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Exploring the Relationship Between Feeling of Rightness and Recall:

A Study Challenging Dual Process Theory

Validating Feeling of Rightness and recall proxies for detecting system 1 and system 2

usage.

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Preface

It has been a journey writing this master's thesis. I remember moving to Tromsø two years ago, never having been here before and not knowing what to expect. Not long after I arrived, I got in contact with Dr. Gerit Pfuhl. We quickly agreed that we had the same interest in cognitive psychology, and since then, I have had a supervisor who supports and pushes me through the dark winter times and writing blocks. You have encouraged me to take weekend breaks (which is difficult when deadlines creep up) and make the most out of the sunny days when we have them. I am very grateful for all the guidance, time and work you have put in to help me get my master's degree. It has been an honor working with you.

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Thank you all! - Nora, 27.04.2023

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Sammendrag

Tidlig forskning på bedømming- og beslutningstaking antyder at vi har to systemer som tas i bruk når vi tenker: et raskt, intuitivt system (system 1) og et langsommere, mer overveiende system (system 2), referert til som toprosessteorien. Gjennom resonneringsoppgaver har denne forskningen vist at system 2 produserer normativt korrekte svar, og system 1 produserer feilaktige intuitive svar, og at system 2 tar lengre tid enn system 1. Nyere forskning utfordrer dette, da raske svar kan være normative, og tregere svar feilaktige. Følelsen av korrekthet (FoR) anses som en måling av konfliktdeteksjon, og lav FoR skal utløse bruk av system 2. Hvis system 2 brukes kan vi forvente mer bevisst overveielse, og dermed bedre tilbakekalling av informasjonen. Vi testet denne teorien ved å rekruttere 107 deltakere, hovedsakelig studenter fra UiT – Norges Arktiske Universitet. Vi brukte tre oppgaver for å teste hypotesen om tilbakekalling for Dual Process Theory: base-rate oppgaver, syllogismeoppgaver og teleologiske uttalelsesoppgaver. Oppgavene ble utført i et mellom-deltaker-design. Korrekthet, FoR og tilbakekalling ble målt. Konsistent gjennom alle oppgavene fant vi ingen signifikant sammenheng mellom FoR og tilbakekalling. Det vil si at lav FoR ikke forutsa bedre tilbakekalling. Dette antyder at lav FoR ikke utløser bruk av system 2, eller at FoR ikke er et mål på konfliktdeteksjon. Fremtidig forskning bør vurdere alternative teorier for toprosessteorien, eller endre egenskapene til hvert av systemene for å gi et mer korrekt bilde av hvordan vi bedømmer og tar beslutninger.

Nøkkelord: toprosessteorien, følelsen av riktighet, tilbakekalling, konfliktdeteksjon, overveielse

Abstract

Early research on judgement and decision making suggests that we have two processing systems, one fast, intuitive system (system 1), and a slower, deliberate system (system 2), referred to as Dual Process Theory. Given reasoning items, this research shows that system 2 produces correct normative answers and system 1 produces erroneous intuitive answers, the former taking more time than the latter. Newer research question this as fast responses can be normative, and slow responses incorrect. Still, Feeling of Rightness (FoR) is seen as a measurement of conflict detection, and low FoR is supposed to trigger system 2 usage. Subsequently, if system 2 is used, more deliberate processing and better recall of the item could be expected. We tested this hypothesis. We recruited 107 participants, most of them undergraduate students from UiT - the Arctic University of Norway. We used three tasks to test the recall hypothesis for Dual Process Theory: base-rate tasks, syllogism tasks and teleological statement tasks. The tasks were implemented in a between-participant design. Accuracy, FoR and recall were measured. Consistent among all three tasks, we found no significant relationship between FoR and recall, i.e., low FoR did not predict better recall. This suggests that low FoR does not trigger system 2 usage, or that FoR is not a proxy for conflict detection. Future research should consider alternative theories for the Dual Process Theory or alter the characteristics of each of the systems to paint a more correct picture of how we come to judge and make decisions.

Keywords: dual process theory, feeling of rightness, recall, conflict detection, deliberation

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"(...) research has rarely identified with precision the strategies actually used on judgement tasks" (Eysenck & Keane, 2020, p. 633).

In the field of psychology, dual process theories have been one of the leading theories of how people think and make decisions. It states that we have two systems that are involved in all aspects of thinking; system 1 and system 2 (Kahneman, 2011). System 1 is a fast and intuitive way of thinking, for instance how we recognize the face of a loved one, or how we can solve 1 + 1 with ease. System 2 is slower and more analytical, like solving a more difficult math problem or trace your steps back to remember where you put your keys. Since system 1 is so fast, it is often seen as the more flawed system of the two, as it uses shortcuts like heuristics and biases to come to conclusions quickly. Since system 2 is more analytical and takes more time, it is seen as producing smarter and more correct outcomes. Feeling of Rightness (FoR) is a metacognitive feeling that accompanies every decision we make, indicating the amount of correctness we feel when the decision is made (Thompson et al., 2011). FoR has shown to be an indicator of system 1 and system 2 usage, low FoR indicating system 2 and high FoR indicating system 1.

Several dual process theories, and how the two systems interact with one another, have been proposed (Pennycook et al., 2015). However, newer research shows that the very existence of the two separate systems is diffuse (Melnikoff & Bargh, 2018; Raoelison et al., 2020). For instance, aspects that are typical for system 1 have been seen under conditions where it is natural to assume system 2 usage.

The present study will explore whether the use of recall tests and FoR can provide support for a core value of dual process theories. Some research suggests that recall tests can be used as a measurement of system 2 usage, as it indicates that information has been deliberately processed more deeply. We argue that these tests and FoR measures, when accompanying standard Dual Process Theory tests, are suitable for detecting system 2 usage, by indicating that system 2 usage should have better recall, and show signs of low FoR.

Theoretical Background

Judgement and Decision Making

Throughout the course of a day, we make countless decisions and judgements. Anything from deciding when to get up, which jobs to apply for, and calculating the time it takes to get from your front door to the bus stop, taking into consideration the distance, weather conditions and putting on shoes. The difference between a judgement and a decision is that a judgement has to do with the assessment of the probability of an event happening, given incomplete information (Eysenck & Keane, 2020), and decision making has to do with the selection of one of several options. Judgement is often, but not exclusively, needed when making decisions, as we seldom have all the information we need. Decision making must not be confused with problem solving, which is a scenario where there are no options to choose from, forcing the decision maker to produce their own explication. Hastie and Dawes (2010) described that a rational decision is made when outcome potentials, probability and personal value have been considered. But with either incomplete or complete information, people have a tendency to make irrational judgements and decisions (Barbey & Sloman, 2007; Clark, 2010; Evans, 2003; Eysenck & Keane, 2020; Gigerenzer et al., 1999; Hastie & Dawes, 2010; Kahneman, 2003, 2011; Melnikoff & Bargh, 2018). Decision making based on logic and probability are called "normative decision making" (Thompson & Johnson, 2014). An example of normative decision making is when we are able to take base-rate information into consideration. Base-rate is information about "the relative frequency of an event within a given population" (Eysenck & Keane, 2020, s. 624). For instance, if you know that the baserate within a population is 50 women and 50 men, you should take that into consideration

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when figuring out the probability of the person you are pointing at random at is a woman. The normative answer would be that there is a 50 % chance of pointing to a woman. However, if you were told that the person you are pointing at is a person who loves to watch football, drink beer and listen to hard rock music, you might be biased to assume a higher than 50% probability of the person being a man. This is called the base-rate fallacy (Bar-Hillel, 1980). We are ignoring the fact that there is a 50/50 chance of pointing at a woman (the base-rate) and focusing on stereotypical tendencies. This is often done unconsciously or intuitively and is a shortcut our brain uses to reach conclusions faster and more efficiently. In other words, it is a heuristic. Heuristics are strategies people use to reach a conclusion with less effort, often ignoring parts of the information to get there (Eysenck & Keane, 2020). There are several different heuristics, each a different mental shortcut. Two examples are the representativeness heuristic and the availability heuristic. The representativeness heuristic helps us quickly categorize by evaluating whether the object or person is representative (stereotypical) or not for said category. The availability heuristic evaluates the frequency of an event by favoring the information that comes quickly to mind. Answers that are produced through these shortcuts are usually not normative, as they rely more on past experiences and convenience, more than logic and probability. In a sense, one could argue that to conclude with a rational answer, you must process the information more in depth and be deliberate about weighing the information, because intuition and heuristics can produce biased answers. Note, however, that deliberation based on incomplete or erroneous information can also produce biased answers (Melnikoff & Bargh, 2018).

Dual Process Theories

Intuition, or a gut feeling based on experience, serve us well in situations where we need to make quick decisions and generally in our day to day lives. Deliberation, or analytical reasoning, is required when experience alone is unable to guide us. Accordingly, intuition and

deliberation have been proposed to be two different processes. Already in 1890, William James described two kinds of reasoning (James, 1890). This has since developed into what will be referred to here, namely intuitive reasoning as system 1 and deliberate reasoning as system 2, adopting the terminology from Kahneman (2003). System 1 is believed to be the reasoning that humans share with other animals (Evans, 2003). System 1 is a set of both innate behaviors and naturally acquired knowledge. It is reasoning that happens without much effort. Examples of system 1 thinking are to turn your head towards a sudden sound, calculating simple mathematical problems and detecting that one thing is more distant than another thing (Kahneman, 2011). System 2 is believed to be newer in evolutionary terms, and also unique to humans (Evans, 2003). It is a slower way of thinking, which includes abstract and hypothetical thinking. Examples of system 2 thinking are calculating more complicated mathematical problems, focusing on one specific voice in a crowded room and parking a car in a narrow space (Kahneman, 2011).

The dual process theories differ in nuance, particularly on how these two systems interact with one another. The "Default-Interventionist" theory argues that system 1 comes before system 2 and that system 1 is used as a default way of thinking, i.e. there is serial processing (De Neys, 2012). In this theory the system 2 thinking will occur after system 1, if at all. In the Parallel Processing theory, both system 1 and system 2 are engaged from the start, with system 1 being more overriding due to its speed and autonomy (Handley & Trippas, 2015). Another study suggest a three-stage dual process theory, with conflict detection being the third process that determines whether one should engage in deliberation, or stick with intuition (Pennycook et al., 2015). Several studies find that when we are faced with conflicting information or information that causes a cognitive conflict, we tend to prioritize our heuristic responses, rather than normative considerations (De Neys, 2012; De Neys & Glumicic, 2008; Thompson & Johnson, 2014). In some dual process theories,

conflict is the factor that induces the change from system 1 usage to system 2 usage (De Neys, 2012).

In the Default-Interventionalist theory, the ability to engage in system 2 thinking is an act of, and therefore also limited to, our working memory (WM), and is also what we refer to as deliberation. Because it is an active, although possibly unconscious, choice we make to engage in more analytic and deep processing of information, system 2 thinking has been associated with normatively correct answers (De Neys, 2012), making it so that system 1 generates wrong answers, while system 2 corrects them (Morewedge & Kahneman, 2010). Slower response times (RTs) and solving items correctly were seen as evidence for system 2. That is, deliberation requires time for reasoning, and these items can only be solved by deliberation. In other words, according to this theory, RT should be longer and accuracy higher when solving conflict problems. However, recent takes on dual process theories are questioning these assumptions (Melnikoff & Bargh, 2018; Raoelison et al., 2020).

Recent Dual Process Theory

A theory contrasting the Default-Interventionalist and Parallel Processing view is "the smart intuitor" view (Raoelison et al., 2020; Thompson et al., 2018). This view suggests that people can make correct decisions fast. The model distinguishes between two types of intuition: intuitive heuristic and intuitive logical. The heuristic intuition is often associated with producing incorrect responses, as it is based on biases and heuristics, making us ignore the facts in favor of our perceived reality. This is somewhat similar to the standard system 1 description (Kahneman, 2003). The logical intuition is more associated with producing correct answers. Both intuitions are accompanied by a feeling of being right, which decides whether further deliberation is needed.

Feeling of Rightness

Having a feeling of being correct, when we in fact are wrong, is something most people have felt. Perhaps you had a test in school that you were confident that you nailed. However, when discussing the answers with your classmates, you realize you were completely wrong. The Feeling of Rightness (FoR) is an operationalization of this specific feeling, a metacognitive assessment which accompanies every decision we make (Thompson et al., 2011, 2013, 2018). In other words, FoR is a confidence measurement where we evaluate the correctness of our answer. According to the smart intuitor view, high FoR is associated with the fast heuristic intuition (Raoelison et al., 2020). This intuition ignores conflict and makes use of biases and heuristics to reach conclusions, not leaving much room for uncertainty. The logical intuition is also fast, but often produces correct answers. This intuition can for instance come as a result of expertise or special interest. Even though it is said to produce correct answers, it is often accompanied by a low FoR, indicating that some sort of deliberation that causes uncertainty might have taken place.

FoR has proven to be a good indicator of whether system 2 has been engaged. Several studies have found that when tested, FoR would predict the probability of participants wanting to revise their answer or not, given the chance, as well as predicting longer rethinking times (Thompson et al., 2011; Wang & Thompson, 2019). This is, according to the Default-Interventionist approach, a sign that deliberation has taken place. High FoR, which indicates that the participants were confident that their answer was correct, predicted a low tendency of answer revision. FoR can therefore also be seen as a cue to whether people have detected conflict or not. Low FoR is a sign that the participants have a wish for answer revision and longer rethinking times when they encounter problems that do not have an immediately obvious answer. Hence, they detect conflict. Using this logic, and what we know about dual process theories, we can assume that FoR indicates the presence of system 2

usage. Thompson and Johnson (2014) did a study where they had participants solve conflict and non-conflict versions of several different reasoning tasks. They measured RTs and had the participants answer the first thing that came to mind. They were then given more time to think through the items again with as much time as needed. They found that participants' FoR was low during conflict items and higher in non-conflict items. This study supports the idea that low FoR indicate conflict detection.

