $[x, y]$, yields either x or y tokens with equal probability.

TABLE B.3. List of options in decision problems (continued).

No.	Problem
14	[0, 270], [9, 243], [18, 216], [27, 189], [36, 162], [45, 135], [53, 111], [60, 90], [68, 66], [79, 33], [90, 0]
15	[0, 60], [27, 54], [54, 48], [81, 42], [108, 36], [135, 30], [162, 24], [189, 18], [216, 12], [243, 6], [270, 0]
16	[0, 194], [9, 176], [20, 154], [30, 134], [41, 112], [51, 92], [65, 64], [72, 50], [79, 36], [88, 18], [97, 0]
17	[0, 135], [12, 120], [24, 105], [32, 95], [44, 80], [52, 70], [60, 60], [72, 45], [84, 30], [96, 15], [108, 0]
18	[0, 58], [25, 53], [45, 49], [80, 42], [115, 35], [145, 29], [175, 23], [205, 17], [230, 12], [260, 6], [290, 0]
19	[0, 290], [6, 260], [12, 230], [17, 205], [23, 175], [29, 145], [35, 115], [42, 80], [49, 45], [53, 25], [58, 0]
20	[0, 195], [20, 175], [39, 156], [59, 136], [78, 117], [96, 99], [118, 77], [137, 58], [157, 38], [176, 19], [195, 0]
21	[0, 105], [14, 95], [28, 85], [42, 75], [56, 65], [77, 50], [91, 40], [105, 30], [119, 20], [133, 10], [147, 0]
22	[0, 120], [13, 110], [26, 100], [52, 80], [65, 70], [78, 60], [91, 50], [104, 40], [130, 20], [143, 10], [156, 0]
23	[0, 147], [10, 133], [20, 119], [30, 105], [40, 91], [50, 77], [65, 56], [75, 42], [85, 28], [95, 14], [105, 0]
24	[0, 156], [10, 143], [20, 130], [40, 104], [50, 91], [60, 78], [70, 65], [80, 52], [100, 26], [110, 13], [120, 0]
25	[0, 0], [11, 11], [22, 22], [33, 33], [44, 44], [55, 55], [66, 66], [77, 77], [88, 88], [99, 99], [111, 111]

Note: Each option, denoted as $[x, y]$, yields either x or y tokens with equal probability.



(a) Decision problem

(b) GARP violation

FIGURE B.7. Graphical illustrations of a decision problem and a GARP violation. In panel (a), the squares represent a menu of options in a two-dimensional space, randomly ordered during the experiment. In panel (b), the squares and diamonds depict the two distinct menus, with the circles indicating a pair of choices that violate consistency with preference maximization, or equivalently, a GARP violation.

C Sample details

TABLE C.1. Sample descriptive statistics.

Variable	Direct Procedure	Sequential Elimination	Minimum-Time Procedure	Overall Mean	Overall p-value
Age	45.080	42.378	44.463	43.995	0.103
	(0.912)	(0.880)	(0.942)	(0.528)	
Female	0.533	0.552	0.483	0.523	0.352
	(0.034)	(0.035)	(0.035)	(0.020)	
Education	2.797	2.726	2.872	2.799	0.349
	(0.079)	(0.075)	(0.085)	(0.046)	
IQ	4.462	4.547	4.522	4.510	0.870
	(0.146)	(0.146)	(0.156)	(0.086)	
Selective attention	17.175	17.876	17.581	17.537	0.096
	(0.232)	(0.219)	(0.230)	(0.132)	
Working memory	6.425	6.537	6.345	6.435	0.769
	(0.171)	(0.156)	(0.169)	(0.095)	
Inattention (ASRS)	2.448	2.756	2.754	2.649	0.190
	(0.173)	(0.177)	(0.167)	(0.099)	
Hyperactivity-impulsivity (ASRS)	1.929	2.035	1.941	1.968	0.316
	(0.149)	(0.139)	(0.155)	(0.085)	
Attitude toward inconsistency	5.651	6.050	5.877	5.856	0.468
	(0.208)	(0.194)	(0.205)	(0.117)	
Observations	212	201	203	616	

Note: This table reports treatment-specific means of key variables and the corresponding overall mean. The last column presents p-values from Kruskal–Wallis tests of equality across procedures. The variable *education* is coded numerically based on the highest level of education attained: 0 = "no formal qualifications", 1 = "high school diploma/A-levels/secondary education", 2 = "technical/community college", 3 = "undergraduate degree", 4 = "graduate degree", 5 = "doctorate degree". Selective attention is measured using a Stroop task; working memory using a Sternberg task; and inattention using the ASRS subscale. Standard errors are reported in parentheses.

TABLE C.2. Breakdown of observations by IQ and attention groups.

	Direct Procedure	Sequential Elimination	Minimum-Time Procedure	Overall
Panel A: Overall by IQ				
Low-IQ	118 (55.7%)	107 (53.2%)	107 (52.7%)	332 (53.9%)
High-IQ	94 (44.3%)	94 (46.8%)	96 (47.3%)	284 (46.1%)
Total	212 (100%)	201 (100%)	203 (100%)	616 (100%)
Panel B: Overall by attention				
Low-attention	108 (50.9%)	117 (58.2%)	127 (62.6%)	352 (57.1%)
High-attention	104 (49.1%)	84 (41.8%)	76 (37.4%)	264 (42.9%)
Panel C: Low-attention participants by IQ				
Low-IQ	60 (55.6%)	62 (53.0%)	67 (52.8%)	189 (53.7%)
High-IQ	48 (44.4%)	55 (47.0%)	60 (47.2%)	163 (46.3%)
Total	108 (100%)	117 (100%)	127 (100%)	352 (100%)
Panel D: High-attention participants by IQ				
Low-IQ	58 (55.8%)	45 (53.6%)	40 (52.6%)	143 (54.2%)
High-IQ	46 (44.2%)	39 (46.4%)	36 (47.4%)	121 (45.8%)
Total	104 (100%)	84 (100%)	76 (100%)	264 (100%)

The table reports counts by IQ and attention groups for each treatment, with percentages in parentheses. Panels A and B show the overall breakdown by IQ and by attention, respectively. Panel C reports counts and percentages for low-attention participants, while Panel D reports for high-attention participants. Percentages are calculated within each panel (i.e., within the relevant attention group or overall IQ).

