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Centaur: a foundation model of human cognition	007
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Marcel Binz ^{1*} , Elif Akata ¹ , Matthias Bethge ² ,	010
Franziska Brändle ^{3,5} , Fred Callaway ⁴ , Julian Coda-Forno ¹ ,	011
Peter Dayan ^{2,5} , Can Demircan ¹ , Maria K. Eckstein ⁶ ,	012
Noémi Éltető ⁵ , Thomas L. Griffiths ⁷ , Susanne Haridi ^{1,13} ,	013
Akshay K. Jagadish ^{1,2,5} , Li Ji-An ⁸ , Alexander Kipnis ¹ ,	014
Sreejan Kumar ⁷ , Tobias Ludwig ^{2,5} , Marvin Mathony ¹ ,	015
Marcelo Mattar ⁴ , Alireza Modirshanechi ¹ , Surabhi S. Nath ^{2,5,13} ,	016
Joshua C. Peterson ⁹ , Milena Rmus ¹ , Evan M. Russek ⁷ ,	017
Tankred Saanum ⁵ , Natalia Scharfenberg ⁵ , Johannes A. Schubert ⁵ ,	018
Luca M. Schulze Buschoff ¹ , Nishad Singhi ¹⁴ , Xin Sui ^{2,5} ,	019
Mirko Thalmann ¹ , Fabian Theis ¹ , Vuong Truong ⁵ ,	020
Vishaal Udandarao ^{2,15} , Konstantinos Voudouris ¹ ,	021
Robert Wilson ¹⁰ , Kristin Witte ¹ , Shuchen Wu ¹ ,	022
Dirk U. Wulff ^{11,12} , Huadong Xiong ¹⁰ , Eric Schulz ¹	023
	024
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	026
¹ Helmholtz Munich.	027
² University of Tuebingen.	028
³ University of Oxford.	029
⁴ New York University.	030
⁵ Max Planck Institute for Biological Cybernetics.	031
⁶ Google DeepMind.	032
⁷ Princeton University.	033
⁸ University of California San Diego.	034
⁹ Boston University.	035
¹⁰ Georgia Institute of Technology.	036
¹¹ University of Basel.	037
¹² Max Planck Institute for Human Development.	038
¹³ Max Planck School of Cognition.	039
¹⁴ TU Darmstadt.	040
¹⁵ University of Cambridge.	041
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047 *Corresponding author(s). E-mail(s): marcel.binz@helmholtz-munich.de;

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Abstract

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Establishing a unified theory of cognition has been a major goal of psychology [1, 2]. While there have been previous attempts to instantiate such theories by building computational models [1, 2], we currently do not have one model that captures the human mind in its entirety. Here we introduce Centaur, a computational model that can predict and simulate human behavior in any experiment expressible in natural language. We derived Centaur by finetuning a state-of-the-art language model on a novel, large-scale data set called Psych-101. Psych-101 reaches an unprecedented scale, covering trial-by-trial data from over 60,000 participants performing over 10,000,000 choices in 160 experiments. Centaur not only captures the behavior of held-out participants better than existing cognitive models, but also generalizes to new cover stories, structural task modifications, and entirely new domains. Furthermore, we find that the model’s internal representations become more aligned with human neural activity after finetuning. Taken together, Centaur is the first real candidate for a unified model of human cognition. We anticipate that it will have a disruptive impact on the cognitive sciences, challenging the existing paradigm for developing computational models.

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Introduction

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The human mind is remarkably general [3–5]. Not only do we routinely make mundane decisions, like choosing a breakfast cereal or selecting an outfit, but we also tackle complex challenges, such as figuring out how to cure cancer or explore outer space. We learn new skills from only a few demonstrations [6], reason causally [7], and fuel our actions through curiosity [8]. Whether we are climbing mountains, playing video games, or creating captivating art, our versatility defines what it means to be human.

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In contrast to this, most contemporary computational models – whether in machine learning or the cognitive sciences – are domain-specific. They are designed to excel at one particular problem and that problem alone. Take, for instance, AlphaGo – a computer system created by Google DeepMind to master the game of Go [9]. Even though the system can play this particular game at an impressive level, it can do

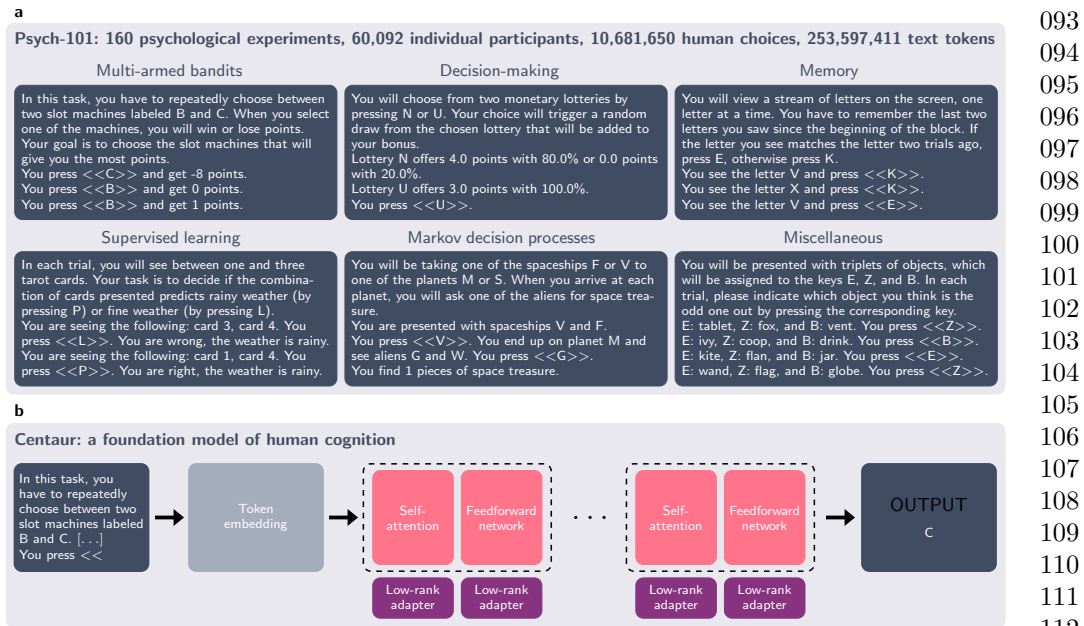


Fig. 1 Psych-101 and Centaur overview. **a**, Psych-101 comprises of trial-by-trial data from 160 psychological experiments and 60,092 participants, making 10,681,650 choices in total. It contains domains such as multi-armed bandits, decision-making, memory, supervised learning, Markov decision processes, and others (shown examples are stylized and abbreviated for readability). **b**, Centaur is a foundation of model human cognition that is obtained by adding low-rank adapters to a state-of-the-art language model and finetuning it on Psych-101.

not much beyond that. A similar pattern emerges in the cognitive sciences. Prospect theory, one of the most influential accounts of human cognition, for instance, offers valuable insights into how people make choices [10], but it tells us nothing about how we learn, plan, or explore.

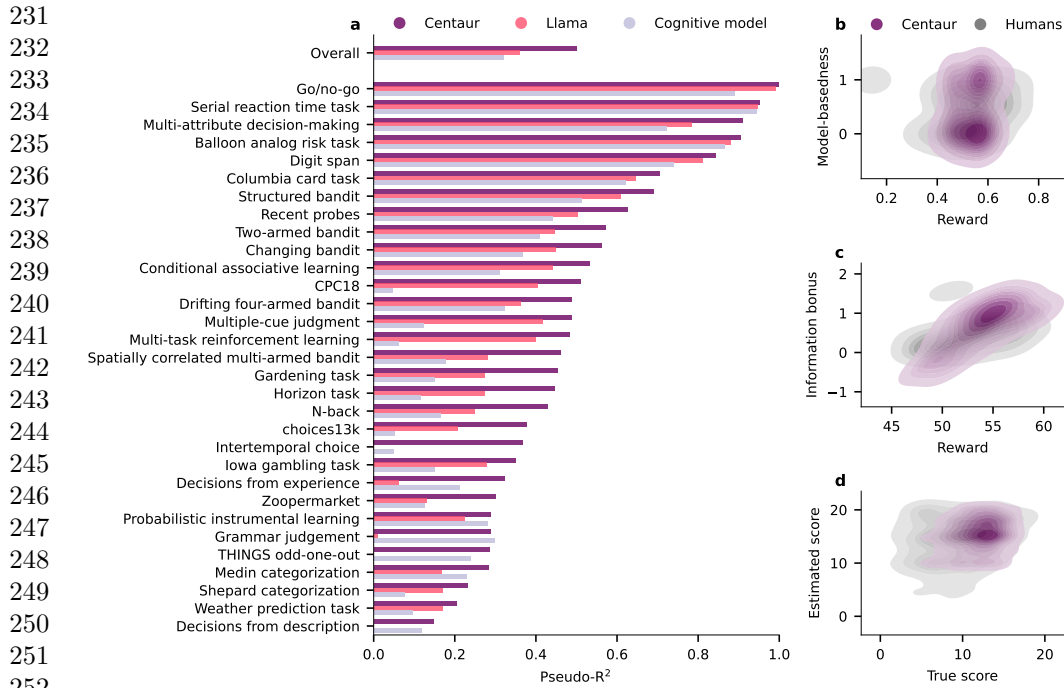
If we want to understand the human mind in its entirety, we must move from domain-specific to domain-general accounts. The importance of such a unified approach has already been recognized by the pioneers of our field. For example, in 1990, Newell stated that “unified theories of cognition are the only way to bring [our] wonderful, increasing fund of knowledge under intellectual control” [2]. How can we make meaningful progress toward such theories?

139 An important step towards a unified theory of cognition is to build a computa-
140 tional model that can predict and simulate human behavior in any domain [2, 11].
141 The present paper takes up this challenge and introduces Centaur – the first founda-
142 tion model of human cognition [12]. Centaur was designed in a data-driven manner
143 by finetuning a state-of-the-art large language model [13] on a large corpus of human
144 behavior. For this purpose, we curated a novel, large-scale data set called Psych-101,
145 covering trial-by-trial data from 160 psychological experiments. We transcribed each of
146 these experiments into natural language, which provides a common format for express-
147 ing vastly different experimental paradigms [14, 15]. The resulting data set reaches an
148 unprecedented scale, containing over 10,000,000 human choices and including many
149 canonical studies from domains such as multi-armed bandits, decision-making, mem-
150 ory, supervised learning, Markov decision processes, and others (see Figure 1a for an
151 overview and examples).

160 We subject Centaur to a series of rigorous tests and demonstrate that it captures
161 human behavior at several levels of generalization. First, we show that Centaur predicts
162 behavior of held-out participants (i.e., participants that are not part of the training
163 data) better than existing cognitive models in almost every single experiment. We then
164 demonstrate that its ability to capture human behavior also generalizes to held-out
165 experiments. In this context, we find that Centaur accurately predicts human behavior
166 under modified cover stories, problem structures, and even in entirely novel domains.
167 Finally, we show that Centaur’s internal representations become more human-aligned,
168 even though it was never explicitly trained to capture human neural activity.

175 Taken together, these results demonstrate that it is possible to discover domain-
176 general models of human cognition in a data-driven manner. We believe that Centaur
177 is the first real candidate for a unified model of human cognition and that it offers
178 many opportunities to obtain a better understanding of the human mind.
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Results	185
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Model overview	187
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We built Centaur on top of the open-source language model Llama 3.1 70B – a state-	190
of-the-art model pre-trained by Meta AI [13] (hereafter, we refer to this model simply	191
as Llama). Having a large language model as the backbone allowed us to rely on the	192
vast amounts of knowledge that is present in these models [16]. The training pro-	193
cess involved finetuning on Psych-101 using a parameter-efficient finetuning technique	194
known as quantized low-rank adaptation (QLoRA) [17]. QLoRA leaves the parame-	195
ters of the base model intact while adding so-called low-rank adapters, which contain	196
only a few additional, trainable parameters. In our case, we added low-rank adapters	197
of rank eight to all non-embedding layers as illustrated in Figure 1b. With these set-	198
tings, the newly added parameters amount to 0.15% of the base model’s parameters.	199
We then trained the model for one epoch on the entire data set using a standard cross-	200
entropy loss. We masked out the loss for all tokens that do not correspond to human	201
responses, thereby ensuring that the model focuses on capturing human behavior and	202
not on completing experimental instructions. The entire training process took approx-	203
imately five days on an A100 80GB GPU. Further details on the finetuning procedure	204
are provided in the Methods section.	205
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Centaur predicts human behavior better than domain-specific	218
cognitive models	219
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We evaluated Centaur on different types of held-out data to demonstrate that it	222
robustly captures human behavior. In our first analysis, we tested whether it can pre-	223
dict behavior of participants that were not part of the training data. For this, we split	224
each transcribed experiment into two parts, and used 90% of participants for training	225
and retained 10% for testing. We measured goodness-of-fit to human choices using a	226
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Fig. 2 Performance on Psych-101. **a**, Pseudo- R^2 values for different models across experiments. A value of zero corresponds to prediction at chance level while a value of one corresponds to perfect predictability of human responses. Missing bars indicate performance below chance level. Centaur outperforms both Llama and a collection of domain-specific cognitive models in almost every experiment. Note that we only included experiments for which we have implemented a domain-specific cognitive model in this graphic and merged different studies using the same paradigm. A full table for all experiments can be found in the Supplementary Information. **b**, Model simulations on the two-step task. The plot visualizes probability densities over reward and a parameter indicating how model-based learning was for people and simulated runs of Centaur. **c**, Model simulations on the horizon task. The plot visualizes probability densities over reward and an information bonus parameter for both people and simulated runs of Centaur. **d**, Model simulations on a grammar judgement task. The plot visualizes probability densities over true and estimated scores (i.e., number of correct responses out of twenty) for both people and simulated runs of Centaur.

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 266 pseudo- R^2 measure, which normalizes the log-likelihood of a model by that of a randomly guessing model [18]. In this measure, a value of zero corresponds to prediction at chance level while a value of one indicates perfect predictability.¹ Figure 2a presents the result of this analysis, comparing Centaur against the base model without fine-tuning and collection of domain-specific models that represent the state-of-the-art in

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 275 ¹Note that the (unknown) noise ceiling is in general lower than one, which can only be attained when predicting deterministic behavior.

the cognitive science literature. We observed that all models predict human behavior above chance level in the majority of experiments. While there was substantial variance in predictability between the experiments, finetuning always improved goodness-of-fit. The average improvement across experiments after finetuning was 0.14 (Centaur pseudo- $R^2 = 0.50$; Llama pseudo- $R^2 = 0.36$).

Furthermore, we compared Centaur against the previously mentioned collection of domain-specific cognitive models. These models include, amongst others, the generalized context model [19], a prospect theory model [20], and various reinforcement learning models [21, 22]. Further technical details about the modeling can be found in the Supplementary Information. We observed that Centaur outperforms domain-specific cognitive models in all but one experiment. The average improvement in predicting human behavior over the domain-specific cognitive models was 0.18 (Centaur pseudo- $R^2 = 0.50$; cognitive models pseudo- $R^2 = 0.32$).

Next, we investigated which factors of an experiment determine whether Centaur captures human behavior. For this, we conducted a regression analysis using the difference in pseudo- R^2 values between Centaur and Llama as a target variable and the number of participants, the number of choices, the number of text characters, and the experiment domain as regressors. We found positive effects for all domains, indicating that finetuning was beneficial for every type of experiment (see Supplementary Information for detailed results). Furthermore, while we did find a positive effect for the number of participants ($\beta = 2.42 \times 10^{-5}$, $p = 0.003$), the number of choices and text characters did not contribute significantly to the improvement in goodness-of-fit. This suggests that having a larger pool of participants is more important for acquiring a good model than the number of data points per participant.

The previous analyses have focused on predicting human responses conditioned on previously executed behavior. We may ask whether Centaur can also generate human-like behavior when simulated in an open-loop fashion (i.e., when feeding its

own responses back into the model). This setting arguably provides a much stronger
test for the model’s capabilities [23]. To check whether Centaur survives this test, we
ran open-loop simulations in three different experimental paradigms and inspected
the distributions of statistics that resulted from these simulations. The corresponding
results can be found in Figure 2b-d. We found that Centaur performs at human-level in
all of these simulations, confirming that it can generate meaningful open-loop behav-
ior. Furthermore, Centaur’s distributions are well-aligned with the human population,
demonstrating that Centaur does not merely model the behavior of the average partic-
ipant but rather the distribution over trajectories produced by the entire population.
For example, in the two-step task – a well-known paradigm to tease apart model-free
and model-based reinforcement learning [21] – Centaur produced trajectories in which
learning is purely model-free, purely model-based, and mixtures thereof (see Figure
2b).

Probing increasingly complex generalization abilities

Thus far, we have shown that Centaur generalizes to previously unseen participants
performing experiments that were part of the training data. A true foundation model
of human cognition, however, must also capture behavior in any arbitrary experiment,
even if that experiment was not part of the training data. To probe whether Centaur
has this ability, we exposed it to a series of increasingly complex out-of-distribution
evaluations.

First, we investigated whether Centaur is robust in the face of changes to the cover
story. For this analysis, we relied on data collected by Feher da Silva and Hare [24],
who conducted a study using the aforementioned two-step task. In addition to the
canonical cover story (spaceships traveling to foreign planets in search of treasures),
their study introduced a novel cover story involving magical carpets. Importantly,
Psych-101 includes experiments using the canonical spaceship cover story [27, 28] but

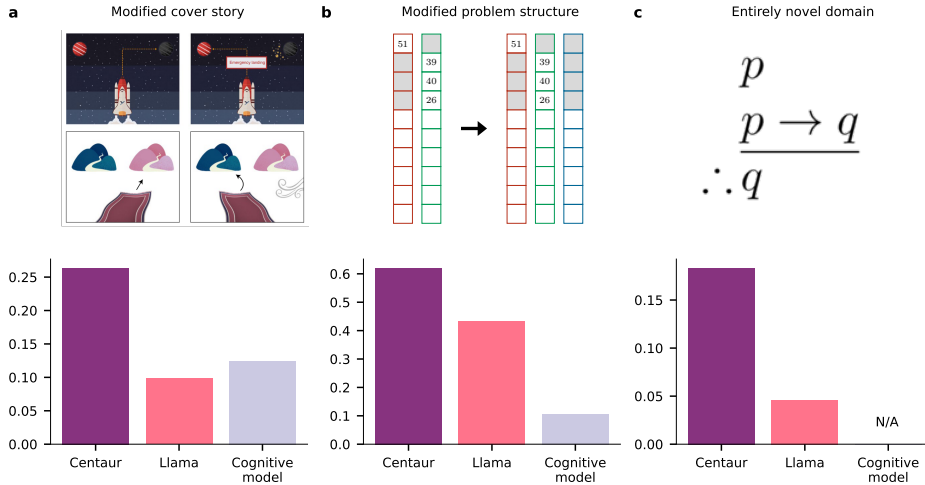


Fig. 3 Evaluation in different held-out settings. **a**, Pseudo-R² values for the two-step task with a modified cover story [24]. **b**, Pseudo-R² values for a three-armed bandit experiment [25]. **c**, Pseudo-R² values for an experiment probing logical reasoning [26]. Centaur outperforms both Llama and domain-specific cognitive models when faced with modified cover stories, problem structures, and entirely novel domains.

no experiments with the magical carpet cover story. Yet, we still found that Centaur captures human behavior in the magical carpet experiment of Feher da Silva and Hare (see Figure 3a). Like in our previous analysis, we observed an improvement after finetuning, as well as a favorable goodness-of-fit when compared to a domain-specific cognitive model (Centaur pseudo-R²: 0.26; Llama pseudo-R²: 0.10; cognitive model pseudo-R²: 0.12).

In a second out-of-distribution evaluation, we probed whether Centaur is robust to modifications in task structure. To test this, we exposed it to a paradigm known as Maggie’s farm [25]. Maggie’s farm extends the horizon task paradigm – a two-armed bandit task used to detect different types of exploration strategies [22] – by adding a third choice option. Psych-101 encompasses several two-armed bandit experiments (including the horizon task) but not Maggie’s farm or any other three-armed bandit experiments.² Thus, this analysis provides a test of Centaur’s robustness to structural task modifications. We found that Centaur captures human behavior on Maggie’s

²It does, however, contain multi-armed bandit experiments with more than three choice options.

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415 farm as shown in Figure 3b. We again observed a benefit of finetuning, as well as a
416 favorable goodness-of-fit compared to a domain-specific cognitive model, which did
417 not generalize well to this setting (Centaur pseudo-R²: 0.62; Llama pseudo-R²: 0.43;
418 cognitive model pseudo-R²: 0.11).
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421 Finally, we investigated whether Centaur can capture human behavior even in
422 entirely novel domains. In this context, we considered a study investigating logical
423 reasoning [26]. While Psych-101 includes probabilistic and causal reasoning problems,
424 we purposefully excluded any studies involving logical reasoning. Like in the previous
425 analyses, there was again a positive effect of finetuning (Centaur pseudo-R²: 0.18;
426 Llama pseudo-R²: 0.05; see Figure 3c). Note that we did not compare to any domain-
427 specific cognitive model in this setting, as it is unclear how to construct a model that
428 would make any meaningful transfer from training data that does not include any
429 related problems.
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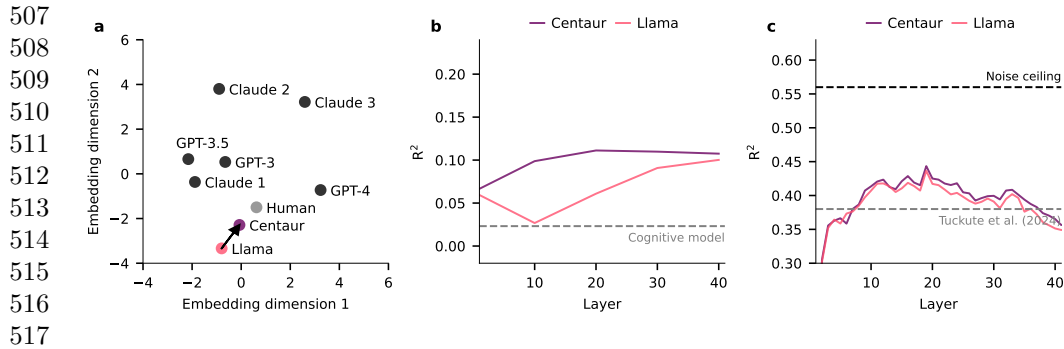
436 Taken together, these analyses cement Centaur’s ability to generalize to experi-
437 ments outside of its training data. We additionally verified the model on a collection
438 of benchmarks from the machine learning literature [29, 30]. We found that Centaur
439 remains stable in performance-based benchmarks, even improving over the base model
440 in some of them [30]. Furthermore, in benchmarks that measure human alignment, we
441 observed a shift towards human-like characteristics. Figure 4a depicts this improved
442 alignment on a low-dimensional embedding derived from ten behavioral metrics in
443 CogBench, a benchmark to test the cognitive abilities of large language models [29].
444 A more detailed description of these additional benchmarking results can be found in
445 the Supplementary Information.
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Internal representations become more aligned to human neural activity

Despite only being trained to match human behavior, we also wondered whether Centaur’s internal representations become more aligned with human neural activity. To check whether this is the case, we conducted two analyses in which we predicted human neural activity using the model’s internal representations [31, 32]. We first conducted a whole-brain analysis, in which we predicted fMRI measurements of people performing the two-step task [33]. We extracted recordings before each choice and after feedback. We then aggregated human neural activity in each region and regressed the aggregated activity on Centaur’s internal representations. This procedure was then repeated separately for each participant and region. Further details can be found in the Methods section. Figure 4b shows the resulting R^2 values across layers for both Centaur and Llama. We found that Centaur’s representations consistently outperform Llama’s representations in predicting human neural activity, suggesting that finetuning a model on large-scale behavioral data aligned its internal representations to human neural activity. It is worth noting that this type of analysis was only possible due to the expressivity of Centaur’s representations, and that using representations of a traditional cognitive model barely predicted human neural activity better than chance (dashed grey line in Figure 4b).

We verified these results in a second analysis, for which we relied on a previously collected data set involving fMRI measurements of people reading simple, six-word sentences [34]. We closely followed the protocol of the original study and predicted aggregated neural activity across participants in the language network. We repeated this procedure for representations extracted from different layers in both Centaur and Llama. Predictability peaked at around layer 20 as shown in Figure 4c. This peak is consistent with the hypothesis that the intermediate layers of such models contain the most amount of information [35]. More importantly, however, this analysis confirmed



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 518 **Fig. 4** Alignment between humans and Centaur. **a**, Multidimensional scaling embedding of the
 519 behavioral metrics in CogBench [29] for different models. **b**, R^2 values indicating how well human
 520 neural activity in the two-step task [33] can be decoded using Centaur’s internal representations
 521 extracted from different layers. **c**, R^2 values indicating how well human neural activity in a sentence-
 522 reading task [34] can be decoded using Centaur’s internal representations extracted from different
 523 layers.

524 that finetuning consistently improves decodability across all layers. Even though the
 525 improvement is somewhat small, this setting provides a particularly strong test for
 526 the generalization abilities of Centaur, given that the stimuli used in this study are far
 527 away from its training data and that it was never trained to capture neural activity.

532 Discussion

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 535 The present paper introduced Centaur, the first real candidate for a unified model
 536 of human cognition. We obtained Centaur by finetuning a state-of-the-art language
 537 model on Psych-101 – a novel, large-scale data set of human behavior. This approach
 538 allowed us to leverage the vast knowledge embedded in large language models, while, at
 539 the same time, aligning them with human behavior [15]. Centaur successfully captures
 540 human behavior and passes a wide range of out-of-distribution checks. It generalizes
 541 not only to unseen participants but also to new cover stories, structural variations, and
 542 entirely novel domains. In addition to analyzing the model on a behavioral level, we
 543 also conducted a series of analyses on its internal representations, in which we found
 544 an increased alignment with human neural activity.

Criterion	Fulfilled by Centaur	
Behave as an (almost) arbitrary function of the environment	✓	553
Operate in real time	✓	554
Exhibit rational, that is, effective adaptive behavior	✓	555
Use vast amounts of knowledge about the environment	✓	556
Behave robustly in the face of error, the unexpected, and the unknown	✓	557
Integrate diverse knowledge	✓	558
Use (natural) language	✓	559
Exhibit self-awareness and a sense of self	•	560
Learn from its environment	✓	561
Acquire capabilities through development	✗	562
Arise through evolution	✗	562
Be realizable within the brain	✓	563

Table 1 Newell test for a theory of cognition. We provide an extended discussion on these criteria in the Supplementary Information.

With his call for unified theories of cognition [2], Newell also outlined a set of criteria that a unified computational model should fulfill [36]. We believe that Centaur is the first model to satisfy the majority of these criteria (see Table 1). Most importantly, it (1) behaves as an almost arbitrary function of the environment, (2) operates in real time, and (3) relies on vast amounts of knowledge about the world. We provide an extended discussion on Newell’s criteria for a theory of cognition in the Supplementary Information.

A computational model like Centaur that can simulate and predict human behavior in any domain offers many direct applications. It may, for instance, be used for in-silico prototyping of experimental studies [37]. In this context, one could use the model to figure out which designs lead to the largest effect sizes, how to design a study to reduce the number of required participants, or to estimate the power of an effect. Thinking one step further, Centaur finds applications in the context of automated cognitive science [38, 39]. For example, it can be integrated into frameworks that utilize predictive models to guide the development of psychological theories, such as scientific regret minimization [40]. Traditionally, this requires collecting huge data sets that are used to build predictive models for the experiment at hand. Centaur removes this constraint and thereby broadens the scope of these frameworks.

599 The ultimate goal of the research program outlined in this paper is to leverage
600 models like Centaur to gain deeper insights into human cognition. While the present
601 paper takes initial steps in that direction, it also opens up exciting new avenues for
602 future exploration. First, one could further probe Centaur’s internal representations
603 to understand how it represents knowledge and processes information. The resulting
604 insights could, in turn, be used to generate new hypotheses about knowledge rep-
605 resentation and information processing in humans that could be validated in future
606 experimental studies. We believe that tools like sparse autoencoders [41] and atten-
607 tion map visualization [42] provide promising avenues towards accomplishing this goal
608 and hope to explore them in future studies.

615 In addition, it might also be possible to train models with different architectures
616 from scratch using the data set that we have created in the process of this paper.
617 Doing so would enable us to investigate the neural architecture of human cognition at
618 a scale that could not have been done before. We might, for example, ask questions
619 such as whether human information processing is better described by attention-based
620 architectures [43] or architectures with a vector-based memory [44], or how much we
621 can improve by incorporating theories from the neuroscience literature [45, 46].

627 Even though Psych-101 is already the broadest and largest data set of human
628 behavior out there, we view its development as an ongoing process and plan to further
629 develop it. The focus in its current state is largely on learning and decision-making,
630 but eventually, we intend to include additional domains such as psycholinguistics,
631 social psychology, and economic games. Experiments with information about indi-
632 vidual differences are another source of neglected data in the current iteration of
633 Psych-101. Ideally, we want to include all types of relevant information about sub-
634 jects (e.g., age, personality traits, or socioeconomic status) in the prompt, such
635 that a model trained on this data can capture individual differences. Experiments
636 from developmental psychology or computational psychiatry provide an ideal source
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for this purpose. Finally, while we have already included some cross-cultural and meta-studies [47–50], the current iteration has still a strong bias toward a Western, educated, industrialized, rich, and democratic (WEIRD) population [51]. To address all of these shortcomings, we have created an open-source repository and invite everyone to contribute to the next iteration of Psych-101 in an open research collaboration (<https://github.com/marcelbinz/Psych-201>). The goal of this effort is to provide psychological data in a standardized format that facilitates benchmarking, thereby complementing existing efforts from the neuroscience community [52–55].

Conclusion

When the idea of a unified model of cognition was first proposed, researchers expressed concern that established areas of cognitive science might react negatively to such a model. In particular, they feared that the new approach might be seen as unfamiliar or incompatible with existing theories, just like an “intruder with improper pheromones” [56]. This could lead to an “attack of the killer bees”, where researchers in traditional fields would fiercely critique or reject the new model to defend their established approaches. To mitigate these concerns, the concept of a cognitive decathlon was proposed: a rigorous evaluation framework in which competing models of cognition are tested across ten experiments and judged based on their cumulative performance in them. In the current work, we applied Centaur to the equivalent of sixteen such cognitive decathlons, where it was tested against numerous established models and consistently won every competition. This outcome suggests that the data-driven discovery of domain-general models of cognition is a promising research direction. The next step for future research should be to translate this domain-general computational model into a unified theory of human cognition.

691 **Methods**

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694 **Data collection**

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696 We constructed Psych-101 by transcribing data from 160 psychological experiments

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698 into natural language. Each prompt was designed to include the entire trial-by-trial

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history of a complete session from a single participant. The included experiments were

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701 selected using the following criteria: (a) publicly available data on a trial-by-trial level,

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703 (b) possibility of transcription into text without a significant loss of information, and

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705 (c) coverage of a broad spectrum of domains. The transcription of each experiment

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was done manually by the authors. We designed our natural language prompts using

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708 the following principles: (a) instructions follow the original study as closely as possible,

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710 (b) simplifications were made where appropriate, and (c) a maximum prompt length

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712 of roughly 32,768 tokens. Full information about all included experiments is provided

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714 in the Supplementary Information.

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716 **Finetuning procedure**

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718 We used Llama 3.1 70B as the base model for our finetuning procedure. We relied

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720 on a parameter-efficient finetuning technique known as QLoRA [17]. QLoRA adds so-

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722 called low-rank adapters to each layer of a 4-bit quantized base model. The base model

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724 was kept fixed during finetuning and only the parameters of the low-rank adapters

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726 were adjusted. For further details on this technique, we refer the reader to [17]. We

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728 finetuned the model for one epoch on the entire data set using a standard cross-entropy

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730 loss (we experimented with prolonged training but found that this led to overfitting).

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732 We only backpropagated the loss at human responses and masked out the loss for all

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734 other tokens. The effective batch size was set to 32, the learning rate to 0.00005, and

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736 the weight decay to 0.01. We used an 8-bit AdamW optimizer [57] with a linearly

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738 increasing warm up over the first 100 gradient steps. We added low-rank adapters to all

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non-embedding layers and set both the rank as well as the scaling parameter to 8. The finetuning procedure was implemented using the unsloth library (<https://unsloth.ai/>).

Evaluation metric

We used a pseudo- R^2 measure to evaluate all our models [18]. This measure takes the average log-likelihood of human responses for a given model and normalizes it using the average log-likelihood of a model that guesses responses uniformly:

$$R^2 = 1 - \frac{\log p_{\text{model}}(\mathcal{D})}{\log p_{\text{guess}}(\mathcal{D})} \quad (1)$$

A value of zero corresponds to prediction at chance level while a value of one corresponds to perfect predictability. Therefore, this measure ensures a common scale across all experiments. For experiments with single-token responses, $\log p_{\text{model}}(\mathcal{D})$ simply amounted to the average log-likelihood of tokens. For experiments with multi-token responses, we summed log-likelihoods within a response and averaged across responses.

Domain-specific cognitive models

We selected 14 cognitive and statistical models that together cover most of the experiments in Psych-101 as our baseline models. Further details regarding the included models and their specifications are provided in the Supplementary Information.

For our main analysis, we were interested in predicting the behavior of held-out participants. Therefore, we fitted a joint set of parameters for all participants in the training data and evaluated how well a model with these parameters predicts responses of held-out participants. Mirroring the evaluation metric for the language-based models, we evaluated goodness-of-fit using a predictive pseudo- R^2 measure.

For the out-of-distribution evaluations, we fitted model parameters using the most similar experiment in the training set, and then evaluated how well a model with the resulting parameters predicts human responses in the unseen setting. The most

783 similar experiment for the magical carpet version of the two-step task was a two-step
784 task experiment with the default spaceship cover story. The most similar experiment
785 for Maggie’s farm was the horizon task. We included no baseline model for the logical
786 reasoning task, as none of the experiments in the training data were similar to it.
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791 **Neural alignment**

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793 The neural alignment analysis on the two-step task was conducted using data col-
794 lected in a previous study [33]. We used a regularized linear regression model to
795 predict fMRI data from internal representations of Centaur and Llama (a separate
796 model was used for each participant and region). We fitted each of these models on
797 data from two scanning blocks and evaluated them on data from the third. The reg-
798 ularization strength was selected using a nested cross-validation procedure. For each
799 run, we split the beta maps into cortical and subcortical regions of interest (ROI)
800 using the Harvard-Oxford atlas. We averaged the betas within each ROI, reducing
801 the number of betas from the number of voxels to the number of ROIs. All cortical
802 and subcortical ROIs from the atlas were evaluated. Reported R^2 values correspond
803 to the average across all ROIs.
804
805

806 Internal representations were extracted from the models’ residual stream and
807 transformed using a principal component analysis. We set the number of retained
808 components such that they explain 95% of the variance.
809

810 The fMRI data were preprocessed using fMRIPrep 24.0 [58]. We used the default
811 settings of fMRIPrep, and all the scans were aligned to the MNI152NLin2009cAsym
812 atlas [59]. To extract effect estimates for each subtrial of the task (e.g., second step
813 of the fifth trial, feedback of the tenth trial), we built separate general linear models
814 (GLMs). Each GLM included the subtrial of interest as a separate regressor, whose
815 z-scored beta estimates were used for the alignment analysis. This part of the data
816 was not modeled using other regressors. Additionally, we included different regressors
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capturing all the first steps, all the second steps, and all the feedback steps. Lastly, we used 6 rotation and translation estimates as well as framewise displacement as noise regressors. The hemodynamic response was modeled using the spm [60] model. A high pass filter of 0.01 Hz and a Gaussian kernel with 6mm full-width at half-maximum was applied. The GLMs were built using nilearn [61].

The neural alignment analysis on the sentence-reading task was conducted using publicly available code from the original study [34]. No other changes were made besides replacing GPT2-XL with Centaur and Llama. We refer the reader to [34] for further details.

Data availability

Psych-101 is publicly available on the Huggingface platform: <https://huggingface.co/datasets/marcelbinz/Psych-101>. The test set is accessible under a CC-BY-ND-4.0 license via a gated repository: <https://huggingface.co/datasets/marcelbinz/Psych-101-test>.

Code availability

Centaur is available on the Huggingface platform: <https://huggingface.co/marcelbinz/Llama-3.1-Centaur-70B-adapter>. We provide additional code to reproduce our results under <https://github.com/marcelbinz/Llama-3.1-Centaur-70B>.

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Author contributions.

875 **Project lead:** Marcel Binz
876
877 **Data curation:** Elif Akata, Franziska Brändle, Marcel Binz, Fred Callaway, Julian
878 Coda-Forno, Can Demircan, Maria Eckstein, Noemi Elteto, Susanne Haridi, Akshay
879 Jagadish, Li Ji-An, Alexander Kipnis, Sreejan Kumar, Tobias Ludwig, Surabhi Nath,
880 Joshua Peterson, Evan Russek, Tankred Saanum, Natalia Scharfenberg, Johannes
881 Schubert, Luca Schulze Buschoff, Nishad Singhi, Xin Sui, Mirko Thalmann, Vuong
882 Truong, Kristin Witte, Shuchen Wu, Dirk Wulff, Huadong Xiong
883
884
885 **Data quality control:** Elif Akata, Marcel Binz, Julian Coda-Forno, Can Demircan,
886 Susanne Haridi, Luca Schulze Buschoff
887
888
889 **Model training:** Marcel Binz, Vishaal Udandaraao
890
891 **Model evaluation:** Marcel Binz, Julian Coda-Forno, Alexander Kipnis, Konstantinos
892 Voudouris
893
894
895 **Domain-specific models:** Marcel Binz, Julian Coda-Forno, Can Demircan, Akshay
896 Jagadish, Marvin Mathony, Alireza Modirshanechi, Milena Rmus, Tobias Ludwig
897
898 **Neural analyses:** Marcel Binz, Can Demircan, Sreejan Kumar, Marcelo Mattar,
899 Evan Russek
900
901 **First draft:** Marcel Binz, Eric Schulz
902
903 **Review and editing:** All authors
904
905
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Supplementary Information

Full goodness-of-fit results

Experiment	Centaur	Llama	Cognitive model
Shepard categorization	0.2315	0.1695	0.0765
Drifting four-armed bandit	0.4896	0.3622	0.3225
N-back	0.4282	0.2484	0.1651
Digit span	0.8431	0.8120	0.7388
Go/no-go	1.0000	0.9910	0.8908
Recent probes	0.6274	0.5026	0.4420
Horizon task	0.4464	0.2730	0.1172
Gardening task	0.4542	0.2729	0.1509
Columbia card task	0.7063	0.6460	0.6219
Balloon analog risk task	0.9048	0.8808	0.8670
Two-armed bandit	0.5725	0.4475	0.4108
Conditional associative learning	0.5326	0.4427	0.3115
THINGS odd-one-out	0.2853	-0.0611	0.2406
Multi-attribute decision-making	0.9107	0.7833	0.7227
Two-step task	0.2715	0.1275	nan
Probabilistic instrumental learning	0.2878	0.2236	0.2802
Medin categorization	0.2835	0.1672	0.2303
Zoopermarket	0.3002	0.1306	0.1256
choices13k	0.3770	0.2075	0.0530
CPC18	0.5109	0.4058	0.0466
Intertemporal choice	0.3677	-0.0656	0.0492
Structured bandit	0.6918	0.6098	0.5136
Weather prediction task	0.2045	0.1705	0.0959
Iowa gambling task	0.3499	0.2781	0.1497
Virtual subway network	0.6864	0.5663	nan
Multi-task reinforcement learning	0.4837	0.3989	0.0625
Serial reaction time task	0.9521	0.9470	0.9453
Decisions from description	0.1478	-0.3177	0.1183
Decisions from experience	0.3236	0.0626	0.2134
Changing bandit	0.5635	0.4483	0.3685
Multiple-cue judgment	0.4888	0.4167	0.1245
Recall and recognition	0.7046	0.6162	nan
Experiential-symbolic task	0.3459	-0.0070	nan
Grammar judgement	0.2877	0.0101	0.2989
Risky choice	0.3828	0.0663	nan
Tile-revealing task	0.5188	0.2966	nan
Episodic long-term memory	0.7578	0.6837	nan
Aversive learning	0.1156	-0.1087	nan
Spatially correlated multi-armed bandit	0.4613	0.2804	0.1789
Probabilistic reasoning	0.3378	0.2632	nan

Table 2 Full pseudo-R² results on held-out participants.