Working Memory and Recall Testing

System 2 requires deeper processing, or deliberation, and is therefore highly dependent on WM, which is mainly involved in the processing, maintenance and control of information over a shorter period of time (Loaiza et al., 2011), and is what allows us to engage in deep processing and deliberation (De Neys & Glumicic, 2008). This is, to some extent, the main characteristics distinguishing system 1 and 2. Research on WM show that deeper processing is dependent on the different operations carried out by the WM, like structural, semantic and episodic analyses (Craik & Tulving, 1975; Loaiza et al., 2011).. To see if deliberation, or system 2, has been engaged, one can investigate recall tests. De Nevs and Glumicic (2008) conducted a study where they had participants think out loud in order to make sure they processed the information consciously. However, they recognized that this method never took into consideration the information that might never have reached the conscious mind. This implicit monitoring was then accounted for by giving the participants a surprise recall test. They hypothesized that "successful conflict detection should be accompanied by a deeper processing of the base-rate information which should benefit recall" (De Neys & Glumicic, 2008, p. 1253). In this sense, conflict items should have better recall proxies than non-conflict items when answered normatively correct. Their data supported this hypothesis. Additionally, the study by Craik and Tulving (1975) and Loaiza et al. (2011)

show that words that has been processed deeply (where the word's meaning, rather than its physical characteristics, has been processed), resulted in better recall of said word.

Testing Dual Process Theories

We understand that recall tests are good measures of system 2 engagement, but traditionally, there are several tests that can and have been used to measure Dual Process Theory. These tests have items that elicit an intuitive response that is normatively wrong, and that when taking all of the information into consideration, you will find the correct answer. One such test, which has been used in several studies on Dual Process Theory, is "The Cognitive Reflection Test" (CRT) (Barr et al., 2015; Frederick, 2005; Purcell et al., 2022; Raoelison et al., 2020; Thompson et al., 2013, 2018). This test consists of three "easy" math problems that trigger an intuitive answer, but that requires some level of system 2 usage to get to the correct answer (Frederick, 2005). One of the problems is famously called "the bat and ball problem", and looks like this:

"A bat and a ball cost \$1.10 in total. The bat cost \$1.00 more than the ball How much does the ball cost? _____ cents." (Frederick, 2005).

Intuitively, people tend to say the ball cost 10 cents, as \$1.10 minus \$1.00 is 10 cents. However, the correct answer is 5 cents, as \$1.05 plus 5 cents is \$1.10. If the ball had cost 10 cents, the bat would have to cost \$1.10 in order to cost \$1.00 more, making it a total of \$1.20. The correct answer seems obvious when explained, but requires that you suppress an intuitive answer to get it correct. The CRT test looks in other words primarily on RTs as an indicator of dual process theories, in accordance with the Default-Interventionalist view. We now know that RTs are not informative, as some reasoners have accurate intuitions (Raoelison et al., 2020) or respond normatively correct intuitively (Thompson et al., 2018).

Other tasks that have been used to assess dual process theories are base-rate tests, teleological statement tests and syllogistic reasoning tests.

Base-rate questions are a common method to research Dual Process Theory (e.g. (Barbey & Sloman, 2007; Bar-Hillel, 1980; Evans & Elqayam, 2007; Thompson et al., 2018)). They have been used to measure the base-rate fallacy, which is the tendency we have to ignore base-rate information in favor of other, often more personalized, information (Bar-Hillel, 1980). The participants can for example be presented with the following information:

"In a study 1000 people were tested. Among the participants there were 5 engineers and 995 lawyers. Jack is 36 years old. Jack is not married and is somewhat introverted. He likes to spend his free time reading science fiction and writing computer programs. What is most likely? Jack is an engineer. Jack is a lawyer." (De Neys & Glumicic, 2008).

The base-rate informs us about the distribution of lawyers and engineers in the population, which strongly favors the lawyers. The description, however, is of one that is stereotypically associable with an engineer. The participants are asked what profession is more likely for the described person. These descriptions elicit not only an intuitive, here stereotypical, answer, but also cue a conflict between the base-rate information and the stereotypical information. Under time pressure, the base-rate questions, as well as the teleological statements, are more difficult to answer normatively (Kelemen et al., 2013; Thompson & Johnson, 2014). The normatively correct answer in this case would be that Jack is a lawyer. Note, however, that it is debatable whether there is such a thing as correct and incorrect when it comes to stereotypical information. If you have never in your life met a single lawyer with the same interests as Jack, it would not be incorrect to assume that he is an engineer.

The use of teleological statements are similar in objective. They are based on the tendency we have to explain that phenomena exist by referring to its function (Kelemen, 1999), instead of the actual, objective reason for its existence. An example of such a statement is:

"Trees produce oxygen so that animals can breathe." (Kelemen et al., 2013). This statement elicits an intuitive, here teleological, answer, which is that the statement is *"true"*. And it is true that animals can breathe because the air contains oxygen, but the oxygen from trees is a by-product of photosynthesis and not intentional, so the correct answer is *"false"*. Teleological statements take one of two forms, either teleological or physical, and each of those can be either false or true (Kelemen, 1999; Kelemen et al., 2013). The teleological ones give objects specific reasons for existing (like the example above), and often a purpose that we, to some extent, can relate to. These statements cause conflict between our wish to give worldly phenomena meaning, and the facts we know to be true. The physical statements, however, simply state a fact. An example of a physical statement can be:

"Viruses replicate because they are microscopic." (Kelemen et al., 2013).

Here, the statement does not give viruses a purpose, it simply implies a fact, even though it is false in this case. These physical statements will often not elicit as much of a conflict, as it is not as difficult for us to determine whether a fact is true or false, as to determine the deeper meaning behind phenomena. Physical statements are often answered more correctly than the teleological (Kelemen et al., 2013) and are used as control items.

Syllogistic reasoning tests are a third way of testing dual process theories, as it tests our ability to use logic as a way of reasoning. The tasks are presented as a set of two premises and a conclusion, with each presented in one of four ways: (1) All A are B, (2) Some A are B, (3) No A are B, (4) Some A are not B (Khemlani & Johnson-Laird, 2012). The syllogisms can be one of two natures: valid or invalid. The following examples differentiate between a valid and an invalid syllogism, respectively:

"Premise 1: All animals with four legs are dangerous. Premise 2: Poodles are not dangerous. Conclusion: Poodles do not have four legs." "Premise 1: All flowers have petals.

Premise 2: Roses have petals.

Conclusion: Roses are flowers." (Markovits & Nantel, 1989)

The first syllogism is valid, but is presented as unbelievable and causes in that sense a conflict: The conclusion is correct, considering the premises, but it does not represent the facts we know to be true in the real world. The latter is an example of an invalid syllogism that is presented as believable. This also elicits a conflict because given the premises provided, the conclusion cannot be considered a finite truth, however, the conclusion is one that we know to be true in the real world. For syllogisms it is important to ignore the facts that you already know to be true. This is often where the confusion starts, and the conflict is elicited. It is important to only take into consideration the two premises provided. Valid syllogisms can also be presented as believable, and invalid presented as unbelievable. Syllogisms require a type of reasoning that does not hold roots in most people's everyday lives, and can therefore not be solved through past experiences or intuition (Thompson et al., 2018). Therefore, people are forced to use deliberation (allegedly) in order to solve the problems.

Although Dual Process Theory has gained popularity in cognitive research, there is still uncertainty about whether system 1 and system 2 are valid operationalizations of how we think. Newer theories, like the smart intuitor view, are already challenging the construction of the Dual Process Theory. There are indications of the presence of system 1 and system 2 usage through response accuracy, FoR and recall, but not much research combines these factors to find cohesive and continuous support.

The Present Study

Can we find support for a core feature of Dual Process Theory, namely shallow and deep processing for system 1 and system 2, respectively? If there in fact are two systems, we

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should be able to find support for them through answer accuracy (normatively), FoR and recall proxies when there is a conflict between intuition and logic/probability. Since accuracy and RTs are ambiguous to identify system 1 and system 2 usage, we focus on FoR and recall. From this overarching question, we derive our main research question:

Does low FoR indicate conflict detection and use of deliberation? To address this, we operationalize it by assuming that low FoR indicates conflict detection and that this may lead to deeper processing seen in better recall, i.e., is there a relationship between FoR and recall?

Null hypothesis (H0): FoR is not related to recall accuracy.

Main hypothesis (H1): Low FoR is related to better recall.

We assume that FoR is an indicator of conflict detection and recall an indicator of processing depth. Low FoR should indicate conflict detection and good recall should indicate deliberation. If system 2 is engaged after conflict detection, deeper processing should have taken place. To find support for dual process theories, we should be able to see low FoR and better recall of the items that have been solved normatively correct in conflict items. If we do not find these tendencies, we might conclude that alternative theories to dual process theories should be considered.

Adjunct second, third and fourth hypotheses (H2, H3 and H4) are:

H2: Response accuracy is lower for conflict items than non-conflict items.

H3: Non-conflict items have higher FoR than conflict items.

H4: Normatively answered conflict items are better recalled than incorrectly answered conflict items.

These latter hypotheses are based on previous research on dual process theories (De Neys & Glumicic, 2008; Thompson & Johnson, 2014), and will not be the focal point in this study. However, it will be interesting to see if we can replicate results from previous research. Given that previous research has found low FoR and good recall to be indications of system 2 usage, finding the same results for normatively correctly solved items will contribute to support dual process theories.

Method

Ethical Considerations

The project has been approved by the internal review board at the Department of Psychology at UiT - The Arctic University of Norway, and data collection was anonymous. See Appendix A for ethical approval. The study was pre-registered, and all material can be found on the Open Science Framework (OSF). Pre-registration and materials can be found here: <u>https://osf.io/k9sjb</u>.

Participants

Participants were recruited through snowballing from UiT - The Arctic University of Norway, e.g., through Studentsamfunnet Driv, which is a student organization, consisting of students from all faculties. The majority were recruited through a mandatory work requirement in the courses PSY-1012 and PSY-2553. 139 participants were randomly assigned to one of three groups, in which they were asked to answer a survey. People without sufficient English reading and understanding skills were excluded from the data. The Wordsum test was used for measuring English proficiency (Mækelæ et al., 2018).

Experimental design

The experiment was a randomized between-subject design, where the task paradigms are teleological reasoning, base-rate and syllogisms. In all three paradigms participants received items with and without conflict, they provided their response and answered FoR and recall questions. Each of the three questionnaires consist of six components: (1) A consent form, (2) the Wordsum test, (3) teleological statements, base-rate questions or syllogisms, as well as (4) a recall task, (5) the Need for Cognition questionnaire, and (6) demographic

questions about age and gender. We measure response accuracy and RTs, FoR, validity and reliability after each item, and after all items, a recall test is given. All three questionnaires have components that have been widely used in research on dual process theories. Their specific qualities will be presented in the following sections. The recall test allows us to detect whether or not deep processing, or deliberation, has been taken place. We assume that if the participants have processed the information, or the items (base-rate, teleological or syllogism) deeply, they should be able to remember a missing word from one of said items. Note that we chose to exclude the cognitive reflection test (CRT), as it is well known in the field, and many students at UiT, specifically at the Faculty of Health Science, are familiar with the tests.

Materials and Procedure

Before data collection began, a pilot study was conducted. We tested all three paradigms to make sure they measured what we expected. All participants were tested once. The questionnaires were administered in Qualtrics (Qualtrics, Provo, UT) and completed on the participants' personal computer or mobile phone. The participants recruited from the PSY-1012 class, as well as those recruited through Studentsamfunnet Driv, were given the base-rate form. Participants recruited from the PSY-2553 were randomly assigned to either the syllogism or teleological form. For each form, the questions were randomized. See appendix for an overview of all the three complete forms.

Need for Cognition

Participants were tested for Need for Cognition (NfC), but will not be further discussed in this paper, except for an overview of the results.

Wordsum Test

The Wordsum test is included to track the participants' English skills and also serves as a verbal intelligence proxy (Barr et al., 2015). The test consists of ten English words with increasing difficulty. That is, how common the word is. The participants are asked to identify the meaning of the target word by selecting among a handful of words the closest match. For example, one target word could be "beast". Participants choose between "afraid", "words", "large", "animal" and "separate". The word that closest resembles the target word would be "animal" in this case.

Base-rate Form

Base-rate problems produce a conflict within reasoners, who has to make a decision based on either statistics or beliefs (Thompson et al., 2018). In the base-rate problems, participants are presented with two pieces of information, one about the statistics regarding the problem, and one description of a randomly selected person, usually in a stereotypical manner in regard to the occupations presented as alternatives. The items were either congruent, incongruent or neutral. In congruent items, the statistical information and the stereotypical information are not supposed to induce conflict. In incongruent items, there is a conflict between the statistical and stereotypical information. The neutral items were created with statistical information, but no stereotypical information. Rather, the items would have a neutral description of a person. These items should not cause conflict. Examples of congruent, incongruent and neutral base-rate questions, respectively:

"In a study, 1000 people were tested. Among the participants there were 5 Americans and 995 French people. Martine is a randomly chosen participant. Martine is 26 years old. She is bilingual and reads a lot in her spare time. She is a very fashionable dresser and a great cook. What is most probable? Martine is American. Martine is French."

"In a study, 1000 people were tested. Among the participants there were 4 whose favorite series is Star Trek and 996 whose favorite series is Friends. Jeremy is a randomly chosen participant. Jeremy is 26 and is doing graduate studies in physics. He stays at home most of the time and likes to play videogames. What is most probable? Jeremy's favorite series is Star Trek. Jeremy's favorite series is Friends." "In a study 1000 people were tested. Among the participants there were 995 prison guards and 5 judges. Alex is a randomly chosen participant. Alex has brown eyes, brown hair and drives a gray car. What is most probable? Alex is a prison guard. Alex is a judge."

Items are taken from the work of De Neys and Glumicic (2008) and Thompson et al. (2018). However, some modification has been done to adapt it for a Norwegian context.

Syllogism Form

Syllogisms are reasoning tasks which consist of two premises and one conclusion. The participants' task is to verify whether the conclusion is true or false. There are four ways to formulate the syllogisms – two congruent and two incongruent, yielding four categories: invalid/believable (IB), invalid/unbelievable (IU), valid/believable (VB), and valid/unbelievable (VU). Examples of each category, respectively:

"Premise 1: All things that have a motor need oil, Premise 2: Automobiles need oil, Conclusion: Automobiles have motors."

"Premise 1: All ants have wings, Premise 2: Everything winged sings, Conclusion: Everything that sings is an ant."

"Premise 1: All grasses are green, Premise 2: Everything green is alive, Conclusion: All grasses are alive."

"Premise 1: All things that are smoked are good for health, Premise 2: Cigarettes are smoked, Conclusion: Cigarettes are good for health."

Each participant was given eight items per category, 32 syllogisms in total, in a randomized order. Here, we consider IB and VU as conflict items, and IU and VB as non-conflict items.

The items are taken from the work of Markovits and Nantel (1989) and Čavojová et al. (2018).