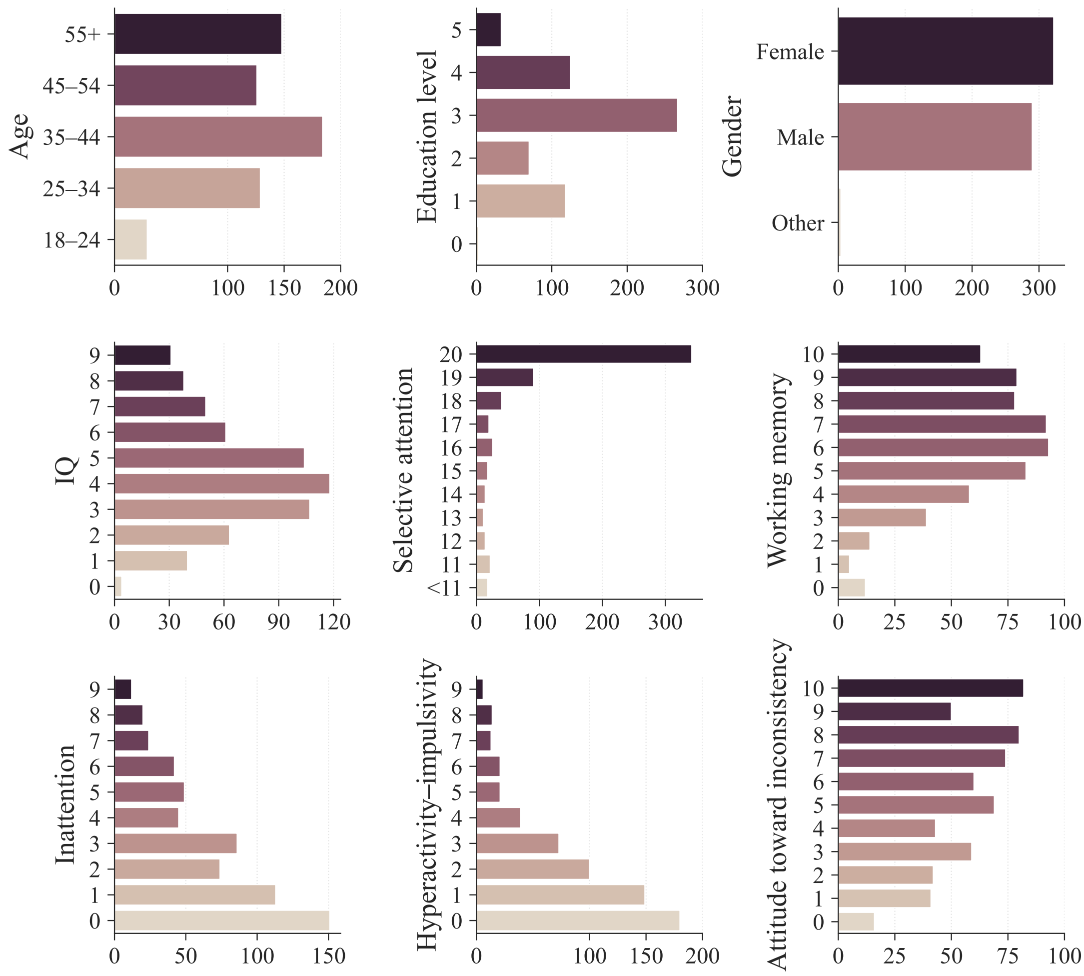


FIGURE C.1. Histograms of individual characteristics. The variable *education* is coded numerically based on the highest level of education attained: 0 = "no formal qualifications", 1 = "high school diploma/A-levels/secondary education", 2 = "technical/community college", 3 = "undergraduate degree", 4 = "graduate degree", 5 = "doctorate degree".

D Supplementary experimental results

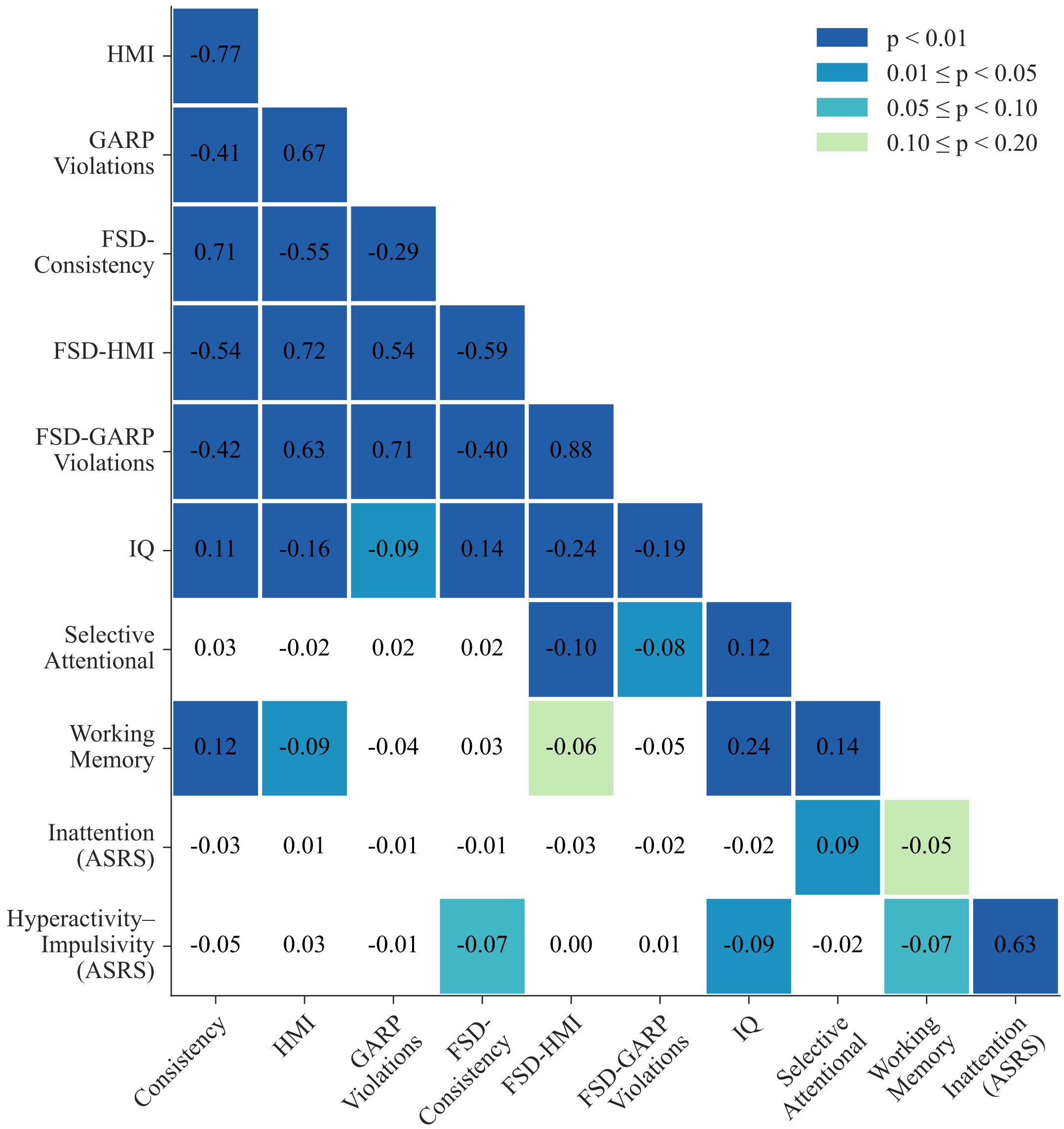


FIGURE D.1. Heatmap of correlations among economic rationality and cognitive measures. Pearson correlation coefficients are displayed in the lower triangular part of the matrix. Cells are color-coded based on p-values, with darker colors indicating higher levels of statistical significance and white representing non-significant correlations.