	Experiment	Centaur	Llama	Cognitive model
967				
968	Shepard categorization	0.5327	0.5756	0.6401
969	Drifting four-armed bandit	0.7075	0.8842	0.9393
970	N-back	0.3963	0.5210	0.5787
971	Digit span	0.5622	0.6735	0.9359
972	Go/no-go	0.0000	0.0062	0.0757
972	Recent probes	0.2583	0.3448	0.3868
973	Horizon task	0.3837	0.5039	0.6119
974	Gardening task	0.3783	0.5040	0.5885
975	Columbia card task	0.2036	0.2454	0.2621
976	Balloon analog risk task	0.0660	0.0826	0.0922
976	Two-armed bandit	0.2963	0.3829	0.4084
977	Conditional associative learning	0.5135	0.6123	0.7564
978	THINGS odd-one-out	0.7852	1.1657	0.8343
978	Multi-attribute decision-making	0.0619	0.1502	0.1922
979	Two-step task	0.5050	0.6048	nan
980	Probabilistic instrumental learning	0.4937	0.5382	0.4989
981	Medin categorization	0.4967	0.5772	0.5335
982	Zoopermarket	0.4850	0.6026	0.6061
982	choices13k	0.4318	0.5493	0.6564
983	CPC18	0.3390	0.4118	0.6609
984	Intertemporal choice	0.4383	0.7386	0.6590
985	Structured bandit	0.6410	0.8114	1.0114
986	Weather prediction task	0.5514	0.5749	0.6267
986	Iowa gambling task	0.9012	1.0007	1.1787
987	Virtual subway network	1.1237	1.5540	nan
988	Multi-task reinforcement learning	0.5672	0.6604	1.0299
989	Serial reaction time task	0.1718	0.1900	0.1962
990	Decisions from description	0.5907	0.9133	0.6111
990	Decisions from experience	0.4688	0.6497	0.5452
991	Changing bandit	0.3025	0.3824	0.4378
992	Multiple-cue judgment	1.1232	1.2815	1.9237
993	Recall and recognition	1.0587	1.3754	nan
994	Experiential-symbolic task	0.4534	0.6980	nan
994	Grammar judgement	1.4351	1.9945	1.4127
995	Risky choice	0.4278	0.6472	nan
996	Tile-revealing task	1.8728	2.7374	nan
997	Episodic long-term memory	0.8680	1.1335	nan
998	Aversive learning	4.0729	5.1057	nan
998	Spatially correlated multi-armed bandit	1.8321	2.4475	2.7928
999	Probabilistic reasoning	2.3730	2.6405	nan

Table 3 Full negative log-likelihoods results on held-out participants.

1004 Regression results

1006 We conducted a regression analysis using the per-experiment difference in pseudo-R²
1007 values between Centaur and Llama as a target variable and the number of participants,
1008 the number of choices, the number of text characters, and the experiment domain as
1009 regressors. We found positive effects for all domains, indicating that finetuning was

beneficial for every type of experiment (see Figure 5a). Furthermore, while we did find a positive effect for the number of participants ($\beta = 2.42 \times 10^{-5}$, $p = 0.003$), the number of choices and text characters did not contribute significantly to the improvement in goodness-of-fit (see Figure 5b).

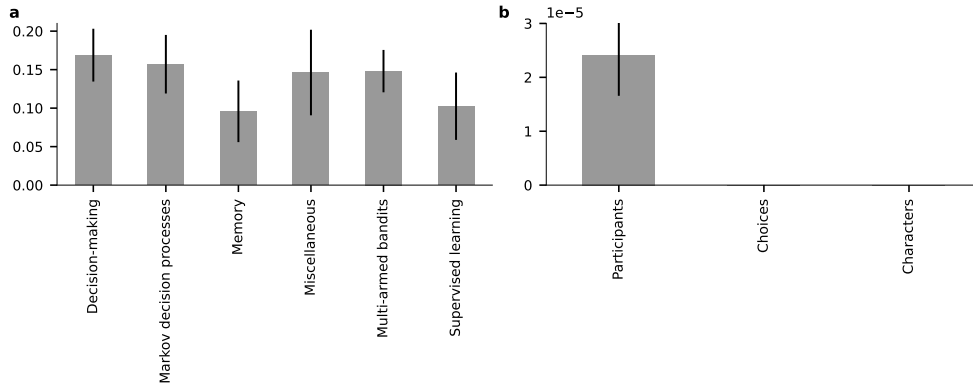


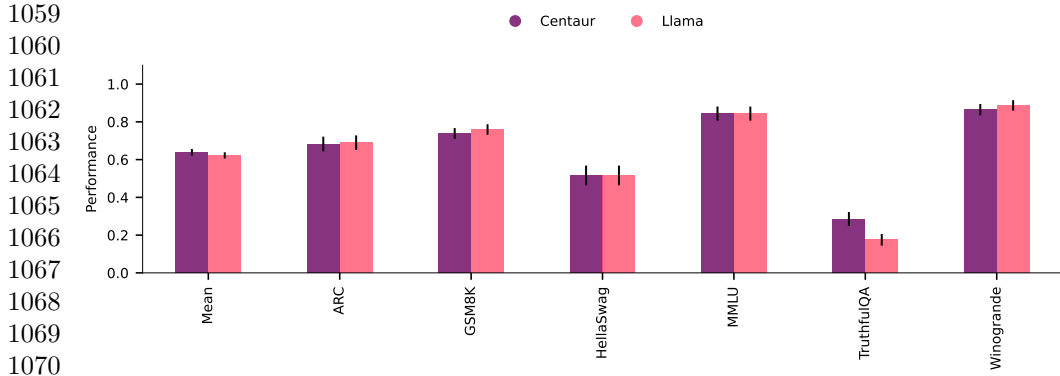
Fig. 5 Regression analysis. **a**, Influence of experiment domain on difference in pseudo-R² values. **b**, Influence of prompt properties on difference in pseudo-R² values. Positive values for a given variable indicate that finetuning led to an improved goodness-of-fit. Error bars depict the standard error.

Benchmarks

metabench

Figure 6 shows additional results in `metabench`, a sparse benchmark containing several canonical benchmarks from the machine learning literature [30]. We find that Centaur maintains the level of performance of Llama, indicating that finetuning on human behavior did not lead to deterioration in other tasks. Performance on TruthfulQA [62] – which measures how models mimic human falsehoods – even improved significantly with finetuning. We refer the reader to [30] for further details.

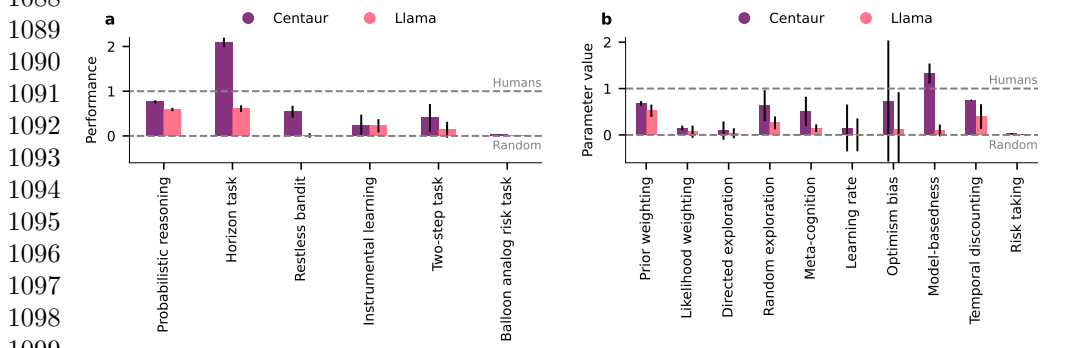
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1073 **Fig. 6** metabench [30] results.
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 1077 **CogBench**

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 1079 Figure 7 shows additional results in CogBench, a benchmark that includes ten behav-
 1080
 1081 iorral metrics derived from seven cognitive psychology experiments [29]. We find that –
 1082
 1083 relative to Llama – Centaur’s performance improves in all experiments (see Figure 7a).
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 1085 Furthermore, Centaur becomes more similar to human subjects in all ten behavioral
 1086
 1087 metrics (see Figure 7b). We refer the reader to [29] for further details.
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 1100 **Fig. 7** CogBench [29] results. **a**, Performance-based metrics. **b**, Behavioral metrics. All metrics are
 1101
 1102 human-normalized: a value of zero corresponds to a random agent, while a value of one corresponds
 1103
 1104 to the average human subject.

Newell test	1105
	1106
Together with his call for unified theories of cognition [2], Newell outlined a set of	1107
criteria that a unified computational model should fulfill. In the following, we discuss	1108
Centaur in the light of a modified version proposed by Anderson and Lebiere [36].	1109
	1110
	1111
	1112
Behave as an (almost) arbitrary function of the environment	1113
	1114
This is the most important criterion according to Newell. Centaur fulfills it more than	1115
any previous model as shown by our extensive analysis. Yet, Centaur’s scope is still	1116
limited to psychological experiments that can be expressed in natural language. It	1117
will be an important avenue for future research to transfer this ability to real-world	1118
applications.	1119
	1120
	1121
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Operate in real time	1125
	1126
Centaur can simulate human behavior in (almost) real-time. For example, running an	1127
open-loop simulation of a typical two-step task experiment takes around 30 minutes,	1128
while it takes around 20 minutes for the average human participant. We believe that	1129
inference time could be further optimized to fully close this gap.	1130
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Exhibit rational, that is, effective adaptive behavior	1135
	1136
Bayesian inference is the gold standard for rational and adaptive behavior [63]. Pre-	1137
vious work has shown that systems that engage in in-context learning implement	1138
Bayesian inference implicitly [64]. In-context learning is at the heart of Centaur,	1139
thereby making it a rational and adaptive system.	1140
	1141
	1142
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	1144
Use vast amounts of knowledge about the environment	1145
	1146
Large language models are the biggest knowledge bases we have to date. As Centaur	1147
is built on top of a state-of-the-art language model, it fulfills this criterion by design.	1148
	1149
	1150

1151 **Behave robustly in the face of error, the unexpected, and the**
1152
1153 **unknown**
1154
1155 Our extensive out-of-distribution evaluations clearly demonstrate that Centaur has
1156 this ability.
1157
1158
1159 **Integrate diverse knowledge**
1160
1161 This was originally a criterion on symbols and abstractions [2]. At the basic level,
1162 Centaur is a system that processes language. Language is a symbolic system, meaning
1163 that Centaur fulfills this criterion.
1164
1165
1166
1167 **Use (natural) language**
1168
1169 No further elaboration is required.
1170
1171
1172 **Exhibit self-awareness and a sense of self**
1173
1174 This is a tricky criterion as Centaur is trained on a population of individuals. Yet,
1175 to make good predictions about the future, Centaur needs to make inferences about
1176 the person who has produced a given trajectory, and in order to do that it requires a
1177 representation of that person [65].
1178
1179
1180
1181
1182 **Learn from its environment**
1183
1184 Psych-101 contains many experiments that require learning from an environment.
1185 Centaur does well in those experiments, thereby clearly satisfying this criterion.
1186
1187
1188
1189 **Acquire capabilities through development**
1190
1191 Centaur makes no claims about how human behavior might arise through development.
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1193
1194 **Arise through evolution**
1195
1196 Centaur makes no claims about how human behavior might arise through evolution.

Be realizable within the brain	1197
	1198
We have shown that Centaur’s internal representations are robust predictors of human	1199
neural activity. Even though there is clearly a gap between the transformer architecture	1200
that Centaur is based on and the human brain, Centaur still represents the current	1201
state-of-the-art when looking at neural alignment to human subjects.	1202
	1203
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Modeling details	1207
	1208
In the following, we list the domain-specific cognitive and statistical models used in	1209
our comparison. Each model was implemented in PyTorch [66]. We optimized a joint	1210
set of parameters for all participants in the training data by maximizing log-likelihoods	1211
of their choices and then evaluated how well a model with these parameters predicts	1212
choices of held-out participants. The optimization procedure involved 1000 iterations	1213
over the entire training set, and relied on a gradient-based algorithm [67] with an	1214
initial learning rate of 0.1. We use $\mathbb{1}$ to denote the indicator function that takes a	1215
value of one if the argument is true and zero otherwise.	1216
	1217
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Generalized context model	1224
	1225
Reference: [19]	1226
This model was used for the following experiments:	1227
	1228
• Shepard categorization	1229
	1230
• Medin categorization	1231
	1232
• Weather prediction task	1233
	1234
It uses the following log-likelihood:	1235
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1243 where \mathbf{x}_t are the features of the item observed at trial t and y_t is the corresponding
 1244 class label. β is a free parameter of the model.

1245

1247 Prospect theory model

1248

1249 Reference: [20]

1251 This model was used for the following experiments:

1252

1253 • CPC18

1254

1255 • choices13k

1256

1257 • Decisions from description

1258

1259 It uses the following log-likelihood:

1260

1261

$$1262 p(c_t = i | p_i = \mathbf{p}_i, x_i = \mathbf{x}_i) \propto \exp \left(\exp(\beta) \left(\pi(\mathbf{p}_i)^\top u(\mathbf{x}_i) \right) \right)$$

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1264

$$\pi(\mathbf{p}_i) = \text{sigmoid}(a) + \text{sigmoid}(b) \cdot \mathbf{p}_i$$

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1272 where \mathbf{p}_i is the vector of probabilities and \mathbf{x}_i is the vector of values for each possible

1273

1273 outcome in option i . β, a, b, c, d, e, f , and g are free parameters of the model.

1274

1275

1276 Hyperbolic discounting model

1277

1278 Reference: [68]

1279

1280 This model was used for the following experiments:

1281

1282 • Intertemporal choice

1283

1284 It uses the following log-likelihood:

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1286

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1288

$$p(c_t = i | x_i = x_i, \gamma_i = \gamma_i) \propto \exp \left(\beta \left(x_i \cdot \frac{1}{1 + (a \cdot \gamma_i)} \right) \right)$$

where x_i is the reward and γ_i is the delay of delivery for option i . β and a are free parameters of the model.

Dual-systems model

Reference: [21]

This model was used for the following experiments:

- Two-step task

It uses the following log-likelihood:

$$p(c_t = i | s_t = s) \propto \begin{cases} \exp(\beta (\text{sigmoid}(\tau) Q_{s,i}^{\text{MB}} + (1 - \text{sigmoid}(\tau)) Q_{s,i}^{\text{MF}})) & \text{if } s = 0 \\ \exp(\beta Q_{s,i}^{\text{MF}}) & \text{if } s > 0 \end{cases}$$

where $Q_{s,i}^{\text{MB}}$ and $Q_{s,i}^{\text{MF}}$ are model-based and model-free value estimates that are computed as described in [21]. β and τ are free parameters of the model. We also included a stickiness term for the first stage choices, which is omitted for brevity in the equations above.

Rescorla-Wagner model

Reference: [22]

This model was used for the following experiments:

- Drifting four-armed bandit
- Horizon task
- Two-armed bandit
- Probabilistic instrumental learning
- Iowa gambling task
- Changing bandit
- Decisions from experience

1335 It uses the following log-likelihood:

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1338 $p(c_t = i) \propto \exp(aV_{i,t} + bS_{i,t} + cI_{i,t})$

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$$V_{i,t} = \begin{cases} V_{i,t-1} + \text{sigmoid}(\alpha^+)(r_{t-1} - V_{i,t-1}) & \text{if } c_{t-1} = i \text{ and } r_{t-1} - V_{i,t-1} \geq 0 \\ V_{i,t-1} + \text{sigmoid}(\alpha^-)(r_{t-1} - V_{i,t-1}) & \text{if } c_{t-1} = i \text{ and } r_{t-1} - V_{i,t-1} < 0 \\ V_{i,t-1} & \text{otherwise} \end{cases}$$

$$S_{i,t} = \mathbb{1}[c_{t-1} = i]$$

$$I_{i,t} = \sum_{k=1}^{t-1} \mathbb{1}[c_k = i]$$

$$V_{i,1} = d$$

$$S_{i,1} = 0$$

$$I_{i,1} = 0$$

1359 where r_t is the reward obtained in trial t . α^+ , α^- , a , b , c , and d are free parameters

1360 of the model.

1363 Rescorla-Wagner model with context

1365 Reference: [69]

1367 This model was used for the following experiments:

- 1369 • Conditional associative learning

1371 It uses the following log-likelihood:

1375 $p(c_t = i | s_t = s) \propto \exp(\beta V_{s,i,t})$

$$V_{s,i,t} = \begin{cases} V_{s,i,t-1} + \text{sigmoid}(\alpha)(r_{t-1} - V_{s,i,t-1}) & \text{if } c_{t-1} = i \text{ and } s_{t-1} = s \\ V_{s,i,t-1} & \text{otherwise} \end{cases}$$

$$V_{s,i,1} = d$$

where r_t is the reward obtained in trial t . α , β , and d are free parameters of the model.

Linear regression model

Reference: [70]

This model was used for the following experiments:

- Multiple-cue judgment
- Gardening task

It uses the following log-likelihood for multiple-cue judgment:

$$p(c_t = i | x_t = \mathbf{x}_t) \propto \exp\left(-\beta (\mathbf{w}_t^\top \mathbf{x}_t - i)^2 + \gamma\right)$$

It uses the following log-likelihood for the gardening task:

$$p(c_t = \text{accept} | x_t = \mathbf{x}_t) \propto \exp(\beta \mathbf{w}_t^\top \mathbf{x}_t)$$

$$p(c_t = \text{reject} | x_t = \mathbf{x}_t) \propto \exp(0)$$

and the following learning rule for both tasks:

$$\mathbf{w}_t = \mathbf{w}_{t-1} + \alpha (r_{t-1} - \mathbf{w}_{t-1}^\top \mathbf{x}_{t-1}) \mathbf{x}_{t-1}$$

$$\mathbf{w}_1 = \mathbf{d}$$

where r_t is the reward obtained in trial t and \mathbf{x}_t are the observed features. α , β , γ , and \mathbf{d} are free parameters of the model.

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1427 **Weighted-additive model**

1428

1429 Reference: [71]

1430

1431 This model was used for the following experiments:

1432

- 1433 • Multi-attribute decision-making

1434

1435 It uses the following log-likelihood:

1436

1437

1438

1439

$$p(c_t = i | x_i = \mathbf{x}_i) \propto \exp(\mathbf{w}^\top \mathbf{x}_i)$$

1440

1441

1442 where \mathbf{x}_i is the vector of features for option i . \mathbf{w} are free parameters of the model.

1443

1444

1445 **Decision-updated reference point model**

1446

1447 Reference: [72]

1448

1449 This model was used for the following experiments:

1450

- 1451 • Columbia card task

1452

1453 It uses the following log-likelihood:

1454

1455

1456 $p(c_t = \text{sample} | x_{\text{win}}, x_{\text{loss}}, p_{\text{win}}, p_{\text{loss}}) \propto \exp(h \cdot (x_{\text{win}} \cdot p_{\text{win}} + x_{\text{loss}} \cdot p_{\text{loss}}) + i)$

1457

1458 $p(c_t = \text{stop} | x_{\text{win}}, x_{\text{loss}}, p_{\text{win}}, p_{\text{loss}}) \propto \exp(j)$

1459

1460

$$\pi(p) = \text{sigmoid}(a) + \text{sigmoid}(b) \cdot p$$

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1466

$$u(v) = \begin{cases} \text{sigmoid}(c) \cdot v^{\text{sigmoid}(d)} & \text{where } v \geq 0 \\ -\text{sigmoid}(e) \cdot (-\text{sigmoid}(f) v)^{\text{sigmoid}(g)} & \text{where } v < 0 \end{cases}$$

1467 where x_{win} and x_{loss} are the values that can be won or lost respectively, and p_{win}

1468

1469 and p_{loss} are the corresponding probabilities. $a, b, c, d, e, f, g, h, i$, and j are free

1470

1471 parameters of the model.

1472

Odd-one-out model	1473
	1474
Reference: [73]	1475
This model was used for the following experiments:	1476
	1477
	1478
• THINGS odd-one-out	1479
	1480
It uses the following log-likelihood:	1481
	1482
	1483
	1484
	1485
	1486
	1487
	1488
where x_i , x_j , and x_k are the observed objects with their corresponding embeddings	1488
\mathbf{x}_i , \mathbf{x}_j , and $\mathbf{x}_k \in \mathbb{R}^{16}$ that are free parameters of the model.	1489
	1490
	1491
	1492
Multi-task reinforcement learning model	1493
	1494
Reference: [74]	1495
This model was used for the following experiments:	1496
	1497
	1498
• Multi-task reinforcement learning	1499
	1500
• Zoopermarket	1501
	1502
	1503
GP-UCB model	1504
	1505
Reference: [18]	1506
This model was used for the following experiments:	1507
	1508
	1509
• Spatially correlated multi-armed bandit	1510
	1511
• Structured bandit	1512
	1513
It uses the following log-likelihood:	1514
	1515
	1516
	1517
	1518

1519 where $\mathbf{m}_{i,t}$ and $\mathbf{s}_{i,t}$ are obtained via Gaussian Process regression with a radial basis
1520 function kernel as described in [18]. β and γ are free parameters of the model.

1522

1523 **Rational model**

1524

1525 Reference: N/A

1527 This model was used for the following experiments:

1528

1529 • Balloon analog risk task

1530

1531 • N-back

1532

1533 • Digit span

1534 • Go/no-go

1535

1536 • Recent probes

1537

1538 • Serial reaction time task

1539

1540 It uses the following log-likelihood:

1541

1542

$$1543 \quad p(c_t = i | o_t = j) \propto \exp(\Theta_{j,i})$$

1544

1545

1546 where j is the optimal choice at trial t . $\Theta \in \mathbb{R}^{N_c \times N_c}$ are free parameters of the model.

1547

1548

1549 **Lookup table model**

1550

1551 Reference: N/A

1552

1553 This model was used for the following experiments:

1554

1555 • Grammar judgement

1556

1557

1558 It uses the following log-likelihood:

1559

1560

$$1561 \quad p(c_t = i) \propto \exp(\Theta_{t,i})$$

1562

1563

1564

where $\Theta \in \mathbb{R}^{T \times N_c}$ are free parameters of the model.

Psych-101 data

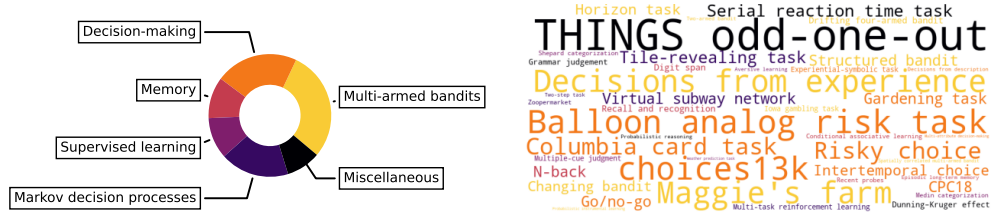


Fig. 8 Visual summary of Psych-101. The left panel shows the proportion of included domains. The right panel shows a word cloud with the included experimental paradigms.

The following sections present the included experiments in detail. Example prompts are truncated to 4096 characters but otherwise shown as is.

Shepard categorization

Data source: [75]

Number of experiments: 1

Number of participants: 85

Number of choices: 29776

Example prompt:

You will be shown several examples of geometric objects.

Your task is to learn a rule that allows you to tell whether an object belongs to the E or K category.

For each presented object, you will be asked to make a category judgment by pressing the corresponding key and then you will receive feedback.

You will encounter four different problems with different rules.

1611
1612
1613 You encounter a new problem with a new rule determining which objects belong to
1614 each category:
1615
1616 You see a big black square. You press <<K>>. The correct category is K.
1617
1618 You see a small black triangle. You press <<K>>. The correct category is E.
1619 You see a big white triangle. You press <<E>>. The correct category is K.
1620
1621 You see a small white triangle. You press <<E>>. The correct category is E.
1622
1623 You see a small white square. You press <<E>>. The correct category is E.
1624
1625 You see a small black square. You press <<K>>. The correct category is E.
1626
1627 You see a big white square. You press <<E>>. The correct category is K.
1628
1629 You see a big black triangle. You press <<E>>. The correct category is K.
1630
1631 You see a big white square. You press <<E>>. The correct category is K.
1632
1633 You see a small white triangle. You press <<K>>. The correct category is E.
1634
1635 You see a small black triangle. You press <<K>>. The correct category is E.
1636
1637 You see a big white triangle. You press <<E>>. The correct category is K.
1638
1639 You see a small white square. You press <<K>>. The correct category is E.
1640
1641 You see a small black square. You press <<K>>. The correct category is E.
1642
1643 You see a big black triangle. You press <<E>>. The correct category is K.
1644
1645 You see a small white square. You press <<E>>. The correct category is E.
1646
1647 You see a small black square. You press <<E>>. The correct category is E.
1648
1649 You see a big white triangle. You press <<K>>. The correct category is K.
1650
1651 You see a small black triangle. You press <<K>>. The correct category is E.
1652
1653 You see a small white triangle. You press <<E>>. The correct category is E.
1654
1655 You see a big white square. You press <<K>>. The correct category is K.
1656
1657 You see a big black triangle. You press <<E>>. The correct category is K.
1658
1659 You see a big black square. You press <<E>>. The correct category is K.

1703 **Drifting four-armed bandit**

1704

1705 Data source: [76]

1706

1707

1708 Number of experiments: 1

1709

1710 Number of participants: 869

1711

1712 Number of choices: 125952

1713

1714

1715 **Example prompt:**

1716

1717 You will be asked to repeatedly choose between four different options labeled L, G,

1718 O, and U.

1719

1720 You select an option by pressing the corresponding key on your keyboard.

1721

1722 Each time you select an option, you will get a different number of points.

1723

1724 Your goal is to win as many points as possible.

1725

1726

1727 You press <<L>> and get 84.0 points.

1728

1729 You press <<G>> and get 90.0 points.

1730

1731 You press <<O>> and get 53.0 points.

1732

1733 You press <<U>> and get 24.0 points.

1734

1735 You press <<G>> and get 92.0 points.

1736

1737 You press <<G>> and get 78.0 points.

1738

1739 You press <<L>> and get 71.0 points.

1740

1741 You press <<L>> and get 75.0 points.

1742

1743 You press <<G>> and get 80.0 points.

1744

1745 You press <<G>> and get 80.0 points.

1746

1747 You press <<G>> and get 91.0 points.

1748

1749 You press <<G>> and get 90.0 points.

1750

1751 You press <<U>> and get 29.0 points.

1752

You press <<O>> and get 45.0 points.	1749
You press <<G>> and get 81.0 points.	1750
You press <<G>> and get 75.0 points.	1751
You press <<G>> and get 82.0 points.	1752
You press <<G>> and get 82.0 points.	1753
You press <<G>> and get 82.0 points.	1754
You press <<G>> and get 82.0 points.	1755
You press <<G>> and get 87.0 points.	1756
You press <<G>> and get 87.0 points.	1757
You press <<G>> and get 85.0 points.	1758
You press <<G>> and get 85.0 points.	1759
You press <<G>> and get 87.0 points.	1760
You press <<G>> and get 87.0 points.	1761
You press <<G>> and get 87.0 points.	1762
You press <<G>> and get 79.0 points.	1763
You press <<G>> and get 75.0 points.	1764
You press <<G>> and get 75.0 points.	1765
You press <<L>> and get 61.0 points.	1766
You press <<O>> and get 40.0 points.	1767
You press <<U>> and get 37.0 points.	1768
You press <<G>> and get 72.0 points.	1769
You press <<G>> and get 73.0 points.	1770
You press <<G>> and get 73.0 points.	1771
You press <<L>> and get 66.0 points.	1772
You press <<G>> and get 57.0 points.	1773
You press <<L>> and get 64.0 points.	1774
You press <<L>> and get 63.0 points.	1775
You press <<L>> and get 61.0 points.	1776
You press <<L>> and get 61.0 points.	1777
You press <<O>> and get 54.0 points.	1778
You press <<U>> and get 30.0 points.	1779
You press <<L>> and get 59.0 points.	1780
You press <<O>> and get 56.0 points.	1781
You press <<O>> and get 46.0 points.	1782
You press <<L>> and get 59.0 points.	1783
	1784
	1785
	1786
	1787
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	1793
	1794

1795 You press <<G>> and get 63.0 points.
1796
1797 You press <<G>> and get 63.0 points.
1798 You press <<G>> and get 58.0 points.
1799
1800 You press <<L>> and get 53.0 points.
1801
1802 You press <<O>> and get 60.0 points.
1803 You press <<O>> and get 59.0 points.
1804
1805 You press <<L>> and get 52.0 points.
1806
1807 You press <<O>> and get 54.0 points.
1808 You press <<U>> and get 23.0 points.
1809
1810 You press <<G>> and get 52.0 points.
1811
1812 You press <<O>> and get 52.0 points.
1813 You press <<L>> and get 67.0 points.
1814
1815 You press <<L>> and get 71.0 points.
1816
1817 You press <<L>> and get 71.0 points.
1818 You press <<L>> and get 69.0 points.
1819
1820 You press <<G>> and get 46.0 points.
1821
1822 You press <<O>> and get 47.0 points.
1823 You press <<U>> and get 19.0 points.
1824
1825 You press <<L>> and get 63.0 points.
1826
1827 You press <<L>> and get 58.0 points.
1828 You press <<L>> and get 62.0 points.
1829
1830 You press <<L>> and get 53.0 points.
1831
1832 You press <<L>> and get 59.0 points.
1833 You press <<L>> and get 65.0 points.
1834
1835 You press <<G>> and get 58.0 points.
1836
1837 You press <<O>> and get 54.0 points.
1838 You press <<L>> and get 61.0 points.
1839
1840

You press <<G>> and get 66.0 points.	1841
You press <<O>> and get 62.0 points.	1842
You press <<O>> and get 62.0 points.	1843
You press <<L>> and get 61.0 points.	1844
You press <<L>> and get 61.0 points.	1845
You press <<G>> and get 56.0 points.	1846
You press <<G>> and get 56.0 points.	1847
You press <<O>> and get 58.0 points.	1848
You press <<L>> and get 49.0 points.	1849
You press <<L>> and get 49.0 points.	1850
You press <<O>> and get 50.0 points.	1851
You press <<G>> and get 63.0 points.	1852
You press <<G>> and get 63.0 points.	1853
You press <<G>> and get 68.0 points.	1854
You press <<G>> and get 68.0 points.	1855
You press <<G>> and get 56.0 points.	1856
You press <<G>> and get 56.0 points.	1857
You press <<G>> and get 59.0 points.	1858
You press <<G>> and get 59.0 points.	1859
You press <<G>> and get 66.0 points.	1860
You press <<G>> and get 56.0 points.	1861
You press <<G>> and get 56.0 points.	1862
You press <<G>> and get 56.0 points.	1863
You press <<L>> and get 48.0 points.	1864
You press <<L>> and get 48.0 points.	1865
You press <<G>> and get 59.0 points.	1866
You press <<G>> and get 59.0 points.	1867
You press <<G>> and get 55.0 points.	1868
You press <<G>> and get 55.0 points.	1869
You press <<O>> and get 51.0 points.	1870
You press <<O>> and get 58.0 points.	1871
You press <<O>> and get 58.0 points.	1872
You press <<O>> and get 51.0 points.	1873
You press <<O>> and get 51.0 points.	1874
You press <<O>> and get 62.0 points.	1875
You press <<O>> and get 64.0 points.	1876
You press <<O>> and get 64.0 points.	1877
You press <<O>> and get 60.0 points.	1878
You press <<O>> and get 60.0 points.	1879
You press <<O>> and get 62.0 points.	1880
You press <<O>> and get 64.0 points.	1881
You press <<O>> and get 64.0 points.	1882
You press <<O>> and get 50.0 points.	1883
You press <<O>> and get 50.0 points.	1884
You press <<U>> and get 40.0 points.	1885
You press <<U>> and get 40.0 points.	1886

1887 You press <<O>> and get 50.0 points.
1888
1889 You press <<G>> and get 49.0 points.
1890 You press <<L>> and get 33.0 points.
1891
1892 You press <<G>> and get 55.0 points.
1893
1894 You press <<O>> and get 78.0 points.
1895 You press <<O>> and get 79.0 points.
1896
1897 You press <<O>> and get 85.0 points.
1898
1899 You press <<O>> and get 82.0 points.
1900 You press <<O>> and get 83.0 po

1901
1902

1903 **Multiple-cue judgment**

1904

1905 Data source: [77]

1906

1907

1908

1909 Number of experiments: 3

1910 Number of participants: 232

1911

1912 Number of choices: 52464

1913

1914

1915 **Example prompt:**

1916

1917 Your task is to estimate the blood concentration of the hormone Caldionine based on
1918 information about the amount of two other hormones, Progladine and Amalydine, in
1919 multiple individuals' urine.
1920

1921
1922 Both Progladine and Amalydine can take five values (very little, a little, average, a
1923 lot, very much).
1924

1925 Caldionine can take nine values (extremely low, very low, low, somewhat low, normal,
1926 somewhat high, high, very high, extremely high).
1927

1928

1929 Your goal is to estimate the concentration of Caldionine correctly.

1930 You will receive feedback about the actual concentration after making your estimate.

1931

1932 This feedback will stop at some point.

	1933
	1934
Progladine: a lot. Amalydine: very much. You say that the Caldionine concentration	1935
is <<high>>. That is incorrect. The correct concentration of Caldionine is somewhat	1936
low.	1937
	1938
	1939
Progladine: average. Amalydine: a lot. You say that the Caldionine concentration	1940
is <<somewhat low>>. That is correct. The correct concentration of Caldionine is	1941
indeed somewhat low.	1942
	1943
	1944
Progladine: a lot. Amalydine: average. You say that the Caldionine concentration is	1945
<<normal>>. That is incorrect. The correct concentration of Caldionine is somewhat	1946
high.	1947
	1948
	1949
Progladine: average. Amalydine: a little. You say that the Caldionine concentration	1950
is <<low>>. That is incorrect. The correct concentration of Caldionine is somewhat	1951
high.	1952
	1953
	1954
Progladine: a little. Amalydine: average. You say that the Caldionine concentration	1955
is <<normal>>. That is incorrect. The correct concentration of Caldionine is some-	1956
what low.	1957
	1958
	1959
Progladine: a lot. Amalydine: a little. You say that the Caldionine concentration is	1960
<<very high>>. That is incorrect. The correct concentration of Caldionine is high.	1961
	1962
Progladine: very little. Amalydine: very little. You say that the Caldionine concen-	1963
tration is <<normal>>. That is correct. The correct concentration of Caldionine is	1964
indeed normal.	1965
	1966
	1967
Progladine: very much. Amalydine: a little. You say that the Caldionine concentration	1968
is <<very high>>. That is correct. The correct concentration of Caldionine is indeed	1969
very high.	1970
	1971
	1972
Progladine: a lot. Amalydine: very little. You say that the Caldionine concentration	1973
is <<very high>>. That is correct. The correct concentration of Caldionine is indeed	1974
very high.	1975
	1976
	1977
	1978

1979 Progladine: a little. Amalydine: a little. You say that the Caldionine concentration is
1980
1981 <<normal>>. That is correct. The correct concentration of Caldionine is indeed nor-
1982 mal.
1983
1984 Progladine: a little. Amalydine: very little. You say that the Caldionine concentration
1985
1986 is <<somewhat high>>. That is correct. The correct concentration of Caldionine is
1987 indeed somewhat high.
1988
1989 Progladine: very little. Amalydine: a little. You say that the Caldionine concentration
1990
1991 is <<somewhat low>>. That is correct. The correct concentration of Caldionine is
1992 indeed somewhat low.
1993
1994 Progladine: very much. Amalydine: a lot. You say that the Caldionine concentration is
1995
1996 <<very high>>. That is incorrect. The correct concentration of Caldionine is some-
1997 what high.
1998
1999 Progladine: a little. Amalydine: very much. You say that the Caldionine concentration
2000
2001 is <<very low>>. That is correct. The correct concentration of Caldionine is indeed
2002 very low.
2003
2004 Progladine: average. Amalydine: very much. You say that the Caldionine concentra-
2005
2006 tion is <<low>>. That is correct. The correct concentration of Caldionine is indeed
2007 low.
2008
2009 Progladine: very much. Amalydine: average. You say that the Caldionine concentration
2010
2011 is <<somewhat high>>. That is incorrect. The correct concentration of Caldionine
2012 is high.
2013
2014 Progladine: average. Amalydine: very little. You say that the Caldionine concentra-
2015
2016 tion is <<high>>. That is correct. The correct concentration of Caldionine is indeed
2017 high.
2018
2019 Progladine: a little. Amalydine: a lot. You say that the Caldionine concentration is
2020
2021 <<normal>>. That is incorrect. The correct concentration of Caldionine is low.
2022 Progladine: very much. Amalydine: very much. You say that the Caldionine concen-
2023
2024 tration is <<normal>>. That is correct. The correct concentration of Caldionine is

indeed normal.	2025
Progladine: a lot. Amalydine: a lot. You say that the Caldionine concentration is	2026
<<normal>>. That is correct.	2027
	2028
	2029
	2030
Recall and recognition	2031
	2032
Data source: [78]	2033
	2034
	2035
	2036
Number of experiments: 1	2037
Number of participants: 424	2038
	2039
Number of choices: 109201	2040
	2041
	2042
Example prompt:	2043
	2044
You study the following 20 word pairs:	2045
FILE, GERMAN	2046
	2047
STANDS, RISES	2048
	2049
OFFICER, FUEL	2050
	2051
CLASSROOM, JOURNEY	2052
	2053
TERRITORY, EDUCATIONAL	2054
	2055
TRANSPORTATION, AGREEMENT	2056
	2057
SIGNIFICANT, SPECIALIZED	2058
	2059
TUBE, ENEMY	2060
	2061
CLUB, RAPID	2062
	2063
LEGAL, CONCEPT	2064
	2065
TOWARDS, VICTORY	2066
	2067
RARELY, BAY	2068
	2069
ELECTION, ROYAL	2070
BELONG, SUPREME	
FRIGHTENED, PLAINS	

2071 SLAVES, FILM
2072
2073 STOMACH, WHISPERED
2074 NURSE, GOLDEN
2075
2076 POLITICS, WINGS
2077
2078 BOXES, TOM
2079
2080
2081 You will now view a single pair of words.
2082
2083 Your task is to indicate if the pair of words you see on the screen was studied as a
2084 pair on the list you just studied (by pressing D) or was not a pair (by pressing N).
2085
2086
2087
2088 You view the word pair SPECIALIZED, POLITICS. You press <<N>>.
2089 You view the word pair TOWARDS, VICTORY. You press <<D>>.
2090
2091 You view the word pair SUPREME, BELONG. You press <<D>>.
2092
2093 You view the word pair WINGS, OFFICER. You press <<D>>.
2094 You view the word pair CONCEPT, FRIGHTENED. You press <<N>>.
2095
2096 You view the word pair GERMAN, NURSE. You press <<N>>.
2097
2098 You view the word pair BAY, RARELY. You press <<D>>.
2099 You view the word pair FILE, GOLDEN. You press <<N>>.
2100
2101 You view the word pair JOURNEY, LEGAL. You press <<N>>.
2102
2103 You view the word pair CLASSROOM, ENEMY. You press <<N>>.
2104 You view the word pair ROYAL, ELECTION. You press <<D>>.
2105
2106 You view the word pair BOXES, TOM. You press <<D>>.
2107
2108 You view the word pair TERRITORY, EDUCATIONAL. You press <<D>>.
2109 You view the word pair WHISPERED, STOMACH. You press <<D>>.
2110
2111 You view the word pair STANDS, RISES. You press <<D>>.
2112
2113 You view the word pair AGREEMENT, TUBE. You press <<N>>.
2114 You view the word pair FUEL, TRANSPORTATION. You press <<N>>.
2115
2116

You view the word pair CLUB, RAPID. You press <<D>>.	2117
	2118
You view the word pair SLAVES, FILM. You press <<D>>.	2119
	2120
You view the word pair PLAINS, SIGNIFICANT. You press <<N>>.	2121
	2122
	2123
You study the following 20 word pairs:	2124
METALS, BEAUTY	2125
	2126
SHORE, COLONISTS	2127
	2128
HIGHEST, FASHION	2129
	2130
INFLUENCED, FLEW	2131
	2132
SHADOW, GRANDFATHER	2133
	2134
MOTOR, DISAPPEARED	2135
	2136
DETAIL, SHOULDERS	2137
	2138
REPORTS, MALE	2139
	2140
PAINT, COMMUNITIES	2141
	2142
STORM, RESULTING	2143
	2144
SELECTION, NIGHTS	2145
	2146
APPLICATION, FELLOW	2147
	2148
DESIGN, PRINCIPLE	2149
	2150
POSSIBILITY, AFRICAN	2151
	2152
REMOVE, TRAIL	2153
	2154
STAFF, JUSTICE	2155
	2156
SECTIONS, TRADITIONAL	2157
	2158
CLAY, MIXED	2159
	2160
TEA, AGRICULTURE	2161
	2162
PATIENT, LIMIT	
You will now view a single word item.	