Teleological Form

Teleological statements communicate an object or event by referring to a consequence or purpose (Kelemen et al., 2013). Participants are asked to verify whether 32 such statements are true or false, and the statements can take one of four forms: Physical/false, physical/true, teleological/false and teleological/true. Examples of these statements are, respectively:

"Viruses replicate because they are microscopic." "People wear contact lenses in order to see more clearly." "The sun radiates heat because warmth nurtures life." "Schools exist in order to help people learn new things."

For most of the statements, the intuitive response is that the statement is "true", but the correct answer is actually "false". However, some of the items, the teleological control items, will seem to be true, and actually be true. It is important to include these control items to make sure that the participants do not detect a pattern in the teleological test items. There were 6 physical true statements, 10 physical false statements, 4 teleological true statements and 12 teleological false statements. In total 32 statements. Order was randomized per participant. The statements were taken from Kelemen et al. (2013).

Feeling of Rightness

Inspired by Thompson et al. (2011, 2013; 2014; 2019), we measured Feeling of FoR through a self-reported scale where participants indicate their FoR on a sliding-scale from 1 to 10. They are asked to indicate "at the time I provided my answer, I felt: "guessing" (coded as 1), "fairly certain" (coded as 5) and "certain, I am right" (coded as 10).

Believability and Fluency

In all three paradigms we also measure believability or fluency, or both. Fluency, which is the ease with which information comes to mind mediate the relationship between FoR and answer revision (Wang & Thompson, 2019). The syllogism questionnaire tested for believability. The items would be followed up by the question: "is the conclusion in line with your view of the world". If the syllogism was valid/believable, the believability rating should reflect that. In the teleological questionnaire, we tested for fluency by asking "was the answer immediately obvious to you?" In the base-rate questionnaire, we asked for both fluency and believability. "Was the answer immediately obvious to you?" measuring fluency, and "Did the answer you picked match the description of the person?" measuring believability. This will not be further discussed in this paper.

Recall test

After all items had been answered, participants were asked to remember one essential key word from some of the items. We would take one sentence from an item and have the participants fill in a blank word by typing in that word themselves. Examples of a recall task from base-rate, syllogism and teleological items are as follows, respectively:

Fill in the missing word from a previously presented sentence:

"Among the participants there were 4 whose favorite series is Star Trek and 996 whose favorite series is ."

Fill in the missing word from a previous premise:

"Automobiles need ."

Please fill in the missing word from a previously presented statement:

" replicate because they are microscopic."

Analysis

Statistical tests were performed with a statistics program (JASP, 2022, version 0.16.4). To compare the means between all paradigms and conditions, a repeated measures analysis of variance (rmANOVA) was done for the base-rate and syllogism, and paired samples t-test for the teleological / control items. rmANOVA was used for accuracy, FoR and recall. Since we used Qualtrics, RTs might not be reliable, as participants can get distracted or interrupted when they take the survey at home and not in a lab. RTs are also not sufficient to identify system 1 or system 2 usage. Participants with a Wordsum score less than 4 were excluded as this indicates poor English (Mækelæ & Pfuhl, 2018). For H1, a correlation analysis between FoR and recall accuracy for conflict items (base-rate incongruent, syllogism IB, VU, and teleological statements) was performed. Items without a conflict served as fillers and to assess whether the conflict items do induce non-normative responses. Recall had to be scored manually, (since participants typed in the word) as incorrect = 0 or correct = 1.

Results

Table 1 presents an overview of mean scores and standard deviation for each variable in each paradigm. 111 responses were collected; 30 participants completed the base-rate task (F=21, M=9, age range from 19 to 52, $M_{age} = 24.1$ years, SD = 8.1 years), 41 participants completed the syllogism task (F=34, M=6, Non-binary=1, age range from 20 to 50, $M_{age} = 24.6$ years, SD = 6.6 years) and 45 participants completed the teleological task (F=30, M=15, age range from 20 to 37, $M_{age} = 23.5$ years, SD = 3.8 years). 9 participants were excluded due to lack of adequate English skills (Word sum test score <4), resulting in 107 valid responses. An overall tendency of low accuracy and FoR on the conflict items on the base-rate tasks (incongruent items) and the teleological tasks (teleological items) reveal that those tasks indeed work as they were intended. This was not as prominent for the syllogism task.

Table 1

Paradigm	Accuracy	RT	FoR	Recall
BR congruent	96.6 (0.052)	2.880 (0.440)	5.497 (1.842)	54.8 (0.202)
BR incongruent*	74.7 (0.324)	2.900 (0.498)	4.486 (2.083)	41.1 (0.124)
BR neutral	92.8 (0.091)	2.880 (0.467)	3.391 (1.675)	28.0 (0.236)
Teleo physical	91.4 (0.078)	7.422 (3.021)	7.594 (1.283)	86.8 (0.119)
Teleo teleological*	74.8 (0.168)	8.572 (3.641)	7.207 (1.566)	72.1 (9.138)
Syllogism IB*	34.4 (0.252)	19.170 (11.455)	6.521 (1.909)	35.8 (0.224)
Syllogism IU	66.3 (0.176)	27.422 (28.506)	5.125 (1.892)	60.4 (0.195)
Syllogism VB	81.3 (0.160)	19.807 (11.312)	6.486 (2.122)	33.7 (0.241)
Syllogism VU*	79.5 (0.257)	19.556 (12.313)	6.635 (2.067)	45.8 (0.222)

Mean Score and Standard Deviation of Each Paradigm in Each Condition

Note: *= conflict. BR = Base-rate, Teleo physical = teleological task/physical items, Teleo teleological = teleological task/teleological items, Syllogism = Syllogism task, IB = invalid/believable, IU = invalid/unbelievable, VB = valid/believable, VU = valid/unbelievable. Accuracy means normative responding and is presented as percent (%), RTs are presented in seconds, recall is recall accuracy in percent (%). Standard Deviation in brackets.

Wordsum test

9 participants had a score of 3 or less, one in base-rate task (n=29), five in syllogism task (n=36) and three in the teleological task (n=42). These 9 participants are excluded from further analysis, resulting in N=107.

Need for Cognition Score

In the base-rate task the average NfC score was 58.79, SD = 9.9 (range 37 to 77). In

the syllogism task the average NfC score was 57.94, SD = 10.99 (range 31 to 83). In the

teleological task the average NfC score was 62.73, SD = 11.56 (range 34 to 83).

Results Base-rate task

For base-rate we measured RTs, response accuracy, FoR and recall accuracy in each of the three conditions: congruent, incongruent and neutral. Means and SDs are reported in Table 1.

Base-rate and Response Accuracy

With correct answers coded as 1 and wrong answers coded as 0, we found that participant on average had 96.6% correct in the congruent condition, 74.7% in the incongruent condition and 92.8% in the neutral condition. We found a significant difference for response accuracy by condition, F(1.090, 30.512) = 12.365, p = .001, $\eta^2 = 0.306$. A posthoc test yielded a significant difference between the congruent and incongruent condition, t = 4.649, $P_{holm} = <.001$, Cohen's d(28) = 1.111, and between incongruent and neutral condition, t = -3.854, $P_{holm} = <.001$, Cohen's d(28) = -0.921. This supports H2.

Base-rate and RTs

Mean RTs are higher for the incongruent condition (M = 2.900, SD = .498), than in the congruent (M = 2.880, SD = .440) and neutral (M = 2.880, SD = .467). There was no significant difference in RTs between the three conditions, F(2, 56) = 0.110, p = .896, $\eta^2 =$.004.

Base-rate and FoR

FoR is highest in the congruent condition (M = 5.497), intermediate in the incongruent condition (M = 4.486) and lowest in the neutral condition (M = 3.391). We found a significant difference in FoR by condition, F(2, 56) = 61.581, p = <.001, $\eta^2 = 0.687$. A posthoc test reveals a significant difference between congruent and neutral, t = 11.095, $P_{holm} =$ <.001, *Cohen's d*(28) = 1.124; and a significant difference between congruent and incongruent, t = 5.328, $P_{holm} = <.001$, *Cohen's d*(28) = 0.540, and also a significant difference between incongruent and neutral, t = 5.767, $P_{holm} = <.001$, Cohen's d(28) =

0.584. This supports H3.

Base-rate and Recall Accuracy

Recall is significantly better for the congruent items, M = .548, followed by incongruent items, M = .411, and neutral items M = .280. The differences were significant, F(1.601, 43.218) = 19.085, p = <.001, $\eta^2 = 0.414$. A post-hoc test found significant differences between congruent and neutral, t = 6.178, $P_{holm} = <.001$, *Cohen's d*(28) = 1.387; between congruent and incongruent, t = 3.157, $P_{holm} = .005$, *Cohen's d*(28) = 0.709, and between incongruent and neutral, t = 3.020, $P_{holm} = .005$, *Cohen's d*(28) = 0.678. For conflict items (incongruent condition) recall accuracy was 42.2% for correctly solved items and 37.6% for incorrectly solved items. Recall accuracy was not significantly different for correctly or incorrectly solved conflict items, t = -0.763, p = .446, *Cohen's d* = -.092. This does not support H4.

FoR and Recall

Figure 1 shows logistic regression results for the incongruent (conflict) condition.

Figure 1

Recall accuracy as a function of FoR for normatively correctly answered incongruent Baserate items.



We found that both FoR (M = 5.497) and recall (M = 54.8) are better in the congruent condition, that is, the non-conflict inducing problems, in the base-rate tasks. In other words, the higher the FoR, the better the recall. To assess H1, we look at recall accuracy as a function of FoR for normatively correctly answered conflict items only. There was no significant effect of FoR on recall B = .059, p = .082. This contradicts H1.

Results Syllogism task

For syllogism, we measured RTs, response accuracy, FoR and recall accuracy in each of the four conditions: invalid/believable (IB), invalid/unbelievable (IU), valid/believable (VB) and valid/unbelievable (VU). IU and VB are congruent, while IB and VU are incongruent. The descriptives are shown in Table 1.

Syllogism and Response Accuracy

With correct items coded as 1 and wrong answers coded as 0, IB, IU, VB and VU have the following means, respectively: $M_{\rm IB} = 0.344$, $M_{\rm IU} = 0.663$, $M_{\rm VB} = 0.813$, and $M_{\rm VU} =$ 0.795. There was a significant difference in response accuracy, F(3, 105) = 36.193, p =<.001, $\eta^2 = 0.508$. A post-hoc test found significant differences between IB and IU, t = -6.260, $P_{holm} = <.001$, Cohen's d(35) = -1.480, between IB and VB, t = -9.185, $P_{holm} =$ <.001, Cohen's d(35) = -2.171, and between IB and VU, t = -8.845, $P_{holm} = <.001$, Cohen's d(35) = -2.091. The results partially support H2, i.e., the non-conflict condition VB had highest accuracy, followed by the conflict condition VU, then the non-conflict condition IU and finally IB.

Syllogism and RT

The mean RTs solving the syllogisms are: $M_{\rm IB}$ =19.170, $M_{\rm IU}$ =27.422. $M_{\rm VB}$ =19.807, $M_{\rm VU}$ =19.556. There were no significant differences for RT by condition, F(1.386, 48.507) =2.696, p = .035, $\eta^2 = 0.078$.

Syllogism and FoR

Descriptives reveal mean scores as $M_{IB} = 6.521$, $M_{IU} = 5.125$, $M_{VB} = 6.486$, and $M_{VU} = 6.635$. We found a significant main effect of FoR by condition, F(3, 105) = 26.880, p = <.001, $\eta^2 = 0.434$. Post-hoc test yielded a significant difference between IB and IU, t = 7.166, $P_{holm} = <.001$, *Cohen's d*(35) = 0.698, between IU and VB, t = -6.988, $P_{holm} = <.001$, *Cohen's d*(35) = -0.681, and between IU and VU, t = -7.754, $P_{holm} = <.001$, *Cohen's d*(35) = -0.755. The results do not support H3, i.e., conflict items had higher FoR (IB and VU) than non-conflict items (IU and VB).

Syllogism and Recall Accuracy

Mean recall scores were $M_{\rm IB}$ =0.358, $M_{\rm IU}$ =0.604, $M_{\rm VB}$ =0.337, and $M_{\rm VU}$ =0.458. We found a highly significant main effect of recall accuracy by condition, F(3, 105) = 22.194, p = <.001, $\eta^2 = 0.388$. Post-hoc test yielded a significant difference between IB and IU, t = -6.727, $P_{holm} = <.001$, *Cohen's* d(35) = -1.116, between IU and VB, t = 7.295, $P_{holm} = <.001$, *Cohen's* d(35) = 1.211, between IU and VU, t = 3.979, $P_{holm} = <.001$, *Cohen's* d(35) = -0.550. Recall proxies are lower for both believable conditions and higher for both unbelievable conditions. For conflict items recall accuracy was 47.5% for correctly solved items and 53.3% for incorrectly solved items, i.e., correctly solved conflict items were not recalled better, disconfirming H4.

FoR and Recall

Figure 2 shows logistic regression results for the conflict conditions. We found that the IU (conflict) condition has low FoR (5.125) and high recall accuracy (66.3%), giving some support to H1. However, for the IB (6.521, 35.8%), VB (6.486, 33.7%) and VU (6.635, 45.8%), FoR is high and recall is low. In other words, the higher the FoR, the lower the recall accuracy for conflict conditions. When This contradicts H1. To assess H1, we look at recall

accuracy as a function of FoR for normatively correctly answered conflict items only. There was no significant effect of FoR on recall B = -0.509, p = .854.

Figure 2

Recall accuracy as function of FoR in correctly solved conflict items; syllogism task, invalid believable and valid unbelievable items.



Results Teleological Task

To analyze the results from the teleological task, we performed a paired samples ttest. In this paradigm, there are only two conditions, physical and teleological. Physical statements are control questions, while the teleological statements are conflict inducing.

Teleological and Response Accuracy

Participants answer on average 91.4% of the physical control items and 74.8% of the teleological items correct. This difference was statistically significant, t(40) = 6.795, p = <.001, *Cohen's d* = 1.049. This confirms H2.

Teleological and RT

For RTs we found that the teleological items take longer than the physical items to answer, M_P =7.422, M_T =8.572. There was a statistical significant difference in the RTs between the two conditions, t(40) = -2.789, p = .008, *Cohen's d* = -0.430.

Teleological and FoR

We found that participants have higher FoR on the physical statements, $M_P = 7.594$ than in the teleological statements, $M_T = 7.207$; t(40) = 2.927, p = .006, d = 0.452. This confirmed H3.