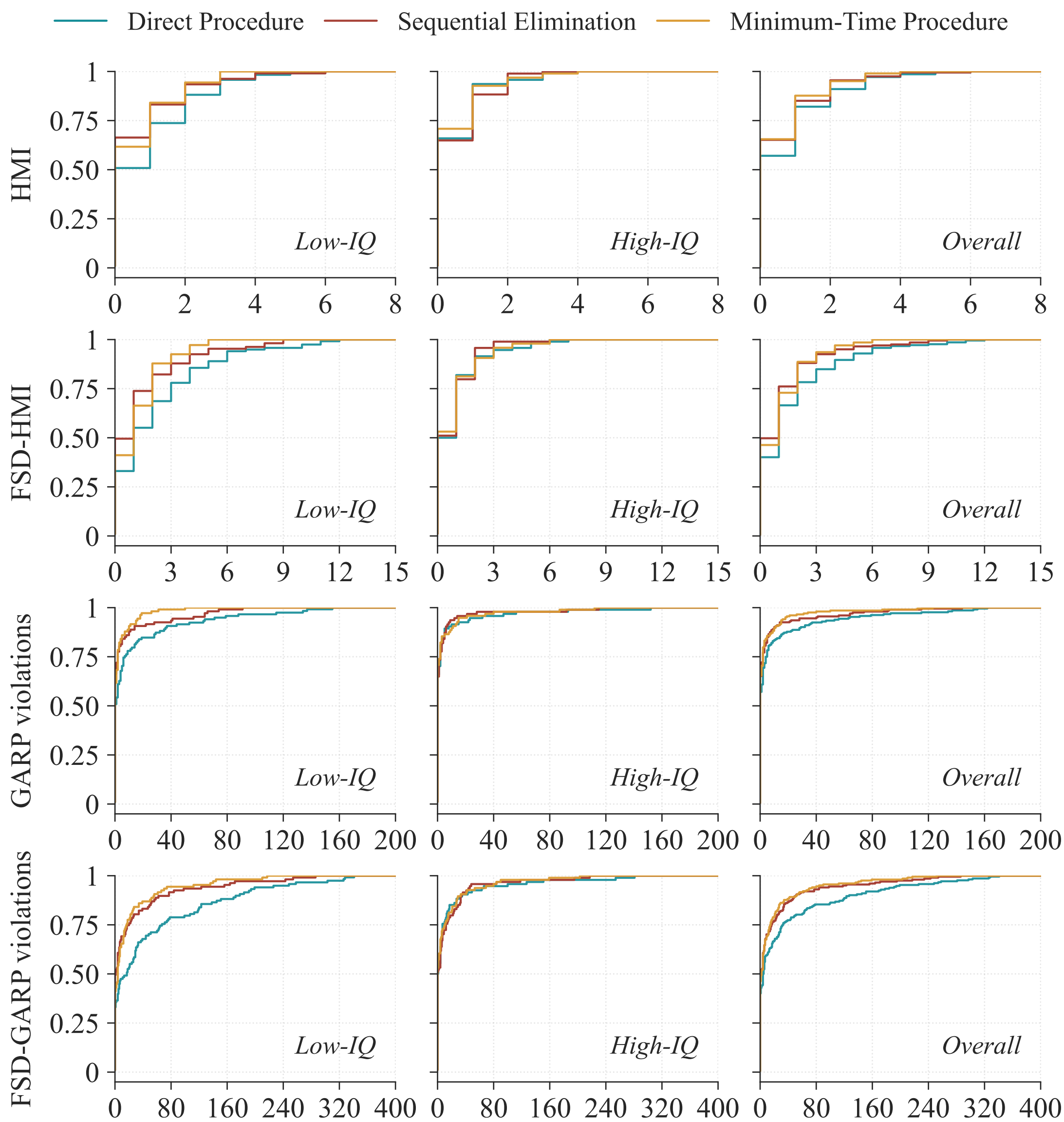


FIGURE D.2. Empirical cumulative distributions of rationality measures across treatments and IQ groups.

TABLE D.1. Pairwise treatment comparisons by IQ group across rationality measures.

Measure	SE vs. DP	MTP vs. DP	SE vs. MTP
Panel A: Low-IQ participants			
Consistency	0.154 (0.020)	0.047 (0.479)	0.107 (0.106)
HMI	-0.308 (0.021)	0.056 (0.642)	-0.364 (0.052)
GARP violations	-6.447 (0.011)	3.421 (0.731)	-9.867 (0.014)
FSD-consistency	0.164 (0.012)	0.084 (0.216)	0.080 (0.213)
FSD-HMI	-0.853 (0.003)	0.140 (0.377)	-0.993 (0.016)
FSD-GARP violations	-27.566 (0.001)	5.234 (0.523)	-32.800 (0.003)
Panel B: High-IQ participants			
Consistency	-0.011 (0.879)	-0.060 (0.383)	0.049 (0.472)
HMI	0.021 (0.743)	0.073 (0.356)	-0.052 (0.534)
GARP violations	-1.638 (0.950)	-0.342 (0.528)	-1.296 (0.544)
FSD-consistency	0.011 (0.884)	-0.021 (0.774)	0.031 (0.664)
FSD-HMI	-0.106 (0.915)	-0.023 (0.873)	-0.083 (0.764)
FSD-GARP violations	-2.681 (0.848)	1.167 (0.599)	-3.848 (0.722)
Panel C: Overall			
Consistency	0.081 (0.093)	-0.003 (0.942)	0.084 (0.079)
HMI	-0.166 (0.095)	0.065 (0.818)	-0.232 (0.053)
GARP violations	-4.363 (0.044)	1.652 (0.885)	-6.015 (0.026)
FSD-consistency	0.096 (0.049)	0.034 (0.489)	0.062 (0.202)
FSD-HMI	-0.535 (0.012)	0.066 (0.523)	-0.600 (0.048)
FSD-GARP violations	-16.800 (0.012)	3.369 (0.870)	-20.168 (0.015)

Note: The table presents the differences in means for pairwise treatment comparisons across rationality measures among low-IQ, high-IQ, and overall participants. The corresponding p-values are reported in parentheses below each difference. SE = Sequential Elimination, DP = Direct Procedure, MTP = Minimum-Time Procedure. Binary measures use chi-square tests; count measures use Mann–Whitney *U* tests.

TABLE D.2. Comparison of economic rationality between high-IQ and low-IQ participants within treatments.