2163 Your task is to type the other word in the pair.
2164
2165 For example if you studied BRICK, BRACK and you now see BRICK, your response
2166 should be BRACK.
2167
2168 The spelling does not matter; focus on providing as many responses as possible.
2169
2170 If you cannot recall the word, answer DON'T REMEMBER.
2171
2172
2173 You view the word STAFF. You answer <<JUSTICE>>.
2174
2175 You view the word MOTOR. You answer <<DON'T REMEMBER>>.
2176
2177 You view the word INFLUENCED. You answer <<DON'T REMEMBER>>.
2178
2179 You view the word DETAIL. You answer <<SHOULDER>>.
2180
2181 You view the word REMOVE. You answer <<DON'T REMEMBER>>.
2182
2183 You view the word PATIENT. You answer <<LIMITED>>.
2184
2185 You view the word PAINT. You answer <<COMMUNITY>>.
2186
2187 You view the word STORM. You answer <<RESULTS>>.
2188
2189 You view the word TEA. You answer <<ARIGCULTURE>>.
2190
2191 You view the word SHADOW. You answer <<GRANDFATHER>>.
2192
2193 You view the word APPLICATION. You answer <<FELLOW>>.
2194
2195 You view the word METALS. You answer <<BEAUTY>>.
2196
2197 You view the word POSSIBILITY. You answer <<AFRICANS>>.
2198
2199 You view the word DESIGN. You answer <<PRINCIPLE>>.
2200
2201 You view the word SHORE. You answer <<DON'T REMEMBER>>.
2202
2203 You view the word REPORTS. You answer <<DON'T REMEMBER>>.
2204
2205 You view the word SECTIONS. You answer <<DON'T REMEMBER>>.
2206
2207
2208
2209 You view the word SELECTION. You answer <<DON'T REMEMBER>>.

You study the following 20 word pairs:	2209
DEFENSE, EXPANSION	2210
PROGRESS, PROMISE	2211
EGG, ATTRACTIVE	2212
CRYING, RECOGNIZE	2213
PURE, AUNT	2214
OBTAINED, FEATURE	2215
TRAVELED, FLOWER	2216
INCREASINGLY, FEMALE	2217
POURED, VALUABLE	2218
TIGHT, HOLDS	2219
BIGGER, HONOR	2220
DRUG, SPENDING	2221
DOUBLE, OUTPUT	2222
ESTABLISH, CRITICAL	2223
DRIED, CHRISTMAS	2224
PROCESSING, NUMEROUS	2225
MEASURES, PARAGRAPH	2226
AFFAIRS, MOVEMENTS	2227
DAMAGE, FED	2228
WARS, CONTRACT	2229
	2230
	2231
	2232
	2233
	2234
	2235
	2236
	2237
	2238
	2239
	2240
	2241
	2242
	2243
	2244
	2245
You will now view a single word item.	2246
Your task is to indicate if the item you view was on the list you just studied (by	2247
pressing D) or not on the list (by pressing N).	2248
	2249
	2250
	2251
	2252
You view the word EXPANSION. You press <<D>>.	2253
	2254

2255 **N-back**
2256
2257 Data source: [50]
2258
2259
2260 Number of experiments: 1
2261
2262 Number of participants: 470
2263
2264 Number of choices: 200821
2265
2266
2267 **Example prompt:**
2268
2269 You will view a stream of letters on the screen, one letter at a time.
2270 At the beginning of a block, you are told a number N.
2271
2272 You have to remember the last N letters you saw since the beginning of the block.
2273
2274 If the letter you see matches the letter N trials ago, press W, otherwise press D.
2275
2276 The case of the letter is irrelevant, so "t" matches "T" for example.
2277 If you make more than 5 mistakes in a block, N is decreased by 1.
2278
2279 If you make fewer than 3 mistakes in a block, N is increased by 1.
2280
2281 You will go through 20 blocks with 20+N trials each.
2282
2283
2284 Block 0, N = 2:
2285 You see the letter d.
2286
2287 You see the letter g.
2288
2289 You see the letter D and press <<W>>.
2290
2291 You see the letter v.
2292 You see the letter B.
2293
2294 You see the letter V.
2295
2296 You see the letter d.
2297
2297 You see the letter g.
2298
2299 You see the letter D and press <<W>>.
2300

You see the letter t.	2301
You see the letter G.	2302
You see the letter B and press <<D>>.	2303
You see the letter B and press <<D>>.	2304
You see the letter G.	2305
You see the letter G.	2306
You see the letter g and press <<W>>.	2307
You see the letter g and press <<W>>.	2308
You see the letter g and press <<W>>.	2309
You see the letter v.	2310
You see the letter v.	2311
You see the letter V.	2312
You see the letter V.	2313
You see the letter B.	2314
You see the letter B.	2315
You see the letter G.	2316
You see the letter G.	2317
You see the letter G.	2318
You see the letter G and press <<W>>.	2319
You see the letter G and press <<W>>.	2320
You see the letter G.	2321
	2322
	2323
Block 1, N = 1:	2324
	2325
You see the letter g.	2326
You see the letter g.	2327
You see the letter D and press <<D>>.	2328
You see the letter D and press <<D>>.	2329
You see the letter D.	2330
You see the letter d and press <<W>>.	2331
You see the letter d and press <<W>>.	2332
You see the letter D.	2333
You see the letter d and press <<W>>.	2334
You see the letter d and press <<W>>.	2335
You see the letter v.	2336
You see the letter v.	2337
You see the letter b and press <<D>>.	2338
You see the letter b and press <<D>>.	2339
You see the letter V.	2340
You see the letter t and press <<D>>.	2341
You see the letter t and press <<D>>.	2342
You see the letter d.	2343
You see the letter d.	2344
You see the letter b and press <<D>>.	2345
You see the letter b and press <<D>>.	2346
You see the letter G.	2347

2347 You see the letter t and press <<D>>.
2348
2349 You see the letter D.
2350 You see the letter t and press <<D>>.
2351
2352 You see the letter t.
2353
2354 You see the letter b and press <<D>>.
2355 You see the letter B.
2356
2357 You see the letter B and press <<W>>.
2358
2359 You see the letter v.
2360
2361
2362 Block 2, N = 1:
2363
2364 You see the letter g.
2365 You see the letter g and press <<W>>.
2366
2367 You see the letter d.
2368
2369 You see the letter d and press <<W>>.
2370 You see the letter T.
2371
2372 You see the letter v.
2373
2374 You see the letter V.
2375 You see the letter D and press <<W>>.
2376
2377 You see the letter g.
2378
2379 You see the letter G and press <<W>>.
2380 You see the letter t.
2381
2382 You see the letter D and press <<D>>.
2383
2384 You see the letter t.
2385 You see the letter g and press <<D>>.
2386
2387 You see the letter g.
2388
2389 You see the letter D and press <<W>>.
2390 You see the letter d.
2391
2392 You see the letter V.

You see the letter B.	2393
You see the letter v and press <<D>>.	2394
	2395
You see the letter V.	2396
	2397
	2398
	2399
Block 3, N = 1:	2400
You see the letter T.	2401
	2402
You see the letter d and press <<W>>.	2403
	2404
You see the letter t.	2405
You see the letter V and press <<D>>.	2406
	2407
You see the letter v.	2408
	2409
You see the letter B and press <<D>>.	2410
	2411
You see the letter b.	2412
	2413
You see the letter D and press <<D>>.	2414
	2415
You see the letter d.	2416
You see the letter d and press <<W>>.	2417
	2418
You see the letter G.	2419
	2420
You see the letter B and press <<D>>.	2421
	2422
You see the letter G.	2423
	2424
You see the letter d.	2425
	2426
You see the letter v and press <<D>>.	2427
	2428
You see the letter B.	2429
	2430
You see the letter t and press <<D>>.	2431
	2432
You see the letter T.	2433
You see the letter T and press <<W>>.	2434
	2435
You see the letter T.	2436
	2437
	2438

2439 Block 4, N = 1:
2440
2441 You see the letter d.
2442 You see the letter d and press <<W>>.
2443
2444 You see the letter d.
2445
2446 You see the letter V and press <<D>>.
2447 You see the letter V.
2448
2449 You see the letter v and press <<D>>.
2450
2451 You see the letter B.
2452 You see the letter B and press <<W>>.
2453
2454 You see the letter g.
2455
2456 You see the letter B.
2457 You see the letter t.
2458
2459 You see the letter D.
2460
2461 You see the letter d.
2462 You see the letter B.
2463
2464 You see the letter B.
2465
2466 You see the letter t.
2467 You see the letter d.
2468
2469 You see the letter G.
2470
2471 You see the letter d.
2472 You see the letter v.
2473
2474 You see the letter t.
2475
2476
2477 Block 5, N = 1:
2478
2479 You see the letter v.
2480
2481 You see the letter t and press <<D>>.
2482 You see the letter D.
2483
2484

You see the letter V and press <<D>>.	2485
You see the letter v.	2486
You see the letter D and press <<D>>.	2487
You see the letter D.	2488
You see the letter B and press <<D>>.	2489
You see the letter g.	2490
You see the letter v and press <<D>>.	2491
You see the letter d.	2492
You see the letter g.	2493
You see the letter G.	2494
You see the letter D and press <<D>>.	2495
You see the letter b.	2496
You see the letter v.	2497
You see the letter V.	2498
You see the letter D and press <<D>>.	2499
You see the	2500
Digit span	2501
Data source: [50]	2502
	2503
Number of experiments: 1	2504
Number of participants: 472	2505
Number of choices: 97012	2506
	2507
Example prompt:	2508
You will view a series of digits and are then asked to recall them in the order you have	2509
seen them by pressing the corresponding keys.	2510
After having recalled all digits, please press 'S' to indicate the end of your recalled	2511
	2512
	2513
	2514
	2515
	2516
	2517
	2518
	2519
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	2526
	2527
	2528
	2529
	2530

2531 sequence.
2532
2533
2534 The digits are the following: [4, 8, 2]
2535
2536 You press <<4>>.
2537
2538 You press <<8>>.
2539 You press <<2>>.
2540
2541 You press <<S>>.
2542
2543
2544 You will view a series of digits and are then asked to recall them in the order you have
2545
2546 seen them by pressing the corresponding keys.
2547
2548 After having recalled all digits, please press 'S' to indicate the end of your recalled
2549 sequence.
2550
2551
2552 The digits are the following: [5, 2, 8, 5]
2553
2554 You press <<5>>.
2555
2556 You press <<2>>.
2557
2558 You press <<8>>.
2559 You press <<5>>.
2560
2561 You press <<S>>.
2562
2563
2564 You will view a series of digits and are then asked to recall them in the order you have
2565
2566 seen them by pressing the corresponding keys.
2567
2568 After having recalled all digits, please press 'S' to indicate the end of your recalled
2569 sequence.
2570
2571
2572 The digits are the following: [9, 2, 8, 2, 5]
2573
2574 You press <<9>>.
2575
2576

You press <<2>>.	2577
You press <<8>>.	2578
You press <<2>>.	2579
You press <<5>>.	2580
You press <<S>>.	2581
	2582
	2583
	2584
	2585
	2586
You will view a series of digits and are then asked to recall them in the order you have	2587
seen them by pressing the corresponding keys.	2588
After having recalled all digits, please press 'S' to indicate the end of your recalled	2589
sequence.	2590
	2591
	2592
	2593
	2594
The digits are the following: [8, 1, 4, 8, 4, 9]	2595
You press <<8>>.	2596
You press <<1>>.	2597
You press <<4>>.	2598
You press <<8>>.	2599
You press <<8>>.	2600
You press <<1>>.	2601
You press <<S>>.	2602
	2603
	2604
	2605
	2606
	2607
	2608
	2609
You will view a series of digits and are then asked to recall them in the order you have	2610
seen them by pressing the corresponding keys.	2611
After having recalled all digits, please press 'S' to indicate the end of your recalled	2612
sequence.	2613
	2614
	2615
	2616
	2617
	2618
The digits are the following: [5, 1, 7, 1, 6, 3]	2619
You press <<7>>.	2620
	2621
	2622

2623 You press <<1>>.
2624
2625 You press <<5>>.
2626 You press <<1>>.
2627
2628 You press <<6>>.
2629
2630 You press <<3>>.
2631 You press <<S>>.
2632
2633
2634
2635 You will view a series of digits and are then asked to recall them in the order you have
2636 seen them by pressing the corresponding keys.
2637
2638 After having recalled all digits, please press 'S' to indicate the end of your recalled
2639 sequence.
2640
2641
2642
2643 The digits are the following: [5, 9, 5, 9, 1]
2644
2645 You press <<5>>.
2646 You press <<9>>.
2647
2648 You press <<5>>.
2649
2650 You press <<9>>.
2651 You press <<1>>.
2652
2653 You press <<S>>.
2654
2655
2656 You will view a series of digits and are then asked to recall them in the order you have
2657 seen them by pressing the corresponding keys.
2658
2659 After having recalled all digits, please press 'S' to indicate the end of your recalled
2660 sequence.
2661
2662
2663
2664 The digits are the following: [7, 2, 5, 8, 2, 6]
2665
2666 You press <<7>>.
2667
2668

You press <<7>>.	2669
You press <<2>>.	2670
You press <<8>>.	2671
You press <<5>>.	2672
You press <<2>>.	2673
You press <<S>>.	2674
	2675
	2676
	2677
	2678
	2679
	2680
You will view a series of digits and are then asked to recall them in the order you have seen them by pressing the corresponding keys.	2681
After having recalled all digits, please press 'S' to indicate the end of your recalled sequence.	2682
	2683
	2684
	2685
	2686
	2687
	2688
The digits are the following: [8, 5, 8, 3, 9, 4]	2689
You press <<8>>.	2690
You press <<5>>.	2691
You press <<8>>.	2692
You press <<3>>.	2693
You press <<9>>.	2694
You press <<4>>.	2695
You press <<S>>.	2696
	2697
	2698
	2699
	2700
	2701
	2702
	2703
You will view a series of digits and are then asked to recall them in the order you have seen them by pressing the corresponding keys.	2704
After having recalled all digits, please press 'S' to indicate the end of your recalled sequence.	2705
	2706
	2707
	2708
	2709
	2710
	2711
The digits are the following: [9, 6, 9, 5, 1, 7, 1]	2712
	2713
	2714

2715 You press <<9>>.
2716
2717 You press <<6>>.
2718 You press <<9>>.
2719
2720 You press <<5>>.
2721
2722 You press <<7>>.
2723 You press <<1>>.
2724
2725 You press <<7>>.
2726
2727 You press <<S>>.
2728
2729
2730 You will view a series of digits and are then asked to recall them in the order you have
2731 seen them by pressing the corresponding keys.
2732
2733 After having recalled all digits, please press 'S' to indicate the end of your recalled
2734 sequence.
2735
2736
2737
2738 The digits are the following: [7, 2, 5, 9, 1, 8]
2739
2740 You press <<7>>.
2741
2742 You press <<2>>.
2743 You press <<5>>.
2744
2745 You press <<9>>.
2746
2747 You press <<1>>.
2748 You press <<8>>.
2749
2750 You press <<S>>.
2751
2752
2753 You will view a series of digits and are then asked to recall them in the order you have
2754 seen them by pressing the corresponding keys.
2755
2756 After having recalled all digits, please
2757
2758
2759
2760

Go/no-go	2761
	2762
Data source: [50]	2763
	2764
	2765
Number of experiments: 1	2766
	2767
Number of participants: 463	2768
	2769
Number of choices: 150517	2770
	2771
	2772
Example prompt:	2773
	2774
In this task, you need to emit responses to certain stimuli and omit responses to others.	2775
	2776
	2777
You will see one of two colours, colour1 or colour2, on the screen in each trial.	2778
	2779
You need to press button X when you see colour1 and press nothing when you see colour2.	2780
	2781
	2782
You need to respond as quickly as possible.	2783
	2784
You will be doing 10 practice trials followed by 350 test trials.	2785
	2786
	2787
You see colour1 and press nothing.	2788
	2789
You see colour2 and press <<X>> in 753.0ms.	2790
	2791
You see colour2 and press <<X>> in 381.0ms.	2792
	2793
You see colour2 and press nothing.	2794
	2795
You see colour1 and press <<X>> in 473.0ms.	2796
	2797
You see colour1 and press <<X>> in 713.0ms.	2798
	2799
You see colour2 and press nothing.	2800
	2801
You see colour1 and press <<X>> in 364.0ms.	2802
	2803
You see colour2 and press nothing.	2804
	2805
You see colour1 and press <<X>> in 378.0ms.	2806
	2806

2807 You see colour1 and press <<X>> in 436.0ms.
2808
2809 You see colour1 and press <<X>> in 427.0ms.
2810 You see colour1 and press <<X>> in 337.0ms.
2811
2812 You see colour1 and press <<X>> in 269.0ms.
2813
2814 You see colour1 and press <<X>> in 312.0ms.
2815 You see colour1 and press <<X>> in 273.0ms.
2816
2817 You see colour2 and press nothing.
2818
2819 You see colour1 and press <<X>> in 288.0ms.
2820 You see colour1 and press <<X>> in 276.0ms.
2821
2822 You see colour1 and press <<X>> in 314.0ms.
2823
2824 You see colour1 and press <<X>> in 309.0ms.
2825 You see colour1 and press <<X>> in 320.0ms.
2826
2827 You see colour1 and press <<X>> in 342.0ms.
2828
2829 You see colour1 and press <<X>> in 301.0ms.
2830 You see colour1 and press <<X>> in 289.0ms.
2831
2832 You see colour2 and press nothing.
2833
2834 You see colour1 and press <<X>> in 360.0ms.
2835 You see colour2 and press <<X>> in 424.0ms.
2836
2837 You see colour2 and press nothing.
2838
2839 You see colour1 and press <<X>> in 525.0ms.
2840 You see colour1 and press <<X>> in 306.0ms.
2841
2842 You see colour1 and press <<X>> in 387.0ms.
2843
2844 You see colour1 and press <<X>> in 292.0ms.
2845 You see colour1 and press <<X>> in 317.0ms.
2846
2847 You see colour1 and press <<X>> in 270.0ms.
2848
2849 You see colour1 and press <<X>> in 278.0ms.
2850 You see colour2 and press nothing.
2851
2852

You see colour1 and press <<X>> in 277.0ms.	2853
	2854
You see colour1 and press <<X>> in 311.0ms.	2855
	2856
You see colour1 and press <<X>> in 338.0ms.	2857
	2858
You see colour1 and press <<X>> in 323.0ms.	2859
	2860
You see colour1 and press <<X>> in 304.0ms.	2861
	2862
You see colour1 and press <<X>> in 323.0ms.	2863
	2864
You see colour1 and press <<X>> in 354.0ms.	2865
	2866
You see colour1 and press <<X>> in 292.0ms.	2867
	2868
You see colour1 and press <<X>> in 302.0ms.	2869
	2870
You see colour2 and press nothing.	2871
	2872
You see colour1 and press <<X>> in 340.0ms.	2873
	2874
You see colour1 and press <<X>> in 603.0ms.	2875
	2876
You see colour1 and press <<X>> in 289.0ms.	2877
	2878
You see colour1 and press <<X>> in 284.0ms.	2879
	2880
You see colour1 and press <<X>> in 275.0ms.	2881
	2882
You see colour1 and press <<X>> in 299.0ms.	2883
	2884
You see colour2 and press nothing.	2885
	2886
You see colour1 and press <<X>> in 265.0ms.	2887
	2888
You see colour1 and press <<X>> in 267.0ms.	2889
	2890
You see colour2 and press nothing.	2891
	2892
You see colour1 and press <<X>> in 274.0ms.	2893
	2894
You see colour1 and press <<X>> in 382.0ms.	2895
	2896
You see colour1 and press <<X>> in 272.0ms.	2897
	2898
You see colour2 and press nothing.	
You see colour1 and press <<X>> in 258.0ms.	
You see colour1 and press <<X>> in 305.0ms.	

2899 You see colour1 and press <<X>> in 320.0ms.
2900
2901 You see colour1 and press <<X>> in 261.0ms.
2902 You see colour1 and press <<X>> in 275.0ms.
2903
2904 You see colour2 and press nothing.
2905
2906 You see colour1 and press <<X>> in 424.0ms.
2907 You see colour1 and press <<X>> in 266.0ms.
2908
2909 You see colour1 and press <<X>> in 273.0ms.
2910
2911 You see colour1 and press <<X>> in 287.0ms.
2912 You see colour1 and press <<X>> in 437.0ms.
2913
2914 You see colour1 and press <<X>> in 293.0ms.
2915
2916 You see colour1 and press <<X>> in 297.0ms.
2917 You see colour1 and press <<X>> in 308.0ms.
2918
2919 You see colour1 and press <<X>> in 313.0ms.
2920
2921 You see colour1 and press <<X>> in 373.0ms.
2922 You see colour1 and press <<X>> in 390.0ms.
2923
2924 You see colour1 and press <<X>> in 304.0ms.
2925
2926 You see colour1 and press <<X>> in 334.0ms.
2927 You see colour1 and press <<X>> in 326.0ms.
2928
2929 You see colour1 and press <<X>> in 382.0ms.
2930
2931 You see colour1 and press <<X>> in 803.0ms.
2932 You see colour1 and press <<X>> in 430.0ms.
2933
2934 You see colour1 and press <<X>> in 324.0ms.
2935
2936 You see colour
2937
2938 **Recent probes**
2939
2940
2941 Data source: [50]
2942
2943
2944 Number of experiments: 1

Number of participants: 471	2945
	2946
Number of choices: 34714	2947
	2948
	2949
Example prompt:	2950
You will repeatedly observe sequences of six letters.	2951
	2952
You have to remember these letters before they disappear.	2953
	2954
Afterward, you will be prompted with one letter. You have to answer whether the	2955
letter was part of the six previous letters.	2956
	2957
If you think it was, you have to press C. If you think it was not, press Q.	2958
	2959
	2960
	2961
You are shown the letters ['C', 'I', 'Q', 'F', 'W', 'Z']. You see the letter Y. You press	2962
<<Q>>.	2963
	2964
You are shown the letters ['I', 'Q', 'C', 'D', 'M', 'V']. You see the letter U. You press	2965
<<Q>>.	2966
	2967
You are shown the letters ['I', 'O', 'C', 'X', 'A', 'Q']. You see the letter M. You press	2968
<<C>>.	2969
	2970
	2971
You are shown the letters ['Z', 'C', 'W', 'I', 'J', 'O']. You see the letter C. You press	2972
<<Q>>.	2973
	2974
You are shown the letters ['Q', 'M', 'F', 'V', 'P', 'E']. You see the letter W. You press	2975
<<C>>.	2976
	2977
	2978
You are shown the letters ['W', 'F', 'U', 'M', 'B', 'Q']. You see the letter V. You press	2979
<<Q>>.	2980
	2981
You are shown the letters ['R', 'U', 'F', 'J', 'W', 'D']. You see the letter W. You press	2982
<<C>>.	2983
	2984
You are shown the letters ['X', 'U', 'R', 'Y', 'H', 'F']. You see the letter X. You press	2985
<<Q>>.	2986
	2987
	2988
You are shown the letters ['R', 'Q', 'M', 'X', 'V', 'U']. You see the letter W. You press	2989
<<C>>.	2990

2991 You are shown the letters ['G', 'Q', 'M', 'N', 'R', 'O']. You see the letter V. You press
2992
2993 <<Q>>.
2994 You are shown the letters ['T', 'P', 'Q', 'M', 'W', 'G']. You see the letter X. You press
2995
2996 <<Q>>.
2997
2998 You are shown the letters ['P', 'J', 'Q', 'S', 'D', 'T']. You see the letter J. You press
2999 <<Q>>.
3000
3001 You are shown the letters ['J', 'R', 'H', 'Q', 'F', 'P']. You see the letter F. You press
3002
3003 <<C>>.
3004 You are shown the letters ['B', 'V', 'J', 'G', 'R', 'H']. You see the letter R. You press
3005
3006 <<Q>>.
3007
3008 You are shown the letters ['X', 'J', 'V', 'L', 'B', 'D']. You see the letter B. You press
3009 <<Q>>.
3010
3011 You are shown the letters ['N', 'M', 'J', 'C', 'V', 'X']. You see the letter C. You press
3012
3013 <<Q>>.
3014 You are shown the letters ['N', 'T', 'J', 'R', 'M', 'W']. You see the letter C. You press
3015
3016 <<Q>>.
3017
3018 You are shown the letters ['N', 'T', 'J', 'E', 'I', 'D']. You see the letter N. You press
3019 <<Q>>.
3020
3021 You are shown the letters ['J', 'T', 'N', 'K', 'C', 'B']. You see the letter T. You press
3022
3023 <<C>>.
3024 You are shown the letters ['M', 'O', 'N', 'T', 'P', 'J']. You see the letter O. You press
3025
3026 <<Q>>.
3027
3028 You are shown the letters ['O', 'Q', 'W', 'U', 'M', 'N']. You see the letter Q. You press
3029 <<C>>.
3030
3031 You are shown the letters ['Q', 'Z', 'Y', 'O', 'I', 'W']. You see the letter I. You press
3032
3033 <<C>>.
3034 You are shown the letters ['Z', 'A', 'Y', 'F', 'Q', 'G']. You see the letter Q. You press
3035
3036 <<C>>.

You are shown the letters ['Z', 'M', 'Y', 'P', 'A', 'B']. You see the letter X. You press	3037
<<Q>>.	3038
You are shown the letters ['L', 'X', 'M', 'Z', 'Y', 'N']. You see the letter B. You press	3039
<<Q>>.	3040
You are shown the letters ['M', 'J', 'X', 'C', 'L', 'U']. You see the letter P. You press	3041
<<Q>>.	3042
You are shown the letters ['S', 'J', 'E', 'H', 'X', 'M']. You see the letter M. You press	3043
<<C>>.	3044
You are shown the letters ['F', 'I', 'E', 'A', 'J', 'S']. You see the letter X. You press	3045
<<Q>>.	3046
You are shown the letters ['D', 'U', 'I', 'M', 'O', 'T']. You see the letter Q. You press	3047
<<Q>>.	3048
You are shown the letters ['I', 'D', 'U', 'G', 'Q', 'W']. You see the letter B. You press	3049
<<Q>>.	3050
You are shown the letters ['U', 'I', 'B', 'L', 'D', 'Z']. You see the letter W. You press	3051
<<Q>>.	3052
You are shown the letters ['U', 'E', 'B', 'I', 'H', 'R']. You see the letter I. You press	3053
<<C>>.	3054
You are shown the letters ['S', 'B', 'U', 'E', 'F', 'N']. You see the letter I. You press	3055
<<Q>>.	3056
You are shown the letters ['Y', 'S', 'Q', 'U', 'B', 'A']. You see the letter Y. You press	3057
<<C>>.	3058
You are shown the letters ['Q', 'V', 'Y', 'S', 'H', 'O']. You see the letter H. You press	3059
<<C>>.	3060
You are shown the letters ['V', 'Z', 'P', 'D', 'Q', 'Y']. You see the letter H. You press	3061
<<C>>.	3062
You are shown the letters ['Z', 'P', 'V', 'W', 'L', 'N']. You see the letter H. You press	3063
	3064
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	3082

3083 <<Q>>.
3084
3085 You are shown the letters ['U', 'S', 'Z', 'V', 'P', 'M']. You see the letter W. You press
3086 <<Q>>.
3087
3088 You are shown the letters ['U', 'Y', 'Z', 'S', 'C', 'G']. You see the letter W. You press
3089
3090 <<Q>>.
3091
3092 **Horizon task**
3093
3094 Data source: [79]
3095
3096
3097
3098 Number of experiments: 1
3099
3100 Number of participants: 26
3101
3102 Number of choices: 29120
3103
3104
3105 **Example prompt:**
3106 You are participating in multiple games involving two slot machines, labeled I and H.
3107
3108 The two slot machines are different across different games.
3109
3110 Each time you choose a slot machine, you get some points.
3111
3112 You choose a slot machine by pressing the corresponding key.
3113
3114 Each slot machine tends to pay out about the same amount of points on average.
3115
3116 Your goal is to choose the slot machines that will give you the most points across the
3117 experiment.
3118
3119 The first 4 trials in each game are instructed trials where you will be told which slot
3120 machine to choose.
3121
3122 After these instructed trials, you will have the freedom to choose for either 1 or 6
3123 trials.
3124
3125
3126 Game 1. There are 10 trials in this game.
3127
3128 You are instructed to press I and get 73 points.

You are instructed to press H and get 91 points.	3129
You are instructed to press I and get 68 points.	3130
You are instructed to press H and get 95 points.	3131
You press <<I>> and get 71 points.	3132
You press <<H>> and get 96 points.	3133
You press <<I>> and get 57 points.	3134
You press <<I>> and get 30 points.	3135
You press <<I>> and get 54 points.	3136
You press <<H>> and get 81 points.	3137
	3138
	3139
	3140
	3141
	3142
	3143
	3144
	3145
Game 2. There are 10 trials in this game.	3146
You are instructed to press I and get 38 points.	3147
You are instructed to press I and get 1 points.	3148
You are instructed to press I and get 18 points.	3149
You are instructed to press H and get 44 points.	3150
You press <<I>> and get 5 points.	3151
You press <<I>> and get 3 points.	3152
You press <<H>> and get 53 points.	3153
You press <<I>> and get 6 points.	3154
You press <<H>> and get 37 points.	3155
You press <<H>> and get 50 points.	3156
	3157
	3158
	3159
	3160
	3161
	3162
	3163
	3164
	3165
Game 3. There are 5 trials in this game.	3166
You are instructed to press H and get 24 points.	3167
You are instructed to press H and get 34 points.	3168
You are instructed to press I and get 68 points.	3169
You are instructed to press I and get 53 points.	3170
	3171
	3172
	3173
	3174

3175 You press <<I>> and get 57 points.
3176
3177
3178 Game 4. There are 10 trials in this game.
3179
3180 You are instructed to press H and get 53 points.
3181
3182 You are instructed to press I and get 57 points.
3183 You are instructed to press H and get 45 points.
3184
3185 You are instructed to press H and get 51 points.
3186
3187 You press <<H>> and get 37 points.
3188 You press <<I>> and get 35 points.
3189
3190 You press <<I>> and get 51 points.
3191
3192 You press <<I>> and get 37 points.
3193 You press <<I>> and get 29 points.
3194
3195 You press <<H>> and get 53 points.
3196
3197
3198 Game 5. There are 5 trials in this game.
3199
3200 You are instructed to press H and get 46 points.
3201
3202 You are instructed to press I and get 9 points.
3203 You are instructed to press H and get 38 points.
3204
3205 You are instructed to press H and get 36 points.
3206
3207 You press <<H>> and get 37 points.
3208
3209
3210 Game 6. There are 5 trials in this game.
3211
3212 You are instructed to press I and get 35 points.
3213 You are instructed to press I and get 36 points.
3214
3215 You are instructed to press I and get 27 points.
3216
3217 You are instructed to press H and get 49 points.
3218 You press <<H>> and get 41 points.
3219
3220

Game 7. There are 5 trials in this game.	3221
You are instructed to press H and get 53 points.	3222
You are instructed to press H and get 59 points.	3223
You are instructed to press H and get 59 points.	3224
You are instructed to press I and get 80 points.	3225
You are instructed to press I and get 80 points.	3226
You are instructed to press I and get 99 points.	3227
You are instructed to press I and get 99 points.	3228
You press <<H>> and get 54 points.	3229
	3230
	3231
	3232
Game 8. There are 10 trials in this game.	3233
You are instructed to press H and get 21 points.	3234
You are instructed to press H and get 21 points.	3235
You are instructed to press I and get 43 points.	3236
You are instructed to press I and get 43 points.	3237
You are instructed to press H and get 18 points.	3238
You are instructed to press H and get 18 points.	3239
You are instructed to press H and get 19 points.	3240
You press <<H>> and get 26 points.	3241
You press <<H>> and get 26 points.	3242
You press <<H>> and get 21 points.	3243
You press <<I>> and get 47 points.	3244
You press <<I>> and get 47 points.	3245
You press <<I>> and get 37 points.	3246
You press <<I>> and get 37 points.	3247
You press <<I>> and get 37 points.	3248
You press <<I>> and get 36 points.	3249
	3250
	3251
	3252
Game 9. There are 5 trials in this game.	3253
You are instructed to press H and get 47 points.	3254
You are instructed to press H and get 47 points.	3255
You are instructed to press H and get 41 points.	3256
You are instructed to press H and get 41 points.	3257
You are instructed to press I and get 40 points.	3258
You are instructed to press I and get 40 points.	3259
You are instructed to press I and get 35 points.	3260
You press <<I>> and get 30 points.	3261
	3262
	3263
	3264
Game 10. There are 5 trials in this game.	3265
	3266

3267 You are instructed to press I and get 69 points.
3268
3269 You are instructed to press I and get 69 points.
3270 You are instructed to press H and get 65 points.
3271
3272 You are instructed to press I and get 68 points.
3273
3274 You press <<I>> and get 63 points.
3275
3276
3277 Game 11. There are 10
3278
3279
3280 **Gardening task**
3281
3282 Data source: [80]
3283
3284
3285 Number of experiments: 1
3286
3287 Number of participants: 320
3288
3289 Number of choices: 192000
3290
3291
3292 **Example prompt:**
3293
3294 You are going to plant trees in two different gardens labeled North and South.
3295 The trees look different from each other regarding their leafiness and branchiness.
3296
3297 There are 5 levels of leafiness (0, 1, 2, 3, 4) and 5 levels of branchiness (0, 1, 2, 3, 4).
3298
3299 In each round, you get presented with a tree.
3300 You can accept to plant the tree by pressing T and reject to plant it by pressing N.
3301
3302 If you accept to plant the tree and your answer is correct, you will be rewarded with
3303 points, otherwise, you will lose some points.
3304
3305 If you reject to plant the tree, you will not be rewarded (0 points).
3306
3307 Your task is to learn which type of tree grows best in each garden.
3308
3309 During the training phase, there will be feedback on every trial about your decisions.
3310 During the testing phase, there will be no feedback for your decision.
3311
3312

You get a tree with level 3 of leafiness and level 0 of branchiness in the South garden.	3313
You press <<T>> and get -50 points. You would have gotten 0 points, had you	3314
rejected to plant the tree.	3315
	3316
	3317
You get a tree with level 4 of leafiness and level 0 of branchiness in the North garden.	3318
You press <<T>> and get -50 points. You would have gotten 0 points, had you	3319
rejected to plant the tree.	3320
	3321
	3322
You get a tree with level 1 of leafiness and level 1 of branchiness in the South garden.	3323
You press <<T>> and get -25 points. You would have gotten 0 points, had you	3324
rejected to plant the tree.	3325
	3326
	3327
You get a tree with level 3 of leafiness and level 1 of branchiness in the North garden.	3328
You press <<T>> and get -25 points. You would have gotten 0 points, had you	3329
rejected to plant the tree.	3330
	3331
	3332
You get a tree with level 0 of leafiness and level 4 of branchiness in the North garden.	3333
You press <<T>> and get 50 points. You would have gotten 0 points, had you rejected	3334
to plant the tree.	3335
	3336
	3337
You get a tree with level 2 of leafiness and level 2 of branchiness in the North garden.	3338
You press <<N>> and get 0 points. You would have gotten 0 points, had you accepted	3339
to plant the tree.	3340
	3341
	3342
You get a tree with level 0 of leafiness and level 2 of branchiness in the South garden.	3343
You press <<T>> and get 0 points. You would have gotten 0 points, had you rejected	3344
to plant the tree.	3345
	3346
	3347
You get a tree with level 4 of leafiness and level 3 of branchiness in the North garden.	3348
You press <<N>> and get 0 points. You would have gotten -50 points, had you	3349
accepted to plant the tree.	3350
	3351
	3352
You get a tree with level 1 of leafiness and level 1 of branchiness in the North garden.	3353
You press <<T>> and get 25 points. You would have gotten 0 points, had you rejected	3354
to plant the tree.	3355
	3356
	3357
	3358