Teleological and Recall Accuracy

Overall recall is better for the physical statements, M_P =0.868, than the teleological statements, M_T =0.721. The paired samples t-test was significant, t(40) = 6.942, p = <.001, d = 1.071. For teleological items, recall accuracy was 71.2% for correctly solved items and 65% for incorrectly solved items. The difference was not significant, t = -1.622, p = .105, Cohen's d = -.134. This does not support H4.

FoR and Recall

Figure 3 shows logistic regression results for the conflict conditions. To assess H1, we look at recall accuracy as a function of FoR for normatively correctly answered conflict items only. There was a significant effect of FoR on recall B = .077, p = .002. We found no support for H1. The higher the FoR (7.594), the better the recall (86.8%).

Figure 3





Low FoR Does Not Lead to Better Recall

To assess H1, we focus on normatively correctly solved conflict items in the three task paradigms (16 syllogism items, 12 incongruent base-rate items, 12 teleological items), and assess the relationship between the FoR rating (ordinal from 1 to 10) of the items with its recall accuracy (either 0 or 1). As can be seen in Figure 1 to 3, the probability of a correct recall is more or less independent of the FoR for the (conflict) item when answered normatively correct. These results also hold up when looking at table 1, i.e., conditions with larger FoR also have better recall. Table 1 provides an overview of the descriptives (accuracy, RT, FoR and recall accuracy) per condition and paradigm. As can be seen, the conflict items (incongruent base-rate, teleological statements, syllogisms IB and syllogism VU) had lower response accuracy, generally lower FoR and somewhat mixed recall results.

Discussion

We wanted to see if we could find support for a core feature of dual process theories and find support for the presence of two different systems governing the way we think. To address this, we implemented tasks that are well-known in Dual Process Theory testing, namely base-rate tasks, syllogistic reasoning tasks and teleological statement tasks. We wanted to see if conflict detection, in the sense of low FoR would lead to deliberation, in the sense of good recall. Confirming this would contribute to the evidence that supports dual process theories. To recap our hypothesis, the main ones are as follows: H0: FoR is not related to recall. H1: Low FoR is related to better recall. Adjunct hypotheses are: H2: Response accuracy is lower for conflict items than non-conflict items. H3: Non-conflict items have higher FoR than conflict items. H4: Normatively answered conflict items are better recalled than incorrectly answered conflict items.

H1: Low FoR is not predicting better recall.

To see if we could find support for H1, we measured FoR and recall in three task paradigms. From the base-rate paradigm we found that the tasks with the lowest FoR score, namely the neutral, non-conflict, items also have the lowest recall scores. The conflict items, the incongruent condition, does not have the lowest FoR or best recall. In fact, the nonconflict congruent items have the highest recall accuracy. This rejects H1, but does not support H0 either. From the syllogism tasks, we found that the condition with lowest FoR is the IU condition, also non-conflict. The IU condition has the highest recall scores, giving support for H1 and seemingly rejecting H0. However, the two conflict conditions, IB and VU should have low FoR and high recall if the conflict is detected and overridden. However, there is no indication for that. Hence, also in the syllogism task we found no support for H1. In the teleological paradigm we found the lowest FoR score in the teleological items, that is, the conflict items. We also found, similarly to the base-rate paradigm, that the lower the FoR, the lower the recall. This does not support H1.

In sum, across the three task paradigms we found no support for FoR triggering deeper processing as seen in better recall. This questions the presence of system 2 usage in the tasks or the necessity to implicate two processing systems, or both.

H2: Response Accuracy is Lower for Conflict Items than Non-Conflict Items.

From results on response accuracy from the base-rate paradigm, we found that the congruent and neutral items, both non-conflict conditions, had higher accuracy (96.6% and 92.8%) than conflict items (74.7%). From the syllogism we found partly support for H2. For this paradigm we had two conflict conditions (IB and VU) and two non-conflict conditions (IU and VB). Here, we found the lowest response accuracy in the IB condition (34.4%), supporting H2. However, the other conflict condition (VU) has almost as high response accuracy (79.5%) as the VB condition (81.3%). Since IB is so significantly lower when
compared to all the other three conditions, it is natural to assume there either is a mistake with the VU condition and that it does not elicit much conflict after all, or that it is simply easier with the valid (V) conditions than the invalid (I) conditions. From the teleological paradigm, we found lower accuracy for the teleological, here conflict, items. All in all, we found lower response accuracy for conflict items, supporting H2, and replicating previous studies (e.g. (Barbey & Sloman, 2007; Kelemen et al., 2013; Oakhill et al., 1989; Thompson & Johnson, 2014)).

H3: Conflict items often have Low FoR

In the base-rate paradigm the incongruent condition has the lowest response accuracy. But this condition does not have the lowest FoR score, the neutral condition has. This suggests that difficulty is not linearly related to FoR. For the syllogism task, we found VB to have the highest response accuracy and second lowest FoR score. The two conflict conditions, VU and IB, do not have the lowest FoR, rather the non-conflict condition IU has the lowest FoR. This contradicts the findings by Thompson and Johnson (2014) and H3. For the teleological paradigm, we found that the physical items have high FoR scores whereas the teleological (conflict) items have low FoR, supporting H3. In sum, in two of the three task paradigms conflict items do yield low FoR, replicating Thompson and Johnson (2014).

H4: Normatively Answered Conflict Items Are Not Better Recalled Than Incorrectly Answered Conflict Items

From the base-rate paradigm, we found that correctly answered conflict items are similarly well recalled than conflict items incorrectly solved. The same is true for teleological items solved correctly or incorrectly and for conflict syllogism items. This does not replicate the finding by de Neys and Glumicic (2008).

General Discussion

There are many interesting finds from all three paradigms. Looking at the results, we conclude that we found no support for H1. In other words, low FoR is not related to better recall. When it comes to H2, H3 and H4, we get some mixed results. This study found support for H2 and H4, and not for H1 and H3. The fact that conflict items show lower accuracy and correctly solved items leads to better recall, it means that non-conflict and "easier" items are remembered better. This may indicate that difficulty does not predict FoR and recall accuracy, and hence challenge the idea that we have two separate systems. Since the easier items are remembered better, it seems that the system we see as fast and intuitive to a great extent makes use of WM and could also be a sort of deep processing. And what we believed to be the deliberate system 2, does not necessarily result in deep processing or deliberation.

Looking at the previous work on recall in dual process testing, they found that conflict items and deeply processed words result in better recall (Craik & Tulving, 1975; De Neys & Glumicic, 2008; Loaiza et al., 2011). Being that we tested for the same, and in similar nature, we should be able to find somewhat similar results. However, our results show no such effect. This might have to do with the nature of the recall tests. De Neys and Glumicic (2008) used the base-rate and recall task to measure deep processing, but focused the recall task on the base-rate information, not a word, like we did. Participants had to remember the specific base-rate information. Craik and Tulving (1975) and Loaiza et al. (2011) had tasks that focused on words and their meaning, either the characteristics or the meaning of words. Even though we also had participants focusing on specific words for our recall task, they had never been asked to remember the characteristics or deeper meaning of that specific word. In some cases, one might argue that this is not giving the participants a fair chance of remembering the words, but if they actually processed all the information deeply, they should be able to

remember key words from said information. How the difference in recall accuracy comes to be, is therefore not very clear. It might have to do with the nuanced difference in the presentation of the recall tasks, or it simply goes to show that with all the tasks, deep processing never really occurred the way we assume it should.

The FoR-scale was highly influenced by Thompson et al.'s work (2011, 2013; 2014; 2019). Thompson et al. found consistent results where low FoR indicates conflict detection and high FoR indicated no conflict detection. In alignment, we also found low FoR in the conflict condition for both the base-rate task and teleological task, however, not for the syllogism task. This might be because we used other syllogisms, using words that would be easier to remember in recall tasks. That change could potentially influence recall results and RTs, but should in theory not change the FoR score between ours and Thompson et al.'s results, as the logic behind the premises are the same. But other than the syllogism, the pattern is the same. This indicate that FoR in fact enables us to differentiate between conflict and non-conflict items. One could also argue that these factors say something about the difficulty level of the tasks. FoR is not necessarily a measurement of a person's actual conflict detection, but is rather an indication of how confident the person is to have given the correct answer. One may guess correctly as there was a 50% chance in the three task paradigms.

According to the default interventionalist theory, RT and answer accuracy proxies should be enough to determine that either system 1 or system 2 has been used. Both RT and accuracy should be high when system 2 has been used. Our RT and accuracy results show no clear pattern where RT and accuracy is high in the same task. With our results showing no significant difference in RT for conflict versus non-conflict items, and previous research finding similar results (Melnikoff & Bargh, 2018; Raoelison et al., 2020), RT is not a defining feature of system 1 or 2 usage. The smart intuitor view, which recognizes that people tend to make normatively correct answers fast, differentiates between two heuristic responses: heuristic and logical intuition. To recap, the heuristic intuition is associated with normatively wrong answers, as it is based on biases and heuristics. Logical intuition is associated with normatively correct answers and could for instance be based on expertise. For this view, RTs would not distinguish between right and wrong answers, but could potentially distinguish between intuition and deliberation, and cognitive capacity was an indication of answering intuitively correct. Our study has not aimed to find support for the two intuitions, but our evidence points in a direction where deliberation and intuition cannot be identified by RTs or recall accuracies. Hence, a broader and more intricate parting of the systems should be evaluated.

Implications and Future Direction

In developing the present study, we challenged a leading theory within the field of judgement and decision making, namely the Dual Process Theory (Kahneman, 2003). Even though this study alone does not reject dual process theories as a concept, it opens up for discussion of whether alternative theories should be considered. Perhaps a single-process theory of reasoning is more explanatory, where reasoning is a more intricate process of intuition and deliberation, without a standardized pattern (Dewey, 2022). Or perhaps something entirely different, like "a many-processes theory" with several sub-processes within both intuition and deliberation, explaining the relationship between our FoR, what we recall, what we answer correctly, what we answer fast, and how these factors communicate with each other. Future research could benefit from finding a better measurement of system 2 usage, as we see that FoR and recall does not hold its stance. Alternatively, if system 2 is legitimate, it might need to be redefined, as the current characteristics of it are not supported in this study. System 2 might represent a combination of the current characteristics of both system 1 and system 2, only it operates differently depending on factors like difficulty of the

task, previous experiences and WM, as well as IQ and individual differences. On a broader sense, this research contributes to the ever-expanding field of judgement and decision making. Expanded knowledge in this field will help us better understand human behavior and potentially improve decision making by enabling us to identify and correct for biases and heuristics that commonly make us judge and conclude with error. These corrections can for example help us make better financial decisions and help group decision making within an organization.

Limitations

This study had limitations, mainly related to our task paradigms, the sample and the administration of the experiment. For the base-rate task we measured correctness by referring to whether they were able to ignore stereotypical information in favor of base-rate information. This, however, is not necessarily the conclusion of correctness, and is the reason we emphasized "normative correctness". The task might have been more informative if it was able to capture a subjective idea of correctness. For the other tasks, this was not so much a problem as neither syllogism or teleological statements have the element of individual experience coloring the idea of correctness. Participants must consider whether or not a statement is true or false, rather than consider possibility.

A potential limitation with the syllogism task is that we used the version of this task that has words we are familiar with. There also exists a version with words that are nonsense (Thompson et al., 2018). We chose to not use these as they were too difficult for a recall test. That might have altered some of the difficulty aspects of solving the items, making it easier to solve than they could have been.

The second and third limitation regards our sample size and quantity. First of all, we gathered 107 valid responses. Our study would benefit from having a larger sample size. Additionally, the sample size could benefit from consisting of people from other

backgrounds, with different lifestyles, or both. Common for most of our participants is that they are students living in Tromsø, many of which study psychology. It is natural to assume some of the participants were familiar with concepts or contents of the tasks presented. This could result in them already knowing the answers or understanding that we measure more than we want them to believe. To try and minimize this effect, we excluded the well-known CRT test and gave the also well-known base-rate task to mainly students outside of The Department of Psychology at UiT. The lesser-known syllogism and teleological statement tasks we were more confident could go to psychology students. However, we cannot exclude the possibility that some were familiar with those as well.

The fifth and last limitation is that participants did the test online on their own terms. They performed the test on either their personal computer or phone, meaning that RTs are not as reliable as for lab experiments, i.e. participants could take it in their own time and spend as much time as they wanted. We controlled for this by asking whether they were distracted during the questionnaire, however it would be even better to have participants answer the questionnaire in a controlled setting.

Conclusion

To answer the research question "Does low FoR indicate conflict detection and use of deliberation?" the answer is: No, it does not appear to do so. This does not necessarily debunk the entire idea of dual process theories, but it opens for the idea that alternative theories should be explored. As presented introductory, Eysenck and Keane (2020) wrote: "(...) research has rarely identified with precision the strategies actually used on judgement tasks". This study does not identify the strategies used on judgement tasks, but it gives new insight into the field by comparing well known Dual Process Theory tests with FoR and recall tests. This combination has not yet been researched to a great extent. Results from it also show signs of altering typical FoR and recall results, contradicting typical FoR and recall

VALIDATING DUAL PROCESS THEORY

tests when measured separately. Post-hoc tests reveal large effect sizes, and we see statistically significant results across the paradigms, so there is little indication that our results are due to chance. It is obvious that our study should be tested on a larger scale with a bigger sample size and preferably on a variety of people across ages and cultures. Hopefully, this contributes to broadening the knowledge of how we tend to make judgements and decisions, and also how we measure dual process theories (or alternative theories) in the future.