	Direct Procedure		Sequential Elimination		Minimum-Time Procedure	
	Mean diff.	*p*-value	Mean diff.	*p*-value	Mean diff.	*p*-value
Consistency	0.149	0.030	-0.016	0.814	0.090	0.177
HMI	-0.500	0.005	-0.170	0.883	-0.188	0.123
GARP violations	-6.815	0.007	-2.006	0.951	1.757	0.276
FSD-consistency	0.167	0.013	0.014	0.843	0.119	0.089
FSD-HMI	-1.267	<0.001	-0.520	0.377	-0.357	0.040
FSD-GARP violations	-35.914	<0.001	-11.029	0.540	-6.963	0.070
Observations (low/high)	118/94		107/94		107/96	

Note: This table reports differences in economic rationality between high-IQ and low-IQ participants within each treatment. Mean differences are computed as high-IQ minus low-IQ group means, so that negative values indicate higher rationality among low-IQ participants. p-values are from chi-square tests for consistency and FSD-consistency, and from Mann–Whitney U tests for all other measures. Observations report the number of low-IQ and high-IQ participants in each treatment.

TABLE D.3. Regression results on the effects of choice procedures on economic rationality with treatment-by-high-IQ interactions.

				FSD-compliant		
	Consistency (1)	HMI (2)	GARP violations (3)	Consistency (4)	HMI (5)	GARP violations (6)
Sequential Elimination	0.605	-0.351	-0.689	0.696	-0.466	-0.759
	(0.278)	(0.213)	(0.354)	(0.279)	(0.187)	(0.271)
Minimum-Time Procedure	0.459	-0.440	-1.285	0.345	-0.566	-0.904
	(0.277)	(0.187)	(0.371)	(0.282)	(0.167)	(0.280)
High-IQ	0.428	-0.571	-0.676	0.639	-0.771	-1.071
	(0.293)	(0.221)	(0.422)	(0.287)	(0.198)	(0.320)
Sequential Elimination × high-IQ	-0.514	0.298	0.405	-0.568	0.318	0.622
	(0.416)	(0.328)	(0.645)	(0.405)	(0.292)	(0.467)
Minimum-Time Procedure × high-IQ	-0.218	0.332	1.232	-0.210	0.495	0.746
	(0.418)	(0.325)	(0.602)	(0.405)	(0.278)	(0.475)
Selective attention	0.010	-0.007	0.008	0.014	-0.038	-0.037
	(0.028)	(0.020)	(0.035)	(0.026)	(0.018)	(0.024)
Working memory	0.090	-0.043	-0.079	-0.001	-0.009	-0.035
	(0.038)	(0.027)	(0.051)	(0.036)	(0.023)	(0.037)
Inattention (ASRS)	-0.023	0.003	0.026	-0.006	-0.009	0.004
	(0.035)	(0.024)	(0.048)	(0.035)	(0.023)	(0.036)
Attitude toward inconsistency	-0.030	0.007	-0.035	-0.021	0.018	0.012
	(0.030)	(0.022)	(0.039)	(0.029)	(0.020)	(0.033)
Age	0.010	-0.008	-0.017	0.012	-0.009	-0.008
	(0.007)	(0.006)	(0.010)	(0.007)	(0.004)	(0.007)
Female	-0.120	0.142	0.159	-0.087	-0.005	0.148
	(0.172)	(0.132)	(0.248)	(0.166)	(0.115)	(0.189)
Education	0.113	-0.108	-0.159	0.061	-0.040	-0.030
	(0.075)	(0.056)	(0.108)	(0.074)	(0.049)	(0.082)
Constant	-1.125	0.868	4.206	-1.485	1.909	5.151
	(0.754)	(0.513)	(0.972)	(0.719)	(0.457)	(0.709)
Log α		0.003	2.145		0.056	1.748
		(0.187)	(0.077)		(0.119)	(0.067)
Log-likelihood	-397.347	-665.999	-1244.996	-414.590	-946.968	-2022.552
Observations	616	616	616	616	616	616

Note: This table reports the regression coefficients for the effects of Sequential Elimination and the Minimum-Time Procedure on economic rationality relative to the Direct Procedure, estimated from models with treatment–High-IQ interactions. Columns 1 and 4 present coefficients from logistic regressions, while the remaining columns present those from negative binomial regressions. Robust standard errors are reported in parentheses.

TABLE D.4. Regression results on the effect of choice procedures on economic rationality with treatment-by-IQ interactions.

				FSD-compliant		
	Consistency (1)	HMI (2)	GARP violations (3)	Consistency (4)	HMI (5)	GARP violations (6)
Sequential Elimination	0.030	-0.098	-0.216	0.663	-0.352	-0.772
	(0.484)	(0.343)	(0.645)	(0.496)	(0.296)	(0.434)
Minimum-Time Procedure	0.526	-0.760	-2.661	0.568	-0.977	-1.927
	(0.474)	(0.343)	(0.619)	(0.481)	(0.298)	(0.465)
IQ	0.064	-0.129	-0.286	0.167	-0.209	-0.337
	(0.068)	(0.053)	(0.104)	(0.070)	(0.045)	(0.059)
Sequential Elimination × IQ	0.080	-0.037	-0.073	-0.050	-0.004	0.063
	(0.101)	(0.074)	(0.141)	(0.099)	(0.062)	(0.087)
Minimum-Time Procedure × IQ	-0.035	0.104	0.437	-0.068	0.144	0.317
	(0.097)	(0.075)	(0.137)	(0.095)	(0.065)	(0.100)
Inattention (ASRS)	-0.024	-0.001	0.008	-0.006	-0.016	-0.001
	(0.035)	(0.025)	(0.047)	(0.035)	(0.023)	(0.036)
Selective attention	0.007	-0.006	-0.015	0.010	-0.030	-0.024
	(0.028)	(0.020)	(0.035)	(0.027)	(0.017)	(0.021)
Working memory	0.091	-0.044	-0.073	-0.006	-0.006	-0.027
	(0.038)	(0.027)	(0.050)	(0.036)	(0.022)	(0.035)
Attitude toward inconsistency	-0.027	0.005	-0.034	-0.019	0.015	0.026
	(0.030)	(0.022)	(0.038)	(0.029)	(0.019)	(0.031)
Age	0.011	-0.009	-0.017	0.013	-0.010	-0.008
	(0.007)	(0.005)	(0.010)	(0.007)	(0.004)	(0.007)
Female	-0.143	0.148	0.022	-0.094	-0.000	0.097
	(0.172)	(0.131)	(0.244)	(0.167)	(0.113)	(0.181)
Education	0.107	-0.091	-0.071	0.042	-0.024	-0.015
	(0.075)	(0.057)	(0.111)	(0.075)	(0.048)	(0.079)
Constant	-1.217	1.203	5.363	-1.828	2.353	5.761
	(0.798)	(0.538)	(1.039)	(0.771)	(0.476)	(0.679)
Log α		-0.026	2.113		-0.017	1.723
		(0.188)	(0.078)		(0.122)	(0.067)
Log-Likelihood	-396.372	-663.528	-1239.567	-412.834	-937.810	-2016.481
Observations	616	616	616	616	616	616

Note: This table reports the regression coefficients for the effects of Sequential Elimination and the Minimum-Time Procedure on economic rationality relative to the Direct Procedure, estimated from models with treatment–High-IQ interactions. Columns 1 and 4 present coefficients from logistic regressions, while the remaining columns present those from negative binomial regressions. Robust standard errors are reported in parentheses.