3359 You get a tree with level 2 of leafiness and level 1 of branchiness in the South garden.
3360
3361 You press <<N>> and get 0 points. You would have gotten -25 points, had you
3362 accepted to plant the tree.
3363
3364 You get a tree with level 4 of leafiness and level 4 of branchiness in the North garden.
3365
3366 You press <<N>> and get 0 points. You would have gotten -50 points, had you
3367 accepted to plant the tree.
3368
3369 You get a tree with level 1 of leafiness and level 3 of branchiness in the South garden.
3370
3371 You press <<N>> and get 0 points. You would have gotten 25 points, had you
3372 accepted to plant the tree.
3373
3374 You get a tree with level 0 of leafiness and level 2 of branchiness in the South garden.
3375
3376 You press <<N>> and get 0 points. You would have gotten 0 points, had you accepted
3377 to plant the tree.
3378
3379 You get a tree with level 4 of leafiness and level 1 of branchiness in the South garden.
3380
3381 You press <<T>> and get -25 points. You would have gotten 0 points, had you
3382 rejected to plant the tree.
3383
3384 You get a tree with level 4 of leafiness and level 0 of branchiness in the North garden.
3385
3386 You press <<N>> and get 0 points. You would have gotten -50 points, had you
3387 accepted to plant the tree.
3388
3389 You get a tree with level 1 of leafiness and level 1 of branchiness in the South garden.
3390
3391 You press <<T>> and get -25 points. You would have gotten 0 points, had you
3392 rejected to plant the tree.
3393
3394 You get a tree with level 0 of leafiness and level 2 of branchiness in the South garden.
3395
3396 You press <<N>> and get 0 points. You would have gotten 0 points, had you accepted
3397 to plant the tree.
3398
3399 You get a
3400
3401
3402
3403
3404

Columbia card task	3405
	3406
Data source: [49]	3407
	3408
	3409
Number of experiments: 1	3410
	3411
Number of participants: 1368	3412
	3413
Number of choices: 613299	3414
	3415
	3416
Example prompt:	3417
You will play a games with 84 rounds.	3418
	3419
In each round, you will be presented with 32 face-down cards.	3420
	3421
Every card is either a gain card or a loss card.	3422
	3423
If you turn over a gain card, the gain amount of that card (between 10 and 600 points)	3424
will be added to your current game score.	3425
	3426
If you turn over a loss card, the loss amount of that card (between 25 and 750 points)	3427
will be subtracted from your game score.	3428
	3429
In different rounds, between 1 and 28 cards are loss cards.	3430
	3431
Loss and gain amounts also differ between rounds.	3432
	3433
You may keep turning over cards as long as you keep encountering gain cards.	3434
	3435
You may also stop the round at any point and claim your current payout.	3436
	3437
If you encounter a loss card, the round ends immediately.	3438
	3439
Your gains and losses will be summed up to give you your final score for each round.	3440
	3441
Press E to turn a card over, or C to stop the round and claim your current payout.	3442
	3443
Round 1:	3444
	3445
You will be awarded 150 points for turning over a gain card.	3446
	3447
You will lose 75 points for turning over a loss card.	3448
	3449
There are 20 loss cards in this round.	3450

3451 You press <<E>> and turn over a loss card. Your current score is -75. The round
3452
3453 has now ended because you encountered a loss card.
3454 Your final score for this round is -75.
3455
3456
3457
3458 Round 2:
3459 You will be awarded 50 points for turning over a gain card.
3460
3461 You will lose 100 points for turning over a loss card.
3462
3463 There are 1 loss cards in this round.
3464 You press <<E>> and turn over a gain card. Your current score is 50.
3465
3466 You press <<E>> and turn over a gain card. Your current score is 100.
3467
3468 You press <<E>> and turn over a gain card. Your current score is 150.
3469
3469 You press <<E>> and turn over a gain card. Your current score is 200.
3470
3471 You press <<E>> and turn over a loss card. Your current score is 100. The round
3472
3473 has now ended because you encountered a loss card.
3474 Your final score for this round is 100.
3475
3476
3477
3478 Round 3:
3479 You will be awarded 200 points for turning over a gain card.
3480
3481 You will lose 100 points for turning over a loss card.
3482
3483 There are 10 loss cards in this round.
3484 You press <<E>> and turn over a gain card. Your current score is 200.
3485
3486 You press <<E>> and turn over a gain card. Your current score is 400.
3487
3488 You press <<E>> and turn over a gain card. Your current score is 600.
3489
3489 You press <<C>> and claim your payout.
3490
3491 Your final score for this round is 600.
3492
3493
3494 Round 4:
3495
3496

You will be awarded 200 points for turning over a gain card.	3497
You will lose 50 points for turning over a loss card.	3498
There are 28 loss cards in this round.	3499
You press <<C>> and claim your payout.	3500
Your final score for this round is 0.	3501
	3502
	3503
	3504
	3505
	3506
Round 5:	3507
You will be awarded 20 points for turning over a gain card.	3508
You will lose 750 points for turning over a loss card.	3509
There are 1 loss cards in this round.	3510
You press <<E>> and turn over a gain card. Your current score is 20.	3511
You press <<E>> and turn over a gain card. Your current score is 40.	3512
You press <<E>> and turn over a gain card. Your current score is 60.	3513
You press <<E>> and turn over a gain card. Your current score is 80.	3514
You press <<E>> and turn over a gain card. Your current score is 100.	3515
You press <<C>> and claim your payout.	3516
Your final score for this round is 100.	3517
	3518
	3519
	3520
	3521
	3522
	3523
	3524
	3525
	3526
Round 6:	3527
You will be awarded 300 points for turning over a gain card.	3528
You will lose 100 points for turning over a loss card.	3529
There are 16 loss cards in this round.	3530
You press <<E>> and turn over a loss card. Your current score is -100. The round	3531
has now ended because you encountered a loss card.	3532
Your final score for this round is -100.	3533
	3534
	3535
	3536
	3537
	3538
	3539
Round 7:	3540
	3541
	3542

3543 You will be awarded 10 points for turning over a gain card.
3544
3545 You will lose 500 points for turning over a loss card.
3546
3547 There are 3 loss cards in this round.
3548 You press <<E>> and turn over a gain card. Your current score is 10.
3549
3550 You press <<E>> and turn over a gain card. Your current score is 20.
3551
3552 You press <<E>> and turn over a gain card. Your current score is 30.
3553
3554 You press <<E>> and turn over a gain card. Your current score is 40.
3555
3556 You press <<C>> and claim your payout.
3557
3558
3559
3560 Round 8:
3561
3562 You will be awarded 10 points for turning over a gain card.
3563
3564 You will lose 250 points for turning over a loss
3565
3566 **Balloon analog risk task**
3567
3568 Data source: [49]
3569
3570
3571 Number of experiments: 1
3572
3573 Number of participants: 1331
3574
3575 Number of choices: 1496974
3576
3577
3578 **Example prompt:**
3579
3580 Throughout the task, you will be presented with balloons, one at a time.
3581
3582 In each step, you can choose to pump up the balloon by pressing H and you will accu-
3583
3584 mulate 1 point for each pump.
3585
3586 At any point, you can stop pumping up the balloon by pressing W and you will col-
3587
3588 lect your accumulated points.
3589
3590 You will repeat this procedure on multiple different balloons.

It is your choice to determine how much to pump up the balloon, but be aware that	3589
at some point the balloon will explode.	3590
If the balloon explodes before you collect your accumulated points, then you move on	3591
to the next balloon and the points are lost.	3592
	3593
	3594
	3595
	3596
Balloon 1:	3597
You press <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>	3598
<<H>> <<H>> <<H>> <<H>> <<H>>. The balloon was inflated too much	3599
and explodes.	3600
	3601
	3602
	3603
	3604
	3605
Balloon 2:	3606
You press <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>	3607
<<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>	3608
<<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>	3609
<<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>	3610
<<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>	3611
<<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>	3612
<<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>	3613
<<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>	3614
<<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>	3615
<<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>	3616
<<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<W>>. You stop	3617
inflating the balloon and get 60 points.	3618
	3619
	3620
	3621
	3622
Balloon 3:	3623
You press <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>	3624
<<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>	3625
<<H>> <<H>> <<H>> <<H>> <<H>>. The balloon was inflated too much	3626
and explodes.	3627
	3628
	3629
	3630
	3631
	3632
Balloon 4:	3633
	3634

3635 You press <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>
3636
3637 <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>
3638 <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>
3639
3640 <<H>> <<H>> <<H>> <<H>>. The balloon was inflated too much and
3641
3642 explodes.
3643
3644
3645 Balloon 5:
3646
3647 You press <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>
3648 <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>
3649
3650 <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>
3651
3652 <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>
3653 <<H>> <<H>>. The balloon was inflated too much and explodes.
3654
3655
3656
3657 Balloon 6:
3658
3659 You press <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>
3660 <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>
3661
3662 <<H>> <<W>>. You stop inflating the balloon and get 18 points.
3663
3664
3665 Balloon 7:
3666
3667 You press <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>
3668 <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>
3669
3670 <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>
3671
3672 <<H>> <<H>>. The balloon was inflated too much and explodes.
3673
3674
3675 Balloon 8:
3676
3677 You press <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>
3678 <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>
3679
3680

3727 <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>
3728
3729 <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<W>>. You stop inflat-
3730 ing the balloon and get 50 points.
3731
3732
3733
3734 Balloon 13:
3735 You press <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>
3736
3737 <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>
3738
3739 <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>
3740
3741 <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>
3742 <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>> <<H>>
3743
3744 <<H>> <<H>> <<H>> <<H>>

3745
3746 **Experiential-symbolic task**
3747

3748 Data source: [81]
3749

3750
3751
3752 Number of experiments: 4
3753
3754 Number of participants: 346
3755
3756 Number of choices: 70608
3757

3758 **Example prompt:**
3759

3760 This experiment is composed of three parts.
3761
3762 In each round of the first part, you have to choose between one of two options repre-
3763 sented by letters.
3764
3765 In a given pair, one option is, on average, more advantageous compared to the other.
3766
3767 You can win or lose the following outcomes: 1.0 points and -1.0 points.
3768
3769 In the second part, there will be two types of options.
3770
3771 The first type of option is represented by the letters you already encountered during
3772 the previous part.

Note that the options maintain the same odds of winning or losing a point as in the first part.	3773 3774 3775
The second type of option is represented by an explicit description of the odds of winning or losing a point.	3776 3777 3778
In each round of the third part, you will be presented with the options you met in the first and the second part.	3779 3780 3781 3782
This is the occasion to test your knowledge of each options's outcome.	3783
You will be asked to indicate (in percentages), what are the odds that a given option makes you win a point.	3784 3785 3786 3787
You can choose an option by pressing its corresponding key.	3788
Your goal for the first two parts is to maximize the amount of received points.	3789
Your goal in the third part is to guess as accurately as possible.	3790 3791 3792 3793 3794
You can choose between option Q and option L. You press <<Q>> and get 1.0 points.	3795
You would have gotten 1.0 points had you chosen option L instead.	3796 3797
You can choose between option Z and option H. You press <<Z>> and get 1.0 points.	3798
You would have gotten 1.0 points had you chosen option H instead.	3799 3800
You can choose between option D and option X. You press <<X>> and get 1.0 points.	3801
You would have gotten -1.0 points had you chosen option D instead.	3802 3803
You can choose between option U and option C. You press <<C>> and get 1.0 points.	3804
You would have gotten 1.0 points had you chosen option U instead.	3805 3806 3807
You can choose between option U and option C. You press <<C>> and get -1.0 points. You would have gotten 1.0 points had you chosen option U instead.	3808 3809 3810
You can choose between option D and option X. You press <<X>> and get 1.0 points.	3811
You would have gotten 1.0 points had you chosen option D instead.	3812 3813
You can choose between option Z and option H. You press <<Z>> and get 1.0 points.	3814
You would have gotten -1.0 points had you chosen option H instead.	3815 3816 3817 3818

3819 You can choose between option Z and option H. You press <<Z>> and get 1.0 points.
3820
3821 You would have gotten 1.0 points had you chosen option H instead.
3822 You can choose between option D and option X. You press <<X>> and get -1.0
3823
3824 points. You would have gotten 1.0 points had you chosen option D instead.
3825
3826 You can choose between option D and option X. You press <<D>> and get 1.0 points.
3827 You would have gotten 1.0 points had you chosen option X instead.
3828
3829 You can choose between option Q and option L. You press <<Q>> and get 1.0 points.
3830
3831 You would have gotten -1.0 points had you chosen option L instead.
3832 You can choose between option D and option X. You press <<X>> and get -1.0
3833
3834 points. You would have gotten 1.0 points had you chosen option D instead.
3835
3836 You can choose between option D and option X. You press <<D>> and get 1.0 points.
3837 You would have gotten -1.0 points had you chosen option X instead.
3838
3839 You can choose between option Q and option L. You press <<Q>> and get -1.0
3840
3841 points. You would have gotten -1.0 points had you chosen option L instead.
3842 You can choose between option Q and option L. You press <<L>> and get -1.0
3843
3844 points. You would have gotten 1.0 points had you chosen option Q instead.
3845
3846 You can choose between option Q and option L. You press <<Q>> and get 1.0 points.
3847 You would have gotten -1.0 points had you chosen option L instead.
3848
3849 You can choose between option Q and option L. You press <<Q>> and get -1.0
3850
3851 points. You would have gotten 1.0 points had you chosen option L instead.
3852 You can choose between option U and option C. You press <<C>> and get -1.0
3853
3854 points. You would have gotten 1.0 points had you chosen option U instead.
3855
3856 You can choose between option U and option C. You press <<C>> and get -1.0
3857
3858 points. You would have gotten -1.0 points had you chosen option U instead.
3859 You can choose between option Q and option L. You press <<Q>> and get 1.0 poi
3860
3861
3862
3863
3864

Two-armed bandit	3865
	3866
Data source: [82]	3867
	3868
	3869
Number of experiments: 2	3870
	3871
Number of participants: 80	3872
	3873
Number of choices: 16000	3874
	3875
	3876
Example prompt:	3877
	3878
In this task, you have to repeatedly choose between two slot machines labeled U and P.	3879
	3880
You can choose a slot machine by pressing its corresponding key.	3881
	3882
When you select one of the machines, you will win or lose points.	3883
	3884
Machine U will not always give you the same points when you select it again, but machine P will always give 0 points when you select it.	3885
	3886
Your goal is to choose the slot machines that will give you the most points.	3887
	3888
You will receive feedback about the outcome after making a choice.	3889
	3890
You will play 20 games in total, each with a different pair of slot machines.	3891
	3892
Each game will consist of 10 trials.	3893
	3894
	3895
	3896
Game 1:	3897
	3898
You press <<U>> and get -1 points.	3899
	3900
You press <<U>> and get 0 points.	3901
	3902
You press <<U>> and get 2 points.	3903
	3904
You press <<U>> and get -1 points.	3905
	3906
You press <<U>> and get 1 points.	3907
	3908
You press <<U>> and get -1 points.	3909
	3910

3911 You press <<U>> and get -1 points.
3912
3913 You press <<U>> and get 1 points.
3914 You press <<U>> and get 1 points.
3915
3916
3917
3918 Game 2:
3919 You press <<U>> and get -1 points.
3920
3921 You press <<U>> and get -1 points.
3922
3923 You press <<U>> and get -2 points.
3924 You press <<U>> and get 0 points.
3925
3926 You press <<U>> and get -1 points.
3927
3928 You press <<P>> and get 0 points.
3929 You press <<P>> and get 0 points.
3930
3931 You press <<P>> and get 0 points.
3932
3933 You press <<P>> and get 0 points.
3934 You press <<P>> and get 0 points.
3935
3936
3937
3938 Game 3:
3939 You press <<U>> and get -2 points.
3940
3941 You press <<U>> and get -1 points.
3942
3943 You press <<P>> and get 0 points.
3944 You press <<P>> and get 0 points.
3945
3946 You press <<P>> and get 0 points.
3947
3948 You press <<U>> and get -4 points.
3949 You press <<P>> and get 0 points.
3950
3951 You press <<P>> and get 0 points.
3952
3953 You press <<P>> and get 0 points.
3954 You press <<P>> and get 0 points.
3955
3956

Game 4:	3957
You press <<U>> and get 2 points.	3958
You press <<U>> and get 0 points.	3959
You press <<U>> and get 2 points.	3960
You press <<U>> and get 1 points.	3961
You press <<U>> and get 2 points.	3962
You press <<U>> and get 1 points.	3963
You press <<U>> and get 2 points.	3964
You press <<U>> and get 2 points.	3965
You press <<U>> and get -1 points.	3966
You press <<U>> and get 0 points.	3967
You press <<U>> and get 0 points.	3968
You press <<U>> and get 2 points.	3969
You press <<U>> and get 2 points.	3970
You press <<U>> and get 1 points.	3971
You press <<U>> and get 1 points.	3972
You press <<U>> and get 0 points.	3973
	3974
	3975
	3976
Game 5:	3977
You press <<U>> and get 0 points.	3978
You press <<U>> and get 1 points.	3979
You press <<U>> and get 1 points.	3980
You press <<U>> and get 1 points.	3981
You press <<U>> and get 0 points.	3982
You press <<U>> and get 2 points.	3983
You press <<U>> and get 2 points.	3984
You press <<U>> and get 1 points.	3985
You press <<U>> and get 1 points.	3986
You press <<U>> and get 2 points.	3987
You press <<U>> and get 2 points.	3988
You press <<U>> and get 1 points.	3989
You press <<U>> and get 2 points.	3990
You press <<U>> and get 2 points.	3991
You press <<U>> and get 1 points.	3992
	3993
	3994
	3995
	3996
Game 6:	3997
You press <<U>> and get 3 points.	3998
You press <<U>> and get 2 points.	3999
	4000
	4001
	4002

4003 You press <<U>> and get 0 points.
4004
4005 You press <<U>> and get 2 points.
4006 You press <<U>> and get 2 points.
4007
4008 You press <<U>> and get 2 points.
4009
4010 You press <<U>> and get 1 points.
4011 You press <<U>> and get 3 points.
4012
4013 You press <<U>> and get 2 points.
4014
4015 You press <<U>> and get 1 points.
4016
4017
4018 Game 7:
4019
4020 You press <<U>> and get -1 points.
4021 You press <<U>> and get -3 points.
4022
4023 You press <<P>> and get 0 points.
4024
4025 You press <<P>> and get 0 points.
4026 You press <<P>> and get 0 points.
4027
4028 You press <<P>> and get 0 points.
4029
4030 You press <<P>> and get 0 points.
4031 You press <<P>> and get 0 points.
4032
4033 You press <<P>> and get 0 points.
4034
4035 You press <<P>> and get 0 points.
4036
4037
4038 Game 8:
4039
4040 You press <<U>> and get 0 points.
4041 You press <<U>> and get -1 points.
4042
4043 You press <<P>> and get 0 points.
4044
4045 You press <<P>> and get 0 points.
4046 You press <<P>> and get 0 points.
4047
4048

You press <<P>> and get 0 points.	4049
You press <<P>> and get 0 points.	4050
You press <<P>> and get 0 points.	4051
You press <<P>> and get 0 points.	4052
You press <<P>> and get 0 points.	4053
You press <<P>> and get 0 points.	4054
You press <<P>> and get 0 points.	4055
You press <<P>> and get 0 points.	4056
	4057
	4058
Game 9:	4059
You press <<U>> and get 2 points.	4060
You press <<U>> and get 2 points.	4061
You press <<U>> and get 3 points.	4062
You press <<U>> and get 3 points.	4063
You press <<U>> and get 4 points.	4064
You press <<U>> and get 4 points.	4065
You press <<U>> and get 1 points.	4066
You press <<U>> and get 1 points.	4067
You press <<U>> and get 1 points.	4068
You press <<U>> and get 2 points.	4069
You press <<U>> and get 2 points.	4070
You press <<U>> and get 2 points.	4071
You press <<U>> and get 2 points.	4072
You press <<U>> and get 2 points.	4073
You press <<U>> and get -1 points.	4074
You press <<U>> and get -1 points.	4075
You press <<U>> and get 2 points.	4076
	4077
	4078
Game 10:	4079
You press <<U>> and get 1 points.	4080
You press <<U>> and get 1 points.	4081
You press <<U>> and get 0 points.	4082
You press <<U>> and get 0 points.	4083
You press <<U>> and get 0 points.	4084
You press <<U>> and get 1 points.	4085
You press <<U>> and get 1 points.	4086
You press <<U>> and get -1 points.	4087
You press <<U>> and get -1 points.	4088
You press <<U>> and get -2 points.	4089
You press <<U>> and get -2 points.	4090
You press <<U>> and get 1 points.	4091
You press <<U>> and get 1 points.	4092
You press <<U>> and get 2 points.	4093
	4094

4095 You press <<U>> and get 1 points.
4096
4097 You pr
4098
4099 **Conditional associative learning**
4100
4101
4102 Data source: [83]
4103
4104
4105 Number of experiments: 1
4106
4107 Number of participants: 74
4108
4109 Number of choices: 40539
4110
4111
4112 **Example prompt:**
4113 You are presented with a series of stimuli, each associated with one of three possible
4114
4115 responses.
4116
4117 Your goal is to learn which response is the correct one for each stimulus.
4118
4119 When a stimulus is presented, you can press one of three keys to respond.
4120
4121 The three responses available are S, F, and A.
4122
4123 After your response, you will receive feedback: 1 point for a correct response, or 0
4124
4125 points for an incorrect response.
4126
4127 The correct response for one stimulus does not inform you about the correct response
4128
4129 for another stimulus.
4130
4131 You will play 13 games, each with a different mapping from stimuli to responses.
4132
4133 Game 1:
4134
4135 There are 6 different stimuli.
4136
4137 You see stimulus 1. You press <<S>> and get 0 points.
4138
4139 You see stimulus 0. You press <<F>> and get 0 points.
4140
4141 You see stimulus 4. You press <<A>> and get 1 points.
4142
4143 You see stimulus 5. You press <<S>> and get 0 points.

4187 You see stimulus 4. You press <<A>> and get 1 points.
4188
4189 You see stimulus 0. You press <<S>> and get 1 points.
4190 You see stimulus 2. You press <<S>> and get 0 points.
4191
4192 You see stimulus 2. You press <<S>> and get 0 points.
4193
4194 You see stimulus 3. You press <<F>> and get 1 points.
4195 You see stimulus 5. You press <<S>> and get 0 points.
4196
4197 You see stimulus 1. You press <<A>> and get 0 points.
4198
4199 You see stimulus 0. You press <<F>> and get 0 points.
4200 You see stimulus 5. You press <<F>> and get 0 points.
4201
4202 You see stimulus 4. You press <<A>> and get 1 points.
4203
4204 You see stimulus 4. You press <<A>> and get 1 points.
4205 You see stimulus 1. You press <<A>> and get 0 points.
4206
4207 You see stimulus 3. You press <<F>> and get 1 points.
4208
4209 You see stimulus 2. You press <<F>> and get 1 points.
4210 You see stimulus 2. You press <<F>> and get 1 points.
4211
4212 You see stimulus 3. You press <<F>> and get 1 points.
4213
4214 You see stimulus 0. You press <<F>> and get 0 points.
4215 You see stimulus 1. You press <<F>> and get 1 points.
4216
4217 You see stimulus 5. You press <<F>> and get 0 points.
4218
4219 You see stimulus 0. You press <<F>> and get 0 points.
4220 You see stimulus 5. You press <<F>> and get 0 points.
4221
4222 You see stimulus 4. You press <<A>> and get 1 points.
4223
4224 You see stimulus 2. You press <<A>> and get 0 points.
4225 You see stimulus 0. You press <<F>> and get 0 points.
4226
4227 You see stimulus 0. You press <<F>> and get 0 points.
4228
4229 You see stimulus 1. You press <<A>> and get 0 points.
4230 You see stimulus 2. You press <<A>> and get 0 points.
4231
4232

You see stimulus 1. You press <<A>> and get 0 points.	4233
You see stimulus 4. You press <<A>> and get 1 points.	4234
You see stimulus 4. You press <<A>> and get 1 points.	4235
You see stimulus 4. You press <<A>> and get 1 points.	4236
You see stimulus 2. You press <<S>> and get 0 points.	4237
You see stimulus 2. You press <<S>> and get 0 points.	4238
You see stimulus 5. You press <<S>> and get 0 points.	4239
You see stimulus 5. You press <<S>> and get 0 points.	4240
You see stimulus 5. You press <<F>> and get 0 points.	4241
	4242
	4243
THINGS odd-one-out	4244
	4245
Data source: [84]	4246
	4247
	4248
Number of experiments: 1	4249
	4250
Number of participants: 11122	4251
	4252
Number of choices: 2611240	4253
	4254
	4255
Example prompt:	4256
	4257
You will be presented with triplets of objects, which will be assigned to the keys B, J,	4258
and K.	4259
	4260
In each trial, please indicate which object you think is the odd one out by pressing	4261
the corresponding key.	4262
	4263
In other words, please choose the object that is the least similar to the other two.	4264
	4265
	4266
	4267
B: prune, J: nail polish, and K: diskette. You press <<K>>.	4268
	4269
B: ladle, J: water bottle, and K: pug. You press <<K>>.	4270
	4271
B: punch, J: hair, and K: lollipop. You press <<J>>.	4272
	4273
B: oar, J: mug, and K: macaroni. You press <>.	4274
	4275
B: towel, J: hot tub, and K: mallet. You press <<K>>.	4276
	4277
B: train set, J: hot-water bottle, and K: treasure. You press <<J>>.	4278
	4279
B: shutter, J: cleaver, and K: toe. You press <<K>>.	4280

4279 B: straw, J: sweeper, and K: baton. You press <<J>>.
4280
4281 B: footprint, J: beehive, and K: skunk. You press <>.
4282 B: cash machine, J: thermostat, and K: mandolin. You press <<K>>.
4283
4284 B: orange, J: throne, and K: stir fry. You press <<J>>.
4285
4286 B: boy, J: burrito, and K: microscope. You press <<J>>.
4287 B: pheasant, J: sponge, and K: orchid. You press <<J>>.
4288
4289 B: forklift, J: clipper, and K: hip. You press <<J>>.
4290
4291 B: candelabra, J: beard, and K: glue. You press <<J>>.
4292 B: raccoon, J: hammer, and K: roulette wheel. You press <>.
4293
4294 B: wing, J: beanie, and K: girl. You press <>.
4295
4296 B: piggy bank, J: footrest, and K: sandal. You press <>.
4297 B: knee, J: cornhusk, and K: tuning fork. You press <>.
4298
4299 B: anklet, J: bedpost, and K: ice cube. You press <>.
4300
4301 B: mannequin, J: stove, and K: coin. You press <<K>>.
4302 B: tortellini, J: cantaloupe, and K: sequin. You press <<K>>.
4303
4304 B: coffee filter, J: fingerprint, and K: rose. You press <>.
4305
4306 B: porcupine, J: christmas tree, and K: corkscrew. You press <>.
4307 B: freezer, J: coat rack, and K: puffin. You press <<K>>.
4308
4309 B: maggot, J: mouth, and K: stockings. You press <>.
4310
4311 B: soap, J: hot-water bottle, and K: knitting needle. You press <<K>>.
4312 B: mosquito net, J: baklava, and K: beanbag. You press <<J>>.
4313
4314 B: skewer, J: baklava, and K: propeller. You press <<K>>.
4315
4316 B: nail polish, J: goose, and K: pizza. You press <<J>>.
4317 B: face mask, J: cinnamon, and K: toilet paper. You press <>.
4318
4319 B: bag, J: eel, and K: trampoline. You press <<J>>.
4320
4321 B: lightbulb, J: moose, and K: curling iron. You press <<J>>.
4322 B: dumbwaiter, J: jigsaw puzzle, and K: lamb. You press <<K>>.
4323
4324

B: eyeliner, J: shopping basket, and K: flipper. You press <<K>>.	4325
B: bowtie, J: wooden leg, and K: kangaroo. You press <<K>>.	4326
B: puffin, J: wire cutters, and K: battery. You press <>.	4327
B: toilet, J: rack, and K: star fruit. You press <<K>>.	4328
B: stingray, J: cork, and K: fire pit. You press <>.	4329
B: bun, J: snow, and K: tinsel. You press <<J>>.	4330
B: almond, J: trailer, and K: paper. You press <>.	4331
B: anteater, J: chalice, and K: wedge. You press <>.	4332
B: scone, J: pie, and K: ant. You press <<K>>.	4333
B: heater, J: aircraft carrier, and K: joystick. You press <>.	4334
B: comic book, J: playing card, and K: organ. You press <<K>>.	4335
B: flag, J: measuring cup, and K: strawberry. You press <>.	4336
B: bunkbed, J: tractor, and K: windshield. You press <>.	4337
B: aircraft carrier, J: prism, and K: turban. You press <<K>>.	4338
B: egg, J: scrambled egg, and K: doorknocker. You press <<K>>.	4339
B: microscope, J: stained glass, and K: strainer. You press <<J>>.	4340
B: polygraph, J: hairdryer, and K: harness. You press <<J>>.	4341
B: chip, J: iguana, and K: hedge. You press <>.	4342
B: tick, J: binder, and K: shoelace. You press <>.	4343
B: nut, J: yogurt, and K: jug. You press <<K>>.	4344
B: hairpin, J: giraffe, and K: fur coat. You press <>.	4345
B: lasagna, J: statue, and K: bookshelf. You press <>.	4346
B: grill, J: catapult, and K: sonogram. You press <<K>>.	4347
B: fondue, J: pill, and K: firewood. You press <<K>>.	4348
B: sunroof, J: onion, and K: flan. You press <>.	4349
B: wreck, J: bungee, and K: cockroach. You press <<K>>.	4350
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	4370

4371 **Multi-attribute decision-making**

4372

4373 Data source: [85]

4374

4375

4376 Number of experiments: 1

4377

4378 Number of participants: 73

4379

4380 Number of choices: 7008

4381

4382

4383 **Example prompt:**

4384

4385 You are repeatedly presented with two options, labeled A and R.

4386

4387 Each option represents a fictitious product and you have to infer which product is

4388

4388 superior in terms of quality.

4389

4390 You select a product by pressing the corresponding key.

4391

4392 For each decision, you are provided with four expert ratings (with 1 representing a

4393

4393 positive and 0 representing a negative rating).

4394

4395 The four experts differ in their validity.

4396

4397 The ratings of experts are given in descending order of their validity (having validities

4398

4398 of 90%, 80%, 70%, and 60%).

4399

4400

4401 Product A ratings: [0 1 1 1]. Product R ratings: [1 0 0 1]. You press <<A>>.

4402

4403 Product A ratings: [1 1 1 1]. Product R ratings: [0 0 1 1]. You press <<A>>.

4404

4405 Product A ratings: [1 0 0 0]. Product R ratings: [0 0 0 1]. You press <<A>>.

4406

4407 Product A ratings: [1 1 1 0]. Product R ratings: [0 0 1 0]. You press <<A>>.

4408

4408 Product A ratings: [0 1 1 1]. Product R ratings: [1 1 1 0]. You press <<R>>.

4409

4410 Product A ratings: [0 1 0 1]. Product R ratings: [1 1 0 0]. You press <<R>>.

4411

4412 Product A ratings: [0 0 1 1]. Product R ratings: [1 0 1 0]. You press <<R>>.

4413

4413 Product A ratings: [1 0 0 1]. Product R ratings: [0 1 1 1]. You press <<R>>.

4414

4415 Product A ratings: [0 1 1 1]. Product R ratings: [1 0 0 1]. You press <<A>>.

4416

4463 Product A ratings: [1 0 1 0]. Product R ratings: [0 0 1 1]. You press <<A>>.
4464
4465 Product A ratings: [1 1 0 0]. Product R ratings: [0 0 0 0]. You press <<A>>.
4466 Product A ratings: [0 0 1 1]. Product R ratings: [1 0 1 0]. You press <<R>>.
4467
4468 Product A ratings: [1 0 0 0]. Product R ratings: [0 1 1 0]. You press <<R>>.
4469
4470 Product A ratings: [1 1 1 0]. Product R ratings: [0 0 1 0]. You press <<A>>.
4471 Product A ratings: [1 0 0 1]. Product R ratings: [0 1 1 1]. You press <<R>>.
4472
4473 Product A ratings: [1 0 1 0]. Product R ratings: [0 0 1 1]. You press <<A>>.
4474
4475 Product A ratings: [0 1 1 0]. Product R ratings: [1 0 0 0]. You press <<A>>.
4476 Product A ratings: [1 1 0 0]. Product R ratings: [0 1 0 1]. You press <<A>>.
4477
4478 Product A ratings: [0 1 1 0]. Product R ratings: [1 0 0 0]. You press <<A>>.
4479
4480 Product A ratings: [1 0 0 0]

4481

4482 **Grammar judgement**

4483

4484 Data source: [26]

4485

4486

4487

4488 Number of experiments: 1

4489

4490 Number of participants: 3192

4491

4492 Number of choices: 89376

4493

4494

4495 **Example prompt:**

4496

4497 You're about to answer a set of 20 questions about grammar. How many of the 20

4498

4498 questions do you think you will answer correctly?

4499

4500 You say <<4>>.

4501

4502 Compared to other participants in this study, how well do you think you will do?

4503

4503 Marking 90% means you will do better than 90% of participants, marking 10% means

4504

4505 you will do better than only 10%, and marking 50% means that you will perform bet-

4506

4506 ter than half of the participants.

4507

4508 You say <<50>>%.

On a scale of 0 to 10, how difficult is recognizing correct grammar for the average participant?	4509
	4510
You say <<6>>.	4511
	4512
On a scale of 0 to 10, how difficult is recognizing correct grammar for you?	4513
	4514
You say <<6>>.	4515
	4516
	4517
	4518
You will now see twenty questions.	4519
	4520
In each question, some part of each sentence is in square brackets.	4521
	4522
Five choices for rephrasing that part follow each sentence; one choice repeats the original, and the other four are different.	4523
	4524
Your task is to use the buttons J, E, V, H, and G to select the grammatically correct choice.	4525
	4526
	4527
	4528
	4529
	4530
Q1. The school-age child faces a formidable task when during the first few years of classroom experiences [he or she is expected to master the printed form of language.]	4531
	4532
	4533
The choices are:	4534
	4535
V: he or she expects to master the printed form of language.	4536
	4537
E: he or she is expected to master the printed form of language.	4538
	4539
H: he or she faces expectations of mastering the printed form of language.	4540
	4541
J: mastery of the printed form of language is expected of him or her.	4542
	4543
G: mastery of print is expected by his or her teacher.	4544
	4545
You press <<E>>.	4546
	4547
Q2. He came to the United States as a young [man, he found] a job as a coal miner.	4548
	4549
The choices are:	4550
	4551
H: man, he found	4552
	4553
G: man and found	4554
E: man and there he was able to find	

4555 V: man and then finding
4556
4557 J: man and had found
4558 You press <<H>>.
4559
4560
4561
4562 Q3. To a large degree, [poetry, along with all the other arts, is] a form of imitation.
4563 The choices are:
4564
4565 E: poetry, along with all the other arts, is
4566
4567 V: poetry along with all the other arts is
4568
4568 J: poetry, along with all the other arts, are
4569
4570 G: poetry, and other arts, is
4571
4571 H: poetry and art are
4572
4573 You press <<V>>.
4574
4575
4576
4577 Q4. Delegates to the political convention found [difficulty to choose] a candidate from
4578 among the few nominated.
4579
4580 The choices are:
4581
4582 E: difficulty to choose
4583
4583 G: it difficult in making the choice of
4584
4585 H: it difficult to choose
4586
4587 V: choosing difficult when selecting
4588
4588 J: making a choice difficult in selecting
4589
4590 You press <<E>>.
4591
4592
4593 Q5. Reading in any language can be viewed as a developmental task much the same
4594
4595 as learning to walk, to cross the street independently, to care for one's possessions, or
4596
4597 [accepting responsibility for one's own decisions.]
4598 The choices are:
4599
4600

J: accepting responsibility for one's own decisions.	4601
V: accepting one's own decisions responsibly.	4602
H: to accept responsibility for one's own decisions.	4603
E: accepting responsibility and making one's own decisions.	4604
G: to make one's own decisions.	4605
You press <<G>>.	4606
	4607
	4608
	4609
	4610
	4611
	4612
Q6. Sea forests of giant kelp, which fringe only one coastline in the Northern Hemisphere, [is native to shores] throughout the Southern Hemisphere.	4613
	4614
The choices are:	4615
E: is native to shores	4616
V: is native to most shores	4617
G: are native only in shores	4618
J: are native	4619
H: are native to shores	4620
You press <<J>>.	4621
	4622
	4623
	4624
	4625
	4626
	4627
	4628
Q7. Taking an occasional respite between chapters or assignments is more desirable [than a long, continuous period of study.	4629
	4630
The choices are:	4631
E: than a long, continuous period of study.	4632
G: than a period of long, continuous study.	4633
V: than a long period of continuous study.	4634
J: than studying for a long, continuous period.	4635
H: than a study period long and continuous.	4636
You press <<V>>.	4637
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	4645
	4646

4647 Q8. Like so many characters in Russian fiction, [Crime and Punishment exhibits] a
4648 behavior so foreign to the American temperament that many readers find the story
4649 rather incredible.
4650

4651 The choices are:

4652

4653 J: Crime and Punishment exhibits

4654 H: those in Crime and Punishment exhibit

4655

4656 G: those in Crime and Punishment exhibits

4657

4658 V: often exhibiting

4659 E: characterized by

4660

4661 You press <<G>>.

4662

4663

4664 Q9. Don Quixote provides a cross section of Spanish life, thought, and [portrays the
4665 feelings of many Spaniards] at the end of the chivalric age.

4666

4667

4668 The choices are:

4669 H: portrays th

4670

4671

4672 **Two-step task**

4673

4674 Data source: [27]

4675

4676

4677

4678 Number of experiments: 2

4679 Number of participants: 181

4680

4681 Number of choices: 52861

4682

4683

4684 **Example prompt:**

4685

4686 Each day you will either be presented with spaceships P and F or with spaceships Z

4687

4688 and J.