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Appendix A

Ethical Approval



Gerit Pfuhl Department of Psychology UiT - The Arctic University of Norway

Ethical evaluation of research project

Dear Gerit,

Your application concerning your research project "When do we reason intuitively and when do we deliberate? Validating feeling of rightness, response times and recall as proxies for detecting system 1 and system 2 usage, respectively" has been evaluated and approved by the Department of Psychology's internal research ethics committee (IPS-REC) based on the received information.

on behalf of the Committee

Mr. Mith

Matthias Mittner Chair of IPS-REC research-ethics.ips@uit.no

Kopi sendt: John Vegard Bjørklund



Appendix B

Informed Consent

Consent Welcome to the study: Reasoning and Memory WHAT IS THE STUDY ABOUT AND WHO CAN PARTICIPATE? The purpose of this study is to measure the relationship between reasoning, confidence and memory. The prerequisite for participating is that you are at least 18 years old and have normal or corrected-to-normal vision. DESCRIPTIONS OF THE STUDY This study will consist of tasks measuring aspects of human thinking. We will also ask you about your confidence and how well you remember the items. The study lasts about 45 min. VOLUNTARY PARTICIPATION AND THE POSSIBLITY TO WITHDRAW CONSENT (OPT-OUT) This study is anonymous. The results will be made public when the project ends, but your data cannot be linked to you. Participation is voluntary, and you can withdraw from the study at any time by exiting the browser tab. You have the right to gain access to the information recorded about you and the right to ask that any error in that information be corrected. As described above, your data is completely anonymous. Therefore, you can only gain access to your information when you can provide your completion code. All information will be processed and used without your name or personal identification number, or any other information that renders you identifiable. POSSIBLE BENEFITS AND EXPECTED DISADVANTAGES OF TAKING PART To our present knowledge, solving the described computer-based tasks and filling out the questionnaire does not cause any kind of psychological discomfort. Some participants might find the entire session somewhat tiring. ETHICAL APPROVAL AND CONTACT INFORMATION The study has been approved by the ethics committee at the Department of Psychology at UiT - The Arctic University of Norway. If you have any questions, please contact Nora Tveit (ntv002@post.uit.no) or Gerit Pfuhl (gerit.pfuhl@uit.no). Yes, I consent

No, I do not consent

Appendix C

Base-Rate Form

Consent

Welcome to the study: Reasoning and Memory

WHAT IS THE STUDY ABOUT AND WHO CAN PARTICIPATE?

The purpose of this study is to measure the relationship between reasoning, confidence and memory. The prerequisite for participating is that you are at least 18 years old and have normal or corrected-to-normal vision.

DESCRIPTIONS OF THE STUDY

This study will consist of tasks measuring aspects of human thinking. We will also ask you about your confidence and how well you remember the items. The study lasts about 45 min.

VOLUNTARY PARTICIPATION AND THE POSSIBLITY TO WITHDRAW CONSENT (OPT-OUT)

This study is anonymous. The results will be made public when the project ends, but your data cannot be linked to you. Participation is voluntary, and you can withdraw from the study at any time by exiting the browser tab. You have the right to gain access to the information recorded about you and the right to ask that any error in that information be corrected. As described above, your data is completely anonymous. Therefore, you can only gain access to your information when you can provide your completion code. All information will be processed and used without your name or personal identification number, or any other information that renders you identifiable.

POSSIBLE BENEFITS AND EXPECTED DISADVANTAGES OF TAKING PART

To our present knowledge, solving the described computer-based tasks and filling out the questionnaire does not cause any kind of psychological discomfort. Some participants might find the entire session somewhat tiring.

ETHICAL APPROVAL AND CONTACT INFORMATION

The study has been approved by the ethics committee at the Department of Psychology at UiT – The Arctic University of Norway. If you have any questions, please contact Nora Tveit (ntv002@post.uit.no) or Gerit Pfuhl (gerit.pfuhl@uit.no).

- Yes, I consent
- O No, I do not consent

Wordsum

We want to know how people guess the meaning of words that they rarely or never use. You will be presented with some words in capital letters that you may or may not know the meaning of, along with five other random words. Your task is to find the word that best describes or goes well with the capital letter word.

Here is an example:

BEAST afraid, words, large, animal, separate

The correct answer in this instance is "animal" as that is the word that resembles beast the most.

Space O school

- 🔿 noon
- captain
- 🔘 room
- board
- don't know

BROADEN

- efface
- make level
- 🔘 elapse
- \bigcirc embroider
- \bigcirc widen
- 🔘 don't know

EMANATE

- O populate
- \bigcirc free
- prominent
- 🔘 rival
- \bigcirc come
- 🔘 don't know

EDIBLE

- auspicious
- \bigcirc eligible
- fit to eat
- ⊖ sagacious
- able to speak
- 🔘 don't know

ANIMOSITY

- hatred
- \bigcirc animation
- \bigcirc disobedience
- diversity
- friendship
- O don't know

PACT

- puissance
- \bigcirc remonstrance
- ⊖ agreement
- skillet
- ⊖ pressure
- O don't know

CLOISTERED

- miniature
- bunched
- arched
- 🔘 malady
- o secluded
- O don't know

CAPRICE

- value
- 🔘 a star
- grimace
-) whim
- inducement
- don't know

ACCUSTOM

- disappoint
- ◯ customary
- encounter
- O get used to
- ⊖ business
- O don't know

ALLUSION

- reference
- O dream
- eulogy
- illusion
- 🔘 aria
- O don't know

Info

On the next pages your task is to make a decision based on the information provided. There are no right or wrong answers. After the task, you will be asked to state your level of confidence, how obvious the answer felt and the basis of your choice. You will also be asked to remember some parts the test.

BRi_01

science fiction and w	riting computer prog	jrams.		
What is more probab	le?			
◯ Jack is an engineer				
◯ Jack is a lawyer				
At the time I provided	d my answer, I felt:			
	Guessing	Fairly c	certain	Certain, I'm right
Was the answer imm	ediately obvious to y	ou?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
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02				
n a study 1000 neon	le were tested. Kurt i	s a randomly chosen na	rticipant of this stud	v Among the
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Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
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)Paul is a nurse				
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and a first second of the first	o hip hop and rap mu	sic. She enjoys wearing	tight shirts and jean	s. She's fond of
ancing and has a sr	nall nose piercing.			
Vhat is most probab	le?			
○ Ellen is a fifty-year old				
Ellen is a sixteen-year	old			
At the time I provided	d my answer, I felt:			
	Guessing	Fairly	certain	Certain, I'm right
Definitely not	Probably not	OU ? Might or might not	Probably yes	Definitely ves
0	\bigcirc	\bigcirc	\bigcirc	\bigcirc
Did the answer you p Definitely not	vicked match the desored and the desored by the second sec	Cription of the person? Might or might not	Probably yes	Definitely yes
\bigcirc	0	0	\bigcirc	\bigcirc
c_07				
c_07				
c_07 n a study 1000 peop	le were tested. Karen	is a randomly chosen p	participant of this stu	dy. Among the
c_07 n a study 1000 peop participants there we retailers.	le were tested. Karen re 5 who buy their cl	is a randomly chosen p othes at thrift shops and	participant of this stu I 995 who buy their c	dy. Among the lothes at high-end
c_07 n a study 1000 peop participants there we retailers.	le were tested. Karen re 5 who buy their cl	is a randomly chosen p othes at thrift shops and	participant of this stu I 995 who buy their c drives a Porsche, SI	dy. Among the lothes at high-end
c_07 n a study 1000 peop participants there we retailers. Karen is a 33-year-ole penthouse with her b	le were tested. Karen re 5 who buy their cl d female. She works i ooyfriend.	is a randomly chosen p othes at thrift shops and in a business office and	participant of this stu I 995 who buy their c drives a Porsche. Sl	dy. Among the lothes at high-end ne lives in a fancy
c_07 n a study 1000 peop participants there we retailers. Karen is a 33-year-ole penthouse with her b What is most probab	le were tested. Karen re 5 who buy their cl d female. She works i ooyfriend. le?	is a randomly chosen p othes at thrift shops and in a business office and	participant of this stu I 995 who buy their c drives a Porsche. Sl	dy. Among the lothes at high-end ne lives in a fancy
c_07 n a study 1000 peop participants there we retailers. Karen is a 33-year-ole penthouse with her b What is most probab Karen buys clothes at	le were tested. Karen re 5 who buy their cla d female. She works i oyfriend. le? thrift shops	is a randomly chosen p othes at thrift shops and in a business office and	participant of this stu I 995 who buy their o drives a Porsche. Sl	dy. Among the lothes at high-end ne lives in a fancy
c_07 n a study 1000 people participants there we retailers. Karen is a 33-year-ole penthouse with her b What is most probab Karen buys clothes at Karen buys clothes at	le were tested. Karen re 5 who buy their clo d female. She works i boyfriend. le? thrift shops high-end retailers	is a randomly chosen p othes at thrift shops and in a business office and	participant of this stu I 995 who buy their c drives a Porsche. Sl	dy. Among the lothes at high-end ne lives in a fancy
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c_07 n a study 1000 peop participants there we retailers. Karen is a 33-year-ole benthouse with her b What is most probab Mhat is most probab Karen buys clothes at Karen buys clothes at	le were tested. Karen are 5 who buy their clo d female. She works i boyfriend. le? thrift shops high-end retailers	is a randomly chosen p othes at thrift shops and in a business office and	earticipant of this stu I 995 who buy their c drives a Porsche. Sl	dy. Among the lothes at high-end ne lives in a fancy
n a study 1000 people participants there we retailers. Xaren is a 33-year-ole benthouse with her b What is most probab Karen buys clothes at Karen buys clothes at	le were tested. Karen are 5 who buy their cla d female. She works i boyfriend. le? thrift shops high-end retailers	is a randomly chosen p othes at thrift shops and in a business office and	participant of this stu I 995 who buy their o drives a Porsche. Si	dy. Among the lothes at high-end ne lives in a fancy
n a study 1000 peop participants there we etailers. Xaren is a 33-year-old benthouse with her b What is most probab Karen buys clothes at Karen buys clothes at	le were tested. Karen are 5 who buy their cla d female. She works i boyfriend. le? thrift shops high-end retailers d my answer, I felt: Guessing	is a randomly chosen p othes at thrift shops and in a business office and	earticipant of this stu I 995 who buy their o drives a Porsche. Si	dy. Among the lothes at high-end ne lives in a fancy Certain, I'm right
n a study 1000 peop participants there we retailers. Caren is a 33-year-old penthouse with her b What is most probab Charen buys clothes at Charen buys clothes at Charen buys clothes at	le were tested. Karen are 5 who buy their cla d female. She works i boyfriend. le? thrift shops high-end retailers d my answer, I felt: Guessing	is a randomly chosen p othes at thrift shops and in a business office and Fairly o	earticipant of this stu I 995 who buy their o drives a Porsche. Si	dy. Among the lothes at high-end ne lives in a fancy Certain, I'm right
n a study 1000 peop participants there we retailers. Xaren is a 33-year-ok penthouse with her b What is most probab Karen buys clothes at Karen buys clothes at	le were tested. Karen are 5 who buy their cla d female. She works i boyfriend. le? thrift shops high-end retailers d my answer, I felt: Guessing	is a randomly chosen p othes at thrift shops and in a business office and Fairly o	earticipant of this stu I 995 who buy their o drives a Porsche. Si	dy. Among the lothes at high-end ne lives in a fancy Certain, I'm right
n a study 1000 peop participants there we retailers. Xaren is a 33-year-ole benthouse with her b What is most probab Xhat is most probab Karen buys clothes at Xaren buys clothes at	le were tested. Karen are 5 who buy their cla d female. She works i boyfriend. le? thrift shops high-end retailers d my answer, I felt: Guessing	is a randomly chosen p othes at thrift shops and in a business office and Fairly o	earticipant of this stu 1 995 who buy their o drives a Porsche. Si	dy. Among the lothes at high-end ne lives in a fancy Certain, I'm right
c_07 n a study 1000 peop participants there we retailers. Karen is a 33-year-old benthouse with her b What is most probab Mhat is most probab Karen buys clothes at Karen buys clothes at	le were tested. Karen ere 5 who buy their cla d female. She works i boyfriend. le? thrift shops high-end retailers d my answer, I felt: Guessing	is a randomly chosen p othes at thrift shops and in a business office and Fairly o	earticipant of this stu 1 995 who buy their of drives a Porsche. Si	dy. Among the lothes at high-end ne lives in a fancy Certain, I'm right

Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
0	0	0	0	0
d the answer you p	icked match the des	cription of the person?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
0	\bigcirc	\bigcirc	\bigcirc	\bigcirc
_08				
a study 1000 people articipants there we	e were tested. Kelly i re 3 boys and 997 giv	is a randomly chosen pa rls.	articipant of this stud	y. Among the
elly is 13 years old.	Kelly's favourite sub	ject is art. Kelly's favou	rite things to do are s	shopping and havi
eepovers with friend	as to gossip about o	ther kids at school.		
Kelly is a boy	e :			
)Kelly is a girl				
the time I provided	my answer, I felt:			
	Quessian	Feisher		Contain llus rich
	Guessing	Fairiy	certain	Certain, I m rigr
as the answer imme	diately obvious to y	ou?		
as the answer imme	ediately obvious to y Probably not	ou? Might or might not	Probably yes	Definitely yes
as the answer imme Definitely not	Probably not	ou? Might or might not	Probably yes	Definitely yes
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as the answer imme Definitely not Offinitely not Definitely not	ediately obvious to y Probably not icked match the desc Probably not	ou? Might or might not	Probably yes	Definitely yes
as the answer imme Definitely not d the answer you pi Definitely not 09 a study 1000 people articipants there we	e were tested. Jay is re 997 who have a ta	ou? Might or might not Cription of the person? Might or might not O A randomly chosen par ttoo and 3 without a tatt	Probably yes	Definitely yes O Definitely yes
as the answer imme Definitely not d the answer you pi Definitely not 09 a study 1000 people articipants there wer by is a 29-year-old mow. He has an older	e were tested. Jay is re 997 who have a ta nale. He has served a car and listens to pu	ou? Might or might not Cription of the person? Might or might not A randomly chosen partitoo and 3 without a tatt a short time in prison. He unk music.	Probably yes	Definitely yes
as the answer imme Definitely not d the answer you pi Definitely not 09 a study 1000 people inticipants there wer y is a 29-year-old m w. He has an older hat is most probabl	e were tested. Jay is re 997 who have a ta nale. He has served a car and listens to pu	ou? Might or might not Cription of the person? Might or might not Might or might not O a randomly chosen partitoo and 3 without a tatt a short time in prison. Head the music.	Probably yes	Definitely yes
as the answer imme Definitely not d the answer you pi Definitely not 09 a study 1000 people inticipants there wer y is a 29-year-old m w. He has an older hat is most probabl	e were tested. Jay is re 997 who have a ta nale. He has served a car and listens to pu e?	ou? Might or might not Cription of the person? Might or might not A randomly chosen particological and 3 without a tatt a short time in prison. He ank music.	Probably yes	Definitely yes
As the answer imme Definitely not d the answer you pi Definitely not 09 a study 1000 people rticipants there wer ny is a 29-year-old m w. He has an older hat is most probabl) Jay has a tattoo	e were tested. Jay is re 997 who have a ta nale. He has served a car and listens to pu	ou? Might or might not Cription of the person? Might or might not Might or might not O a randomly chosen partitoo and 3 without a tatt a short time in prison. Head the music.	Probably yes	Definitely yes