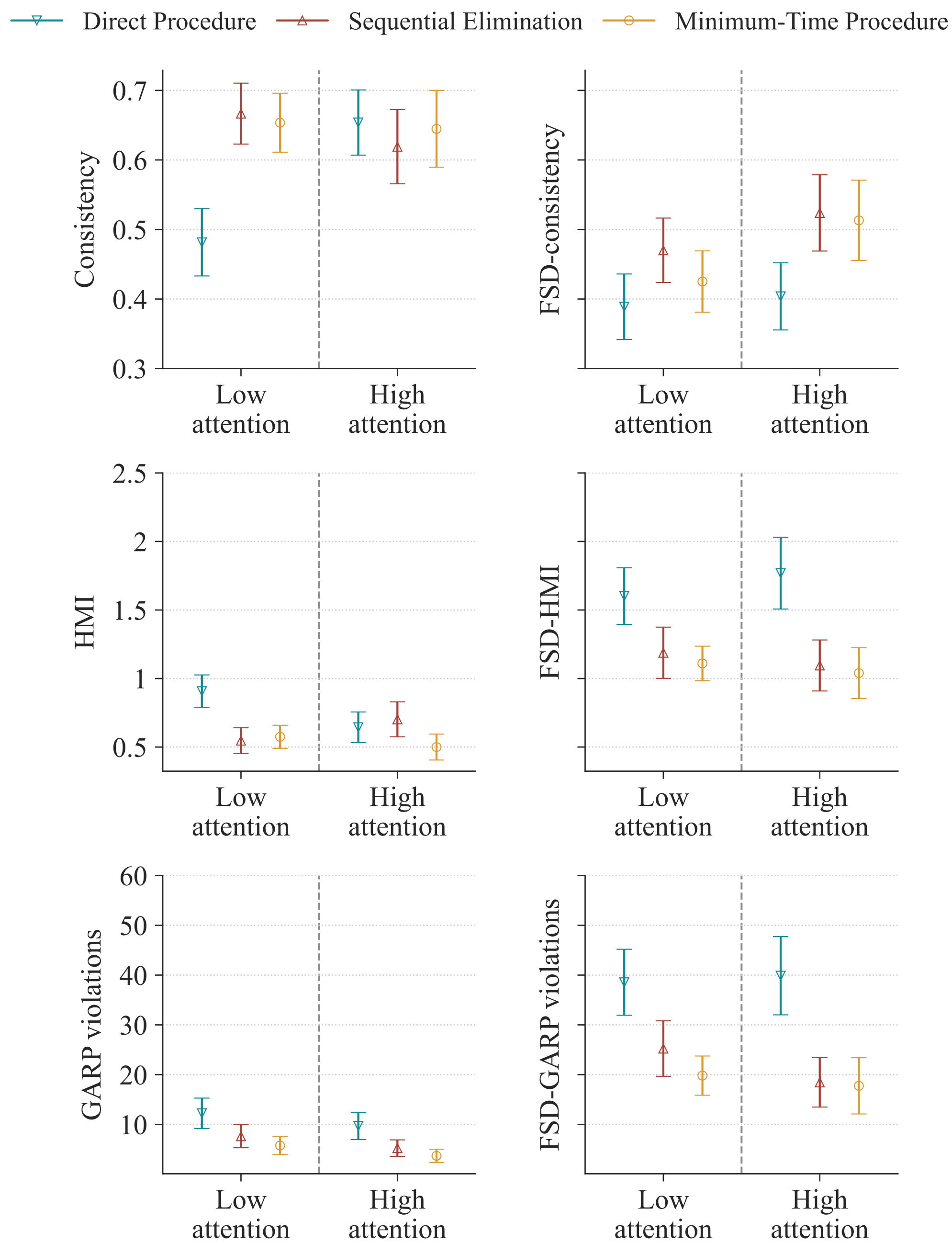


FIGURE D.3. Economic rationality across treatments. Mean values of rationality measures for low-IQ, high-IQ, and overall participants in each treatment group are shown, with error bars representing standard errors.

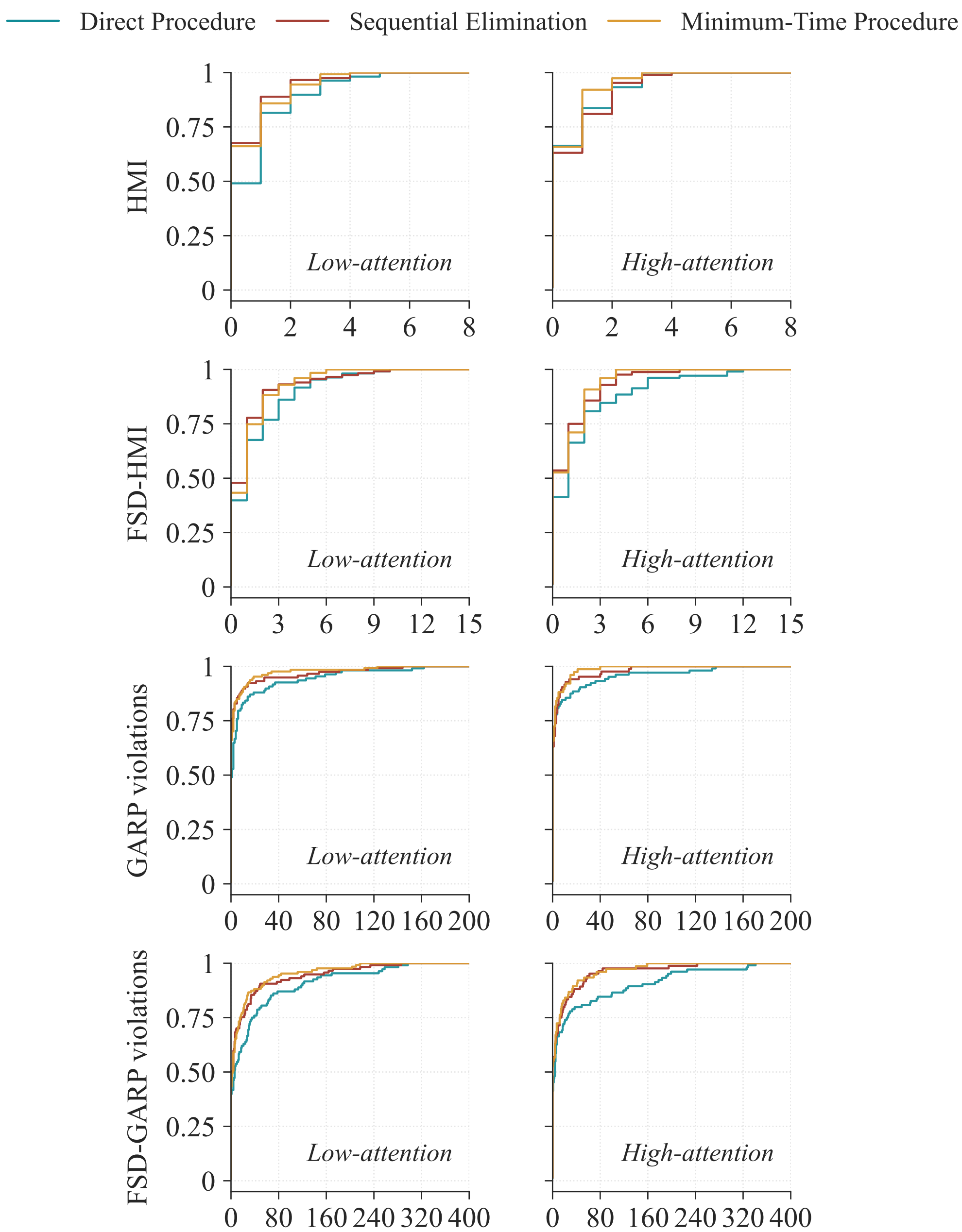


FIGURE D.4. Empirical cumulative distributions of rationality measures across treatments and IQ groups.