4689 These spaceships will take you to two different planets L and Q.

4690

4691 You can take a spaceship by pressing the corresponding key.

Each planet has one alien on it and each alien has its own space treasure mine.	4693
When you arrive at a planet, you will ask the alien for space treasure from its mine.	4694
When you ask the alien, you will find out whether you got space treasure.	4695
However, sometimes the alien will not bring up any treasure.	4696
The quality of each alien's mine will change during the game.	4697
Before you choose a spaceship, you will be told whether there is a treasure multiplier.	4698
If there is a treasure multiplier, you will receive 5 times the amount of treasure you will find.	4699
Your goal is to get as much treasure as possible over the next 200 days.	4700
There is no treasure multiplier. You are presented with spaceships F and P. You press <<P>>. You end up on planet L. You find 7 pieces of space treasure. You receive 7 pieces of space treasure.	4701
There is no treasure multiplier. You are presented with spaceships F and P. You press <<F>>. You end up on planet Q. You find 0 pieces of space treasure. You receive 0 pieces of space treasure.	4702
There is no treasure multiplier. You are presented with spaceships J and Z. You press <<Z>>. You end up on planet L. You find 7 pieces of space treasure. You receive 7 pieces of space treasure.	4703
There is no treasure multiplier. You are presented with spaceships Z and J. You press <<Z>>. You end up on planet L. You find 7 pieces of space treasure. You receive 7 pieces of space treasure.	4704
There is no treasure multiplier. You are presented with spaceships Z and J. You press <<Z>>. You end up on planet L. You find 8 pieces of space treasure. You receive 8 pieces of space treasure.	4705
There is a treasure multiplier. You are presented with spaceships F and P. You press <<P>>. You end up on planet L. You find 6 pieces of space treasure. You receive 30	4706
	4707
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	4738

4739 pieces of space treasure.
4740
4741 There is a treasure multiplier. You are presented with spaceships F and P. You press
4742 <<P>>. You end up on planet L. You find 8 pieces of space treasure. You receive 40
4743
4744 pieces of space treasure.
4745
4746 There is no treasure multiplier. You are presented with spaceships J and Z. You press
4747 <<Z>>. You end up on planet L. You find 9 pieces of space treasure. You receive 9
4748
4749 pieces of space treasure.
4750
4751 There is no treasure multiplier. You are presented with spaceships P and F. You press
4752 <<P>>. You end up on planet L. You find 8 pieces of space treasure. You receive 8
4753
4754 pieces of space treasure.
4755
4756 There is a treasure multiplier. You are presented with spaceships J and Z. You press
4757 <<Z>>. You end up on planet L. You find 9 pieces of space treasure. You receive 45
4758
4759 pieces of space treasure.
4760
4761 There is a treasure multiplier. You are presented with spaceships P and F. You press
4762 <<P>>. You end up on planet L. You find 9 pieces of space treasure. You receive 45
4763
4764 pieces of space treasure.
4765
4766 There is no treasure multiplier. You are presented with spaceships J and Z. You press
4767 <<Z>>. You end up on planet L. You find 8 pieces of space treasure. You receive 8
4768
4769 pieces of space treasure.
4770
4771 There is a treasure multiplier. You are presented with spaceships J and Z. You press
4772 <<Z>>. You end up on planet L. You find 9 pieces of space treasure. You receive 45
4773
4774 pieces of space treasure.
4775
4776 There is no treasure multiplier. You are presented with spaceships Z and J. You press
4777 <<Z>>. You end up on planet L. You find 5 pieces of space treasure. You receive 5
4778
4779 pieces of space treasure.
4780
4781 There is no treasure multiplier. You are presented with spaceships Z and J. You press
4782 <<Z>>. You end up on planet L. You find 6 pieces of space treasure. You receive 6
4783
4784

pieces of space treasure.	4785
There is a treasure multiplier. You are presented with spaceships P and F. You press	4786
<<P>>. You end up on planet L. You find 8 pieces of space treasure. You receive 40	4787
pieces of space treasure.	4788
There is no treasure multiplier. You are presented with spaceships J and Z. You press	4789
<<Z>>. You end up on planet L. You find 7 pieces of space treasure.	4790
	4791
	4792
	4793
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	4795
Two-step task	4796
	4797
Data source: [28]	4798
	4799
	4800
	4801
Number of experiments: 2	4802
Number of participants: 367	4803
	4804
Number of choices: 67041	4805
	4806
	4807
	4808
Example prompt:	4809
Each day you will either be presented with spaceships G and S or with spaceships T	4810
and N.	4811
	4812
These spaceships will take you to two different planets R and Z.	4813
	4814
You can take a spaceship by pressing the corresponding key.	4815
	4816
Each planet has one alien on it and each alien has its own space treasure mine.	4817
	4818
When you arrive at a planet, you will ask the alien for space treasure from its mine.	4819
	4820
When you ask the alien, you will find out whether you got space treasure.	4821
	4822
However, sometimes the alien's mine will dig up antimatter.	4823
	4824
Antimatter is bad because each piece will destroy a piece of space treasure, reducing	4825
the total amount of treasure that you have.	4826
	4827
The quality of each alien's mine will change during the game.	4828
	4829
Your goal is to get as much treasure and as little antimatter as possible over the next	4830
125 days.	

4831
4832
4833 You are presented with spaceships N and T. You press <<T>>. You end up on planet
4834 R. You find 1 pieces of antimatter.
4835
4836 You are presented with spaceships T and N. You do not respond in time on this day.
4837
4838 You do not go to any planet. You find nothing.
4839 You are presented with spaceships N and T. You press <<N>>. You end up on planet
4840
4841 Z. You find 4 pieces of space treasure.
4842
4843 You are presented with spaceships T and N. You press <<N>>. You end up on planet
4844 Z. You find 4 pieces of space treasure.
4845
4846 You are presented with spaceships S and G. You press <<S>>. You end up on planet
4847
4848 Z. You find 5 pieces of space treasure.
4849 You are presented with spaceships T and N. You press <<N>>. You end up on planet
4850
4851 Z. You find 3 pieces of space treasure.
4852
4853 You are presented with spaceships N and T. You press <<N>>. You end up on planet
4854 Z. You find 4 pieces of space treasure.
4855
4856 You are presented with spaceships T and N. You press <<N>>. You end up on planet
4857
4858 Z. You find 2 pieces of space treasure.
4859 You are presented with spaceships S and G. You press <<S>>. You end up on planet
4860
4861 Z. You find 1 pieces of space treasure.
4862
4863 You are presented with spaceships T and N. You press <<N>>. You end up on planet
4864 Z. You find 3 pieces of antimatter.
4865
4866 You are presented with spaceships T and N. You press <<T>>. You end up on planet
4867
4868 R. You find 2 pieces of space treasure.
4869 You are presented with spaceships G and S. You press <<G>>. You end up on planet
4870
4871 R. You find 4 pieces of space treasure.
4872
4873 You are presented with spaceships S and G. You press <<G>>. You end up on planet
4874 R. You find 2 pieces of space treasure.
4875
4876

You are presented with spaceships T and N. You press <<T>>. You end up on planet	4877
R. You find 3 pieces of space treasure.	4878
You are presented with spaceships T and N. You press <<T>>. You end up on planet	4879
R. You find 5 pieces of space treasure.	4880
You are presented with spaceships N and T. You press <<T>>. You end up on planet	4881
R. You find 4 pieces of space treasure.	4882
You are presented with spaceships S and G. You press <<G>>. You end up on planet	4883
R. You find 4 pieces of space treasure.	4884
You are presented with spaceships S and G. You press <<G>>. You end up on planet	4885
R. You find nothing.	4886
You are presented with spaceships T and N. You press <<T>>. You end up on planet	4887
R. You find 3 pieces of antimatter.	4888
You are presented with spaceships T and N. You press <<N>>. You end up on planet	4889
Z. You find 2 pieces of space treasure.	4890
You are presented with spaceships S and G. You press <<S>>. You end up on planet	4891
Z. You find 2 pieces of space treasure.	4892
You are presented with spaceships S and G. You press <<S>>. You end up on planet	4893
Z. You find 4 pieces of space treasure.	4894
You are presented with spaceships S and G. You press <<S>>. You end up on planet	4895
Z. You find 4 pieces of space treasure.	4896
You are presented with spaceships N and T. You press <<N>>. You end up on planet	4897
Z. You find 4 pieces of space treasure.	4898
You are presented with spaceships N and T. You press <<N>>. You end up on planet	4899
Z. You find 5 pieces of space treasure.	4900
You are presented with spaceships S and G. You press <<S>>. You end up on planet	4901
Z. You find 3 pieces of space treasure.	4902
You are presented with spaceships G and S. You press <<S>>. You end up on planet	4903
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	4922

4923 Z. You find 4 pieces of space treasure.
4924
4925 You are presented with spaceships S and G. Yo
4926
4927 **Risky choice**
4928
4929 Data source: [86]
4930
4931
4932
4933 Number of experiments: 1
4934
4935 Number of participants: 1755
4936
4937 Number of choices: 499728
4938
4939
4940 **Example prompt:**
4941 You will play multiple rounds of a gambling game.
4942
4943 In each round, you will be presented with 6 different gambles labeled: Q, N, E, S, H,
4944 and K.
4945
4946 You will have to choose one of the gambles and receive a payoff for doing so.
4947
4948 The payoff you receive depends on both the gamble you choose and also the color of
4949 a ball we pull out of a jar with 100 colored balls.
4950
4951 There are a different number of balls of each color on every round.
4952
4953 The colors with more balls are more likely to be chosen.
4954
4955 Before making your choice, you may check how much different gambles are worth for
4956 different ball colors.
4957
4958 Each time you check a gamble will cost you 4 points.
4959
4960 To choose or check a gamble, first press the corresponding key, followed by typing
4961 "stop" (for choosing) or the ball color you would like to check.
4962
4963
4964 A new round begins.
4965
4966 There are 50 pink balls, 19 red balls, 15 black balls, and 16 maroon balls.
4967
4968 You press <<Q>> and then type <<pink>>. The payoff for this combination would

be -105 points.	4969
You press <<E>> and then type <<pink>>. The payoff for this combination would	4970
be 47 points.	4971
	4972
You press <<H>> and then type <<pink>>. The payoff for this combination would	4973
be 91 points.	4974
	4975
You press <<H>> and then type <<stop>>. A maroon ball is chosen, and you earn	4976
-16 points.	4977
	4978
	4979
	4980
	4981
A new round begins.	4982
	4983
There are 2 pink balls, 47 red balls, 14 black balls, and 37 maroon balls.	4984
	4985
You press <<Q>> and then type <<red>>. The payoff for this combination would	4986
be -168 points.	4987
	4988
You press <<E>> and then type <<red>>. The payoff for this combination would	4989
be 209 points.	4990
	4991
You press <<H>> and then type <<red>>. The payoff for this combination would	4992
be 22 points.	4993
	4994
	4995
You press <<E>> and then type <<stop>>. A maroon ball is chosen, and you earn	4996
25 points.	4997
	4998
	4999
	5000
A new round begins.	5001
	5002
There are 13 pink balls, 1 red balls, 47 black balls, and 39 maroon balls.	5003
	5004
You press <<Q>> and then type <<black>>. The payoff for this combination would	5005
be -101 points.	5006
	5007
You press <<E>> and then type <<black>>. The payoff for this combination would	5008
be -98 points.	5009
	5010
You press <<H>> and then type <<black>>. The payoff for this combination would	5011
be 32 points.	5012
	5013
	5014

5015 You press <<H>> and then type <<stop>>. A maroon ball is chosen, and you earn
5016
5017 -85 points.
5018
5019
5020 A new round begins.
5021
5022 There are 7 pink balls, 15 red balls, 76 black balls, and 2 maroon balls.
5023 You press <<N>> and then type <<black>>. The payoff for this combination would
5024
5025 be -108 points.
5026
5027 You press <<Q>> and then type <<black>>. The payoff for this combination would
5028
5029 be -191 points.
5030 You press <<S>> and then type <<black>>. The payoff for this combination would
5031
5032 be -222 points.
5033 You press <<K>> and then type <<stop>>. A black ball is chosen, and you earn
5034
5035 -90 points.
5036
5037
5038 A new round begins.
5039
5040 There are 17 pink balls, 54 red balls, 16 black balls, and 13 maroon balls.
5041
5042 You press <<Q>> and then type <<red>>. The payoff for this combination would
5043
5044 be 138 points.
5045 You press <<N>> and then type <<red>>. The payoff for this combination would
5046
5047 be 171 points.
5048 You press <<E>> and then type <<red>>. The payoff for this combination would
5049
5050 be -197 points.
5051
5052 You press <<N>> and then type <<stop>>. A red ball is chosen, and you earn 171
5053
5054 points.
5055
5056
5057 A new round begins.
5058
5059 There are 1 pink balls, 38 red balls, 25 black balls, and 36 maroon balls.
5060

You press <<N>> and then type <<red>>. The payoff for this combination would	5061
be -124 points.	5062
	5063
You press <<E>> and then type <<red>>. The payoff for this combination would	5064
be -158 points.	5065
	5066
You press <<S>> and then type <<red>>. The payoff for this combination would	5067
be -114 points.	5068
	5069
You press <<H>> and then type <<stop>>. A black ball is chosen, and you earn	5070
338 points.	5071
	5072
	5073
	5074
	5075
A new round begins.	5076
	5077
There are 37 pink balls, 44 red balls, 17 black balls, and 2 maroon balls.	5078
	5079
You press <<Q>> and then type <<red>>. The payoff for this combination would	5080
be -198 points.	5081
	5082
You press <<S>> and then type <<red>>. The payoff for this combination would	5083
be 39 points.	5084
	5085
You press <<H>> and then type <<red>>. The payoff for this combination would	5086
be -63 points.	5087
	5088
You press <<E>> and then type <<stop>>. A red ball is chosen, and you earn 51	5089
points.	5090
	5091
	5092
	5093
A new round begins.	5094
	5095
There are 12 pink balls, 32 red balls, 45	5096
	5097
	5098
Tile-revealing task	5099
	5100
Data source: [87]	5101
	5102
	5103
Number of experiments: 1	5104
	5105
Number of participants: 707	5106

5107 Number of choices: 321738
5108
5109
5110 **Example prompt:**
5111
5112 You are playing a game where you are revealing patterns on a binary grid.
5113
5114 Each turn you will be presented with a 7x7 grid of tiles.
5115 If you give the location on the grid with an "X" on it, then it will either turn into a
5116
5117 "1" or a "0".
5118
5119 Please give the location as a [row, column] pair where both row and column take
5120 values between 0 and 6.
5121
5122 Do not give the location on the grid where there is already a "1" or a "0".
5123
5124 Your job is to reveal as many 1s as possible while revealing as little 0s as possible.
5125 The game ends when you have revealed all 1s on the grid.
5126
5127 You will have 25 boards to complete, each with a different underlying pattern.
5128
5129
5130 You are currently solving board 1.
5131
5132 The board state is now:
5133
5134 XXXXXXXX
5135 XXXXXXXX
5136
5137 XXXXXXXX
5138
5139 XXX1XXX
5140 XXXXXXXX
5141
5142 XXXXXXXX
5143
5144 XXXXXXXX
5145 You choose <<[2, 2]>> and get a miss!
5146
5147
5148
5149 The board state is now:
5150 XXXXXXXX
5151
5152 XXXXXXXX

XX0XXXX	5153
	5154
XXX1XXX	5155
	5156
XXXXXXXX	5157
	5158
XXXXXXXX	5159
	5160
You choose <<[2, 4]>> and get a miss!	5161
	5162
	5163
	5164
The board state is now:	5165
	5166
XXXXXXXX	5167
	5168
XXXXXXXX	5169
	5170
XX0X0XX	5171
	5172
XXX1XXX	5173
	5174
XXXXXXXX	5175
	5176
XXXXXXXX	5177
	5178
You choose <<[2, 3]>> and get a hit!	5179
	5180
	5181
The board state is now:	5182
	5183
XXXXXXXX	5184
	5185
XXXXXXXX	5186
	5187
XX010XX	5188
	5189
XXX1XXX	5190
	5191
XXXXXXXX	5192
	5193
XXXXXXXX	5194
	5195
You choose <<[1, 3]>> and get a miss!	5196
	5197
	5198
The board state is now:	

5199 XXXXXXXX
5200
5201 XXX0XXX
5202 XX010XX
5203
5204 XXX1XXX
5205
5206 XXXXXXXX
5207 XXXXXXXX
5208
5209 XXXXXXXX
5210
5211 You choose <<[3, 4]>> and get a hit!
5212
5213
5214 The board state is now:
5215
5216 XXXXXXXX
5217 XXX0XXX
5218
5219 XX010XX
5220
5221 XXX11XX
5222 XXXXXXXX
5223
5224 XXXXXXXX
5225
5226 XXXXXXXX
5227 You choose <<[3, 2]>> and get a hit!
5228
5229
5230
5231 The board state is now:
5232 XXXXXXXX
5233
5234 XXX0XXX
5235
5236 XX010XX
5237 XX111XX
5238
5239 XXXXXXXX
5240
5241 XXXXXXXX
5242 XXXXXXXX
5243
5244

You choose <<[3, 5]>> and get a hit!	5245
	5246
	5247
The board state is now:	5248
XXXXXXXX	5249
XXXXXXXX	5250
XXX0XXX	5251
XXX0XXX	5252
XX010XX	5253
XX1111X	5254
XXXXXXXX	5255
XXXXXXXX	5256
XXXXXXXX	5257
XXXXXXXX	5258
XXXXXXXX	5259
XXXXXXXX	5260
You choose <<[3, 6]>> and get a hit!	5261
	5262
	5263
	5264
The board state is now:	5265
XXXXXXXX	5266
XXXXXXXX	5267
XXX0XXX	5268
XXX0XXX	5269
XX010XX	5270
XX11111	5271
XXXXXXXX	5272
XXXXXXXX	5273
XXXXXXXX	5274
XXXXXXXX	5275
XXXXXXXX	5276
XXXXXXXX	5277
You choose <<[3, 1]>> and get a hit!	5278
	5279
	5280
	5281
You are currently solving board 2.	5282
	5283
The board state is now:	5284
XXXXXXXX	5285
X1XXXXX	5286
XXXXXXXX	5287
XXXXXXXX	5288
XXXXXXXX	5289
XXXXXXXX	5290

5291 XXXXXXXX
5292 XXXXXXXX
5293 XXXXXXXX
5294 XXXXXXXX
5295
5296 You choose <<[2, 1]>> and get a miss!
5297
5298
5299 The board state is now:
5300
5301 XXXXXXXX
5302 X1XXXXXX
5303 X1XXXXXX
5304 X0XXXXXX
5305
5306 XXXXXXXX
5307
5308 XXXXXXXX
5309 XXXXXXXX
5310
5311 XXXXXXXX
5312
5313 You choose <<[0, 1]>> and get a miss!
5314
5315
5316 The board state is now:
5317
5318 X0XXXXXX
5319 X1XXXXXX
5320
5321 X0XXXXXX
5322
5323 XXXXXXXX
5324 XXXXXXXX
5325
5326 XXXXXXXX
5327
5328 XXXXXXXX
5329 You choose <<[1, 2]>> and get a hit!
5330
5331
5332
5333 The board state is now:
5334 X0XXXXXX
5335
5336 X11XXXXX

X0XXXXX	5337
XXXXXXX	5338
XXXXXXX	5339
XXXXXXX	5340
XXXXXXX	5341
XXXXXXX	5342
XXXXXXX	5343
XXXXXXX	5344
You choose <<[1, 0]>> and get a hit!	5345
	5346
	5347
The board state is now:	5348
	5349
X0XXXXX	5350
111XXXX	5351
XXXXXXX	5352
X0XXXXX	5353
XXXXXXX	5354
XXXXXXX	5355
XXXXXXX	5356
XXXXXXX	5357
XXXXXXX	5358
XXXXXXX	5359
XXXXXXX	5360
You choose <<[1, 3]>> and get a hit!	5361
	5362
	5363
	5364
The board state is now:	5365
	5366
X0XXXXX	5367
1111XXX	5368
XXXXXXX	5369
X0XXXXX	5370
XXXXXXX	5371
XXXXXXX	5372
XXXXXXX	5373
XXXXXXX	5374
XXXXXXX	5375
XXXXXXX	5376
XXXXXXX	5377
You choose <<[1, 4]>> and get a hit!	5378
	5379
	5380
	5381
The board state is now:	5382

5383 X0XXXXXX
5384
5385 11111XX
5386 X0XXXXXX
5387
5388 XXXXXXXX
5389
5390 XXXXXXXX
5391 XXXXXXXX
5392
5393 XXXXXXXX
5394
5395 You choose <<[1, 5]>> and get a miss!
5396
5397
5398 The board state is now:
5399
5400 X0XXXXXX
5401 111110X
5402
5403 X0XXXXXX
5404
5405 XXXXXXXX
5406 XXXXXXXX
5407
5408 XXXXXXXX
5409
5410 XXXXXXXX
5411 You choose <<[0, 0]>> and get a miss!
5412
5413
5414
5415 The board state is now:
5416 00XXXXXX
5417
5418 111110X
5419
5420 X0XXXXXX
5421 XXXXXXXX
5422
5423 XXXXXXXX
5424
5425 XXXXXXXX
5426 XXXXXXXX
5427
5428

You choose <<[2, 2]>> and get a miss!	5429
	5430
	5431
The board state is now:	5432
00XXXXX	5433
	5434
111110X	5435
	5436
X00XXXX	5437
	5438
XXXXXXXX	5439
	5440
XXXXXXXX	5441
	5442
XXXXXXXX	5443
	5444
XXXXXXXX	5445
You choose <<[2, 3]>> and get a hit!	5446
	5447
	5448
The board state is now:	5449
00XXXXX	5450
	5451
111110X	5452
	5453
X001XXX	5454
	5455
XXXXXXXX	5456
	5457
XXXXXXXX	5458
	5459
XXXXXXXX	5460
	5461
XXXXXXXX	5462
You choose <<[3, 3]>> and get a hit!	5463
	5464
	5465
The board state is now:	5466
00XXXXX	5467
	5468
111110X	5469
	5470
X001XXX	5471
	5472
XXX1XXX	5473
	5474
XXXXXXXX	

5475 XXXXXXXX
5476
5477 XXXXXXXX
5478 You choose <<[0, 3]>> and get a hit!
5479
5480
5481
5482 The board state is now:
5483 00X1XXX
5484
5485 111110X
5486
5487 X001XXX
5488 XXX1XXX
5489
5490 XXXXXXXX
5491
5492 XXXXXXXX
5493 XXXXXXXX
5494
5495 You choose <<[4, 3]>> and get a hit!
5496
5497
5498 You are currently solving board 3.
5499
5500 The board state is now:
5501
5502 XXXXXXXX
5503 XXXXXXXX
5504
5505 XXXXXXXX
5506
5507 XXXXXXXX
5508 XXXXXXXX
5509
5510 XXX1XXX
5511
5512 XXXXXXXX
5513 You choose <<[4, 2]>> and get a hit!
5514
5515
5516
5517 The board state is now:
5518 XXXXXXXX
5519
5520 XXXXXXXX

XXXXXXX	5521
XXXXXXX	5522
XXXXXXX	5523
XX1XXXX	5524
XXXXXXX	5525
XXX1XXX	5526
XXXXXXX	5527
XXXXXXX	5528
You choose <<[3, 1]>> and get a hit!	5529
	5530
	5531
The board state is now:	5532
	5533
XXXXXXX	5534
XXXXXXX	5535
XXXXXXX	5536
XXXXXXX	5537
X1XXXXX	5538
XX1XXXX	5539
XXX1XXX	5540
XXXXXXX	5541
XXXXXXX	5542
XXXXXXX	5543
XXXXXXX	5544
You choose <<[2, 0]>> and get a hit!	5545
	5546
	5547
	5548
The board state is now:	5549
	5550
XXXXXXX	5551
XXXXXXX	5552
XXXXXXX	5553
1XXXXXX	5554
X1XXXXX	5555
XX1XXXX	5556
XXX1XXX	5557
XXXXXXX	5558
XXXXXXX	5559
XXXXXXX	5560
XXXXXXX	5561
You choose <<[1, 1]>> and get a miss!	5562
	5563
	5564
	5565
The board state is now:	5566

5567 XXXXXXXX
5568
5569 X0XXXXXX
5570 1XXXXXXX
5571
5572 X1XXXXXX
5573
5574 XX1XXXX
5575 XXX1XXX
5576
5577 XXXXXXXX
5578
5579 You choose <<[2, 2]>> and get a miss!
5580
5581
5582 The board state is now:
5583
5584 XXXXXXXX
5585 X0XXXXXX
5586
5587 1X0XXXX
5588
5589 X1XXXXXX
5590 XX1XXXX
5591
5592 XXX1XXX
5593
5594 XXXXXXXX
5595 You choose <<[3, 3]>> and get a hit!
5596
5597
5598
5599 The board state is now:
5600 XXXXXXXX
5601
5602 X0XXXXXX
5603
5604
5605 **Probabilistic instrumental learning**
5606
5607 Data source: [88]
5608
5609
5610 Number of experiments: 2
5611
5612 Number of participants: 77

Number of choices: 7392	5613
	5614
	5615
Example prompt:	5616
	5617
You are going to visit four different casinos (named 1, 2, 3, and 4) 24 times each.	5618
	5619
Each casino owns two slot machines that return either 0 or 0.5 points stochastically	5620
with different probabilities.	5621
	5622
You can play one of the machines in order to win points by pressing the corresponding	5623
key.	5624
	5625
Your goal is to maximize the sum of received points within all visits.	5626
	5627
	5628
	5629
You go to casino 3. You can choose between machines B and C. You press <>	5630
and receive 0.0 points.	5631
	5632
You go to casino 4. You can choose between machines P and T. You press <<T>>	5633
and receive 0.5 points.	5634
	5635
You go to casino 4. You can choose between machines P and T. You press <<T>>	5636
and receive 0.5 points.	5637
	5638
	5639
You go to casino 3. You can choose between machines B and C. You press <>	5640
and receive 0.0 points.	5641
	5642
You go to casino 1. You can choose between machines F and I. You press <<I>> and	5643
receive 0.0 points.	5644
	5645
You go to casino 1. You can choose between machines F and I. You press <<F>>	5646
and receive 0.0 points.	5647
	5648
	5649
You go to casino 2. You can choose between machines L and J. You press <<L>>	5650
and receive 0.5 points.	5651
	5652
You go to casino 3. You can choose between machines B and C. You press <>	5653
and receive 0.0 points.	5654
	5655
You go to casino 4. You can choose between machines P and T. You press <<T>>	5656
	5657
	5658

5659 and receive 0.0 points.
5660
5661 You go to casino 3. You can choose between machines B and C. You press <<C>>
5662 and receive 0.0 points.
5663
5664 You go to casino 4. You can choose between machines P and T. You press <<P>>
5665
5666 and receive 0.5 points.
5667
5668 You go to casino 1. You can choose between machines F and I. You press <<F>>
5669 and receive 0.5 points.
5670
5671 You go to casino 2. You can choose between machines L and J. You press <<L>>
5672 and receive 0.5 points.
5673
5674 You go to casino 2. You can choose between machines L and J. You press <<L>>
5675
5676 and receive 0.5 points.
5677
5678 You go to casino 1. You can choose between machines F and I. You press <<F>>
5679 and receive 0.0 points.
5680
5681 You go to casino 2. You can choose between machines L and J. You press <<J>>
5682 and receive 0.5 points.
5683
5684 You go to casino 1. You can choose between machines F and I. You press <<I>> and
5685
5686 receive 0.0 points.
5687
5688 You go to casino 1. You can choose between machines F and I. You press <<F>>
5689 and receive 0.0 points.
5690
5691 You go to casino 2. You can choose between machines L and J. You press <<J>>
5692 and receive 0.0 points.
5693
5694 You go to casino 2. You can choose between machines L and J. You press <<L>>
5695
5696 and receive 0.5 points.
5697
5698 You go to casino 3. You can choose between machines B and C. You press <>
5699 and receive 0.5 points.
5700
5701 You go to casino 3. You can choose between machines B and C. You press <>
5702 and receive 0.0 points.
5703
5704

You go to casino 2. You can choose between machines L and J. You press <<L>>	5705
and receive 0.5 points.	5706
	5707
You go to casino 3. You can choose between machines B and C. You press <<C>>	5708
and receive 0.5 points.	5709
	5710
You go to casino 2. You can choose between machines L and J. You press <<L>>	5711
and receive 0.0 points.	5712
	5713
You go to casino 1. You can choose between machines F and I. You press <<I>> and	5714
receive 0.0 points.	5715
	5716
	5717
You go to casino 4. You can choose between machines P and T. You press <<P>>	5718
and receive 0.0 points.	5719
	5720
	5721
You go to casino 4. You can choose between machines P and T. You press <<T>>	5722
and receive 0.5 points.	5723
	5724
You go to casino 4. You can choose between machines P and T. You press <<T>>	5725
and receive 0.5 points.	5726
	5727
	5728
You go to casino 1. You can choose between machines F and I. You press <<I>> and	5729
receive 0.5 points.	5730
	5731
You go to casino 4. You can choose between machines P and T. You press <<P>>	5732
and receive 0.5 points.	5733
	5734
You go to casino 3. You can choose between machines B and C. You press <<C>>	5735
and receive 0.5 points.	5736
	5737
	5738
You go to casino 2. You can choose between machines L and J. You press <<L>>	5739
and receive 0.5 points.	5740
	5741
You go to casino 3. You can choose between machines B and C. You press <<C>>	5742
and receive 0.5 points.	5743
	5744
You go to casino 4. You can choose between machines P and T. You press <<P>>	5745
and receive 0.5 points.	5746
	5747
	5748
You go to casino 3. You can choose between machines B and C. You press <<C>>	5749
	5750

5751 and receive 0.5 points.
5752
5753 You go to casino 4. You can choose between machines P and T. You press <<P>>
5754 and receive 0.5 point
5755
5756
5757 **Medin categorization**
5758
5759 Data source: [89]
5760
5761
5762 Number of experiments: 2
5763
5764 Number of participants: 228
5765
5766 Number of choices: 37848
5767
5768
5769 **Example prompt:**
5770
5771 You will observe a series of objects, one at a time.
5772
5773 The objects differ along three binary dimensions: shape (square vs. triangle), size (1.50
5774 inch vs. 0.75 inch), and shading (black vs. white).
5775
5776 Each dimension is indicated by the three digits, for example, '121' means a square,
5777 0.75 inch, black object.
5778
5779 Based on some combination of the three dimensions, each object belongs to one of two
5780
5781 categories, W or N.
5782
5783 You have to assign each object to one of the two categories by pressing the corre-
5784 sponding key.
5785
5786 If your choice is correct, you get a point, otherwise you lose a point.
5787
5788 Your goal is to get as many points as possible.
5789
5789 At some point, you begin a 'test block' in which you will see eight objects.
5790
5791 Here, you have to assign each object to one of the two categories as before.
5792
5793 Furthermore, you have to rate how typical the object is for the category you chose,
5794 on a scale from 1 to 9.
5795
5796 1 means 'not at all typical', and 9 means 'most typical'.

You see the image 112, press <<W>> and get 1 points.	5797
You see the image 121, press <<N>> and get 0 points.	5798
You see the image 212, press <<W>> and get 0 points.	5799
You see the image 211, press <<N>> and get 0 points.	5800
You see the image 221, press <<W>> and get 0 points.	5801
You see the image 122, press <<W>> and get 0 points.	5802
You see the image 122, press <<N>> and get 1 points.	5803
You see the image 221, press <<W>> and get 0 points.	5804
You see the image 121, press <<N>> and get 0 points.	5805
You see the image 212, press <<N>> and get 1 points.	5806
You see the image 211, press <<N>> and get 0 points.	5807
You see the image 112, press <<W>> and get 1 points.	5808
You see the image 112, press <<W>> and get 1 points.	5809
You see the image 212, press <<N>> and get 1 points.	5810
You see the image 221, press <<W>> and get 0 points.	5811
You see the image 211, press <<N>> and get 0 points.	5812
You see the image 121, press <<N>> and get 0 points.	5813
You see the image 122, press <<W>> and get 0 points.	5814
You see the image 212, press <<N>> and get 1 points.	5815
You see the image 221, press <<W>> and get 0 points.	5816
You see the image 211, press <<N>> and get 0 points.	5817
You see the image 121, press <<N>> and get 0 points.	5818
You see the image 122, press <<W>> and get 0 points.	5819
You see the image 212, press <<N>> and get 1 points.	5820
You see the image 221, press <<W>> and get 0 points.	5821
You see the image 211, press <<N>> and get 0 points.	5822
You see the image 121, press <<N>> and get 0 points.	5823
You see the image 122, press <<W>> and get 0 points.	5824
You see the image 212, press <<N>> and get 1 points.	5825
You see the image 221, press <<W>> and get 0 points.	5826
You see the image 211, press <<N>> and get 0 points.	5827
You see the image 121, press <<N>> and get 0 points.	5828
You see the image 112, press <<W>> and get 1 points.	5829
You see the image 122, press <<W>> and get 0 points.	5830
You see the image 122, press <<N>> and get 1 points.	5831
You see the image 112, press <<W>> and get 1 points.	5832
You see the image 122, press <<W>> and get 0 points.	5833
You see the image 122, press <<N>> and get 1 points.	5834
You see the image 112, press <<W>> and get 1 points.	5835
	5836
	5837
	5838
	5839
	5840
	5841
	5842

5843 You see the image 121, press <<N>> and get 0 points.
5844
5845 You see the image 221, press <<N>> and get 1 points.
5846 You see the image 212, press <<N>> and get 1 points.
5847
5848 You see the image 211, press <<N>> and get 0 points.
5849
5850 You see the image 112, press <<W>> and get 1 points.
5851 You see the image 212, press <<N>> and get 1 points.
5852
5853 You see the image 122, press <<W>> and get 0 points.
5854
5855 You see the image 211, press <<N>> and get 0 points.
5856 You see the image 221, press <<W>> and get 0 points.
5857
5858 You see the image 121, press <<N>> and get 0 points.
5859
5860 You see the image 122, press <<N>> and get 1 points.
5861 You see the image 212, press <<W>> and get 0 points.
5862
5863 You see the image 211, press <<N>> and get 0 points.
5864
5865 You see the image 221, press <<N>> and get 1 points.
5866 You see the image 112, press <<W>> and get 1 points.
5867
5868 You see the image 121, press <<W>> and get 1 points.
5869
5870 You see the image 121, press <<W>> and get 1 points.
5871 You see the image 211, press <<N>> and get 0 points.
5872
5873 You see the image 221, press <<N>> and get 1 points.
5874
5875 You see the image 212, press <<N>> and get 1 points.
5876 You see the image 122, press <<W>> and get 0 points.
5877
5878 You see the image 112, press <<W>> and get 1 points.
5879
5880 You see the image 212, press <<N>> and get 1 points.
5881 You see the image 112, press <<W>> and get 1 points.
5882
5883 You see the image 121, press <<N>> and get 0 points.
5884
5885 You see the image 122, press <<W>> and get 0 points.
5886 You see the image 221, press <<N>> and get 1 points.
5887
5888

You see the image 211, press <<N>> and get 0 points.	5889
You see the image 112, press <<W>> and get 1 points.	5890
You see the image 122, press <<W>> and get 0 points.	5891
You see the image 121, press <<N>> and get 0 points.	5892
You see the image 221, press <<N>> and get 1 points.	5893
You see the image 212, press <<W>> and get 0 points.	5894
You see the image 211, p	5895
	5896
	5897
	5898
	5899
	5900
Zoopermarket	5901
	5902
	5903
Data source: [90]	5904
	5905
	5906
Number of experiments: 3	5907
Number of participants: 96	5908
Number of choices: 34442	5909
	5910
	5911
	5912
	5913
Example prompt:	5914
You will have to repeatedly feed animals with fruits.	5915
Each fruit contains two vitamins.	5916
Every animal has a different preference for the vitamins.	5917
The vitamin contents and the preferences are both given as vectors with two entries.	5918
Your points are calculated as the dot product of the vitamin content with the preference of the current animal.	5919
For example, let us assume that you have to feed the elephant who has a preference	5920
[-1 1].	5921
Then, if you feed the elephant a fruit with vitamin content [-1 1], this would yield 2	5922
points.	5923
If you feed it a fruit with vitamins [1 0], this would yield -1 points.	5924
You have to buy the fruits in a market, in which you can go left or right for two steps.	5925
	5926
	5927
	5928
	5929
	5930
	5931
	5932
	5933
	5934

5935 You can press I to go left, and V to go right.
5936
5937 Per round, you always collect two fruits.
5938 There are eight animals in total and you have to feed one, two, or three of them in
5939
5940 each block.
5941
5942 In each block, there are twelve trials with different animals in random order.
5943 After these twelve trials, there are three more in which you have to feed new animals.
5944
5945 The fruits in the market are rearranged after each block, meaning that you have to
5946
5947 relearn the positions.
5948 Your goal is to maximize the points obtained.
5949
5950
5951
5952 A new block starts. The locations of the fruits in the market got scrambled.
5953 You have to feed the crocodile. It has the preference [1 1].
5954
5955 You press <<V>> and find the apple which has the vitamins [-1 -1]. You get -2 points.
5956
5957
5958 You press <<V>> and find the orange which has the vitamins [0 1]. You get 1 points.
5959
5960 You have to feed the crocodile. It has the preference [1 1].
5961
5962 You press <<V>> and find the apple which has the vitamins [-1 -1]. You get -2 points.
5963
5964
5965 You press <<I>> and find the blueberry which has the vitamins [-1 1]. You get 0
5966
5967 points.
5968 You have to feed the crocodile. It has the preference [1 1].
5969
5970 You press <<I>> and find the strawberry which has the vitamins [1 1]. You get 2
5971
5972 points.
5973 You press <<V>> and find the grapes which has the vitamins [1 -1]. You get 0
5974
5975 points.
5976
5977 You have to feed the crocodile. It has the preference [1 1].
5978 You press <<I>> and find the strawberry which has the vitamins [1 1]. You get 2
5979
5980

points.	5981
You press <<V>> and find the grapes which has the vitamins [1 -1]. You get 0	5982
points.	5983
	5984
You have to feed the kangaroo. It has the preference [-1 0].	5985
	5986
You press <<V>> and find the apple which has the vitamins [-1 -1]. You get 1 points.	5987
	5988
	5989
	5990
You press <<I>> and find the blueberry which has the vitamins [-1 1]. You get 1	5991
points.	5992
	5993
You have to feed the kangaroo. It has the preference [-1 0].	5994
	5995
You press <<V>> and find the apple which has the vitamins [-1 -1]. You get 1 points.	5996
	5997
	5998
	5999
You press <<I>> and find the blueberry which has the vitamins [-1 1]. You get 1	6000
points.	6001
	6002
You have to feed the crocodile. It has the preference [1 1].	6003
	6004
You press <<I>> and find the strawberry which has the vitamins [1 1]. You get 2	6005
points.	6006
	6007
You press <<V>> and find the grapes which has the vitamins [1 -1]. You get 0	6008
points.	6009
	6010
You have to feed the kangaroo. It has the preference [-1 0].	6011
	6012
You press <<V>> and find the apple which has the vitamins [-1 -1]. You get 1 points.	6013
	6014
	6015
	6016
You press <<I>> and find the blueberry which has the vitamins [-1 1]. You get 1	6017
points.	6018
	6019
You have to feed the kangaroo. It has the preference [-1 0].	6020
	6021
You press <<V>> and find the apple which has the vitamins [-1 -1]. You get 1 points.	6022
	6023
	6024
	6025
You press <<I>> and find the blueberry which has the vitamins [-1 1]. You get 1	6026

6027 points.
6028
6029 You have to feed the kangaroo. It has the preference [-1 0].
6030 You press <<V>> and find the apple which has the vitamins [-1 -1]. You get 1 points.
6031
6032
6033
6034 You press <<I>> and find the blueberry which has the vitamins [-1 1]. You get 1
6035 points.
6036
6037 You have to feed the kangaroo. It has the preference [-1 0].
6038
6039 You press <<V>> and find the apple which has the vitamins [-1 -1]. You get 1 points.
6040
6041
6042 You press <<I>> and find the blueberry which has the vitamins [-1 1]. You get 1
6043 points.
6044
6045 You have to feed the crocodile. It has the preference [1 1].
6046
6047 You press <<V>> and find the apple which has the vitamins [-1 -1]. You get -2 points.
6048
6049
6050 You press <<V>> and find the orange which has the vitamins [0 1]. You get 1 points.
6051
6052 You
6053
6054
6055 **choices13k**
6056
6057 Data source: [20]
6058
6059
6060 Number of experiments: 1
6061
6062 Number of participants: 13735
6063
6064 Number of choices: 1097375
6065
6066
6067 **Example prompt:**
6068
6069 You will encounter a series of gambling problems where you have to select between
6070 two options.
6071
6072 You can select an option by pressing the corresponding key.