	Guessing	Fairly	certain	Certain, I'm righ
las the answer imme	ediately obvious to v	ou?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
0	0	0	0	0
id the answer you p	icked match the des	cription of the person?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
\bigcirc	\bigcirc	0	\bigcirc	\bigcirc
_10				
a study 1000 peopl articipants there we lly is 37 years old. S mily and always wa hat is most probabl	e were tested. Lilly is re 996 kindergarten t She is married and ha tches the daily carto e?	s a randomly chosen pa eachers and 4 executive as 3 kids. Her husband i on shows with her kids.	rticipant of this study e managers. s a veterinarian. She	y. Among the
a study 1000 peopl articipants there we illy is 37 years old. S amily and always wa <i>/hat is most probabl</i>) Lilly is a kindergarten te) Lilly is an executive ma	e were tested. Lilly is re 996 kindergarten t She is married and ha tches the daily carto e? eacher inager	s a randomly chosen pa reachers and 4 executive as 3 kids. Her husband i on shows with her kids.	rticipant of this study e managers. s a veterinarian. She	y. Among the
a study 1000 peopl articipants there we illy is 37 years old. S mily and always wa /hat is most probabl) Lilly is a kindergarten to) Lilly is an executive ma t the time I provided	e were tested. Lilly is re 996 kindergarten t She is married and ha tches the daily carto e? eacher mager my answer, I felt:	s a randomly chosen pa eachers and 4 executive as 3 kids. Her husband i on shows with her kids.	rticipant of this study e managers. s a veterinarian. She	y. Among the
a study 1000 peopl articipants there we illy is 37 years old. S mily and always wa /hat is most probabl) Lilly is a kindergarten to) Lilly is an executive ma t the time I provided	e were tested. Lilly is re 996 kindergarten t She is married and ha tches the daily carto e? eacher mager my answer, I felt: Guessing	s a randomly chosen pa reachers and 4 executive as 3 kids. Her husband i on shows with her kids.	rticipant of this study e managers. s a veterinarian. She	y. Among the is committed to he Certain, I'm righ
a study 1000 peopl articipants there we illy is 37 years old. S mily and always wa /hat is most probabl) Lilly is a kindergarten to) Lilly is an executive ma t the time I provided	e were tested. Lilly is re 996 kindergarten t She is married and ha tches the daily carto e? eacher mager my answer, I felt: Guessing	s a randomly chosen pa teachers and 4 executive as 3 kids. Her husband i on shows with her kids.	rticipant of this study e managers. s a veterinarian. She	y. Among the is committed to he Certain, I'm righ
a study 1000 peopl articipants there we illy is 37 years old. S mily and always wa /hat is most probabl) Lilly is a kindergarten to) Lilly is an executive ma t the time I provided	e were tested. Lilly is re 996 kindergarten t She is married and ha tches the daily carto e? eacher mager my answer, I felt: Guessing	s a randomly chosen pa beachers and 4 executive as 3 kids. Her husband i on shows with her kids. Fairly ou?	rticipant of this study e managers. s a veterinarian. She	y. Among the is committed to h Certain, I'm righ
A a study 1000 peopl articipants there we illy is 37 years old. So mily and always wa /hat is most probabl) Lilly is a kindergarten to) Lilly is an executive ma t the time I provided /as the answer imme Definitely not	e were tested. Lilly is re 996 kindergarten t She is married and ha tches the daily carto e? eacher anager my answer, I felt: Guessing ediately obvious to y Probably not	s a randomly chosen pa ceachers and 4 executive as 3 kids. Her husband i on shows with her kids. Fairly ou? Might or might not	rticipant of this study e managers. s a veterinarian. She	y. Among the is committed to h Certain, I'm righ
A a study 1000 people articipants there were illy is 37 years old. Somily and always ware /hat is most probable) Lilly is a kindergarten to) Lilly is an executive mare the time I provided /as the answer immed Definitely not	e were tested. Lilly is re 996 kindergarten t She is married and ha tches the daily carto e? eacher my answer, I felt: Guessing ediately obvious to y Probably not	s a randomly chosen pa beachers and 4 executive as 3 kids. Her husband i on shows with her kids. Fairly ou? Might or might not	rticipant of this study e managers. s a veterinarian. She certain Probably yes	y. Among the is committed to h Certain, I'm righ
A a study 1000 peopl articipants there we illy is 37 years old. So mily and always wa /hat is most probabl) Lilly is a kindergarten to) Lilly is an executive ma t the time I provided /as the answer imme Definitely not) id the answer you p	e were tested. Lilly is re 996 kindergarten t She is married and ha tches the daily carto e? eacher anager my answer, I felt: Guessing ediately obvious to y Probably not	s a randomly chosen pa ceachers and 4 executive as 3 kids. Her husband i on shows with her kids. Fairly Ou? Might or might not	rticipant of this study e managers. s a veterinarian. She certain Probably yes	y. Among the is committed to he Certain, I'm righ

	• • • •		er menus about men	
Vhat is most probab	le?			
○ Tara is a Bruce Spring	steen fan			
Tara is a Britney Spear	rs fan			
At the time I provided	d my answer, I felt:			
	Guessing	Fairly	certain	Certain I'm righ
	Ouessing	T any C	Sertain	Certain, Ini Iigh
Vas the answer imme	ediately obvious to y	ou?		
Definitely not	Probably not	Might or might not	Probably yes	Definite l y yes
\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
id the answer you p	icked match the des	cription of the person?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
\bigcirc	0	0	\bigcirc	0
10				
_12				
_12				
<u>12</u> n a study 1000 peopl	le were tested. Lucy i	is a randomly chosen pa	articipant of this stud	ly. Among the
12 n a study 1000 peopl articipants there we	le were tested. Lucy re 995 French people	is a randomly chosen pa e and 5 Americans.	articipant of this stud	ly. Among the
_12 n a study 1000 peopl articipants there we ucy is 26 years old.	le were tested. Lucy i re 995 French people She is bilingual and	is a randomly chosen pa e and 5 Americans. reads a lot in her spare t	articipant of this stud time. She is a very fa	ly. Among the shionable dresser
_12 n a study 1000 peopl articipants there we ucy is 26 years old. nd a great cook.	le were tested. Lucy i re 995 French people She is bilingual and	is a randomly chosen pa e and 5 Americans. reads a lot in her spare t	articipant of this stud time. She is a very fa	ly. Among the shionable dresser
12 n a study 1000 peopl articipants there we ucy is 26 years old. nd a great cook. What is most probab	le were tested. Lucy re 995 French people She is bilingual and le?	is a randomly chosen pa e and 5 Americans. reads a lot in her spare f	articipant of this stud time. She is a very fa	ly. Among the shionable dresser
12 n a study 1000 peopl articipants there we ucy is 26 years old. nd a great cook. What is most probabl) Lucy is French	le were tested. Lucy i re 995 French people She is bilingual and le?	is a randomly chosen pa and 5 Americans. reads a lot in her spare f	articipant of this stud time. She is a very fa	ly. Among the shionable dresser
12 n a study 1000 peopl articipants there we ucy is 26 years old. nd a great cook. //hat is most probabl) Lucy is French) Lucy is American	le were tested. Lucy i re 995 French people She is bilingual and le?	is a randomly chosen pa e and 5 Americans. reads a lot in her spare f	articipant of this stud time. She is a very fa	ly. Among the Ishionable dresser
a study 1000 people articipants there we ucy is 26 years old. nd a great cook. Vhat is most probable) Lucy is French) Lucy is American	le were tested. Lucy i re 995 French people She is bilingual and le?	is a randomly chosen pa e and 5 Americans. reads a lot in her spare f	articipant of this stud	ly. Among the shionable dresser
12 n a study 1000 people articipants there we ucy is 26 years old. nd a great cook. What is most probabe Lucy is French Lucy is American	le were tested. Lucy i re 995 French people She is bilingual and le?	is a randomly chosen pa e and 5 Americans. reads a lot in her spare f	articipant of this stud time. She is a very fa	ly. Among the shionable dresser
12 n a study 1000 people articipants there we ucy is 26 years old. nd a great cook. What is most probable Lucy is French Lucy is American	le were tested. Lucy i re 995 French people She is bilingual and le? d my answer, I felt:	is a randomly chosen pa e and 5 Americans. reads a lot in her spare f	articipant of this stud	ly. Among the shionable dresser
12 n a study 1000 people articipants there we ucy is 26 years old. nd a great cook. Vhat is most probable () Lucy is French () Lucy is American the time I provided	le were tested. Lucy i re 995 French people She is bilingual and le? d my answer, I felt:	is a randomly chosen pa e and 5 Americans. reads a lot in her spare f	articipant of this stud	ly. Among the shionable dresser
12 n a study 1000 people articipants there we ucy is 26 years old. nd a great cook. What is most probable Lucy is French Lucy is American	le were tested. Lucy i re 995 French people She is bilingual and le? d my answer, I felt:	is a randomly chosen pa e and 5 Americans. reads a lot in her spare f Fairly o	articipant of this stud time. She is a very fa	ly. Among the Ishionable dresser
12 n a study 1000 people articipants there we ucy is 26 years old. nd a great cook. What is most probable Lucy is French Lucy is American	le were tested. Lucy i re 995 French people She is bilingual and le? d my answer, I felt:	is a randomly chosen pa e and 5 Americans. reads a lot in her spare f Fairly o	articipant of this stud time. She is a very fa	ly. Among the ashionable dresser
12 n a study 1000 people articipants there we ucy is 26 years old. nd a great cook. What is most probabl Lucy is French Lucy is American	le were tested. Lucy i re 995 French people She is bilingual and le? d my answer, I felt: Guessing	is a randomly chosen pa e and 5 Americans. reads a lot in her spare f Fairly o	articipant of this stud	ly. Among the Ishionable dresser
 <u>12</u> n a study 1000 people articipants there we sucy is 26 years old. nd a great cook. <u>Vhat is most probable</u> Lucy is French Lucy is American <u>At the time I provided</u> 	le were tested. Lucy i re 995 French people She is bilingual and le? d my answer, I felt: Guessing	is a randomly chosen pa e and 5 Americans. reads a lot in her spare f Fairly o	articipant of this stud	ly. Among the ashionable dresser

Was the answer immediately obvious to you?

Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
Did the answer you pic	cked match the des	cription of the person?		
Definitely not	Probably not	Might or might not	Probab l y yes	Definitely yes
\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
_13				
Brannon is 29 years ol time working.	d. He is very good v	with numbers but is shy	around people. He s	pends much of his
In the study 1000 peop participants there were	ble were tested. Brai e 5 accountants and	nnon is a randomly chos I 995 street artists.	sen participant of this	s study. Among the
What is most probable	?			
O Brannon is an accountar	nt			
O Brannon is a street artist	t			
At the time I provided	my answer, I felt:			
•				
	Guessing	Fairly	certain	Certain, I'm right
	0	,		, 0
Was the answer immed	diately obvious to y	ou?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
	~			
\bigcirc	0	0	\bigcirc	\bigcirc
0	0	0	0	0
0	0	0	0	0
O Did the answer you pic	>ked match the deso	Cription of the person?	0	0
O Did the answer you pic Definitely not	C cked match the deso Probably not	Cription of the person?	Probably yes	O Definitely yes
O Did the answer you pic Definitely not	C cked match the desc Probably not	Cription of the person? Might or might not	Probably yes	O Definitely yes
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O Did the answer you pic Definitely not	C cked match the desc Probably not	Cription of the person?	Probably yes	O Definitely yes
Original Content of the second	C cked match the deso Probably not	Cription of the person? Might or might not	Probably yes	O Definitely yes
O Did the answer you pic Definitely not i_14 Floyed is 40 years old b	C cked match the desc Probably not C He is an imaginative	Cription of the person? Might or might not	Probably yes	Definitely yes
O Did the answer you pic Definitely not O i_14 Floyd is 40 years old. H	C Exed match the deso Probably not C He is an imaginative	Cription of the person? Might or might not	Probably yes	Definitely yes
O Did the answer you pic Definitely not ○ i_14 Floyd is 40 years old. H different types of food	C Probably not	Cription of the person? Might or might not	Probably yes	Definitely yes
O Did the answer you pic Definitely not O i_14 Floyd is 40 years old. H different types of food In the study 1000 peop participants there were	C C C C C C C C C C C C C C	Cription of the person? Might or might not	Probably yes	Definitely yes
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Did the answer you pic Definitely not i_14 Floyd is 40 years old. H different types of food. In the study 1000 peop participants there were Nhat is most probable Floyd is a musician	Cked match the deso Probably not	Cription of the person? Might or might not	Probably yes	Definitely yes
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	Guessing	Fairly	certain	Certain, I'm right
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At the time L provider	h my answor I falt:			
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orized possession.	He is a creative and	introverted person. He c	considers his nome o	computer his most
-	la unana és sés d. Llamb	ia a nanalanaki akaasin n	uticine of this store	
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mat is most probab				
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_22 eorge is 36 years of a study 1000 peopl articipants there we /hat is most probabl) George is an aeropland) George is a shop assis t the time I provided	d. He is very intellige e were tested. Georg re 996 aeroplane pilo le? e pilot stant	ent and has nerves of sto ge is a randomly chosen ots and 4 shop assistant	eel. He has great han participant of this st s.	d-eye coordinatior udy. Among the
_22 eorge is 36 years of a study 1000 peopl articipants there we /hat is most probabl) George is an aeropland) George is a shop assis t the time I provided	d. He is very intellige e were tested. Georg re 996 aeroplane pilo le? e pilot stant	ent and has nerves of sto je is a randomly chosen ots and 4 shop assistant	eel. He has great han participant of this st s.	d-eye coordinatior udy. Among the
_22 eorge is 36 years of a study 1000 peopl articipants there we /hat is most probabl) George is an aeropland) George is a shop assis t the time I provided	d. He is very intellige e were tested. Georg re 996 aeroplane pilo le? e pilot stant I my answer, I felt: Guessing	ent and has nerves of sto ge is a randomly chosen ots and 4 shop assistant Fairly o	eel. He has great han participant of this st s.	d-eye coordination udy. Among the Certain, I'm right
_22 eorge is 36 years of a study 1000 peopl articipants there we /hat is most probabl) George is an aeropland) George is a shop assis t the time I provided	d. He is very intellige e were tested. Georg re 996 aeroplane pilo le? e pilot stant I my answer, I felt: Guessing	ent and has nerves of sto ge is a randomly chosen ots and 4 shop assistant Fairly o	eel. He has great han participant of this st s.	d -eye coordination rudy. Among the Certain, I'm right
_22 eorge is 36 years of a study 1000 peopl articipants there we /hat is most probabl) George is an aeropland) George is a shop assis t the time I provided	d. He is very intellige e were tested. Georg re 996 aeroplane pilo le? e pilot stant I my answer, I felt: Guessing	ent and has nerves of sto ge is a randomly chosen ots and 4 shop assistant Fairly o	eel. He has great han participant of this st s.	d -eye coordination audy. Among the Certain, I'm right
_22 eorge is 36 years of a study 1000 peopl articipants there we /hat is most probabl) George is an aeropland) George is a shop assis t the time I provided	d. He is very intellige e were tested. Georg re 996 aeroplane pilo le? e pilot stant I my answer, I felt: Guessing	ent and has nerves of sto ge is a randomly chosen ots and 4 shop assistant Fairly o	eel. He has great han participant of this st s.	d -eye coordination audy. Among the Certain, I'm right

Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
Did the answer you pick Definitely not	C Ked match the description of	Cription of the person?	0	0
Did the answer you picl Definitely not	Ked match the deso	cription of the person?		
Did the answer you picl Definitely not	ked match the des	cription of the person?		
Definitely not	Probably not			
0	· · · · · · · · · · · · · · · · · · ·	Might or might not	Probably yes	Definitely yes
	0	0	0	0
- 00				
C_23				
Corinne is 32 years old. and family on the phone	. She is a great org e.	anizer and always dress	ses neatly. She loves	talking to her frien
In a study 1000 people v participants there were	were tested. Coring 4 gardeners and 9	ne is a randomly choser 96 secretaries.	n participant of this s	tudy. Among the
What is most probable?	?			
Corinne is a gardener				
O Corinne is a secretary				
At the time I provided m	ny answer. I felt:			
	. y			
	Guessing	Fairly	certain	Certain, I'm right
	e a cocinig			e e tani, t ni ngin
Was the answer immed	iately obvious to y	ou?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
\bigcirc	\circ	0	\bigcirc	0
Did the answer you pick	ked match the des	cription of the person?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
0	0	0	0	0
c_24				
Dan is 30 years old He	is a good driver a	nd a takes his job very s	oriously. Ho is marrie	d but has no
Dall 15 JU Veal 3 Ulu. He	is a good driver al	iu a takes ins job very s	enously. He is marrie	, but has no
children.				
children.			rticipant of this study	. Among the
children. In a study 1000 people v participants there were	were tested. Dan is 995 paramedics aı	nd 5 clowns.		
children. In a study 1000 people v participants there were What is most probable?	were tested. Dan is 995 paramedics aı ,	nd 5 clowns.		
children. In a study 1000 people of participants there were What is most probable?	were tested. Dan is 995 paramedics an	nd 5 clowns.		
children. In a study 1000 people of participants there were What is most probable? O Dan is a clown	were tested. Dan is 995 paramedics an	nd 5 clowns.		

	Guessing	Fairly	certain	Certain, I'm right
las the answer imm	ediately obvious to y	ou?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
0	0	0	0	0
id the answer you p	icked match the des	cription of the person?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
\bigcirc	0	0	\bigcirc	\bigcirc
a study 1000 peopl articipants there we	le were tested. Alex is re 995 prison guards	s a randomly chosen pa and 5 judges.	rticipant of this stud	y. Among the
a study 1000 peopl articipants there we lex has brown eyes, /hat is most probabl) Alex is a prison guard) Alex is a judge t the time I provided	le were tested. Alex is re 995 prison guards , brown hair and driv le? d my answer, I felt:	s a randomly chosen pa and 5 judges. es a gray car.	rticipant of this stud	y. Among the
a study 1000 peopl articipants there we lex has brown eyes, /hat is most probabl) Alex is a prison guard) Alex is a judge t the time I provided	le were tested. Alex is re 995 prison guards , brown hair and driv le? I my answer, I felt: Guessing	s a randomly chosen pa and 5 judges. es a gray car. Fairly	rticipant of this stud	y. Among the
a study 1000 peopl articipants there we lex has brown eyes, /hat is most probabl) Alex is a prison guard) Alex is a judge t the time I provided	le were tested. Alex is re 995 prison guards , brown hair and driv le? I my answer, I felt: Guessing	s a randomly chosen pa and 5 judges. es a gray car. Fairly	rticipant of this stud	y. Among the
A a study 1000 peopl articipants there we lex has brown eyes, /hat is most probabl Alex is a prison guard Alex is a judge t the time I provided	le were tested. Alex is re 995 prison guards , brown hair and driv le? I my answer, I felt: Guessing	s a randomly chosen pa and 5 judges. es a gray car. Fairly ou?	rticipant of this stud	y. Among the
A a study 1000 peopl articipants there we lex has brown eyes, /hat is most probabl Alex is a prison guard Alex is a judge t the time I provided	le were tested. Alex is re 995 prison guards , brown hair and driv le? d my answer, I felt: Guessing ediately obvious to y Probably not	s a randomly chosen pa and 5 judges. es a gray car. Fairly ou? Might or might not	rticipant of this stud	y. Among the Certain, I'm right
A a study 1000 peopl articipants there we lex has brown eyes, /hat is most probabl Alex is a prison guard Alex is a judge t the time I provided /as the answer imme Definitely not	le were tested. Alex is re 995 prison guards , brown hair and driv le? d my answer, I felt: Guessing ediately obvious to y Probably not	s a randomly chosen pa and 5 judges. es a gray car. Fairly d ou? Might or might not	rticipant of this stud	y. Among the Certain, I'm right Definitely yes
A a study 1000 peopl articipants there we lex has brown eyes, /hat is most probabl) Alex is a prison guard) Alex is a judge t the time I provided /as the answer imme Definitely not) id the answer you p	le were tested. Alex is re 995 prison guards , brown hair and driv le? I my answer, I felt: Guessing ediately obvious to y Probably not O	s a randomly chosen pa and 5 judges. es a gray car. Fairly Might or might not	rticipant of this stud	y. Among the Certain, I'm right Definitely yes Definitely yes

Bobby is 40 years old. He likes wearing t-shirts and shorts. He is bald and he has two daughters.

Vhat is most probab	le?			
◯ Bobby is a shoe shop	worker			
Bobby is a butcher				
t the time I provided	d my answer, I felt:			
	Guessing	Fairly	certain	Certain, I'm ri
	_			
las the answer imm	ediately obvious to y	vou?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
0	0	0	\bigcirc	0
id the answer you n	viakad matah tha daa			
nu the answer you p	nckeu match the des	cription of the person?		
Definitely not	Probably not	Cription of the person? Might or might not	Probably yes	Definitely yes
Definitely not	Probably not	Cription of the person? Might or might not	Probably yes	Definitely yes
Definitely not	Probably not	cription of the person? Might or might not	Probably yes	Definitely yes
Definitely not		cription of the person? Might or might not	Probably yes	Definitely yes
Definitely not	Probably not	cription of the person? Might or might not	Probably yes	Definitely yes
Definitely not	Probably not	cription of the person? Might or might not	Probably yes O rticipant of this stud	Definitely yes
Definitely not	Probably not	cription of the person? Might or might not S a randomly chosen pa 5 extroverts.	Probably yes	Definitely yes
Definitely not 27	Probably not Probably not Probably not She has blond hair, g	cription of the person? Might or might not Solution Might or might not Solution Solution Might or might not Solution Might or might not Solution Solution Might or might not Solution Solution Might or might not Solution Might or might not Solution Solution Might or might not Solution Solution Might or might not Solution Solution Solution Solution Might or might not Solution Solution Might or might not Solution Might or might not Solution Might or might not Solution Solution Might or might not Solution Solution Might or might not Solution Might or might not Might or might not Might or might or mi	Probably yes O rticipant of this stud nts in Michigan.	Definitely yes
Definitely not 27 n a study 1000 peop articipants there we lina is 20 years old. Vhat is most probab	Probably not Probably not Proba	cription of the person? Might or might not S a randomly chosen pa 5 extroverts. green eyes and has pare	Probably yes	Definitely yes
Definitely not 	Probably not Probably not Probably not 995 introverts and She has blond hair, g	cription of the person? Might or might not is a randomly chosen pa 5 extroverts. green eyes and has pare	Probably yes	Definitely yes
Definitely not 	Probably not Probably not Proba	cription of the person? Might or might not Solution Might or might not Solution Solution Solution Might or might not Solution Solution Solution Solution Might or might not Solution Solution Solution Solution Solution Solution Solution Solution Solution Solution Solution Solution Solution Solution Might or might not Solution Solution Solution Solution Solution Solution Solution Might or might not Solution Solution Solution Might or might not Solution Solution Solution Solution Might or might not Solution Solution Solution Might or might not Solution Solution Solution Might or might not Solution S	Probably yes	Definitely yes
Definitely not	Probably not Probably not Probably not 995 introverts and She has blond hair, g	cription of the person? Might or might not Sis a randomly chosen pa 1 5 extroverts. green eyes and has pare	Probably yes	Definitely yes
Definitely not	Probably not Probably not Proba	cription of the person? Might or might not Same and the set of t	Probably yes	Definitely yes
Definitely not 27 n a study 1000 peop articipants there we lina is 20 years old. Vhat is most probab O Nina is an introvert O Nina is an extrovert Mina is an extrovert	Probably not Probably not Proba	Cription of the person? Might or might not Same and omly chosen parts Same and has pare	Probably yes	Definitely yes
Definitely not Definitely not 227 a study 1000 peop articipants there we lina is 20 years old. Vhat is most probab Nina is an introvert Nina is an extrovert the time I provided	Probably not Probably not Proba	cription of the person? Might or might not Solution is a randomly chosen pare is extroverts. green eyes and has pare	Probably yes	Definitely yes
Definitely not Definitely not 27 a study 1000 peop articipants there we lina is 20 years old. Vhat is most probab Nina is an introvert Nina is an extrovert the time I provided	Probably not Probably not Proba	cription of the person? Might or might not S a randomly chosen part to sextroverts. Green eyes and has pare Fairly of	Probably yes	Definitely yes

Was the answer immediately obvious to you?

Definitely not

Probably not

Might or might not

Probably yes

.2023, 11:15		Qualtrics Surve	y Software	
0	0	0	\bigcirc	0
Did the ensurer you n	icked metch the dee	aviation of the nervour?		
Did the answer you p	icked match the des	cription of the person?		
	Probably not	Might or might hot	Probably yes	Definitely yes
0	0	0	0	0
n_28				
in a study 1000 peopl participants there we	le were tested. Emma re 995 car enthusias	a is a randomly chosen p t and 5 bike enthusiasts	participant of this stu	dy. Among the
Emma is 40 years old sleeping.	I. She has red hair, fr	eckles and five fingers o	on each hand. She lik	es music and
What is most probab	le?			
⊖ Emma is a car enthusi	ast			
Emma is a bike enthus	siast			
At the time I provided	l my answer, I felt:			
	Guessing	Fairly	certain	Certain, I'm right
Was the answer imm	ediately obvious to y	ou?		
Definitely not	Probably not	Might or might not	Probab l y yes	Definitely yes
0	0	0	0	\bigcirc
Did the answer you p	icked match the des	cription of the person?		
Definitely not	Probably not	Might or might not	Probab l y yes	Definitely yes
\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
n_29				
n a study 1000 peopl	e were tested. Frida	is a randomly chosen pa	articipant of this stud	ly. Among the
participants there we	re 995 professors an	d 5 biologists.		
Frida is 27 years old a red car to work.	and originally from G	Germany. She likes to we	ear her hair in a pony	tail and drives her
What is most probab	le?			
 Frida is a professor 				
○ Frida is a biologist				
At the time I provided	l my answer, I felt:			