TABLE D.5. Pairwise treatment comparisons by attention group across rationality measures.

Measure	SE vs. DP	MTP vs. DP	SE vs. MTP
Panel A: Low-attention participants			
Consistency	0.185 (0.005)	0.013 (0.829)	0.172 (0.008)
HMI	-0.360 (0.005)	-0.028 (0.736)	-0.333 (0.013)
GARP violations	-4.608 (0.003)	1.877 (0.810)	-6.485 (0.005)
FSD-consistency	0.081 (0.219)	0.045 (0.481)	0.036 (0.573)
FSD-HMI	-0.414 (0.074)	0.078 (0.498)	-0.492 (0.206)
FSD-GARP violations	-13.316 (0.047)	5.436 (0.854)	-18.752 (0.043)
Panel B: High-attention participants			
Consistency	-0.035 (0.622)	-0.026 (0.737)	-0.009 (0.899)
HMI	0.058 (0.638)	0.202 (0.445)	-0.144 (0.782)
GARP violations	-4.464 (0.882)	1.554 (0.616)	-6.018 (0.729)
FSD-consistency	0.120 (0.101)	0.011 (0.893)	0.109 (0.145)
FSD-HMI	-0.674 (0.078)	0.056 (0.935)	-0.730 (0.110)
FSD-GARP violations	-21.423 (0.101)	0.702 (0.940)	-22.125 (0.094)

Note: The table presents the differences in means for pairwise treatment comparisons across rationality measures among low-attention and high-attention participants. The corresponding p-values are reported in parentheses below each difference. SE = Sequential Elimination, DP = Direct Procedure, MTP = Minimum-Time Procedure. Binary measures use chi-square tests; count measures use Mann–Whitney U tests.

TABLE D.6. Regression results on the effects of choice procedures on economic rationality with treatment-by-high-attention interactions.

				FSD-compliant		
	Consistency	HMI	GARP violations	Consistency	HMI	GARP violations
	(1)	(2)	(3)	(4)	(5)	(6)
Sequential Elimination	0.839	-0.576	-0.532	0.385	-0.376	-0.535
	(0.279)	(0.204)	(0.410)	(0.275)	(0.181)	(0.272)
Minimum-Time Procedure	0.713	-0.417	-0.555	0.117	-0.293	-0.397
	(0.280)	(0.200)	(0.423)	(0.273)	(0.179)	(0.312)
High-attention	0.708	-0.357	-0.279	0.034	0.043	-0.083
	(0.289)	(0.208)	(0.375)	(0.281)	(0.177)	(0.265)
Sequential Elimination × high-attention	-1.014	0.725	-0.050	0.122	0.007	-0.003
	(0.418)	(0.316)	(0.577)	(0.408)	(0.270)	(0.434)
Minimum-Time Procedure × high-attention	-0.735	0.184	-0.125	0.371	-0.208	-0.234
	(0.426)	(0.321)	(0.674)	(0.410)	(0.270)	(0.494)
IQ	0.076	-0.105	-0.095	0.128	-0.161	-0.194
	(0.043)	(0.033)	(0.064)	(0.041)	(0.028)	(0.045)
Selective attention	0.009	-0.007	0.005	0.010	-0.031	-0.027
	(0.028)	(0.020)	(0.035)	(0.027)	(0.017)	(0.023)
Working memory	0.091	-0.047	-0.053	-0.007	-0.002	-0.011
	(0.038)	(0.027)	(0.051)	(0.036)	(0.023)	(0.037)
Attitude toward inconsistency	-0.025	0.008	-0.043	-0.023	0.019	0.015
	(0.030)	(0.022)	(0.039)	(0.029)	(0.019)	(0.031)
Age	0.011	-0.009	-0.016	0.012	-0.008	-0.008
	(0.007)	(0.005)	(0.010)	(0.007)	(0.004)	(0.007)
Female	-0.120	0.141	0.207	-0.109	0.010	0.159
	(0.172)	(0.131)	(0.259)	(0.167)	(0.113)	(0.193)
Education	0.109	-0.095	-0.142	0.042	-0.026	-0.031
	(0.076)	(0.056)	(0.110)	(0.075)	(0.048)	(0.078)
Constant	-1.746	1.306	4.320	-1.636	2.012	5.217
	(0.774)	(0.522)	(0.992)	(0.728)	(0.449)	(0.696)
Log α		-0.035	2.147		0.007	1.740
		(0.189)	(0.078)		(0.121)	(0.067)
Log-likelihood	-393.657	-662.357	-1245.354	-412.059	-941.070	-2020.691
Observations	616	616	616	616	616	616

Note: This table reports the regression coefficients for the effects of Sequential Elimination and the Minimum-Time Procedure on economic rationality relative to the Direct Procedure, estimated from models with treatment–High-attention interactions. Columns 1 and 4 present coefficients from logistic regressions, while the remaining columns present those from negative binomial regressions. Robust standard errors are reported in parentheses.

TABLE D.7. Comparisons between low-attention and low-IQ participants across rationality measures.

Measure	DP	SE	MTP	Overall
Consistency	-0.019 (0.781)	0.012 (0.844)	0.046 (0.467)	0.021 (0.580)
HMI	-0.093 (0.788)	-0.145 (0.630)	-0.061 (0.497)	-0.116 (0.329)
GARP violations	-1.776 (0.843)	0.062 (0.747)	1.606 (0.604)	-0.390 (0.459)
FSD-consistency	0.067 (0.294)	-0.016 (0.812)	0.023 (0.718)	0.028 (0.452)
FSD-HMI	-0.644 (0.084)	-0.204 (0.775)	-0.142 (0.436)	-0.364 (0.070)
FSD-GARP violations	-16.572 (0.138)	-2.321 (0.992)	-2.524 (0.621)	-8.308 (0.190)

Note: The table presents differences in means computed as low-attention minus low-IQ participants across rationality measures. The corresponding p-values are reported in parentheses below each difference. SE = Sequential Elimination, DP = Direct Procedure, MTP = Minimum-Time Procedure. Binary measures use chi-square tests; count measures use Mann–Whitney *U* tests.