For some problems, you are told the points you received and missed out on after each selection, while for others this information is suppressed.	6073 6074 6075
In cases where the probabilities are unknown, they sum up to one and remain constant within a problem.	6076 6077 6078 6079 6080
Option L delivers 10.0 points with 80.0% chance, or -25.0 points with 20.0% chance.	6081
Option B delivers 0.0 points with 20.0% chance, or 5.0 points with 80.0% chance.	6082 6083
You press <>. You receive 5.0 points by selecting this option. You would have received 10.0 points had you chosen the other option.	6084 6085 6086 6087
You press <>. You receive 5.0 points by selecting this option. You would have received -25.0 points had you chosen the other option.	6088 6089 6090
You press <>. You receive 5.0 points by selecting this option. You would have received 10.0 points had you chosen the other option.	6091 6092 6093
You press <>. You receive 5.0 points by selecting this option. You would have received -25.0 points had you chosen the other option.	6094 6095 6096 6097
You press <>. You receive 0.0 points by selecting this option. You would have received -25.0 points had you chosen the other option.	6098 6099 6100 6101 6102
Option L delivers either 30.0 points with 100.0% chance, or 30.0 points with 0.0% chance.	6103 6104 6105
Option B delivers either 0.0 points with unknown chance, or 42.0 points with unknown chance.	6106 6107 6108
You press <<L>>. You receive 30.0 points by selecting this option. You would have received 42.0 points had you chosen the other option.	6109 6110 6111 6112
You press <<L>>. You receive 30.0 points by selecting this option. You would have received 0.0 points had you chosen the other option.	6113 6114 6115
You press <<L>>. You receive 30.0 points by selecting this option. You would have	6116 6117 6118

6119 received 42.0 points had you chosen the other option.
6120
6121 You press <<L>>. You receive 30.0 points by selecting this option. You would have
6122 received 42.0 points had you chosen the other option.
6123
6124 You press <>. You receive 42.0 points by selecting this option. You would have
6125
6126 received 30.0 points had you chosen the other option.
6127
6128
6129 Option L delivers 8.0 points with 100.0% chance, or 8.0 points with 0.0% chance.
6130
6131 Option B delivers 5.0 points with 95.0% chance, or 54.0 points with 5.0% chance.
6132 You press <>. You receive 5.0 points by selecting this option. You would have
6133
6134 received 8.0 points had you chosen the other option.
6135
6136 You press <>. You receive 5.0 points by selecting this option. You would have
6137
6138 received 8.0 points had you chosen the other option.
6139 You press <>. You receive 5.0 points by selecting this option. You would have
6140
6141 received 8.0 points had you chosen the other option.
6142 You press <>. You receive 5.0 points by selecting this option. You would have
6143
6144 received 8.0 points had you chosen the other option.
6145
6146 You press <>. You receive 5.0 points by selecting this option. You would have
6147
6148 received 8.0 points had you chosen the other option.
6149
6150
6151 Option L delivers 20.0 points with 100.0% chance, or 20.0 points with 0.0% chance.
6152 Option B delivers 15.0 points with 99.0% chance, 47.5 points with 0.0078% chance,
6153
6154 48.5 points with 0.0547% chance, 49.5 points with 0.1641% chance, 50.5 points with
6155
6156 0.2734% chance, 51.5 points with 0.2734% chance, 52.5 points with 0.1641% chance,
6157
6158 53.5 points with 0.0547% chance, or 54.5 points with 0.0078% chance.
6159 You press <>. You receive 15.0 points by selecting this option. You would have
6160
6161 received 20.0 points had you chosen the other option.
6162 You press <>. You receive 15.0 points by selecting this option. You would have
6163
6164

received 20.0 points had you chosen the other option.	6165
You press <>. You receive 15.0 points by selecting this option. You would have	6166
received 20.0 points had you chosen the other option.	6167
You press <>. You receive 15.0 points by selecting this option. You would have	6168
received 20.0 points had you chosen the other option.	6169
You press <>. You receive 15.0 points by selecting this option. You would have	6170
received 20.0 points had you chosen the other option.	6171
You press <>. You receive 15.0 points by selecting this option. You would have	6172
received 20.0 points had you chosen the other option.	6173
	6174
	6175
	6176
	6177
Option L delivers 15.0 points with 5.0% chance, or 9.0 points with 95.0%	6178
	6179
	6180
CPC18	6181
	6182
Data source: [91]	6183
	6184
	6185
	6186
Number of experiments: 1	6187
Number of participants: 216	6188
	6189
Number of choices: 162000	6190
	6191
	6192
Example prompt:	6193
	6194
You will encounter a series of gambling problems where you have to select between	6195
two options.	6196
	6197
You can select an option by pressing the corresponding key.	6198
	6199
You will encounter each problem 25 times.	6200
	6201
In the first five encounters, you will not receive feedback.	6202
	6203
In the remaining 20 encounters, you will receive feedback about the outcomes of both	6204
options.	6205
	6206
In cases where the probabilities are stated to be unknown, they sum up to one and	6207
remain constant within a problem.	6208
	6209
	6210

6211 Option F delivers 3 points with 80.0% chance, 94 points with 1.25% chance, 95 points
6212 with 5.0% chance, 96 points with 7.5% chance, 97 points with 5.0% chance, 98 points
6213 with 1.25% chance.
6214
6215 Option X delivers -19 points with 50.0% chance, 59 points with 50.0% chance.
6216
6217 You press <<X>>.
6218
6219 You press <<X>>.
6220
6221 You press <<X>>.
6222
6223 You press <<X>>.
6224
6225 You press <<X>>.
6226
6227 You press <<X>> and gain 59 points. You would have gained 3 points had you chosen
6228 option F.
6229
6230 You press <<X>> and gain 59 points. You would have gained 98 points had you
6231 chosen option F.
6232
6233 You press <<X>> and gain 59 points. You would have gained 3 points had you chosen
6234 option F.
6235
6236 You press <<X>> and lose 19 points. You would have gained 95 points had you
6237 chosen option F.
6238
6239 You press <<X>> and lose 19 points. You would have gained 3 points had you chosen
6240 option F.
6241
6242 You press <<X>> and gain 59 points. You would have gained 3 points had you chosen
6243 option F.
6244
6245 You press <<X>> and lose 19 points. You would have gained 3 points had you chosen
6246 option F.
6247
6248 You press <<X>> and lose 19 points. You would have gained 3 points had you chosen
6249 option F.
6250
6251 You press <<F>> and gain 3 points. You would have lost 19 points had you chosen
6252 option X.
6253
6254
6255
6256

You press <<X>> and lose 19 points. You would have gained 3 points had you chosen option F.	6257 6258 6259
You press <<X>> and lose 19 points. You would have gained 3 points had you chosen option F.	6260 6261 6262 6263
You press <<X>> and gain 59 points. You would have gained 3 points had you chosen option F.	6264 6265 6266
You press <<X>> and gain 59 points. You would have gained 3 points had you chosen option F.	6267 6268 6269
You press <<X>> and lose 19 points. You would have gained 3 points had you chosen option F.	6270 6271 6272 6273
You press <<X>> and lose 19 points. You would have gained 96 points had you chosen option F.	6274 6275 6276
You press <<X>> and gain 59 points. You would have gained 3 points had you chosen option F.	6277 6278 6279
You press <<X>> and lose 19 points. You would have gained 3 points had you chosen option F.	6280 6281 6282 6283
You press <<X>> and gain 59 points. You would have gained 98 points had you chosen option F.	6284 6285 6286
You press <<X>> and gain 59 points. You would have gained 3 points had you chosen option F.	6287 6288 6289
You press <<X>> and lose 19 points. You would have gained 3 points had you chosen option F.	6290 6291 6292 6293 6294
Option F delivers -12 points with 95.0% chance, 47 points with 2.5% chance, 49 points with 1.25% chance, 53 points with 0.625% chance, 61 points with 0.3125% chance, 77 points with 0.15625% chance, 109 points with 0.078125% chance, 173 points with 0.078125% chance.	6295 6296 6297 6298 6299 6300 6301 6302

6303 Option X delivers -9 points with 100.0% chance.
6304 You press <<F>>.
6305 You press <<F>>.
6306 You press <<F>>.
6307 You press <<F>>.
6308 You press <<F>>.
6309 You press <<F>>.
6310 You press <<F>>.
6311 You press <<F>>.
6312 You press <<F>> and lose 12 points. You would have lost 9 points had you chosen
6313 option X.
6314 You press <<F>> and lose 12 points. You would have lost 9 points had you chosen
6315 option X.
6316 You press <<F>> and lose 12 points. You would have lost 9 points had you chosen
6317 option X.
6318 You press <<F>> and lose 12 points. You would have lost 9 points had you chosen
6319 option X.
6320 You press <<F>> and lose 12 points. You would have lost 9 points had you chosen
6321 option X.
6322 You press <<F>> and lose 12 points. You would have lost 9 points had you chosen
6323 option X.
6324 You press <<F>> and lose 12 points. You would have lost 9 points had you chosen
6325 option X.
6326 You press <<F>> and lose 12 points. You would have lost 9 points had you chosen
6327 option X.
6328 You press <<F>> and lose 12 points. You would have lost 9 points had you chosen
6329 option X.
6330 You press <<F>> and lose 12 points. You would have lost 9 points had you chosen
6331 option X.
6332 You press <<F>> and lose 12 points. You would have lost 9 points had you chosen
6333 option X.
6334 You press <<F>> and lose 12 points. You would have lost 9 points had you chosen
6335 option X.
6336 You press <<F>> and lose 12 points. You would have lost 9 points had you chosen
6337 option X.
6338 You press <<F>> and gain 49 points. You would have lost 9 points had you chosen
6339 option X.
6340 You press <<F>> and gain 53 points. You would have lost 9 points had you chosen
6341 option X.
6342 You press <<F>> and lose 12 points. You would have lost 9 points had you chosen
6343 option X.
6344 You press <<F>> and lose 12 points. You would have lost 9 points had you chosen
6345 option X.
6346 You press <<F>> and lose 12 points. You would have lost 9 points had you chosen
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option X.	6349
You press <<F>> and lose 12 points. You would	6350
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	6352
Episodic long-term memory	6353
	6354
Data source: [92]	6355
	6356
	6357
	6358
Number of experiments: 3	6359
Number of participants: 132	6360
	6361
Number of choices: 18649	6362
	6363
	6364
Example prompt:	6365
	6366
In this experiment, you will go through three cycles of three tasks.	6367
	6368
Each cycle concerns itself with a list of 30 words for you to study.	6369
	6370
In the first task of each cycle, you will go through the list.	6371
	6372
You need to remember the words indicated by a red border.	6373
	6374
For each word, please make a judgement on whether the object is larger or smaller	6375
than a football, and press the key "O" if the object is larger than a football, and the	6376
key "M" if it is smaller instead.	6377
	6378
In the second task of each cycle, you will try to solve as many arithmetic equations	6379
as you can in one minute.	6380
	6381
In the third task of each cycle, you will recall the words that you memorized in the	6382
first task of that cycle.	6383
	6384
	6385
	6386
List 1, task 1:	6387
	6388
You see the word "church", surrounded by a blue border. You press <<O>>. The	6389
word disappears but the blue border stays for another 3 seconds before disappearing.	6390
	6391
You see the word "robot", surrounded by a blue border. You press <<O>>. The word	6392
disappears but the blue border stays for another 3 seconds before disappearing.	6393
	6394

6395 You see the word "jewelry", surrounded by a red border. You press <<M>>. The
6396
6397 word disappears but the red border stays for another 3 seconds before disappearing.
6398 You see the word "skull", surrounded by a blue border. You press <<O>>. The word
6399
6400 disappears but the blue border stays for another 3 seconds before disappearing.
6401
6402 You see the word "apple", surrounded by a blue border. You press <<M>>. The
6403
6404 word disappears but the blue border stays for another 3 seconds before disappearing.
6405 You see the word "garden", surrounded by a blue border. You press <<O>>. The
6406
6407 word disappears but the blue border stays for another 3 seconds before disappearing.
6408 You see the word "pipe", surrounded by a red border. You press <<M>>. The word
6409
6410 disappears but the red border stays for another 3 seconds before disappearing.
6411
6412 You see the word "needle", surrounded by a red border. You press <<M>>. The
6413
6414 word disappears but the red border stays for another 3 seconds before disappearing.
6415 You see the word "circus", surrounded by a red border. You press <<O>>. The word
6416
6417 disappears but the red border stays for another 3 seconds before disappearing.
6418 You see the word "towel", surrounded by a blue border. You press <<M>>. The word
6419
6420 disappears but the blue border stays for another 3 seconds before disappearing.
6421
6422 You see the word "rabbit", surrounded by a blue border. You press <<M>>. The
6423
6424 word disappears but the blue border stays for another 3 seconds before disappearing.
6425 You see the word "diamond", surrounded by a red border. You press <<M>>. The
6426
6427 word disappears but the red border stays for another 3 seconds before disappearing.
6428 You see the word "cocktail", surrounded by a red border. You press <<M>>. The
6429
6430 word disappears but the red border stays for another 3 seconds before disappearing.
6431
6432 You see the word "satellite", surrounded by a red border. You press <<O>>. The
6433
6434 word disappears but the red border stays for another 3 seconds before disappearing.
6435 You see the word "sweater", surrounded by a blue border. You press <<O>>. The
6436
6437 word disappears but the blue border stays for another 3 seconds before disappearing.
6438 You see the word "planet", surrounded by a red border. You press <<O>>. The word
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6440

disappears but the red border stays for another 3 seconds before disappearing. 6441
 You see the word "pizza", surrounded by a blue border. You press <<O>>. The word 6442
 disappears but the blue border stays for another 3 seconds before disappearing. 6443
 You see the word "forest", surrounded by a blue border. You press <<O>>. The word 6444
 disappears but the blue border stays for another 3 seconds before disappearing. 6445
 You see the word "carpet", surrounded by a blue border. You press <<O>>. The 6446
 word disappears but the blue border stays for another 3 seconds before disappearing. 6447
 You see the word "highway", surrounded by a red border. You press <<O>>. The 6448
 word disappears but the red border stays for another 3 seconds before disappearing. 6449
 You see the word "jeep", surrounded by a blue border. You press <<O>>. The word 6450
 disappears but the blue border stays for another 3 seconds before disappearing. 6451
 You see t 6452
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Intertemporal choice

Data source: [47]

Number of experiments: 1

Number of participants: 11937

Number of choices: 142236

Example prompt:

In the following you will be presented with multiple choices between two options G and C.

Please name which option you would prefer by pressing the corresponding key.

You have the choice between receiving 500\$ immediately (press G) or receiving 550\$ in one year (press C). You press <<G>>.

You have the choice between receiving 500\$ immediately (press G) or receiving 600\$

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6487 in one year (press C). You press <<C>>.
6488
6489 You have the choice between paying 500\$ immediately (press G) or paying 550\$ in
6490 one year (press C). You press <<G>>.
6491
6492 You have the choice between paying 500\$ immediately (press G) or paying 510\$ in
6493 one year (press C). You press <<C>>.
6494
6495 You have the choice between receiving 5000\$ immediately (press G) or receiving 5500\$
6496 in one year (press C). You press <<G>>.
6497
6498 You have the choice between receiving 5000\$ immediately (press G) or receiving 6000\$
6499 in one year (press C). You press <<C>>.
6500
6501 You have the choice between receiving 500\$ in one year (press G) or receiving 600\$ in
6502 two years (press C). You press <<C>>.
6503
6504 You have the choice between receiving 500\$ immediately (press G) or receiving 700\$
6505 in two years (press C). You press <<C>>.
6506
6507 You have the choice between wait 500\$ immediately (press G) or wait 600\$ in one
6508 year (press C). You press <<C>>.
6509
6510 You have the choice between receive 500\$ immediately (press G) or receive 600\$ in
6511 one year (press C). You press <<C>>.
6512
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6515
6516 **Horizon task**
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6518 Data source: [93]
6519
6520
6521
6522 Number of experiments: 1
6523
6524 Number of participants: 78
6525
6526 Number of choices: 25336
6527
6528
6529 **Example prompt:**
6530 You are participating in multiple games involving two slot machines, labeled J and R.
6531
6532 The two slot machines are different across different games.

Each time you choose a slot machine, you get some points.	6533
You choose a slot machine by pressing the corresponding key.	6534
Each slot machine tends to pay out about the same amount of points on average.	6535
Your goal is to choose the slot machines that will give you the most points across the experiment.	6536
The first 4 trials in each game are instructed trials where you will be told which slot machine to choose.	6537
After these instructed trials, you will have the freedom to choose for either 1 or 6 trials.	6538
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	6549
Game 1. There are 10 trials in this game.	6550
You are instructed to press J and get 57 points.	6551
You are instructed to press R and get 29 points.	6552
You are instructed to press J and get 66 points.	6553
You are instructed to press R and get 38 points.	6554
You press <<R>> and get 45 points.	6555
You press <<R>> and get 38 points.	6556
You press <<R>> and get 49 points.	6557
You press <<J>> and get 59 points.	6558
You press <<R>> and get 28 points.	6559
You press <<R>> and get 51 points.	6560
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Game 2. There are 10 trials in this game.	6570
You are instructed to press J and get 76 points.	6571
You are instructed to press J and get 89 points.	6572
You are instructed to press R and get 61 points.	6573
You are instructed to press J and get 74 points.	6574
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6579 You press <<R>> and get 59 points.
6580
6581 You press <<J>> and get 72 points.
6582 You press <<J>> and get 61 points.
6583
6584 You press <<R>> and get 70 points.
6585
6586 You press <<R>> and get 73 points.
6587 You press <<J>> and get 65 points.
6588
6589
6590
6591 Game 3. There are 10 trials in this game.
6592 You are instructed to press R and get 60 points.
6593
6594 You are instructed to press R and get 43 points.
6595
6596 You are instructed to press J and get 54 points.
6597 You are instructed to press J and get 65 points.
6598
6599 You press <<R>> and get 56 points.
6600
6601 You press <<J>> and get 38 points.
6602 You press <<R>> and get 56 points.
6603
6604 You press <<J>> and get 61 points.
6605
6606 You press <<R>> and get 59 points.
6607 You press <<J>> and get 56 points.
6608
6609
6610
6611 Game 4. There are 5 trials in this game.
6612 You are instructed to press J and get 36 points.
6613
6614 You are instructed to press J and get 43 points.
6615
6616 You are instructed to press R and get 57 points.
6617 You are instructed to press R and get 49 points.
6618
6619 You press <<R>> and get 63 points.
6620
6621
6622 Game 5. There are 5 trials in this game.
6623
6624

You are instructed to press R and get 44 points.	6625
You are instructed to press J and get 45 points.	6626
You are instructed to press R and get 29 points.	6627
You are instructed to press J and get 38 points.	6628
You press <<R>> and get 43 points.	6629
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	6634
Game 6. There are 5 trials in this game.	6635
You are instructed to press R and get 74 points.	6636
You are instructed to press R and get 70 points.	6637
You are instructed to press R and get 61 points.	6638
You are instructed to press J and get 77 points.	6639
You press <<J>> and get 74 points.	6640
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Game 7. There are 5 trials in this game.	6647
You are instructed to press J and get 36 points.	6648
You are instructed to press R and get 50 points.	6649
You are instructed to press J and get 49 points.	6650
You are instructed to press J and get 34 points.	6651
You press <<R>> and get 48 points.	6652
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Game 8. There are 10 trials in this game.	6659
You are instructed to press J and get 54 points.	6660
You are instructed to press R and get 64 points.	6661
You are instructed to press R and get 63 points.	6662
You are instructed to press R and get 52 points.	6663
You press <<J>> and get 63 points.	6664
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6671 You press <<R>> and get 70 points.
6672
6673 You press <<J>> and get 69 points.
6674 You press <<R>> and get 64 points.
6675
6676 You press <<J>> and get 64 points.
6677
6678
6679 Game 9. There are 5 trials in this game.
6680
6681 You are instructed to press J and get 57 points.
6682
6683 You are instructed to press R and get 50 points.
6684 You are instructed to press R and get 57 points.
6685
6686 You are instructed to press J and get 72 points.
6687
6688 You press <<R>> and get 47 points.
6689
6690
6691 Game 10. There are 10 trials in this game.
6692
6693 You are instructed to press R and get 21 points.
6694 You are instructed to press J and get 26 points.
6695
6696 You are instructed to press J and get 52 points.
6697
6698 You are instructed to press J and get 27 points.
6699 You press <<R>> and get 21 points.
6700
6701 You press <<J>> a
6702
6703
6704 **Structured bandit**
6705
6706 Data source: [94]
6707
6708
6709 Number of experiments: 5
6710
6711 Number of participants: 534
6712
6713 Number of choices: 160200
6714
6715
6716 **Example prompt:**

You will be playing a game for 30 rounds.	6717
Each round contains 10 trials.	6718
In each trial, you have to select one option that will generate a reward between 0 and 50 points.	6719
You can choose between options 1, 2, 3, 4, 5, 6, 7 and 8 by pressing the corresponding key.	6720
After each round the options reset and each option can produce different rewards in the following round.	6721
Your goal is to maximize your reward.	6722
	6723
You are playing round 1:	6724
You press <<1>> and get 13.927462234 points.	6725
You press <<2>> and get 36.7688570508 points.	6726
You press <<1>> and get 14.2022179045 points.	6727
You press <<1>> and get 14.255711791 points.	6728
You press <<1>> and get 14.0630012349 points.	6729
You press <<1>> and get 13.7662251776 points.	6730
You press <<1>> and get 14.0950976416 points.	6731
You press <<1>> and get 13.9059322374 points.	6732
You press <<1>> and get 13.7876455405 points.	6733
You press <<1>> and get 14.0791620504 points.	6734
	6735
You are playing round 2:	6736
You press <<1>> and get 7.9614376644 points.	6737
You press <<1>> and get 8.0581019194 points.	6738
You press <<1>> and get 7.8981838872 points.	6739
You press <<1>> and get 7.6801851393 points.	6740
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6763 You press <<1>> and get 7.8750440099 points.
6764
6765 You press <<1>> and get 7.8730616431 points.
6766 You press <<1>> and get 7.9118344028 points.
6767
6768 You press <<1>> and get 8.134691905 points.
6769
6770 You press <<1>> and get 7.3146307967 points.
6771 You press <<1>> and get 7.5832954876 points.
6772
6773
6774
6775 You are playing round 3:
6776 You press <<1>> and get 45.5086514616 points.
6777
6778 You press <<1>> and get 45.4708060494 points.
6779
6780 You press <<1>> and get 45.9992623342 points.
6781 You press <<1>> and get 45.2562607277 points.
6782
6783 You press <<1>> and get 45.4858045741 points.
6784
6785 You press <<1>> and get 45.5714527483 points.
6786 You press <<1>> and get 45.6341629546 points.
6787
6788 You press <<1>> and get 45.0394158823 points.
6789
6790 You press <<1>> and get 45.4305272183 points.
6791 You press <<1>> and get 45.5876540303 points.
6792
6793
6794
6795 You are playing round 4:
6796 You press <<1>> and get 11.3846751956 points.
6797
6798 You press <<1>> and get 11.5363886375 points.
6799
6800 You press <<1>> and get 11.7231131775 points.
6801 You press <<1>> and get 11.6522950289 points.
6802
6803 You press <<1>> and get 11.526071202 points.
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6805 You press <<1>> and get 11.8137491734 points.
6806 You press <<1>> and get 11.3114379632 points.
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You press <<1>> and get 11.9434174388 points.	6809
You press <<1>> and get 11.2375196571 points.	6810
You press <<1>> and get 11.7253908566 points.	6811
	6812
	6813
	6814
You are playing round 5:	6815
	6816
You press <<1>> and get 6.3035553498 points.	6817
	6818
You press <<1>> and get 6.1091934289 points.	6819
	6820
You press <<1>> and get 5.8593245302 points.	6821
	6822
You press <<1>> and get 6.7472106803 points.	6823
	6824
You press <<1>> and get 5.8960908181 points.	6825
	6826
You press <<1>> and get 6.4056392625 points.	6827
	6828
You press <<1>> and get 6.2178725578 points.	6829
	6830
You press <<1>> and get 6.0009585684 points.	6831
	6832
You press <<1>> and get 6.5478514159 points.	6833
	6834
	6835
You are playing round 6:	6836
	6837
You press <<1>> and get 7.6893330342 points.	6838
	6839
You press <<1>> and get 7.3522351643 points.	6840
	6841
You press <<1>> and get 7.5121866021 points.	6842
	6843
You press <<1>> and get 7.7384186564 points.	6844
	6845
You press <<4>> and get 24.8575884026 points.	6846
	6847
You press <<2>> and get 13.8675683188 points.	6848
	6849
You press <<1>> and get 7.8646759927 points.	6850
	6851
You press <<4>> and get 24.9148267139 points.	6852
	6853
You press <<2>> and get 13.7239940234 points.	6854

6855 You are playing round 7:
6856
6857 You press <<1>> and get 4.8637779497 points.
6858 You press <<4>> and get 21.4211685718 points.
6859
6860 You press <<2>> and get 9.9283331067 points.
6861
6862 You press <<1>> and get 4.3283739798 points.
6863 You press <<1>> and get 4.2486815414 points.
6864
6865 You press <<2>> and get 9.7358045234 points.
6866
6867 You press <<3>> and get 15.5522984698 points.
6868 You press <<4>> and get 21.1157043351 points.
6869
6870 You press <<4>> and get 21.2293801786 points.
6871
6872 You press <<4>> and get 21.2346665196 points.
6873
6874
6875 You are playing round 8:
6876
6877 You press <<5>> and get 21.2600225368 points.
6878 You press <<6>> and get 14.9281922416 points.
6879
6880 You press <<6>> and get 15.1378822594 points.
6881
6882 You press <<6>> and get 15.0143768307 points.
6883 You press <<8>> and get 2.1704472833 points.
6884
6885 You press <<7>> and get 8.4601420045 points.
6886
6887 You press <<5>> and get
6888
6889 **Horizon task**
6890
6891
6892 Data source: [95]
6893
6894
6895 Number of experiments: 1
6896
6897 Number of participants: 78
6898
6899 Number of choices: 43680
6900

Example prompt:	6901
You are participating in multiple games involving two slot machines, labeled F and N.	6902
The two slot machines are different across different games.	6903
Each time you choose a slot machine, you get some points.	6904
You choose a slot machine by pressing the corresponding key.	6905
Each slot machine tends to pay out about the same amount of points on average.	6906
Your goal is to choose the slot machines that will give you the most points across the	6907
experiment.	6908
The first 4 trials in each game are instructed trials where you will be told which slot	6909
machine to choose.	6910
After these instructed trials, you will have the freedom to choose for either 1 or 6	6911
trials.	6912
	6913
Game 1. There are 5 trials in this game.	6914
You are instructed to press F and get 63 points.	6915
You are instructed to press N and get 60 points.	6916
You are instructed to press N and get 64 points.	6917
You are instructed to press N and get 74 points.	6918
You press <<N>> and get 65 points.	6919
	6920
	6921
	6922
Game 2. There are 10 trials in this game.	6923
You are instructed to press N and get 36 points.	6924
You are instructed to press N and get 41 points.	6925
You are instructed to press F and get 40 points.	6926
You are instructed to press F and get 33 points.	6927
You press <<N>> and get 44 points.	6928
You press <<N>> and get 34 points.	6929
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6947 You press <<F>> and get 48 points.
6948
6949 You press <<F>> and get 50 points.
6950 You press <<N>> and get 38 points.
6951
6952 You press <<F>> and get 35 points.
6953
6954
6955 Game 3. There are 5 trials in this game.
6956
6957 You are instructed to press F and get 18 points.
6958
6959 You are instructed to press N and get 51 points.
6960 You are instructed to press N and get 41 points.
6961
6962 You are instructed to press F and get 23 points.
6963
6964 You press <<N>> and get 42 points.
6965
6966
6967 Game 4. There are 10 trials in this game.
6968
6969 You are instructed to press F and get 65 points.
6970 You are instructed to press N and get 55 points.
6971
6972 You are instructed to press N and get 68 points.
6973
6974 You are instructed to press N and get 61 points.
6975 You press <<F>> and get 54 points.
6976
6977 You press <<N>> and get 74 points.
6978
6979 You press <<N>> and get 71 points.
6980 You press <<N>> and get 42 points.
6981
6982 You press <<F>> and get 63 points.
6983
6984 You press <<N>> and get 53 points.
6985
6986
6987 Game 5. There are 10 trials in this game.
6988
6989 You are instructed to press N and get 18 points.
6990 You are instructed to press F and get 53 points.
6991
6992

You are instructed to press F and get 50 points.	6993
You are instructed to press N and get 19 points.	6994
You press <<F>> and get 46 points.	6995
You press <<F>> and get 44 points.	6996
You press <<F>> and get 44 points.	6997
You press <<N>> and get 10 points.	6998
You press <<F>> and get 42 points.	6999
You press <<F>> and get 39 points.	7000
You press <<F>> and get 44 points.	7001
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	7007
Game 6. There are 10 trials in this game.	7008
You are instructed to press F and get 13 points.	7009
You are instructed to press N and get 51 points.	7010
You are instructed to press F and get 1 points.	7011
You are instructed to press N and get 36 points.	7012
You press <<N>> and get 38 points.	7013
You press <<N>> and get 36 points.	7014
You press <<N>> and get 52 points.	7015
You press <<N>> and get 36 points.	7016
You press <<N>> and get 27 points.	7017
You press <<F>> and get 12 points.	7018
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	7027
Game 7. There are 5 trials in this game.	7028
You are instructed to press F and get 65 points.	7029
You are instructed to press N and get 50 points.	7030
You are instructed to press F and get 74 points.	7031
You are instructed to press F and get 55 points.	7032
You press <<N>> and get 72 points.	7033
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7039 Game 8. There are 10 trials in this game.
7040
7041 You are instructed to press N and get 29 points.
7042 You are instructed to press F and get 42 points.
7043
7044 You are instructed to press F and get 40 points.
7045
7046 You are instructed to press F and get 42 points.
7047 You press <<F>> and get 53 points.
7048
7049 You press <<F>> and get 47 points.
7050
7051 You press <<N>> and get 40 points.
7052 You press <<N>> and get 41 points.
7053
7054 You press <<F>> and get 38 points.
7055
7056 You press <<F>> and get 51 points.
7057
7058
7059 Game 9. There are 5 trials in this game.
7060
7061 You are instructed to press N and get 60 points.
7062 You are instructed to press N and get 66 points.
7063
7064 You are instructed to press F and get 61 points.
7065
7066 You are instructed to press F and get 65 points.
7067 You press <<N>> and get 54 points.
7068
7069
7070
7071 Game 10. There are 10 trials in this game.
7072 You are instructed to press F and get 44 points.
7073
7074 You are instructed to pr
7075
7076
7077 **Weather prediction task**
7078
7079 Data source: [96]
7080
7081
7082 Number of experiments: 1
7083
7084 Number of participants: 23

Number of choices: 4600

7085

7086

7087

Example prompt:

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7089

You will be playing a game in which you pretend to be a weather forecaster.

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7091

In each trial, you will see between one and three tarot cards.

7092

Your task is to decide if the combination of cards presented predicts rainy weather (by pressing E) or fine weather (by pressing J).

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7094

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You are seeing the following: card 2, card 4. You press <<E>>. You are correct, the weather is indeed rainy.

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7099

7100

You are seeing the following: card 1, card 2. You press <<J>>. You are correct, the weather is indeed fine.

7101

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You are seeing the following: card 3, card 4. You press <<J>>. You are wrong, the weather is rainy.

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You are seeing the following: card 2, card 3. You press <<J>>. You are correct, the weather is indeed fine.

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You are seeing the following: card 1. You press <<E>>. You are wrong, the weather is fine.

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7114

You are seeing the following: card 1, card 2, card 3. You press <<E>>. You are wrong, the weather is fine.

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7116

7117

You are seeing the following: card 1, card 2, card 4. You press <<J>>. You are wrong, the weather is rainy.

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You are seeing the following: card 1, card 2, card 4. You press <<E>>. You are correct, the weather is indeed rainy.

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You are seeing the following: card 3, card 4. You press <<E>>. You are correct, the weather is indeed rainy.

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You are seeing the following: card 3, card 4. You press <<E>>. You are correct, the

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7131 weather is indeed rainy.
7132
7133 You are seeing the following: card 1. You press <<J>>. You are correct, the weather
7134 is indeed fine.
7135
7136 You are seeing the following: card 1, card 4. You press <<J>>. You are correct, the
7137 weather is indeed fine.
7138
7139 You are seeing the following: card 4. You press <<E>>. You are wrong, the weather
7140 is fine.
7141
7142 You are seeing the following: card 3, card 4. You press <<E>>. You are correct, the
7143 weather is indeed rainy.
7144
7145
7146 You are seeing the following: card 1, card 2. You press <<J>>. You are correct, the
7147 weather is indeed fine.
7148
7149 You are seeing the following: card 3, card 4. You press <<E>>. You are correct, the
7150 weather is indeed rainy.
7151
7152 You are seeing the following: card 2. You press <<J>>. You are correct, the weather
7153 is indeed fine.
7154
7155
7156 You are seeing the following: card 1, card 4. You press <<J>>. You are wrong, the
7157 weather is rainy.
7158
7159 You are seeing the following: card 1, card 4. You press <<J>>. You are correct, the
7160 weather is indeed fine.
7161
7162 You are seeing the following: card 1. You press <<J>>. You are correct, the weather
7163 is indeed fine.
7164
7165
7166 You are seeing the following: card 1, card 3, card 4. You press <<J>>. You are
7167 correct, the weather is indeed fine.
7168
7169 You are seeing the following: card 2. You press <<J>>. You are correct, the weather
7170 is indeed fine.
7171
7172 You are seeing the following: card 1, card 2. You press <<J>>. You are correct, the
7173 weather is indeed fine.
7174
7175
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You are seeing the following: card 2, card 3, card 4. You press <<E>>. You are correct, the weather is indeed rainy.	7177 7178 7179
You are seeing the following: card 3. You press <<J>>. You are correct, the weather is indeed fine.	7180 7181 7182 7183
You are seeing the following: card 1, card 2, card 3. You press <<J>>. You are wrong, the weather is rainy.	7184 7185 7186
You are seeing the following: card 3, card 4. You press <<E>>. You are correct, the weather is indeed rainy.	7187 7188 7189
You are seeing the following: card 1, card 3. You press <<J>>. You are correct, the weather is indeed fine.	7190 7191 7192 7193
You are seeing the following: card 1, card 4. You press <<J>>. You are wrong, the weather is rainy.	7194 7195 7196
You are seeing the following: card 2, card 3, card 4. You press <<E>>. You are wrong, the weather is fine.	7197 7198 7199
You are seeing the following: card 2, card 4. You press <<E>>. You are correct, the weather is indeed rainy.	7200 7201 7202 7203
You are seeing the following: card 4. You press <<J>>. You are wrong, the weather is rainy.	7204 7205 7206
You are seeing the following: card 1, card 2. You press <<J>>. You are correct, the weather is indeed fine.	7207 7208 7209
You are seeing the following: card 1, card 3, card 4. You press <<E>>. You are correct, the weather is indeed rainy.	7210 7211 7212 7213
You are seeing the following: card 4. You press <<J>>. You are wrong, the weather is rainy.	7214 7215 7216
You are seeing the following: card 1, card 2. You press <<J>>. You are correct, the weather is indeed fine.	7217 7218 7219
You are seeing the follow	7220 7221 7222

7223 **Iowa gambling task**

7224

7225 Data source: [97]

7226

7227

7228

7229 Number of experiments: 9

7230 Number of participants: 511

7231

7232 Number of choices: 55435

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7234

7235 **Example prompt:**

7236

7237 You see in front of you four decks of cards labeled H, V, J, and D.

7238

7239 You get a loan of 2000\$ of play money.

7240 You have to select one card at a time, from any of the four decks, for 100 trials.

7241

7242 You select a card from a deck by pressing the corresponding key.

7243

7244 After turning a card, you win some money, the amount varies with the deck.

7245 You sometimes also have to pay a penalty, which also varies with the deck.

7246

7247 Your goal is to maximize profit on the loan of the play money.

7248

7249

7250 You press <<H>>. You win 100.0\$ and lose 200.0\$.

7251

7252 You press <<H>>. You win 100.0\$ and lose 150.0\$.

7253

7254 You press <<V>>. You win 100.0\$ and lose 0.0\$.

7255 You press <<D>>. You win 50.0\$ and lose 250.0\$.

7256

7257 You press <<J>>. You win 50.0\$ and lose 0.0\$.

7258

7259 You press <<V>>. You win 100.0\$ and lose 0.0\$.

7260 You press <<H>>. You win 100.0\$ and lose 0.0\$.

7261

7262 You press <<V>>. You win 100.0\$ and lose 0.0\$.

7263

7264 You press <<D>>. You win 50.0\$ and lose 0.0\$.

7265 You press <<V>>. You win 100.0\$ and lose 0.0\$.

7266

7267 You press <<J>>. You win 50.0\$ and lose 0.0\$.

7268

You press <<J>>. You win 50.0\$ and lose 0.0\$.	7269
You press <<H>>. You win 100.0\$ and lose 300.0\$.	7270
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7271
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7272
You press <<V>>. You win 100.0\$ and lose 1250.0\$.	7273
You press <<D>>. You win 50.0\$ and lose 0.0\$.	7274
You press <<D>>. You win 50.0\$ and lose 0.0\$.	7275
You press <<D>>. You win 50.0\$ and lose 0.0\$.	7276
You press <<J>>. You win 50.0\$ and lose 50.0\$.	7277
You press <<H>>. You win 100.0\$ and lose 0.0\$.	7278
You press <<H>>. You win 100.0\$ and lose 0.0\$.	7279
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7280
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7281
You press <<D>>. You win 50.0\$ and lose 0.0\$.	7282
You press <<D>>. You win 50.0\$ and lose 0.0\$.	7283
You press <<J>>. You win 50.0\$ and lose 0.0\$.	7284
You press <<D>>. You win 50.0\$ and lose 0.0\$.	7285
You press <<D>>. You win 50.0\$ and lose 0.0\$.	7286
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7287
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7288
You press <<H>>. You win 100.0\$ and lose 0.0\$.	7289
You press <<D>>. You win 50.0\$ and lose 0.0\$.	7290
You press <<D>>. You win 50.0\$ and lose 0.0\$.	7291
You press <<H>>. You win 100.0\$ and lose 0.0\$.	7292
You press <<H>>. You win 100.0\$ and lose 0.0\$.	7293
You press <<J>>. You win 50.0\$ and lose 50.0\$.	7294
You press <<D>>. You win 50.0\$ and lose 0.0\$.	7295
You press <<D>>. You win 50.0\$ and lose 0.0\$.	7296
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7297
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7298
You press <<H>>. You win 100.0\$ and lose 0.0\$.	7299
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7300
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7301
You press <<D>>. You win 50.0\$ and lose 0.0\$.	7302
You press <<D>>. You win 50.0\$ and lose 0.0\$.	7303
You press <<H>>. You win 100.0\$ and lose 250.0\$.	7304
You press <<H>>. You win 100.0\$ and lose 250.0\$.	7305
You press <<J>>. You win 50.0\$ and lose 50.0\$.	7306
You press <<D>>. You win 50.0\$ and lose 0.0\$.	7307
You press <<D>>. You win 50.0\$ and lose 0.0\$.	7308
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7309
You press <<H>>. You win 100.0\$ and lose 350.0\$.	7310
You press <<H>>. You win 100.0\$ and lose 350.0\$.	7311
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7312
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7313
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7315 You press <<D>>. You win 50.0\$ and lose 0.0\$.
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7317 You press <<J>>. You win 50.0\$ and lose 0.0\$.
7318 You press <<H>>. You win 100.0\$ and lose 300.0\$.
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7320 You press <<V>>. You win 100.0\$ and lose 0.0\$.
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7322 You press <<D>>. You win 50.0\$ and lose 0.0\$.
7323 You press <<V>>. You win 100.0\$ and lose 1250.0\$.
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7325 You press <<H>>. You win 100.0\$ and lose 0.0\$.
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7327 You press <<V>>. You win 100.0\$ and lose 0.0\$.
7328 You press <<D>>. You win 50.0\$ and lose 0.0\$.
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7330 You press <<J>>. You win 50.0\$ and lose 50.0\$.
7331
7332 You press <<H>>. You win 100.0\$ and lose 0.0\$.
7333 You press <<V>>. You win 100.0\$ and lose 0.0\$.
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7335 You press <<D>>. You win 50.0\$ and lose 0.0\$.
7336
7337 You press <<J>>. You win 50.0\$ and lose 50.0\$.
7338 You press <<H>>. You win 100.0\$ and lose 0.0\$.
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7340 You press <<V>>. You win 100.0\$ and lose 0.0\$.
7341
7342 You press <<D>>. You win 50.0\$ and lose 250.0\$.
7343 You press <<J>>. You win 50.0\$ and lose 0.0\$.
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7345 You press <<D>>. You win 50.0\$ and lose 0.0\$.
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7347 You press <<V>>. You win 100.0\$ and lose 0.0\$.
7348 You press <<H>>. You win 100.0\$ and lose 150.0\$.
7349
7350 You press <<H>>. You win 100.0\$ and lose 200.0\$.
7351
7352 You press <<H>>. You win 100.0\$ and lose 350.0\$.
7353 You press <<V>>. You win 100.0\$ and lose 0.0\$.
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7355 You press <<V>>. You win 100.0\$ and lose 0.0\$.
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7357 You press <<V>>. You win 100.0\$ and lose 0.0\$.
7358 You press <<V>>. You win 100.0\$ and lose 0.0\$.
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You press <<V>>. You win 100.0\$ and lose 0.0\$.	7361
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7362
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7363
You press <<D>>. You win 50.0\$ and lose 0.0\$.	7364
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7365
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7366
You press <<V>>. You win 100.0\$ and lose 1250.0\$.	7367
You press <<V>>. You win 100.0\$ and lose 1250.0\$.	7368
You press <<J>>. You win 50.0\$ and lose 0.0\$.	7369
You press <<J>>. You win 50.0\$ and lose 0.0\$.	7370
You press <<J>>. You win 50.0\$ and lose 50.0\$.	7371
You press <<J>>. You win 50.0\$ and lose 50.0\$.	7372
You press <<D>>. You win 50.0\$ and lose 0.0\$.	7373
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7374
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7375
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7376
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7377
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7378
You press <<V>>. You win 100.0\$ and lose 0.0\$.	7379
You press <<D>>. You win 50.0\$ and lose 0.0\$.	7380
Yo	7381

Virtual subway network

Data source: [98]

Number of experiments: 4

Number of participants: 789

Number of choices: 227923

Example prompt:

Imagine that you are a tourist and you have to navigate the subway network in an unfamiliar town.