TABLE D.8. Average marginal effects of choice procedures on economic rationality by ASRS group.

				FSD-compliant		
	Consistency (1)	HMI (2)	GARP violations (3)	Consistency (4)	HMI (5)	GARP violations (6)
Sequential Elimination						
High-ASRS participants	0.166	-0.361	-5.444	0.091	-0.522	-17.442
	(0.062)	(0.141)	(3.459)	(0.062)	(0.239)	(7.597)
Low-ASRS participants	-0.014	0.077	-3.434	0.143	-0.515	-11.651
	(0.075)	(0.176)	(3.122)	(0.077)	(0.305)	(9.367)
Overall	0.096	-0.196	-4.712	0.111	-0.520	-15.276
	(0.048)	(0.112)	(2.469)	(0.048)	(0.191)	(5.898)
Minimum-Time Procedure						
High-ASRS participants	0.175	-0.356	-6.184	0.059	-0.556	-16.364
	(0.063)	(0.146)	(3.362)	(0.063)	(0.241)	(8.753)
Low-ASRS participants	-0.034	-0.044	-2.625	0.072	-0.451	-9.732
	(0.073)	(0.140)	(3.501)	(0.075)	(0.302)	(9.355)
Overall	0.094	-0.239	-4.888	0.064	-0.516	-13.884
	(0.048)	(0.106)	(2.459)	(0.048)	(0.187)	(6.320)
Observations	616	616	616	616	616	616

Note: This table reports average marginal effects of Sequential Elimination and the Minimum-Time Procedure relative to the Direct Procedure (baseline), estimated from models with treatment-by-low-ASRS interactions, where low-ASRS is an indicator equal to one for observations with ASRS scores below the sample median. High-ASRS participants, defined as those with scores at or above the sample median, are the counterpart of low-attention participants as measured by the full ASRS scale. Columns 1 and 4 present average marginal effects from logistic regressions, while the remaining columns present those from negative binomial regressions. All specifications include controls for IQ, selective attention, working memory, attitude toward inconsistency, age, gender, education. Robust standard errors are reported in parentheses.

TABLE D.9. Mean response time and its components by treatment and IQ group.

IQ group	Direct Procedure	Sequential Elimination	Minimum-Time Procedure
Panel A: Low-IQ participants			
Response time	20.673	23.871	40.847
	(0.372)	(0.589)	(0.402)
Time to last click	18.607	22.379	15.279
	(0.371)	(0.592)	(0.227)
Time from last click	2.066	1.492	25.567
	(0.091)	(0.077)	(0.449)
Observations	2832	2568	2568
Panel B: High-IQ participants			
Response time	24.520	29.296	40.112
	(0.607)	(0.726)	(0.480)
Time to last click	22.003	27.514	17.159
	(0.599)	(0.696)	(0.268)
Time from last click	2.517	1.782	22.953
	(0.077)	(0.211)	(0.528)
Observations	2256	2256	2304
Panel C: Overall			
Response time	22.379	26.408	40.499
	(0.340)	(0.464)	(0.311)
Time to last click	20.113	24.780	16.168
	(0.337)	(0.454)	(0.175)
Time from last click	2.266	1.628	24.331
	(0.061)	(0.107)	(0.345)
Observations	5088	4824	4872

Note: This table reports treatment-specific mean timing metrics per decision problem across IQ groups. Response time is measured as the seconds elapsed from when a participant encounters a problem until they submit a choice. Time to last click is measured as the seconds elapsed from encountering a problem until the final click on any option. Observations are at the participant–decision level. Standard errors are reported in parentheses.

TABLE D.10. Regression results on the effects of choice procedures on response time and its components.

	Response time (1)	Time to last click (2)	Time after last click (3)
Sequential Elimination	3.180	3.819	-0.639
	(1.668)	(1.651)	(0.248)
Minimum-Time Procedure	20.198	-3.244	23.442
	(1.187)	(1.076)	(0.926)
High-IQ	3.233	2.562	0.671
	(1.547)	(1.484)	(0.287)
Sequential Elimination × High-IQ	2.242	2.725	-0.484
	(2.678)	(2.641)	(0.398)
Minimum-Time Procedure × High-IQ	-4.443	-1.342	-3.101
	(1.860)	(1.742)	(1.383)
Controls	Yes	Yes	Yes
Decision problem fixed effects	Yes	Yes	Yes
Observations	14784	14784	14784

Note: This table reports linear regression results on how relevant time metrics vary across choice procedures. Response time is measured in seconds from encountering a decision problem until final choice submission. Time to last click is measured in seconds from encountering a decision problem until the last interaction with any option. Time after last click is measured in seconds from the last interaction with any option until final submission. Observations are at the participant–decision level. Controls include inattention (ASRS), selective attention, working memory, attitude toward inconsistency, age, gender, education, and decision order. All specifications include a constant. Standard errors clustered at the individual level are reported in parentheses.

TABLE D.11. Average marginal effects of response time components and choice procedures on economic rationality.

				FSD-compliant		
	Consistency (1)	HMI (2)	GARP violations (3)	Consistency (4)	HMI (5)	GARP violations (6)
Time to last click	0.004	-0.012	-0.025	0.010	-0.014	-0.011
	(0.008)	(0.006)	(0.009)	(0.007)	(0.006)	(0.008)
Time after last click	0.015	-0.020	-0.016	0.040	-0.026	-0.007
	(0.019)	(0.014)	(0.015)	(0.020)	(0.010)	(0.014)
Sequential Elimination						
Low-IQ participants	0.137	-0.229	-6.319	0.161	-0.634	-27.871
	(0.063)	(0.148)	(3.354)	(0.065)	(0.273)	(10.301)
High-IQ participants	0.018	-0.006	-2.421	0.026	-0.109	-3.216
	(0.070)	(0.120)	(3.214)	(0.070)	(0.191)	(6.986)
Overall	0.083	-0.132	-4.685	0.098	-0.403	-17.146
	(0.047)	(0.100)	(2.364)	(0.048)	(0.176)	(6.617)
Minimum-Time Procedure						
Low-IQ participants	0.027	-0.008	-7.651	-0.117	-0.004	-28.456
	(0.126)	(0.302)	(4.182)	(0.106)	(0.491)	(14.649)
High-IQ participants	-0.013	0.144	0.574	-0.145	0.435	-2.322
	(0.105)	(0.222)	(5.056)	(0.103)	(0.363)	(9.557)
Overall	0.009	0.058	-4.203	-0.130	0.189	-17.087
	(0.106)	(0.243)	(3.859)	(0.094)	(0.389)	(10.899)

Note: This table reports the average marginal effects of time to last click, time after last click, Sequential Elimination, and the Minimum-Time Procedure on economic rationality. Both time metrics are averaged across decision problems at the individual level. Treatment effects are reported by IQ group. Columns 1 and 4 present average marginal effects from logistic regressions, while the remaining columns present those from negative binomial regressions. All specifications include controls for inattention (ASRS), selective attention, working memory, attitude toward inconsistency, age, gender, education, and a constant. Robust standard errors are reported in parentheses.