In each round, you will have to navigate from a starting station to a goal station.

Please try to plan your trip as quickly as possible.

During your trip, you will see the name of the current station and its neighboring stations in all four directions.

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7403
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7406

7407 If there is no neighboring station in a particular direction, there will be a circle instead
7408 of a station name.
7409
7410 You can go north by pressing G, west by pressing B, south by pressing V, and east by
7411 pressing C.
7412
7413 When you reach the goal station, press Z to end the round and start the next round.
7414
7415
7416
7417 The new starting station is 1 and the goal station is 3.
7418
7419 Your station: 1. Neighboring stations: circle on the north, 2 on the east, circle on the
7420 south, and 9 on the west. You press <>.
7421
7422 Your station: 9. Neighboring stations: circle on the north, 1 on the east, 8 on the
7423 south, and circle on the west. You press <<V>>.
7424
7425 Your station: 8. Neighboring stations: 9 on the north, circle on the east, 7 on the
7426 south, and circle on the west. You press <<V>>.
7427
7428 Your station: 7. Neighboring stations: 8 on the north, 6 on the east, circle on the
7429 south, and circle on the west. You press <<C>>.
7430
7431
7432 Your station: 6. Neighboring stations: circle on the north, 5 on the east, circle on the
7433 south, and 7 on the west. You press <<C>>.
7434
7435 Your station: 5. Neighboring stations: 4 on the north, circle on the east, circle on the
7436 south, and 6 on the west. You press <<G>>.
7437
7438 Your station: 4. Neighboring stations: 3 on the north, circle on the east, 5 on the
7439 south, and circle on the west. You press <<G>>.
7440
7441
7442 Your station: 3. Neighboring stations: 2 on the north, circle on the east, 4 on the
7443 south, and circle on the west. You press <<Z>>.
7444
7445 You are successful.
7446
7447
7448
7449 The new starting station is 1 and the goal station is 3.
7450
7451 Your station: 1. Neighboring stations: circle on the north, 2 on the east, circle on the
7452

south, and 9 on the west. You press <>.	7453
Your station: 9. Neighboring stations: circle on the north, 1 on the east, 8 on the	7454
south, and circle on the west. You press <<V>>.	7455
Your station: 8. Neighboring stations: 9 on the north, circle on the east, 7 on the	7456
south, and circle on the west. You press <<V>>.	7457
Your station: 7. Neighboring stations: 8 on the north, 6 on the east, circle on the	7458
south, and circle on the west. You press <<C>>.	7459
Your station: 6. Neighboring stations: circle on the north, 5 on the east, circle on the	7460
south, and 7 on the west. You press <<C>>.	7461
Your station: 5. Neighboring stations: 4 on the north, circle on the east, circle on the	7462
south, and 6 on the west. You press <<G>>.	7463
Your station: 4. Neighboring stations: 3 on the north, circle on the east, 5 on the	7464
south, and circle on the west. You press <<G>>.	7465
Your station: 3. Neighboring stations: 2 on the north, circle on the east, 4 on the	7466
south, and circle on the west. You press <<Z>>.	7467
You are successful.	7468
	7469
	7470
The new starting station is 4 and the goal station is 6.	7471
Your station: 4. Neighboring stations: 3 on the north, circle on the east, 5 on the	7472
south, and circle on the west. You press <<V>>.	7473
Your station: 5. Neighboring stations: 4 on the north, circle on the east, circle on the	7474
south, and 6 on the west. You press <>.	7475
Your station: 6. Neighboring stations: circle on the north, 5 on the east, circle on the	7476
south, and 7 on the west. You press <<Z>>.	7477
You are successful.	7478
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	7494
	7495
	7496
The new starting station is 1 and the goal station is 7.	7497
	7498

7499 Your station: 1. Neighboring stations: circle on the north, 2 on the east, circle on the
7500 south, and 9 on the west. You press <>.
7501
7502 Your station: 9. Neighboring stations: circle on the north, 1 on the east, 8 on the
7503 south, and circle on the west. You press <<V>>.
7504
7505 Your station: 8. Neighboring stations: 9 on the north, circle on the east, 7 on the
7506 south, and circle on the west. You press <<V>>.
7507
7508 Your station: 7. Neighboring stations: 8 on the north, 6 on the east, circle on the
7509 south, and circle on the west. You press <<Z>>.
7510
7511 You are successful.
7512
7513
7514
7515 The new starting station is 9 and the goal station is 7.
7516
7517 Your station: 9. Neighboring stations: circle
7518
7519
7520 **Multi-task reinforcement learning**
7521
7522 Data source: [74]
7523
7524
7525 Number of experiments: 2
7526
7527 Number of participants: 380
7528
7529 Number of choices: 76760
7530
7531
7532 **Example prompt:**
7533
7534 You will explore a castle, walking from room to room.
7535
7536 In each room, you will find different amounts of resources: wood, stone, and iron.
7537
7538 In each room, there are three doors that lead to different rooms.
7539
7539 The doors are labeled I, P, and G.
7540
7541 You have to choose the right doors to find the most valuable resources.
7542
7542 You choose a door by pressing the corresponding key.
7543
7544 At the beginning of each round, you will be shown how valuable the resources are.

These values are given as market prices for wood, stone, and iron.	7545
	7546
Multiplying the prices with the amounts of resources and adding them up yields a	7547
reward.	7548
	7549
You want to maximize the cumulative reward.	7550
	7551
After every round, you will start in room 0 again and see the new market prices.	7552
	7553
	7554
The current market prices are 1 for wood, -1 for stone, and 0 for iron.	7555
	7556
You are in room 0. You press <<P>> and you find 0 wood, 0 stone, and 0 iron. You	7557
get 0 points.	7558
	7559
You are in room 2. You press <<P>> and you find 100 wood, 100 stone, and 0 iron.	7560
	7561
You get 0 points.	7562
	7563
The current market prices are -1 for wood, 1 for stone, and 0 for iron.	7564
	7565
You are in room 0. You press <<I>> and you find 0 wood, 0 stone, and 0 iron. You	7566
get 0 points.	7567
	7568
You are in room 1. You press <<G>> and you find 70 wood, 70 stone, and 70 iron.	7569
	7570
You get 0 points.	7571
	7572
The current market prices are -1 for wood, 1 for stone, and 0 for iron.	7573
	7574
You are in room 0. You press <<P>> and you find 0 wood, 0 stone, and 0 iron. You	7575
get 0 points.	7576
	7577
You are in room 2. You press <<G>> and you find 0 wood, 90 stone, and 0 iron. You	7578
get 90 points.	7579
	7580
The current market prices are -2 for wood, 1 for stone, and 0 for iron.	7581
	7582
You are in room 0. You press <<P>> and you find 0 wood, 0 stone, and 0 iron. You	7583
get 0 points.	7584
	7585
You are in room 2. You press <<G>> and you find 0 wood, 90 stone, and 0 iron. You	7586
get 90 points.	7587
	7588
The current market prices are 1 for wood, -2 for stone, and 0 for iron.	7589
	7590

7591 You are in room 0. You press <<I>> and you find 0 wood, 0 stone, and 0 iron. You
7592 get 0 points.
7593
7594 You are in room 1. You press <<G>> and you find 70 wood, 70 stone, and 70 iron.
7595
7596 You get -70 points.
7597
7598 The current market prices are -1 for wood, 1 for stone, and 0 for iron.
7599
7600 You are in room 0. You press <<P>> and you find 0 wood, 0 stone, and 0 iron. You
7601 get 0 points.
7602
7603 You are in room 2. You press <<G>> and you find 0 wood, 90 stone, and 0 iron. You
7604 get 90 points.
7605
7606 The current market prices are 1 for wood, -2 for stone, and 0 for iron.
7607
7608 You are in room 0. You press <<P>> and you find 0 wood, 0 stone, and 0 iron. You
7609 get 0 points.
7610
7611 You are in room 2. You press <<G>> and you find 0 wood, 90 stone, and 0 iron. You
7612 get -180 points.
7613
7614 The current market prices are 1 for wood, -1 for stone, and 0 for iron.
7615
7616 You are in room 0. You press <<G>> and you find 0 wood, 0 stone, and 0 iron. You
7617 get 0 points.
7618
7619 You are in room 3. You press <<P>> and you find 0 wood, 100 stone, and 60 iron.
7620
7621 You get -100 points.
7622
7623 The current market prices are 1 for wood, -2 for stone, and 0 for iron.
7624
7625 You are in room 0. You press <<I>> and you find 0 wood, 0 stone, and 0 iron. You
7626 get 0 points.
7627
7628 You are in room 1. You press <<G>> and you find 70 wood, 70 stone, and 70 iron.
7629 You get -70 points.
7630
7631 The current market prices are -1 for wood, 1 for stone, and 0 for iron.
7632
7633 You are in room 0. You press <<P>> and you find 0 wood, 0 stone, and 0 iron. You
7634 get 0 points.
7635
7636

You are in room 2. You press <<G>> and you find 0 wood, 90 stone, and 0 iron. You get 90 points.	7637 7638 7639
The current market prices are 1 for wood, -2 for stone, and 0 for iron.	7640 7641
You are in room 0. You press <<I>> and you find 0 wood, 0 stone, and 0 iron. You get 0 points.	7642 7643 7644
You are in room 1. You press <<G>> and you find 70 wood, 70 stone, and 70 iron. You get -70 points.	7645 7646 7647
The current market prices are -2 for wood, 1 for stone, and 0 for iron.	7648 7649
You are in room 0. You press <<P>> and you find 0 wood, 0 stone, and 0 iron. You get 0 points.	7650 7651 7652
You are in room 2. You press <<G>> and you find 0 wood, 90 stone, and 0 iron. You get 90 points.	7653 7654 7655
The current market prices are 1 for wood, -2 for stone, and 0 for iron.	7656 7657
You are in room 0. You press <<I>> and you find 0 wood, 0 stone, and 0 iron. You get 0 points.	7658 7659 7660
You are in room	7661 7662 7663
Horizon task	7664 7665
Data source: [99]	7666 7667 7668
Number of experiments: 1	7669 7670
Number of participants: 36	7671 7672
Number of choices: 15290	7673 7674 7675
Example prompt:	7676 7677
You are participating in multiple games involving two slot machines, labeled M and U.	7678 7679 7680
The two slot machines are different across different games.	7681 7682

7683 Each time you choose a slot machine, you get some points.
7684
7685 You choose a slot machine by pressing the corresponding key.
7686
7687 Each slot machine tends to pay out about the same amount of points on average.
7688 Your goal is to choose the slot machines that will give you the most points across the
7689 experiment.
7690
7691 The first 4 trials in each game are instructed trials where you will be told which slot
7692 machine to choose.
7693
7694 After these instructed trials, you will have the freedom to choose for either 1 or 6
7695 trials.
7696
7697
7698
7699
7700 Game 1. There are 10 trials in this game.
7701 You are instructed to press U and get 45 points.
7702
7703 You are instructed to press M and get 25 points.
7704
7705 You are instructed to press U and get 38 points.
7706
7707 You are instructed to press M and get 12 points.
7708
7709 You press <<U>> and get 38 points.
7710
7711 You press <<U>> and get 42 points.
7712
7713 You press <<U>> and get 44 points.
7714
7715 You press <<U>> and get 35 points.
7716
7717 You press <<U>> and get 42 points.
7718
7719
7720 You press <<U>> and get 45 points.
7721
7722 Game 2. There are 10 trials in this game.
7723 You are instructed to press U and get 71 points.
7724
7725 You are instructed to press M and get 35 points.
7726
7727 You are instructed to press U and get 71 points.
7728
7729
7730 You are instructed to press M and get 26 points.
7731
7732

You press <<U>> and get 61 points.	7729
You press <<U>> and get 55 points.	7730
You press <<U>> and get 61 points.	7731
You press <<U>> and get 61 points.	7732
You press <<U>> and get 61 points.	7733
You press <<U>> and get 61 points.	7734
You press <<U>> and get 67 points.	7735
You press <<U>> and get 67 points.	7736
You press <<U>> and get 69 points.	7737
	7738
	7739
	7740
Game 3. There are 5 trials in this game.	7741
You are instructed to press U and get 50 points.	7742
You are instructed to press M and get 43 points.	7743
You are instructed to press M and get 46 points.	7744
You are instructed to press M and get 46 points.	7745
You are instructed to press U and get 45 points.	7746
You are instructed to press U and get 45 points.	7747
You are instructed to press U and get 45 points.	7748
You press <<U>> and get 61 points.	7749
	7750
	7751
	7752
Game 4. There are 10 trials in this game.	7753
You are instructed to press U and get 52 points.	7754
You are instructed to press M and get 51 points.	7755
You are instructed to press M and get 51 points.	7756
You are instructed to press U and get 57 points.	7757
You are instructed to press U and get 57 points.	7758
You are instructed to press M and get 54 points.	7759
You are instructed to press M and get 54 points.	7760
You press <<U>> and get 67 points.	7761
You press <<U>> and get 58 points.	7762
You press <<U>> and get 58 points.	7763
You press <<U>> and get 68 points.	7764
You press <<U>> and get 68 points.	7765
You press <<U>> and get 57 points.	7766
You press <<U>> and get 57 points.	7767
You press <<U>> and get 68 points.	7768
You press <<U>> and get 68 points.	7769
You press <<U>> and get 65 points.	7770
	7771
	7772
Game 5. There are 10 trials in this game.	7773
	7774

7775 You are instructed to press U and get 32 points.
7776
7777 You are instructed to press M and get 32 points.
7778 You are instructed to press M and get 38 points.
7779
7780 You are instructed to press U and get 33 points.
7781
7782 You press <<M>> and get 37 points.
7783 You press <<M>> and get 48 points.
7784
7785 You press <<M>> and get 38 points.
7786
7787 You press <<M>> and get 49 points.
7788 You press <<M>> and get 36 points.
7789
7790 You press <<M>> and get 48 points.
7791
7792
7793 Game 6. There are 5 trials in this game.
7794
7795 You are instructed to press U and get 74 points.
7796
7797 You are instructed to press M and get 51 points.
7798 You are instructed to press M and get 72 points.
7799
7800 You are instructed to press M and get 76 points.
7801
7802 You press <<U>> and get 57 points.
7803
7804
7805 Game 7. There are 10 trials in this game.
7806
7807 You are instructed to press U and get 40 points.
7808 You are instructed to press U and get 34 points.
7809
7810 You are instructed to press M and get 31 points.
7811
7812 You are instructed to press M and get 37 points.
7813 You press <<U>> and get 41 points.
7814
7815 You press <<U>> and get 43 points.
7816
7817 You press <<U>> and get 47 points.
7818 You press <<U>> and get 41 points.
7819
7820

You press <<U>> and get 44 points.	7821
You press <<U>> and get 45 points.	7822
	7823
	7824
	7825
Game 8. There are 5 trials in this game.	7826
You are instructed to press U and get 56 points.	7827
You are instructed to press M and get 59 points.	7828
You are instructed to press M and get 48 points.	7829
You are instructed to press M and get 48 points.	7830
You are instructed to press M and get 48 points.	7831
You are instructed to press M and get 48 points.	7832
You are instructed to press M and get 48 points.	7833
You press <<U>> and get 71 points.	7834
	7835
	7836
	7837
Game 9. There are 5 trials in this game.	7838
You are instructed to press U and get 46 points.	7839
You are instructed to press M and get 46 points.	7840
You are instructed to press M and get 46 points.	7841
You are instructed to press U and get 47 points.	7842
You are instructed to press U and get 47 points.	7843
You are instructed to press U and get 56 points.	7844
You are instructed to press U and get 56 points.	7845
You press <<U>> and get 47 points.	7846
	7847
	7848
	7849
Game 10. There are 10 trials in this game.	7850
You are instructed to press M and get 49 points.	7851
You are instructed to press M and get 49 points.	7852
You are instructed to press M and get 49 points.	7853
	7854
	7855
Horizon task	7856
	7857
Data source: [22] and unpublished data from the authors	7858
	7859
	7860
Number of experiments: 5	7861
Number of participants: 221	7862
Number of participants: 221	7863
Number of choices: 138875	7864
	7865
	7866

7867 **Example prompt:**

7868
7869 You are participating in multiple games involving two slot machines, labeled C and
7870 A.
7871
7872 The two slot machines are different across different games.
7873
7874 Each time you choose a slot machine, you get some points.
7875 You choose a slot machine by pressing the corresponding key.
7876
7877 Each slot machine tends to pay out about the same amount of points on average.
7878
7879 Your goal is to choose the slot machines that will give you the most points across the
7880 experiment.
7881
7882 The first 4 trials in each game are instructed trials where you will be told which slot
7883 machine to choose.
7884
7885 After these instructed trials, you will have the freedom to choose for either 1 or 6
7886 trials.
7887
7888
7889
7890 Game 1. There are 5 trials in this game.
7891
7892 You are instructed to press A and get 66 points.
7893
7894 You are instructed to press A and get 80 points.
7895
7896 You are instructed to press C and get 29 points.
7897
7898 You are instructed to press A and get 75 points.
7899
7900 You press <<A>> and get 81 points.
7901
7902 Game 2. There are 10 trials in this game.
7903
7904 You are instructed to press A and get 69 points.
7905
7906 You are instructed to press A and get 50 points.
7907
7908 You are instructed to press C and get 51 points.
7909
7910 You are instructed to press A and get 64 points.
7911
7912 You press <<C>> and get 42 points.

You press <<A>> and get 54 points.	7913
You press <<A>> and get 64 points.	7914
You press <<A>> and get 64 points.	7915
You press <<A>> and get 64 points.	7916
You press <<A>> and get 57 points.	7917
You press <<A>> and get 57 points.	7918
You press <<C>> and get 55 points.	7919
	7920
	7921
	7922
Game 3. There are 10 trials in this game.	7923
	7924
You are instructed to press A and get 31 points.	7925
You are instructed to press C and get 43 points.	7926
	7927
You are instructed to press A and get 26 points.	7928
	7929
You are instructed to press C and get 36 points.	7930
	7931
You press <<C>> and get 26 points.	7932
	7933
You press <<C>> and get 41 points.	7934
	7935
You press <<C>> and get 44 points.	7936
	7937
You press <<C>> and get 44 points.	7938
	7939
You press <<C>> and get 43 points.	7940
	7941
	7942
Game 4. There are 10 trials in this game.	7943
	7944
You are instructed to press C and get 65 points.	7945
	7946
You are instructed to press A and get 77 points.	7947
	7948
You are instructed to press A and get 52 points.	7949
	7950
You are instructed to press C and get 73 points.	7951
	7952
You press <<C>> and get 61 points.	7953
	7954
You press <<C>> and get 81 points.	7955
	7956
You press <<C>> and get 70 points.	7957
	7958

7959 You press <<A>> and get 62 points.
7960
7961 You press <<C>> and get 68 points.
7962
7963
7964 Game 5. There are 10 trials in this game.
7965
7966 You are instructed to press A and get 70 points.
7967 You are instructed to press C and get 19 points.
7968
7969 You are instructed to press A and get 43 points.
7970
7971 You are instructed to press C and get 41 points.
7972 You press <<A>> and get 53 points.
7973
7974 You press <<C>> and get 19 points.
7975
7976 You press <<A>> and get 61 points.
7977 You press <<A>> and get 68 points.
7978
7979 You press <<A>> and get 62 points.
7980
7981 You press <<C>> and get 46 points.
7982
7983
7984 Game 6. There are 10 trials in this game.
7985
7986 You are instructed to press C and get 63 points.
7987 You are instructed to press A and get 44 points.
7988
7989 You are instructed to press C and get 49 points.
7990
7991 You are instructed to press C and get 47 points.
7992 You press <<A>> and get 52 points.
7993
7994 You press <<A>> and get 52 points.
7995
7996 You press <<C>> and get 55 points.
7997 You press <<A>> and get 51 points.
7998
7999 You press <<A>> and get 34 points.
8000
8001 You press <<C>> and get 56 points.
8002
8003
8004

Game 7. There are 5 trials in this game.	8005
You are instructed to press C and get 61 points.	8006
You are instructed to press A and get 44 points.	8007
You are instructed to press A and get 41 points.	8008
You are instructed to press A and get 47 points.	8009
You press <<A>> and get 29 points.	8010
	8011
	8012
	8013
	8014
	8015
Game 8. There are 5 trials in this game.	8016
You are instructed to press C and get 51 points.	8017
You are instructed to press A and get 76 points.	8018
You are instructed to press C and get 54 points.	8019
You are instructed to press A and get 84 points.	8020
You press <<C>> and get 58 points.	8021
	8022
	8023
	8024
	8025
	8026
	8027
Game 9. There are 10 trials in this game.	8028
You are instructed to press C and get 54 points.	8029
You are instructed to press A and get 14 points.	8030
You are instructed to press A and get 15 points.	8031
You are instructed to press C and get 46 points.	8032
You press <<A>> and get 20 points.	8033
You press <<C>> and get 44 points.	8034
You press <<A>> and get 16 points.	8035
You press <<C>> and get 46 points.	8036
You press	8037
	8038
	8039
	8040
	8041
	8042
	8043
	8044
	8045
Aversive learning	8046
	8047
Data source: [100]	8048
	8049
	8050

8051 Number of experiments: 1
8052
8053 Number of participants: 57
8054
8055 Number of choices: 18240
8056
8057
8058 **Example prompt:**
8059 You are going to predict the probability of electric shocks associated with two visual
8060
8061 stimuli.
8062
8063 First, you will have to indicate the probability that a stimulus predicts a shock at the
8064
8065 current moment in time on a rating bar (between 0 and 100 percent).
8066
8067 After that, the outcome for each stimulus will be presented visually.
8068
8069 An upcoming shock will be indicated by a square over the stimulus, while a no-shock
8070
8071 outcome will be indicated by a circle.
8072
8073 Finally, shocks will be delivered after you have learned about the outcome visually.
8074
8075 If both stimuli indicate a shock, they will be presented one after the other in random
8076
8077 order.
8078
8079 The shock probability fluctuates over time such that one stimulus has a stable prob-
8080
8081 ability while the other varies.
8082
8083 Stimulus J and K are shown on the screen. You predict that the shock probability for
8084
8085 stimulus J is <<50.0>>% and the shock probability for stimulus K is <<50.0>>%.
8086
8087 After that, a circle is shown over stimulus J, and a square is shown over stimulus K.
8088
8089 Finally, a shock is delivered for stimulus K.
8090
8091 Stimulus J and K are shown on the screen. You predict that the shock probability for
8092
8093 stimulus J is <<50.0>>% and the shock probability for stimulus K is <<59.33>>%.
8094
8095 After that, a square is shown over stimulus J, and a circle is shown over stimulus K.
8096
8097 Finally, a shock is delivered for stimulus J.
8098
8099 Stimulus J and K are shown on the screen. You predict that the shock probability for
8100
8101 stimulus J is <<50.0>>% and the shock probability for stimulus K is <<59.33>>%.
8102
8103 After that, a circle is shown over stimulus J, and a square is shown over stimulus K.
8104
8105 Finally, a shock is delivered for stimulus K.

stimulus J is <<55.72>>% and the shock probability for stimulus K is <<59.33>>%.	8097
After that, a circle is shown over stimulus J, and a circle is shown over stimulus K.	8098
Finally, no shocks are delivered.	8099
Stimulus J and K are shown on the screen. You predict that the shock probability for	8100
stimulus J is <<55.72>>% and the shock probability for stimulus K is <<59.33>>%.	8101
After that, a circle is shown over stimulus J, and a circle is shown over stimulus K.	8102
Finally, no shocks are delivered.	8103
Stimulus J and K are shown on the screen. You predict that the shock probability for	8104
stimulus J is <<55.72>>% and the shock probability for stimulus K is <<59.33>>%.	8105
After that, a circle is shown over stimulus J, and a circle is shown over stimulus K.	8106
Finally, no shocks are delivered.	8107
Stimulus J and K are shown on the screen. You predict that the shock probability for	8108
stimulus J is <<55.72>>% and the shock probability for stimulus K is <<59.33>>%.	8109
After that, a circle is shown over stimulus J, and a circle is shown over stimulus K.	8110
Finally, no shocks are delivered.	8111
Stimulus J and K are shown on the screen. You predict that the shock probability for	8112
stimulus J is <<55.72>>% and the shock probability for stimulus K is <<59.33>>%.	8113
After that, a circle is shown over stimulus J, and a square is shown over stimulus K.	8114
Finally, a shock is delivered for stimulus K.	8115
Stimulus J and K are shown on the screen. You predict that the shock probability for	8116
stimulus J is <<55.72>>% and the shock probability for stimulus K is <<59.33>>%.	8117
After that, a circle is shown over stimulus J, and a square is shown over stimulus K.	8118
Finally, a shock is delivered for stimulus K.	8119
Stimulus J and K are shown on the screen. You predict that the shock probability for	8120
stimulus J is <<55.72>>% and the shock probability for stimulus K is <<62.42>>%.	8121
After that, a circle is shown over stimulus J, and a circle is shown over stimulus K.	8122
Finally, no shocks are delivered.	8123
Stimulus J and K are shown on the screen. You predict that the shock probability for	8124
stimulus J is <<55.72>>% and the shock probability for stimulus K is <<62.42>>%.	8125
After that, a circle is shown over stimulus J, and a circle is shown over stimulus K.	8126
Finally, no shocks are delivered.	8127
Stimulus J and K are shown on the screen. You predict that the shock probability for	8128
stimulus J is <<55.72>>% and the shock probability for stimulus K is <<62.42>>%.	8129
After that, a circle is shown over stimulus J, and a circle is shown over stimulus K.	8130
Finally, no shocks are delivered.	8131
Stimulus J and K are shown on the screen. You predict that the shock probability for	8132
stimulus J is <<55.72>>% and the shock probability for stimulus K is <<62.42>>%.	8133
After that, a square is shown over stimulus J, and a square is shown over stimulus K.	8134
Finally, shocks are delivered for both stimulus J and stimulus K.	8135
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8143 Stimulus J and K are shown on the screen. You predict that the shock probability for
8144 stimulus J is <<58.2>>% and the shock probability for stimulus K is <<65.0>>%.
8145 After that, a circle is shown over stimulus J, and a square is shown over stimulus K.
8146 Finally, a shock is delivered for stimulus K.
8147
8148 Stimulus J and K are shown on the screen. You predict that the shock probability for
8149 stimulus J is <<58.2>>% and the shock probability for stimulus K is <<67.48>>%.
8150 After that, a circle is shown over stimulus J, and a circle is shown over stimulus K.
8151 Finally, no shocks are delivered.
8152
8153 Stimulus J and K are shown on the screen. You predict that the shock probability for
8154 stimulus J is <<58.2>>% and the shock probability
8155
8156
8161 Spatially correlated multi-armed bandit
8162
8163 Data source: [18]
8164
8165
8166 Number of experiments: 1
8167
8168 Number of participants: 78
8169
8170 Number of choices: 9360
8171
8172
8173 Example prompt:
8174 You will be presented with a series of 16 different environments to explore.
8175
8176 In each trial, you can select an option between numbers 1 and 30 by pressing the cor-
8177 responding key.
8178
8179 By selecting any of these options, you will earn points associated with each unique
8180 option.
8181
8182 Imagine these options 1 through 30 as lying next to each other in an ordered line;
8183 options closer to each other tend to have similar rewards as rewards tend to cluster
8184 together.
8185
8186 For each environment, you will be able to make either 5 or 10 choices.
8187
8188

When you made all your choices in a given environment, you will start making choices	8189
in the next unexplored environment.	8190
The rewards underlying the different options are different in each environment so you	8191
will learn them anew for each environment.	8192
Each environment starts with the value of a single option revealed.	8193
When you choose the number corresponding to a different option, you will be told the	8194
value of that option and receive those points.	8195
Previously revealed options, including the starting option, can also be reselected,	8196
although there may be small changes in the point value.	8197
It is your task to gain as many points as possible across all 16 environments.	8198
	8199
	8200
Environment number 1:	8201
The value of option 4 is 76. You have 5 choices to make in this environment.	8202
You press <<5>> and receive 61 points.	8203
You press <<3>> and receive 64 points.	8204
You press <<6>> and receive 42 points.	8205
You press <<2>> and receive 49 points.	8206
You press <<11>> and receive 22 points.	8207
	8208
Environment number 2:	8209
The value of option 2 is 65. You have 10 choices to make in this environment.	8210
You press <<3>> and receive 68 points.	8211
You press <<1>> and receive 40 points.	8212
You press <<9>> and receive 10 points.	8213
You press <<17>> and receive 51 points.	8214
You press <<18>> and receive 35 points.	8215
You press <<16>> and receive 54 points.	8216
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8235 You press <<14>> and receive 48 points.
8236
8237 You press <<23>> and receive 64 points.
8238 You press <<22>> and receive 53 points.
8239
8240 You press <<23>> and receive 65 points.
8241
8242
8243 Environment number 3:
8244
8245 The value of option 22 is 37. You have 5 choices to make in this environment.
8246
8247 You press <<13>> and receive 30 points.
8248 You press <<7>> and receive 67 points.
8249
8250 You press <<8>> and receive 77 points.
8251
8252 You press <<6>> and receive 32 points.
8253 You press <<9>> and receive 57 points.
8254
8255
8256
8257 Environment number 4:
8258 The value of option 16 is 34. You have 10 choices to make in this environment.
8259
8260 You press <<5>> and receive 77 points.
8261
8262 You press <<6>> and receive 53 points.
8263 You press <<4>> and receive 79 points.
8264
8265 You press <<3>> and receive 41 points.
8266
8267 You press <<22>> and receive 25 points.
8268 You press <<29>> and receive 41 points.
8269
8270 You press <<26>> and receive 46 points.
8271
8272 You press <<12>> and receive 64 points.
8273 You press <<11>> and receive 41 points.
8274
8275 You press <<13>> and receive 55 points.
8276
8277
8278 Environment number 5:
8279
8280

The value of option 19 is 26. You have 5 choices to make in this environment.	8281
You press <<8>> and receive 42 points.	8282
You press <<3>> and receive 44 points.	8283
You press <<24>> and receive 37 points.	8284
You press <<29>> and receive 35 points.	8285
You press <<15>> and receive 48 points.	8286
	8287
	8288
	8289
	8290
	8291
Environment number 6:	8292
	8293
The value of option 16 is 44. You have 10 choices to make in this environment.	8294
You press <<9>> and receive 32 points.	8295
You press <<4>> and receive 43 points.	8296
You press <<21>> and receive 26 points.	8297
You press <<26>> and receive 5 points.	8298
You press <<1>> and receive 13 points.	8299
You press <<6>> and receive 9 points.	8300
You press <<12>> and receive 27 points.	8301
You press <<18>> and receive 36 points.	8302
You press <<23>> and receive 23 points.	8303
You press <<17>> and receive 21 points.	8304
	8305
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	8313
Environment number 7:	8314
	8315
The value of option 2 is 36. You have 5 choices to make in this environment.	8316
You press <<9>> and receive 49 points.	8317
You press <<16>> and receive 72 points.	8318
You press <<17>> and receive 59 points.	8319
You press <<15>> and receive 49 points.	8320
You press <<17>> and receive 58 points.	8321
	8322
	8323
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	8325
	8326

8327 Environment number 8:
8328
8329 The value of option 9 is 66. You have 10 choices to make in this environment.
8330 You press <<10>> and receive 66 points.
8331
8332 You press <<8>> and receive 37 points.
8333
8334 You press <<11>> and receive 38 points.
8335 You pr
8336
8337
8338 **Serial reaction time task**
8339
8340 Data source: [101]
8341
8342
8343
8344 Number of experiments: 2
8345 Number of participants: 238
8346
8347 Number of choices: 238000
8348
8349
8350 **Example prompt:**
8351
8352 Press the instructed key.
8353
8354
8355 Act as fast and accurately as possible.
8356
8357
8358
8359 The instruction is to press D, you press <<D>> in 1375 ms. That is correct.
8360 The instruction is to press K, you press <<K>> in 1960 ms. That is correct.
8361
8362 The instruction is to press J, you press <<J>> in 1043 ms. That is correct.
8363
8364 The instruction is to press F, you press <<F>> in 718 ms. That is correct.
8365 The instruction is to press D, you press <<D>> in 568 ms. That is correct.
8366
8367 The instruction is to press K, you press <<K>> in 527 ms. That is correct.
8368
8369 The instruction is to press J, you press <<J>> in 587 ms. That is correct.
8370 The instruction is to press K, you press <<K>> in 565 ms. That is correct.
8371
8372 The instruction is to press J, you press <<J>> in 541 ms. That is correct.

8419 The instruction is to press K, you press <<K>> in 528 ms. That is correct.
8420
8421 The instruction is to press J, you press <<J>> in 466 ms. That is correct.
8422 The instruction is to press F, you press <<F>> in 434 ms. That is correct.
8423
8424 The instruction is to press D, you press <<D>> in 355 ms. That is correct.
8425
8426 The instruction is to press J, you press <<K>> in 390 ms. That is incorrect.
8427 The instruction is to press F, you press <<F>> in 769 ms. That is correct.
8428
8429 The instruction is to press D, you press <<D>> in 416 ms. That is correct.
8430
8431 The instruction is to press K, you press <<K>> in 395 ms. That is correct.
8432 The instruction is to press K, you press <<K>> in 601 ms. That is correct.
8433
8434 The instruction is to press J, you press <<J>> in 475 ms. That is correct.
8435
8436 The instruction is to press J, you press <<J>> in 549 ms. That is correct.
8437 The instruction is to press F, you press <<F>> in 438 ms. That is correct.
8438
8439 The instruction is to press D, you press <<D>> in 327 ms. That is correct.
8440
8441 The instruction is to press K, you press <<K>> in 438 ms. That is correct.
8442 The instruction is to press J, you press <<J>> in 342 ms. That is correct.
8443
8444 The instruction is to press F, you press <<F>> in 456 ms. That is correct.
8445
8446 The instruction is to press D, you press <<D>> in 380 ms. That is correct.
8447 The instruction is to press K, you press <<K_i>>
8448
8449
8450 **Decisions from description**
8451
8452 Data source: [48]
8453
8454
8455
8456 Number of experiments: 1
8457 Number of participants: 1981
8458
8459 Number of choices: 28153
8460
8461
8462 **Example prompt:**
8463
8464 You will choose from two monetary lotteries by pressing W or H.

The lotteries offer different points with different probabilities.	8465
Your choice will trigger a random draw from the chosen lottery that will be added to your bonus.	8466 8467 8468 8469
Your goal is to maximize your bonus.	8470
You will be presented with multiple choice problems consisting of different lotteries varying in outcomes and probabilities.	8471 8472 8473 8474 8475 8476
Lottery W offers 4.0 points with 80.0% probability or 0.0 points with 20.0% probability.	8477 8478 8479
Lottery H offers 3.0 points with 100.0% probability.	8480
You press <<H>>.	8481 8482 8483 8484
Lottery W offers 4.0 points with 20.0% probability or 0.0 points with 80.0% probability.	8485 8486 8487
Lottery H offers 3.0 points with 25.0% probability, or 0.0 points with 75.0% probability.	8488 8489 8490
You press <<H>>.	8491 8492 8493 8494
Lottery W offers -3.0 points with 100.0% probability.	8495
Lottery H offers -32.0 points with 10.0% probability, or 0.0 points with 90.0% probability.	8496 8497 8498 8499
You press <<W>>.	8500 8501 8502
Decisions from experience	8503
Data source: [48]	8504 8505 8506 8507
Number of experiments: 79	8508
Number of participants: 3942	8509 8510

8511 Number of choices: 1015249
8512
8513
8514 **Example prompt:**
8515
8516 You can sample from two monetary lotteries by pressing K or D.
8517
8518 The lotteries offer different points with different probabilities.
8519 Initially, you will not know the outcomes and probabilities of the lotteries, but you
8520
8521 can learn about them through sampling.
8522
8523 Whenever you sample, a random draw from the selected lottery will be generated,
8524
8525 which does not affect your bonus.
8526 You can sample from the lotteries in whatever order and for as long as you like.
8527
8528 Whenever you feel ready, you can stop sampling by pressing X and then choose one
8529
8530 lottery for real by pressing the corresponding key.
8531 This choice will then trigger a random draw from the chosen lottery that will be added
8532
8533 to your bonus.
8534 Your goal is to maximize your bonus.
8535
8536 You will be presented with multiple choice problems consisting of different lotteries
8537
8538 varying in outcomes and probabilities.
8539
8540
8541 You encounter a new choice problem:
8542
8543 You press <<K>> and observe 4.0 points.
8544
8545 You press <<K>> and observe 4.0 points.
8546
8547 You press <<K>> and observe 4.0 points.
8548
8549 You press <<K>> and observe 4.0 points.
8550
8551 You press <<K>> and observe 0.0 points.
8552
8553 You press <<K>> and observe 4.0 points.
8554
8555 You press <<K>> and observe 4.0 points.
8556

You press <<K>> and observe 4.0 points.	8557
You press <<K>> and observe 4.0 points.	8558
You press <<K>> and observe 4.0 points.	8559
You press <<K>> and observe 0.0 points.	8560
You press <<K>> and observe 4.0 points.	8561
You press <<K>> and observe 4.0 points.	8562
You press <<D>> and observe 3.0 points.	8563
You press <<D>> and observe 3.0 points.	8564
You press <<D>> and observe 3.0 points.	8565
You press <<D>> and observe 3.0 points.	8566
You press <<D>> and observe 3.0 points.	8567
You press <<D>> and observe 3.0 points.	8568
You press <<D>> and observe 3.0 points.	8569
You press <<D>> and observe 3.0 points.	8570
You press <<D>> and observe 3.0 points.	8571
You press <<D>> and observe 3.0 points.	8572
You press <<D>> and observe 3.0 points.	8573
You press <<D>> and observe 3.0 points.	8574
You press <<D>> and observe 3.0 points.	8575
You press <<D>> and observe 3.0 points.	8576
You press <<D>> and observe 3.0 points.	8577
You press <<D>> and observe 3.0 points.	8578
You press <<D>> and observe 3.0 points.	8579
You press <<D>> and observe 3.0 points.	8580
You press <<D>> and observe 3.0 points.	8581
You press <<D>> and observe 3.0 points.	8582
You press <<D>> and observe 3.0 points.	8583
You press <<D>> and observe 3.0 points.	8584
You press <<D>> and observe 3.0 points.	8585
You press <<D>> and observe 3.0 points.	8586
You press <<D>> and observe 3.0 points.	8587
You press <<D>> and observe 3.0 points.	8588
You press <<D>> and observe 3.0 points.	8589
You press <<K>> and observe 4.0 points.	8590
You press <<K>> and observe 4.0 points.	8591
You press <<K>> and observe 4.0 points.	8592
You press <<K>> and observe 4.0 points.	8593
You press <<K>> and observe 4.0 points.	8594
You press <<K>> and observe 4.0 points.	8595
You press <<K>> and observe 4.0 points.	8596
You press <<K>> and observe 0.0 points.	8597
You press <<K>> and observe 4.0 points.	8598
You press <<K>> and observe 4.0 points.	8599
You press <<X>> to stop sampling and then press <<K>>.	8600
	8601
	8602

8603 You encounter a new choice problem:
8604
8605 You press <<K>> and observe 0.0 points.
8606 You press <<K>> and observe 0.0 points.
8607
8608 You press <<K>> and observe 0.0 points.
8609
8610 You press <<D>> and observe 0.0 points.
8611 You press <<D>> and observe 0.0 points.
8612
8613 You press <<D>> and observe 0.0 points.
8614
8615 You press <<D>> and observe 0.0 points.
8616 You press <<D>> and observe 3.0 points.
8617
8618 You press <<K>> and observe 0.0 points.
8619
8620 You press <<K>> and observe 0.0 points.
8621 You press <<K>> and observe 4.0 points.
8622
8623 You press <<K>> and observe 0.0 points.
8624
8625 You press <<K>> and observe 0.0 points.
8626 You press <<K>> and observe 0.0 points.
8627
8628 You press <<K>> and observe 0.0 points.
8629
8630 You press <<K>> and observe 4.0 points.
8631 You press <<K>> and observe 0.0 points.
8632
8633 You press <<K>> and observe 4.0 points.
8634
8635 You press <<K>> and observe 0.0 points.
8636 You press <<K>> and observe 0.0 points.
8637
8638 You press <<K>> and observe 0.0 points.
8639
8640 You press <<K>> and observe 0.0 points.
8641 You press <<K>> and observe 0.0 points.
8642
8643 You press <<K>> and observe 0.0 points.
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8645 You press <<K>> and observe 0.0 points.
8646 You press <<K>> and observe 0.0 points.
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You press <<K>> and observe 0.0 points.	8649
You press <<K>> and observe 0.0 points.	8650
You press <<K>> and observe 0.0 points.	8651
You press <<K>> and observe 0.0 points.	8652
You press <<D>> and observe 0.0 points.	8653
You press <<D>> and observe 0.0 points.	8654
You press <<D>> and observe 0.0 points.	8655
You press <<D>> and observe 0.0 points.	8656
You press <<D>> and observe 0.0 points.	8657
You press <<D>> and observe 0.0 points.	8658
You press <<D>> and observe 3.0 points.	8659
You press <<D>> and observe 0.0 points.	8660
You press <<D>> and observe 0.0 points.	8661
You press <<D>> and observe 0.0 points.	8662
You press <<D>> and observe 0.0 points.	8663
You press <<D>> and observe 0.0 points.	8664
You press <<D>> and observe 0.0 points.	8665
You press <<D>> and observe 0.0 points.	8666
You press <<D>> and observe 0.0 points.	8667
You press <<D>> and observe 0.0 points.	8668
You press <<D>> and observe 0.0 points.	8669
You press <<D>> and observe 3.0 points.	8670
You press <<D>> and observe 0.0 points.	8671
You press <<D>> and observe 0.0 points.	8672
You press <<D>> and observe 0.0 points.	8673
You press <<D>> and observe 0.0 points.	8674
You press <<D>> and observe 0.0 points.	8675
You press <<D>> and observe 0.0 points.	8676
You press <<D>> and observe 0.0 points.	8677
You press <<D>> and observe 0.0 points.	8678

Changing bandit

Data source: [\[102\]](#)

Number of experiments: 1

Number of participants: 30

Number of choices: 141000

Example prompt:

You are participating in multiple games involving two slot machines, labeled M and

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8695 V.
8696
8697 The two slot machines are different in different games.
8698 Each time you choose a slot machine, you get points (choosing the same slot machine
8699
8700 will not always give you the same points).
8701
8702 You select a slot machine by pressing the corresponding key.
8703 The expected points change randomly, abruptly, and independently with a hazard rate
8704
8705 (which you will be told).
8706
8707 When the points change, the new expected point value assigned to that slot machine
8708 is sampled from a uniform distribution (from 1 to 99 points).
8709
8710 For example, if the hazard rate is 0.1, the expected points of the machines change
8711
8712 with 10%.
8713 Your goal is to choose the slot machine that will give you the most points.
8714
8715
8716
8717 Game 1. The hazard rate is 0.1. There are 100 trials in this game.
8718 You press <<M>> and get 65 points.
8719
8720 You press <<V>> and get 58 points.
8721
8722 You press <<M>> and get 65 points.
8723
8724 You press <<M>> and get 65 points.
8725
8726 You press <<V>> and get 5 points.
8727
8728 You press <<M>> and get 65 points.
8729
8730 You press <<M>> and get 65 points.
8731
8732 You press <<V>> and get 60 points.
8733
8734 You press <<M>> and get 65 points.
8735
8736 You press <<M>> and get 65 points.
8737
8738 You press <<V>> and get 39 points.
8739
8740 You press <<M>> and get 65 points.
8740

8787 You press <<V>> and get 28 points.
8788
8789 You press <<V>> and get 28 points.
8790 You press <<V>> and get 28 points.
8791
8792 You press <<V>> and get 28 points.
8793
8794 You press <<V>> and get 28 points.
8795 You press <<V>> and get 28 points.
8796
8797 You press <<M>> and get 13 points.
8798
8799 You press <<V>> and get 28 points.
8800 You press <<V>> and get 28 points.
8801
8802 You press <<V>> and get 28 points.
8803
8804 You press <<V>> and get 28 points.
8805 You press <<V>> and get 28 points.
8806
8807 You press <<M>> and get 13 points.
8808
8809 You press <<V>> and get 29 points.
8810 You press <<M>> and get 88 points.
8811
8812 You press <<M>> and get 88 points.
8813
8814 You press <<M>> and get 88 points.
8815 You press <<M>> and get 88 points.
8816
8817 You press <<M>> and get 88 points.
8818
8819 You press <<M>> and get 88 points.
8820 You press <<V>> and get 47 points.
8821
8822 You press <<M>> and get 88 points.
8823
8824 You press <<M>> and get 53 points.
8825 You press <<V>> and get 18 points.
8826
8827 You press <<M>> and get 3 points.
8828
8829 You press <<V>> and get 18 points.
8830 You press <<V>> and get 18 points.
8831
8832

8879 **Probabilistic reasoning**

8880

8881 Data source: [103]

8882

8883

8884 Number of experiments: 2

8885
8886 Number of participants: 128

8887

8888 Number of choices: 19740

8889

8890

8891 **Example prompt:**

8892

8893 You have to estimate the probability of a series of weather-related queries.

8894

8895 Please respond by typing your estimated probabilities.

8896

8897

8898 What is the probability that the weather will be icy and not frosty on a random day

8899 in England? You estimate $\langle\langle 20 \rangle\rangle\%$.

8900

8901 What is the probability that the weather will be not normal or not typical on a random

8902

8903 day in England? You estimate $\langle\langle 50 \rangle\rangle\%$.

8904

8905 What is the probability that the weather will be not frosty on a random day in

8906 England? You estimate $\langle\langle 65 \rangle\rangle\%$.

8907

8908 If the weather in England is not frosty on a random day, what is the probability that

8909 the weather will also be not icy on the same day? You estimate $\langle\langle 40 \rangle\rangle\%$.

8910

8911 If the weather in England is icy on a random day, what is the probability that the

8912

8913 weather will also be not frosty on the same day? You estimate $\langle\langle 20 \rangle\rangle\%$.

8914

8915 If the weather in England is typical on a random day, what is the probability that the

8916 weather will also be normal on the same day? You estimate $\langle\langle 50 \rangle\rangle\%$.

8917

8918 What is the probability that the weather will be icy and frosty on a random day in

8919 England? You estimate $\langle\langle 35 \rangle\rangle\%$.

8920

8921 What is the probability that the weather will be normal on a random day in England?

8922

8923 You estimate $\langle\langle 50 \rangle\rangle\%$.

8924

What is the probability that the weather will be icy or frosty on a random day in England? You estimate <<35>>%.	8925
	8926
	8927
What is the probability that the weather will be not icy or not frosty on a random day in England? You estimate <<60>>%.	8928
	8929
	8930
If the weather in England is not typical on a random day, what is the probability that the weather will also be not normal on the same day? You estimate <<40>>%.	8931
	8932
	8933
What is the probability that the weather will be normal and typical on a random day in England? You estimate <<30>>%.	8934
	8935
	8936
What is the probability that the weather will be not normal on a random day in England? You estimate <<20>>%.	8937
	8938
	8939
If the weather in England is not frosty on a random day, what is the probability that the weather will also be icy on the same day? You estimate <<20>>%.	8940
	8941
	8942
If the weather in England is not normal on a random day, what is the probability that the weather will also be typical on the same day? You estimate <<40>>%.	8943
	8944
	8945
If the weather in England is icy on a random day, what is the probability that the weather will also be frosty on the same day? You estimate <<60>>%.	8946
	8947
	8948
If the weather in England is not icy on a random day, what is the probability that the weather will also be not frosty on the same day? You estimate <<60>>%.	8949
	8950
	8951
What is the probability that the weather will be typical on a random day in England? You estimate <<70>>%.	8952
	8953
	8954
What is the probability that the weather will be typical or not normal on a random day in England? You estimate <<50>>%.	8955
	8956
	8957
What is the probability that the weather will be typical and not normal on a random day in England? You estimate <<30>>%.	8958
	8959
	8960
What is the probability that the weather will be not normal and not typical on a random day in England? You estimate <<40>>%.	8961
	8962
	8963
	8964
If the weather in England is frosty on a random day, what is the probability that the	8965
	8966
	8967
	8968
	8969
	8970

8971 weather will also be not icy on the same day? You estimate <<60>>%.
8972
8973 What is the probability that the weather will be frosty or not icy on a random day in
8974 England? You estimate <<65>>%.
8975
8976 If the weather in England is not typical on a random day, what is the probability that
8977 the weather will also be normal on the same day? You estimate <<34>>%.
8978
8979 If the weather in England is normal on a random day, what is the probability that the
8980 weather will also be not typical on the same day? You estimate <<45>>%.
8981
8982 If the weather in England is normal on a random day, what is the probability that the
8983 weather will also be typical on the same day? You estimate <<10>>%.
8984
8985
8986 What is the probability that the weather will be icy or not frosty on a random day in
8987 England? You estimate <<40>>%.
8988
8989 What is the probability that the weather will be frosty on a random day in England?
8990 You estimate <<40>>%.
8991
8992 If the weather in England is frosty on a random day, what is the probability that the
8993 weather will also be icy on the same day? You estimate <<40>>%.
8994
8995
8996 If the weather in England is not icy on a random day, what is the probability that the
8997 wea
8998
8999
9000 **Two-step task**
9001
9002 Data source: [104]
9003
9004
9005
9006 Number of experiments: 1
9007
9008 Number of participants: 139
9009
9010 Number of choices: 55878
9011
9012
9013 **Example prompt:**
9014 You are participating in a space treasure game.
9015
9016 In this game, you will be visiting two alien planets in search of treasure.

Each planet has two aliens on it.	9017
The blue aliens live on the blue planet.	9018
The red aliens live on the red planet.	9019
	9020
When you visit a planet, you can choose an alien to trade with by pressing the corresponding button.	9021
	9022
	9023
When you trade with an alien, it will either give you treasure or junk.	9024
	9025
Your goal is to figure out, and trade with, the aliens that are most likely to give you treasure.	9026
	9027
	9028
To visit a planet, you will choose one rocket ship from two by pressing the corresponding button.	9029
	9030
	9031
They have different designations.	9032
	9033
Each rocket ship has a planet it will fly to most of the time.	9034
	9035
But sometimes they will take you to the other planet!	9036
	9037
Remember the following hints:	9038
	9039
1. How likely an alien is to give you treasure will change over time, but this change will be slow.	9040
	9041
	9042
2. Whether you get treasure depends only on the alien you choose to trade with.	9043
	9044
3. If there is an alien you want to trade with, remember to pick the rocket ship that is most likely to take you to that alien's planet.	9045
	9046
	9047
	9048
	9049
You are presented with two spaceships called S and C. You press <<S>>. You end up on the blue planet. You see a blue alien named D and a blue alien named R. You press <<R>>. You find junk.	9050
	9051
	9052
	9053
	9054
You are presented with two spaceships called S and C. You press <<S>>. You end up on the blue planet. You see a blue alien named D and a blue alien named R. You press <<D>>. You find treasure.	9055
	9056
	9057
	9058
	9059
You are presented with two spaceships called S and C. You press <<S>>. You end	9060
	9061
	9062

9063 up on the blue planet. You see a blue alien named D and a blue alien named R. You
9064
9065 press <<D>>. You find junk.
9066 You are presented with two spaceships called S and C. You press <<C>>. You end
9067
9068 up on the red planet. You see a red alien named G and a red alien named V. You
9069
9070 press <<V>>. You find junk.
9071 You are presented with two spaceships called S and C. You press <<S>>. You end
9072
9073 up on the red planet. You see a red alien named G and a red alien named V. You
9074
9075 press <<G>>. You find treasure.
9076 You are presented with two spaceships called S and C. You press <<S>>. You end
9077
9078 up on the blue planet. You see a blue alien named D and a blue alien named R. You
9079
9080 press <<D>>. You find junk.
9081 You are presented with two spaceships called S and C. You press <<S>>. You end
9082
9083 up on the blue planet. You see a blue alien named D and a blue alien named R. You
9084
9085 press <<R>>. You find junk.
9086 You are presented with two spaceships called S and C. You press <<C>>. You end
9087
9088 up on the red planet. You see a red alien named G and a red alien named V. You
9089
9090 press <<G>>. You find junk.
9091 You are presented with two spaceships called S and C. You press <<C>>. You end
9092
9093 up on the blue planet. You see a blue alien named D and a blue alien named R. You
9094
9095 press <<D>>. You find junk.
9096 You are presented with two spaceships called S and C. You press <<S>>. You end
9097
9098 up on the blue planet. You see a blue alien named D and a blue alien named R. You
9099
9100 press <<R>>. You find treasure.
9101 You are presented with two spaceships called S and C. You press <<S>>. You end
9102
9103 up on the red planet. You see a red alien named G and a red alien named V. You
9104
9105 press <<V>>. You find treasure.
9106 You are presented with two spaceships called S and C. You press <<S>>. You end
9107
9108

up on the red planet. You see a red alien named G and a red alien named V. You	9109
press <<V>>. You find treasure.	9110
	9111
You are presented with two spaceships called S and C. You press <<S>>. You end	9112
up on the blue planet. You see a blue alien named D and a blue alien named R. You	9113
press <<D>>. You find treasure.	9114
	9115
You are presented with two spaceships called S and C. You press <<S>>. You end	9116
up on the blue planet. You see a blue alien named D and a blue alien named R. You	9117
press <<R>>. You find junk.	9118
	9119
You are presented with two spaceships called S and C. You press <<S>>. You end	9120
up on the red planet. You see a red alien named G and a red alien named V. You	9121
press <<V>>. You find junk.	9122
	9123
You are presented with two spaceships called S and C. You press <<S>>. You end	9124
up on the blue planet. You see a blue alien named D and a blue alien	9125
	9126
	9127
	9128
	9129
	9130
	9131
Evaluation data	9132
	9133
Two-step task (modified cover story)	9134
	9135
Data source: [24]	9136
	9137
	9138
	9139
Number of experiments: 1	9140
Number of participants: 24	9141
	9142
Number of choices: 9702	9143
	9144
	9145
Example prompt:	9146
	9147
	9148
	9149
You are playing the role of a musician living in a fantasy land.	9150
	9151
You play the flute for gold coins to an audience of genies, who live inside magic lamps	9152
on Pink Mountain and Blue Mountain.	9153
	9154

9155 Pink Mountain has genies H and J, and Blue Mountain has genies A and E.
9156
9157 Each genie lives in a lamp with the corresponding letter on it.
9158 When you arrive on a mountain, you can pick up a lamp and rub it.
9159
9160 If the genie is in the mood for music, he will come out of his lamp, listen to a song,
9161
9162 and give you a gold coin.
9163 Each genie's interest in music changes with time.
9164
9165 To go to the mountains, you chose one of two magic carpets, which you purchase from
9166
9167 a magician, who enchants them to fly.
9168 Magic carpet K generally flies to Pink Mountain, and magic carpet O generally flies
9169
9170 to Blue Mountain.
9171
9172 However, on rare occasions a strong wind blowing from that mountain makes flying
9173
9174 there too dangerous because the wind might blow you off the carpet.
9175 In this case, the carpet is forced to land instead on the other mountain.
9176
9177 You can take a magic carpet or pick up a lamp and rub it by pressing the corresponding
9178
9179 key.
9180 Your goal is to get as many coins as possible over the next 201 days.
9181
9182
9183 You are presented with magic carpets K and O. You press <<K>>. You end up on
9184
9185 Pink Mountain. You see lamp H and lamp J. You rub lamp <<H>>. You receive 0
9186
9187 coins.
9188 You are presented with magic carpets O and K. You press <<K>>. You end up on
9189
9190 Pink Mountain. You see lamp H and lamp J. You rub lamp <<J>>. You receive 1
9191
9192 coins.
9193 You are presented with magic carpets K and O. You press <<K>>. You end up on
9194
9195 Pink Mountain. You see lamp H and lamp J. You rub lamp <<J>>. You receive 1
9196
9197 coins.
9198 You are presented with magic carpets O and K. You press <<K>>. You end up on
9199
9200

Pink Mountain. You see lamp H and lamp J. You rub lamp <<J>>. You receive 1	9201
coins.	9202
	9203
You are presented with magic carpets K and O. You press <<K>>. You end up on	9204
Pink Mountain. You see lamp H and lamp J. You rub lamp <<J>>. You receive 0	9205
coins.	9206
	9207
You are presented with magic carpets O and K. You press <<O>>. You end up on	9208
Blue Mountain. You see lamp A and lamp E. You rub lamp <<A>>. You receive 1	9209
coins.	9210
	9211
You are presented with magic carpets O and K. You press <<O>>. You end up on	9212
Blue Mountain. You see lamp A and lamp E. You rub lamp <<A>>. You receive 0	9213
coins.	9214
	9215
You are presented with magic carpets K and O. You press <<O>>. You end up on	9216
Blue Mountain. You see lamp A and lamp E. You rub lamp <<A>>. You receive 0	9217
coins.	9218
	9219
You are presented with magic carpets K and O. You press <<O>>. You end up on	9220
Blue Mountain. You see lamp A and lamp E. You rub lamp <<E>>. You receive 1	9221
coins.	9222
	9223
You are presented with magic carpets K and O. You press <<O>>. You end up on	9224
Blue Mountain. You see lamp A and lamp E. You rub lamp <<E>>. You receive 0	9225
coins.	9226
	9227
You are presented with magic carpets O and K. You press <<K>>. You end up on	9228
Pink Mountain. You see lamp H and lamp J. You rub lamp <<J>>. You receive 0	9229
coins.	9230
	9231
You are presented with magic carpets O and K. You press <<K>>. You end up on	9232
Pink Mountain. You see lamp H and lamp J. You rub lamp <<H>>. You receive 0	9233
coins.	9234
	9235
You are presented with magic carpets O and K. You press <<O>>. You end up on	9236
Blue Mountain. You see lamp A and lamp E. You rub lamp <<A>>. You receive 1	9237
coins.	9238
	9239
You are presented with magic carpets K and O. You press <<O>>. You end up on	9240
Blue Mountain. You see lamp A and lamp E. You rub lamp <<A>>. You receive 1	9241
coins.	9242
	9243
You are presented with magic carpets K and O. You press <<O>>. You end up on	9244
	9245
	9246

9247 Pink Mountain. You see lamp H and lamp J. You rub lamp <<J>>. You receive 1
9248
9249 coins.
9250 You are presented with magic carpets K and O. You press <<O>>. You end up on
9251
9252 Blue Mountain. You see lamp A and lamp E. You rub lamp <<A>>. You receive 0
9253
9254 coins.
9255 You are presented with magic carpets O and K. You press <<K>>. You end up on
9256
9257 Blue Mountain. You see lamp A and lamp E. You rub lamp <<A>>. You receive 1
9258
9259 coins.
9260 You are presented with magic carpets K and O. You press <<O>>. You end up on
9261
9262 Pink Mountain. You see lamp H and lamp J. You rub lamp <<J>>. You receive 0
9263
9264 coins.
9265 You are presented with magic carpets K and O. You press <<K>>. You end up on
9266
9267 Pink Mountain. You see lamp H and lamp J. You rub lamp <<J>>. You receive 0
9268
9269 coins.
9270 You are presented with magic carpets O and K. You press <<O>>. You end up on
9271
9272 Blue Mountain. You see lamp A and lamp E. You rub lamp <<A>>. You receive 0
9273
9274 coins.
9275 You are presented with magic carpets O and K. You pr
9276
9277
9278 **Maggie's farm (modified problem structure)**
9279
9280 Data source: [25]
9281
9282
9283
9284 Number of experiments: 1
9285 Number of participants: 658
9286
9287 Number of choices: 921200
9288
9289
9290 Example prompt:
9291
9292

You are participating in multiple games involving three apple trees, labeled S, F, and N.	9293 9294 9295
The three apple trees are different across different games.	9296 9297
Each time you choose an apple tree, you get an apple of a given size.	9298 9299
You choose an apple tree by pressing the corresponding key.	9300 9301
Each apple tree tends to provide apples of about the same size on average.	9302 9303
Your goal is to choose the apple trees that will give you the largest apples across the experiment.	9304 9305
The first few trials in each game are instructed trials where you will be told which apple tree to choose.	9306 9307 9308
After these instructed trials, you will have the freedom to choose for either 1 or 6 trials.	9309 9310 9311 9312 9313
Game 1. There are 8 trials in this game.	9314 9315
You are instructed to press F and get an apple with size 3.0 centimeters.	9316 9317
You are instructed to press N and get an apple with size 2.0 centimeters.	9318 9319
You press <<S>> and get an apple with size 4.0 centimeters.	9320 9321
You press <<S>> and get an apple with size 4.0 centimeters.	9322 9323
You press <<S>> and get an apple with size 4.0 centimeters.	9324 9325
You press <<F>> and get an apple with size 5.0 centimeters.	9326 9327
You press <<N>> and get an apple with size 5.0 centimeters.	9328 9329
You press <<N>> and get an apple with size 4.0 centimeters.	9330 9331
Game 2. There are 10 trials in this game.	9332 9333
You are instructed to press F and get an apple with size 9.0 centimeters.	9334 9335
You are instructed to press N and get an apple with size 2.0 centimeters.	9336 9337
You are instructed to press F and get an apple with size 10.0 centimeters.	9338

9339 You are instructed to press F and get an apple with size 10.0 centimeters.
9340
9341 You press <<F>> and get an apple with size 10.0 centimeters.
9342 You press <<F>> and get an apple with size 8.0 centimeters.
9343
9344 You press <<F>> and get an apple with size 9.0 centimeters.
9345
9346 You press <<F>> and get an apple with size 7.0 centimeters.
9347 You press <<F>> and get an apple with size 9.0 centimeters.
9348
9349 You press <<F>> and get an apple with size 10.0 centimeters.
9350
9351
9352 Game 3. There are 8 trials in this game.
9353
9354 You are instructed to press S and get an apple with size 2.0 centimeters.
9355
9356 You are instructed to press F and get an apple with size 6.0 centimeters.
9357 You press <<F>> and get an apple with size 5.0 centimeters.
9358
9359 You press <<F>> and get an apple with size 6.0 centimeters.
9360
9361 You press <<F>> and get an apple with size 6.0 centimeters.
9362 You press <<F>> and get an apple with size 5.0 centimeters.
9363
9364 You press <<F>> and get an apple with size 6.0 centimeters.
9365
9366 You press <<F>> and get an apple with size 7.0 centimeters.
9367
9368
9369 Game 4. There are 11 trials in this game.
9370
9371 You are instructed to press F and get an apple with size 5.0 centimeters.
9372 You are instructed to press S and get an apple with size 6.0 centimeters.
9373
9374 You are instructed to press F and get an apple with size 4.0 centimeters.
9375
9376 You are instructed to press F and get an apple with size 4.0 centimeters.
9377 You are instructed to press N and get an apple with size 2.0 centimeters.
9378
9379 You press <<S>> and get an apple with size 6.0 centimeters.
9380
9381 You press <<S>> and get an apple with size 5.0 centimeters.
9382 You press <<S>> and get an apple with size 3.0 centimeters.
9383
9384

You press <<S>> and get an apple with size 4.0 centimeters.	9385
You press <<N>> and get an apple with size 2.0 centimeters.	9386
You press <<S>> and get an apple with size 4.0 centimeters.	9387
	9388
	9389
	9390
Game 5. There are 5 trials in this game.	9391
	9392
You are instructed to press S and get an apple with size 6.0 centimeters.	9393
	9394
You are instructed to press F and get an apple with size 7.0 centimeters.	9395
	9396
You are instructed to press S and get an apple with size 6.0 centimeters.	9397
	9398
You are instructed to press S and get an apple with size 5.0 centimeters.	9399
	9400
You press <<S>> and get an apple with size 6.0 centimeters.	9401
	9402
	9403
Game 6. There are 11 trials in this game.	9404
	9405
You are instructed to press S and get an apple with size 6.0 centimeters.	9406
	9407
You are instructed to press S and get an apple with size 4.0 centimeters.	9408
	9409
You are instructed to press S and get an apple with size 5.0 centimeters.	9410
	9411
You are instructed to press F and get an apple with size 3.0 centimeters.	9412
	9413
You are instructed to press N and get an apple with size 4.0 centimeters.	9414
	9415
You press <<S>> and get an apple with size 6.0 centime	9416
	9417
Logical reasoning (entirely novel domain)	9418
	9419
Data source: [26]	9420
	9421
Number of experiments: 1	9422
	9423
Number of participants: 3543	9424
	9425
Number of choices: 99204	9426
	9427
	9428
Example prompt:	9429
	9430

9431 You're about to answer a set of 20 questions about logical reasoning. How many of
9432 the 20 questions do you think you will answer correctly?
9433
9434 You say <<12>>.
9435
9436 Compared to other participants in this study, how well do you think you will do?
9437
9438 Marking 90% means you will do better than 90% of participants, marking 10% means
9439 you will do better than only 10%, and marking 50% means that you will perform bet-
9440
9441 ter than half of the participants.
9442
9443 You say <<70>>%.
9444
9445 On a scale of 0 to 10, how difficult is solving logical reasoning problems for the aver-
9446
9447 age participant?
9448
9449 You say <<6>>.
9450
9451 On a scale of 0 to 10, how difficult is solving logical reasoning problems for you?
9452
9453 You say <<4>>.
9454
9455 You will be presented with brief passages or statements and will be required to eval-
9456
9457 uate their reasoning or determine what inferences you can logically draw from the
9458
9459 passage.
9460
9461 Your task is to use the buttons D, Z, F, O, and X to select the best answer choice,
9462
9463 even though more than one choice may present a possible answer.
9464
9465 Q1. Life imitates art. Which of the following, if true, most strongly supports the pre-
9466
9467 vious statement?
9468
9469 The choices are:
9470
9471 Z: When Warren Beatty filmed Reds, he tried to suggest not only the chaos of the
9472
9473 Russian Revolution but also its relationship to the present.
9474
9475 X: The number of professional ballet companies has increased over the last five years,
9476
9477 but the number of dance majors has decreased.

D: On Tuesday, the business section of the newspaper had predicted the drop in interest rates that occurred on Friday.	9477 9478 9479
O: Truman Capote wrote <i>In Cold Blood</i> as a result of a series of brutal slayings by two crazed killers.	9480 9481 9482 9483
F: Soon after the advent of color television, white shirts became less popular as dressy attire for men, and pastel-colored shirts began to sell well.	9484 9485 9486
You press <<F>>.	9487 9488 9489
Q2. On average, federal workers receive salaries 35.5 percent higher than private-sector salaries. For instance, federal workers in California average \$19,206 a year, 25 percent higher than the average pay in the private sector, which is \$15,365. This information would best support which of the following opinions?	9490 9491 9492 9493 9494 9495 9496
The choices are:	9497
Z: Private-sector salaries in California are above average.	9498 9499
X: The private sector is being paid fairly.	9500 9501
O: Federal jobs are more secure than private-sector jobs.	9502
D: Public-sector work is more difficult than private-sector work.	9503 9504
F: Federal pay is out of line.	9505 9506
You press <<Z>>.	9507 9508 9509
Q3. No high jumper entered the track meet unless he or she was a track club member. No track club member both entered the meet and was a high jumper. Which of the following conclusions can be correctly drawn from the two previous sentences?	9510 9511 9512 9513 9514
The choices are:	9515
F: No one but high jumpers entered the meet.	9516 9517
D: Only track club members entered the meet.	9518 9519
X: No track club members entered the meet.	9520 9521 9522

9523 Z: No high jumper entered the meet.
9524
9525 O: Some track club members entered the meet.
9526 You press <<Z>>.
9527
9528
9529
9530 Q4. About 33% of American men between 25 and 50 are overweight. Research has
9531 shown that in most cases men between 25 and 50 who are overweight are more sub-
9532 ject to heart disease than men who are not overweight. Which of the following is the
9533 most logical conclusion to this argument?
9534
9535 The choices are:
9536
9537 D: Therefore, 33% of the American men between 25 and 50 should lose weight.
9538
9539 O: Therefore, if 33% of the American men between 25 and 50 were to lose weight,
9540 they would reduce their risk of heart disease.
9541
9542 X: Therefore, if the men between 25 and 50 who are overweight were to lose weight,
9543 they would reduce their risk of heart disease by 33%.
9544
9545 Z: Therefore, if 33% of American men were to lose weight, they would reduce their
9546 risk of heart disease.
9547
9548 F: Therefore, if the overweight men between 25 and 50 were to lose weight, their risk
9549 of heart disease would be reduced.
9550
9551 You press <<F>>.
9552
9553
9554
9555
9556 Q5. All computer geniuses are also brilliant mathematicians. Therefore, some com-
9557 puter geniuses don't require calculators for simple multiplication facts. Which of the
9558 following is the least necessary assumption for the previous conclusion to be logically
9559 correct?
9560
9561 The choices are:
9562
9563 F: Some brilliant mathematicians don't require calcul
9564
9565
9566
9567
9568

Two-step task (neural alignment)	9569
	9570
Data source: [33]	9571
	9572
	9573
Number of experiments: 1	9574
	9575
Number of participants: 94	9576
	9577
Number of choices: 28153	9578
	9579
	9580
Example prompt:	9581
	9582
	9583
	9584
You are playing multiple rounds of a game.	9585
Your goal is to collect as many gold coins as possible as you visit different states.	9586
If you are in state C, you have the choice between options B and H.	9587
If you are in state S, you have the choice between options G and X.	9588
Picking one of these options may result in a gold coin.	9589
How likely an option leads to a gold coin slowly changes during the game.	9590
Picking option O generally leads to state C, and picking option N generally leads to state S.	9591
However, on rare occasions you will end up in the other state.	9592
You can select an option by pressing the corresponding key.	9593
	9594
	9595
	9596
	9597
	9598
	9599
	9600
	9601
	9602
You are presented with options O and N. You press <<N>>. You end up in state S. You are presented with option G and option X. You press <<X>>. You receive 1 coins.	9603
	9604
	9605
	9606
	9607
You are presented with options O and N. You press <<N>>. You end up in state S. You are presented with option G and option X. You press <<X>>. You receive 1 coins.	9608
	9609
	9610
	9611
	9612
You are presented with options N and O. You press <<N>>. You end up in state	9613
	9614

9615 S. You are presented with option G and option X. You press <<X>>. You receive 1
9616
9617 coins.
9618 You are presented with options N and O. You press <<O>>. You end up in state
9619
9620 C. You are presented with option B and option H. You press <>. You receive 1
9621
9622 coins.
9623 You are presented with options N and O. You press <<O>>. You end up in state
9624
9625 S. You are presented with option G and option X. You press <<X>>. You receive 1
9626
9627 coins.
9628 You are presented with options N and O. You press <<O>>. You end up in state
9629
9630 C. You are presented with option B and option H. You press <>. You receive 1
9631
9632 coins.
9633 You are presented with options O and N. You press <<N>>. You end up in state
9634
9635 S. You are presented with option G and option X. You press <<X>>. You receive 0
9636
9637 coins.
9638 You are presented with options O and N. You press <<N>>. You end up in state
9639
9640 C. You are presented with option B and option H. You press <<H>>. You receive 1
9641
9642 coins.
9643 You are presented with options N and O. You press <<O>>. You end up in state
9644
9645 C. You are presented with option B and option H. You press <<H>>. You receive 1
9646
9647 coins.
9648 You are presented with options N and O. You press <<O>>. You end up in state
9649
9650 S. You are presented with option G and option X. You press <<G>>. You receive 0
9651
9652 coins.
9653 You are presented with options O and N. You press <<N>>. You end up in state
9654
9655 S. You are presented with option G and option X. You press <<X>>. You receive 1
9656
9657 coins.
9658 You are presented with options N and O. You press <<O>>. You end up in state
9659
9660

C. You are presented with option B and option H. You press <<H>>. You receive 1	9661
coins.	9662
	9663
You are presented with options O and N. You press <<N>>. You end up in state	9664
	9665
S. You are presented with option G and option X. You press <<X>>. You receive 0	9666
coins.	9667
	9668
You are presented with options O and N. You press <<N>>. You end up in state	9669
	9670
S. You are presented with option G and option X. You press <<G>>. You receive 0	9671
coins.	9672
	9673
You are presented with options N and O. You press <<O>>. You end up in state	9674
	9675
C. You are presented with option B and option H. You press <>. You receive 1	9676
coins.	9677
	9678
You are presented with options O and N. You press <<N>>. You end up in state	9679
	9680
S. You are presented with option G and option X. You press <<X>>. You receive 1	9681
coins.	9682
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You are presented with options N and O. You press <<O>>. You end up in state	9684
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S. You are presented with option G and option X. You press <<X>>. You receive 1	9686
coins.	9687
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You are presented with options O and N. You press <<N>>. You end up in state	9689
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S. You are presented with option G and option X. You press <<X>>. You receive 1	9691
coins.	9692
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You are presented with options O and N. You press <<N>>. You end up in state	9694
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S. You are presented with option G and option X. You press <<X>>. You receive 0	9696
coins.	9697
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You are presented with options O and N. You press <<N>>. You end up in state	9699
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C. You are presented with option B and option H. You press <<H>>. You receive 1	9701
coins.	9702
	9703
You are presented with options O and N. You press <<N>>. You end up in state	9704
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9707 C. You are presented with option B and option H. You press <<H>>. You receive 1
9708
9709 coins.
9710 You are presented with options N and O.
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9712
9713 **Sentence reading (neural alignment)**
9714
9715 Data source: [34]
9716
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9718
9719 Number of experiments: 1
9720 Number of participants: 5
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9722 Number of choices: 0
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9725 Example prompt:
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9729 We were sitting on the couch.
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