TABLE D.12. Descriptive patterns of decision sequences by treatment and IQ group.

	Mean position in decision sequence			Spearman rank correlation
	FSD-dominated	Boundary	Middle	
	(1)	(2)	(3)	(4)
Direct Procedure				
Low-IQ participants	6.107	6.146	5.901	0.700
	(0.035)	(0.043)	(0.061)	(0.011)
High-IQ participants	6.124	6.092	5.921	0.769
	(0.039)	(0.045)	(0.066)	(0.012)
Overall	6.115	6.122	5.910	0.730
	(0.026)	(0.031)	(0.045)	(0.008)
Sequential Elimination				
Low-IQ participants	4.922	4.430	8.151	0.097
	(0.035)	(0.051)	(0.063)	(0.011)
High-IQ participants	4.676	3.787	8.049	0.071
	(0.035)	(0.053)	(0.065)	(0.011)
Overall	4.807	4.129	8.103	0.085
	(0.025)	(0.037)	(0.045)	(0.008)

Note: This table reports treatment-specific characteristics of decision sequences by IQ group. Columns 1–3 present the mean position of FSD-dominated, boundary, and middle options in the decision sequence. Under the Sequential Elimination procedure, this corresponds to the elimination order; under the Direct Procedure, it corresponds to the examination order. Column 4 displays the Spearman correlation between the decision sequence and the presentation sequence, with lower values indicating weaker alignment with the default ordering. The Minimum-Time Procedure does not generate decision sequences and is therefore excluded. Observations are at the participant–decision level. Standard errors are reported in parentheses.

TABLE D.13. Descriptive patterns of final choices by treatment and IQ group.

	FSD-dominated (1)	Boundary (2)	Middle (3)	Default-order position (4)	Mirrored choice (5)
Direct Procedure					
Low-IQ participants	0.055	0.117	0.378	6.078	0.440
	(0.004)	(0.006)	(0.009)	(0.059)	(0.014)
High-IQ participants	0.020	0.131	0.370	5.900	0.505
	(0.003)	(0.007)	(0.010)	(0.067)	(0.016)
Overall	0.039	0.123	0.374	5.999	0.469
	(0.003)	(0.005)	(0.007)	(0.045)	(0.010)
Sequential Elimination					
Low-IQ participants	0.035	0.183	0.365	5.982	0.517
	(0.004)	(0.008)	(0.010)	(0.062)	(0.015)
High-IQ participants	0.016	0.135	0.316	6.000	0.484
	(0.003)	(0.007)	(0.010)	(0.068)	(0.016)
Overall	0.026	0.161	0.342	5.991	0.502
	(0.002)	(0.005)	(0.007)	(0.046)	(0.011)
Minimum-Time Procedure					
Low-IQ participants	0.025	0.123	0.322	5.979	0.449
	(0.003)	(0.006)	(0.009)	(0.063)	(0.015)
High-IQ participants	0.016	0.200	0.283	5.967	0.508
	(0.003)	(0.008)	(0.009)	(0.066)	(0.015)
Overall	0.021	0.159	0.304	5.973	0.476
	(0.002)	(0.005)	(0.007)	(0.046)	(0.011)

Note: This table reports treatment-specific means of final choice outcomes by IQ group. Columns 1–3 present the frequencies of selecting FSD-dominated, boundary, and middle options, respectively. Column 4 displays the mean default-order position of the chosen option, with 6 corresponding to the midpoint of the 11-option list. Column 5 shows the frequency of selecting mirrored options in eleven symmetrically equivalent pairs of decision problems. Observations are at the participant–decision level. Standard errors are reported in parentheses.

TABLE D.14. Determinants of choice of Sequential Elimination (pilot results).

	Choice of Sequential Elimination				
	(1)	(2)	(3)	(4)	(5)
High-IQ	-1.312			-1.060	
	(0.588)			(0.628)	
IQ		-0.286			-0.254
		(0.121)			(0.133)
Selective attention	-0.107	-0.124		-0.130	-0.145
	(0.095)	(0.098)		(0.102)	(0.104)
Working Memory	-0.210	-0.194		-0.239	-0.228
	(0.112)	(0.112)		(0.134)	(0.130)
Education			0.567	0.627	0.663
			(0.285)	(0.278)	(0.279)
Age				-0.032	-0.024
				(0.044)	(0.043)
Female				0.668	0.684
				(0.585)	(0.587)
Attitude toward inconsistency				0.038	0.020
				(0.123)	(0.123)
Constant	4.692	5.637	-0.313	4.381	5.093
	(1.850)	(1.899)	(0.504)	(2.315)	(2.344)
Log-likelihood	-41.147	-40.471	-45.901	-38.468	-37.630
Observations	75	75	75	75	75

Note: This table reports logistic regression coefficients for the choice of Sequential Elimination versus the Direct Procedure in the pilot treatment, where participants choose between the two procedures. The dependent variable equals 1 if Sequential Elimination is chosen and 0 otherwise. Robust standard errors are reported in parentheses.

TABLE D.15. Effect of procedure preference on economic rationality (pilot results).

	Sequential Elimination Chosen vs. assigned		Direct Procedure Chosen vs. assigned	
	Consistency	HMI	Consistency	HMI
	(1)	(2)	(3)	(4)
Panel A: Regression coefficients				
Procedure Preference	0.213	0.064	0.739	-0.410
	(0.563)	(0.428)	(0.897)	(0.551)
High-IQ	-0.356	0.078	1.195	-0.888
	(0.556)	(0.359)	(0.538)	(0.319)
Procedure Preference × High-IQ	-0.274	0.052	-1.504	1.184
	(0.831)	(0.610)	(1.059)	(0.646)
Panel B: Average marginal effects of selection				
Low-IQ participants	0.040	0.034	0.178	-0.312
	(0.106)	(0.232)	(0.211)	(0.369)
High-IQ participants	-0.013	0.070	-0.176	0.446
	(0.135)	(0.260)	(0.138)	(0.239)
Overall	0.019	0.046		
	(0.085)	(0.175)		
Log α		-0.310		-14.508
		(0.547)		(2.506)
Log-Likelihood	-72.348	-113.189	-65.197	-103.784
Observations	122	122	101	101

Note: This table reports regression results on the association between procedure preference and economic rationality in the pilot, which includes Sequential Elimination, the Direct Procedure, and a third treatment in which participants choose between the two. Columns 1 and 3 present logit estimates for choice consistency; Columns 2 and 4 present negative binomial estimates for HMI. The first two columns compare rationality for participants who select Sequential Elimination with those assigned to it; the last two provide the analogous comparison for the Direct Procedure. Panel A reports regression coefficients. Panel B reports marginal effects of choice, capturing the average change in rationality when procedures switch from assignment to choice. All specifications include controls for selective attention, working memory, attitude toward inconsistency, age, gender, education, and a constant. Robust standard errors are reported in parentheses.