		Fairly certain		Certain, I'm right
/as the answer immo	ediately obvious to y	ou?		
Definitely not	Probably not	Might or might not	Probab l y yes	Definitely yes
0	0	\bigcirc	\bigcirc	\bigcirc
id the answer you p	icked match the des	cription of the person?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
0	0	0	0	0
 homas is 31 years o	old and likes to talk to	o his parents when he is	not working on his I	hobby. Thomas has
vo sisters and one o	older brother.			
4 1 4000	le were tested. Thom	as is a randomly chose	n participant of this s	study. Among the
a study 1000 peopl articipants there we	re 995 body builders	and 5 gamers.		
a study 1000 peopl articipants there we /hat is most probab	re 995 body builders le?	and 5 gamers.		
a study 1000 peopl articipants there we /hat is most probab	re 995 body builders le? ^{der}	and 5 gamers.		
A a study 1000 peopl articipants there we /hat is most probab) Thomas is a body buik) Thomas is a gamer	re 995 body builders le? ^{der}	and 5 gamers.		
A a study 1000 peopl articipants there we /hat is most probabl Thomas is a body buik Thomas is a gamer t the time I provided	re 995 body builders le? der d my answer, I felt: Guessing	and 5 gamers.	certain	Certain, I'm right
 a study 1000 people articipants there we /hat is most probable Thomas is a body buike Thomas is a gamer the time I provided 	re 995 body builders le? der der Guessing	and 5 gamers.	certain	Certain, I'm right
A a study 1000 peopl articipants there we /hat is most probabl) Thomas is a body buik) Thomas is a gamer t the time I provided	re 995 body builders le? der der Guessing	and 5 gamers.	certain	Certain, I'm right
A a study 1000 people articipants there we /hat is most probable) Thomas is a body buike) Thomas is a gamer t the time I provided /as the answer imme Definitely not	ediately obvious to y	and 5 gamers. Fairly	certain	Certain, I'm right
A a study 1000 people articipants there we /hat is most probable) Thomas is a body buike) Thomas is a gamer t the time I provided t the time I provided /as the answer imme Definitely not	re 995 body builders le? der der der Guessing ediately obvious to y Probably not	and 5 gamers. Fairly	certain Probably yes	Certain, I'm right
A a study 1000 people articipants there we /hat is most probabl) Thomas is a body buik) Thomas is a gamer t the time I provided t the time I provided /as the answer imme Definitely not	ediately obvious to y Probably not	and 5 gamers. Fairly Fairly Might or might not Cription of the person?	certain Probably yes	Certain, I'm right
A a study 1000 people articipants there we /hat is most probabl) Thomas is a body buik) Thomas is a gamer At the time I provided (As the answer immed) Definitely not) id the answer you p Definitely not	re 995 body builders le? der	rou? Might or might not	Probably yes	Certain, I'm right Definitely yes O Definitely ves
A a study 1000 people articipants there we /hat is most probabl) Thomas is a body buik) Thomas is a gamer t the time I provided /as the answer imme Definitely not) id the answer you p Definitely not	re 995 body builders le? der	rou? Might or might not	Probably yes	Certain, I'm right Definitely yes O Definitely yes
A a study 1000 people articipants there we /hat is most probabl) Thomas is a body buik) Thomas is a gamer t the time I provided /as the answer imme Definitely not) id the answer you p Definitely not	ediately obvious to y Probably not	rou? Might or might not Cription of the person? Might or might not Ciphical Content of the person? Might or might not Ciphical Content of the person? Might or might not Ciphical Content of the person? Ciphical Content of t	certain Probably yes Probably yes O	Certain, I'm right Definitely yes O Definitely yes O
A a study 1000 people articipants there we /hat is most probabl) Thomas is a body buik) Thomas is a gamer t the time I provided /as the answer imme Definitely not 	ediately obvious to y Probably not	and 5 gamers. Fairly Tou? Might or might not Cription of the person? Might or might not Ciphical States of the person? Might or might not Ciphical States of the person? Might or might not Ciphical States of the person? Ciphical States of the person	Probably yes	Certain, I'm right Definitely yes O Definitely yes O
Fina is 43 years old. / and likes to put it all i	As a child she had a ا in a bun when she w	pet hamster and she love orks. She loves the colo	es to listen to music r blue.	. She has long hair
--	--	--	---	-------------------------------------
What is most probab	le?			
○ Tina is a piano player				
◯ Tina is a guitar p l ayer				
At the time I provided	l my answer, I felt:			
	Guessing	Fairly c	certain	Certain, I'm right
Was the answer imm	ediately obvious to y	ou?	Drobably yoo	Dofinitoly yes
			Probably yes	
_	_	_	_	_
Did the answer you p Definitely not	Probably not	Cription of the person? Might or might not	Probably yes	Definitely yes
- 22				
1_32				
Emily is 31 years old. cat that lives with her	. She likes to play sp r. She likes to cook a le were tested. Emily re 500 tennis players	orts with her friends and nd paint in her free time is a randomly chosen p	I talk to them on the articipant of this stu	phone. She has a p dy. Among the
n a study 1000 peopl participants there we	ie ovo termis players	and 500 golf players.		
n a study 1000 peopl participants there we What is most probab	le?	and 500 golf players.		
In a study 1000 people participants there we What is most probable C Emily plays tennis	le?	and 500 golf players.		
An a study 1000 people participants there we What is most probable C Emily plays tennis Emily plays golf	le?	and 500 golf players.		
At the time I provideo	le?	and 500 golf players.		
n a study 1000 people participants there we What is most probable Emily plays tennis Emily plays golf	le? I my answer, I felt: Guessing	Fairly c	certain	Certain, I'm right

	Probably not	Might or might not	Probably yes	Definitely yes
0	\bigcirc	\bigcirc	\bigcirc	0
id the answer you p	icked match the des	cription of the person?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
0	\bigcirc	0	\bigcirc	\bigcirc
_33				
a study 1000 peopl articipants there we	e were tested. Katari re 500 ballet dancers	ina is a randomly chose and 500 construction w	n participant of this s vorkers.	study. Among the
atarina is 26 years o nd likes to dress ele	ld. She enjoys going gantly when going o	g to the theater and eat I ut.	ean food. She is very	organized at hom
/hat is most probabl	e?			
) Katarina is a ballet dan	cer			
) Katarina is a constructi	on worker			
t the time I provided	my answer, I felt:			
	Guessina	Fairly	certain	Certain. I'm right
las the answer imme	pdiately obvious to v	0112		
/as the answer imme Definitely not	ediately obvious to y Probably not	ou? Might or might not	Probably yes	Definitely yes
/ <mark>as the answer imme</mark> Definitely not ◯	ediately obvious to y Probably not	ou? Might or might not	Probably yes	Definitely yes
l <mark>'as the answer imme</mark> Definitely not ◯	ediately obvious to y Probably not	ou? Might or might not	Probably yes	Definitely yes
Vas the answer imme Definitely not	ediately obvious to y Probably not	ou? Might or might not	Probably yes	Definitely yes
Vas the answer imme Definitely not	ediately obvious to y Probably not	ou? Might or might not	Probably yes	Definitely yes
<mark>las the answer immer Definitely not ○ id the answer you pi Definitely not</mark>	ediately obvious to y Probably not	ou? Might or might not	Probably yes	Definitely yes
I'as the answer imme Definitely not	ediately obvious to y Probably not	ou? Might or might not	Probably yes	Definitely yes
/as the answer imme Definitely not id the answer you pi Definitely not	ediately obvious to y Probably not	ou? Might or might not	Probably yes Probably yes	Definitely yes
Interpretation of the answer immediately not the answer you place of the answe	ediately obvious to y Probably not	ou? Might or might not	Probably yes	Definitely yes
As the answer imme Definitely not id the answer you pi Definitely not 	ediately obvious to y Probably not icked match the desc Probably not Probably not	ou? Might or might not cription of the person? Might or might not S is a randomly chosen and 500 football player	Probably yes Probably yes Probably yes participant of this stus	Definitely yes
As the answer imme Definitely not id the answer you pi Definitely not 	ediately obvious to y Probably not icked match the desc Probably not Probably not	ou? Might or might not Cription of the person? Might or might not S is a randomly chosen and 500 football player n with good food and dr is fiancé.	Probably yes	Definitely yes
As the answer imme Definitely not id the answer you pi Definitely not 	ediately obvious to y Probably not icked match the desc Probably not Probably not e were tested. James re 500 film reviewers I. He enjoys a night i as three cats with hi e?	ou? Might or might not Cription of the person? Might or might not S is a randomly chosen and 500 football player is fiancé.	Probably yes	Definitely yes
/as the answer imme Definitely not O id the answer you pi Definitely not O -34 a study 1000 people articipants there wer ames is 34 years old very thursday, and h /hat is most probabl O James is a film reviewer	ediately obvious to y Probably not icked match the desc Probably not Probably not e were tested. James re 500 film reviewers I. He enjoys a night i as three cats with hi e? or	ou? Might or might not cription of the person? Might or might not S is a randomly chosen and 500 football player n with good food and dr is fiancé.	Probably yes	Definitely yes

	Guessing	Fairly	Fairly certain	
<i>l</i> as the answer imm	ediately obvious to y	ou?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
0	0	0	0	0
id the answer you p	icked match the des	cription of the person?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
0	0	0	\bigcirc	\bigcirc
_35				
a study 1000 peop articipants there we ladys likes having f	le were tested. Glady re 500 twenty-year of riends over to gossip	s is a randomly chosen lds and 500 seventy-yea o over cake and coffee.	participant of this st r olds. She drinks tea every	udy. Among the morning and enjoy
a study 1000 peop articipants there we ladys likes having f ewing curtains and /hat is most probab) Gladys is a twenty-yea) Gladys is a seventy-yea	le were tested. Glady re 500 twenty-year of riends over to gossig pillows when she is r le? ar old	s is a randomly chosen lds and 500 seventy-yea o over cake and coffee. S not watering her plants.	participant of this st r olds. She drinks tea every	udy. Among the morning and enjoy
a study 1000 peop articipants there we ladys likes having f ewing curtains and /hat is most probab) Gladys is a twenty-yea) Gladys is a seventy-yea t the time I provided	le were tested. Glady re 500 twenty-year of riends over to gossip pillows when she is r le? ar old ear old ear old	s is a randomly chosen lds and 500 seventy-yea o over cake and coffee. S not watering her plants.	participant of this st r olds. She drinks tea every	udy. Among the morning and enjoy
a study 1000 peop articipants there we ladys likes having f ewing curtains and /hat is most probab) Gladys is a twenty-yea) Gladys is a seventy-yea t the time I provided	le were tested. Glady re 500 twenty-year of riends over to gossig pillows when she is r le? ar old ear old d my answer, I felt: Guessing	s is a randomly chosen lds and 500 seventy-yea o over cake and coffee. S not watering her plants. Fairly	participant of this st r olds. She drinks tea every	udy. Among the morning and enjoy
a study 1000 peopl articipants there we ladys likes having f ewing curtains and /hat is most probab) Gladys is a twenty-yea) Gladys is a seventy-yea t the time I provided	le were tested. Glady re 500 twenty-year of riends over to gossip pillows when she is r le? ar old ear old d my answer, I felt: Guessing	s is a randomly chosen lds and 500 seventy-yea o over cake and coffee. S not watering her plants. Fairly	participant of this st r olds. She drinks tea every	udy. Among the morning and enjoy Certain, I'm right
a study 1000 peoplarticipants there we ladys likes having f ewing curtains and /hat is most probab) Gladys is a twenty-yea) Gladys is a seventy-yea t the time I provideo	le were tested. Glady re 500 twenty-year of riends over to gossip pillows when she is r le? ar old ar old d my answer, I felt: Guessing	s is a randomly chosen lds and 500 seventy-yea p over cake and coffee. S not watering her plants. Fairly	participant of this st r olds. She drinks tea every certain	udy. Among the morning and enjoy Certain, I'm right
A a study 1000 people articipants there we ladys likes having f ewing curtains and /hat is most probab) Gladys is a twenty-yea) Gladys is a seventy-yea t the time I provided /as the answer imme Definitely not	le were tested. Glady riends over to gossip pillows when she is in le? ar old ear old d my answer, I felt: Guessing ediately obvious to y Probably not	s is a randomly chosen lds and 500 seventy-yea pover cake and coffee. S not watering her plants. Fairly ou? Might or might not	participant of this st r olds. She drinks tea every certain Probably yes	udy. Among the morning and enjoy Certain, I'm right
A a study 1000 peoplarticipants there we sladys likes having f ewing curtains and /hat is most probab O Gladys is a twenty-yea O Gladys is a seventy-yea At the time I provided Mas the answer imm Definitely not	le were tested. Glady re 500 twenty-year of riends over to gossip pillows when she is r le? ar old ar old d my answer, I felt: Guessing ediately obvious to y Probably not O	s is a randomly chosen lds and 500 seventy-yea pover cake and coffee. S not watering her plants. Fairly ou? Might or might not	participant of this st r olds. She drinks tea every certain Probably yes	udy. Among the morning and enjoy Certain, I'm right Definitely yes

fom is sixteen years o vould rather play vide	Id and just got his o o games with his fr	drivers licence. He is not iends. His favorite meal	t particularly motivat is pizza and diet cok	ed for school and e.
What is most probable	?			
O Tom walks to school				
O Tom drives a car to scho	ol			
At the time I provided	my answer, I felt:			
	Guessing	Fairly	certain	Certain, I'm right
Was the answer immed	diately obvious to y	ou?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
Did the answer you pic	ked match the des	cription of the person?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
0	0	0	0	0
call_simple				
Write down as many ca	apital letter words y	ou can remember from	the word comparisor	n task in the
beginning of this surve the lower case letter w	y. If you don't reme ords from the same	ember any of them you r	nay write "don't know	w" or choose from
				li
Fill in the missing wore	d from a previously	presented sentence:		
Fill in the missing word	d from a previously is to do are	presented sentence: and having sleepovers v	with friends to gossi	o about other kids
Fill in the missing word "Kelly's favourite thing school."	d from a previously ıs to do are	presented sentence: and having sleepovers	with friends to gossi	o about other kids
Fill in the missing word "Kelly's favourite thing school."	d from a previously ıs to do are	presented sentence: and having sleepovers v	with friends to gossi	o about other kids
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Fill in the missing word from a previously presented sentence:

"Among the participants there were 3 who live in a condo and 997 who live in a _____

Fill in the missing word from a previously presented sentence:

"Among the participants there were 997 nurses and 3

Fill in the missing word from a previously presented sentence:

"Jay has been living on his own for 2 years. He has an older car and listens to _____ music"

Fill in the missing word from a previously presented sentence:

"On Friday nights, Jessie likes to go out with friends and listen to loud music and drink _____

Fill in the missing word from a previously presented sentence:

"Among the participants there were 4 whose favorite series is Star Wars and 996 whose favorite series is

Fill in the missing word from a previously presented sentence:

"Among the participants there were 995 _____ olds and 5 sixteen-year olds."

Fill in the missing word from a previously presented sentence:

"Among the participants there were 5 who buy their clothes at _____ and 995 who buy their clothes at high-end retailers."

Fill in the missing word from a previously presented sentence:

"Among the participants there were 996 _____ and 4 executive managers."

Fill in the missing word from a previously presented sentence:

fill in the missing word from a previously presented sentence:	
Among the participants there were 995 French people and 5"	
Fill in the missing word from a previously presented sentence:	
'Among the participants there were 5 and 995 street artists."	
-ill in the missing word from a previously presented sentence:	
'Molly is 25 years old. She is very healthy and she works out at least times a week. "	
Fill in the missing word from a previously presented sentence:	
'Nina has blond hair, green eyes and has parents in ."	
Fill in the missing word from a previously presented sentence:	
'Among the participants there were 3 and 997 consultants."	
fill in the missing word from a proviously presented sentence:	
Among the participants there were 907 and 2 librarians "	
Among the participants there were 337 and 5 librarians.	
Till in the minetum mend from a maniformal management of a sufference.	
Fill in the missing word from a previously presented sentence:	
Fill in the missing word from a previously presented sentence: Among the participants there were 996 and 4 firemen."]
Fill in the missing word from a previously presented sentence:]
Fill in the missing word from a previously presented sentence:]
Fill in the missing word from a previously presented sentence: "Among the participants there were 996 and 4 firemen." Fill in the missing word from a previously presented sentence:]

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Fill in the missing word from a p	previously presented sentence:	
"Alex has brown eyes, brown ha	air and drives a car."	
Fill in the missing word from a p	previously presented sentence:	
"Among the participants there w	vere 995 shoe shop workers and 5"	
Fill in the missing word from a p	previously presented sentence:	
"Emma has red hair, and	five fingers on each hand."	
Fill in the missing word from a p	previously presented sentence:	
"Frida is 27 years old and origin	ally from"	
Fill in the missing word from a p	previously presented sentence:	
"Among the participants there w	vere 995 body builders and 5	
C-18i		

For each of the statements below, please indicate whether or not the statement is characteristic of you or of what you believe. For example, if the statement is extremely uncharacteristic of you or of what you believe about yourself (not at all like you) please click on the first dot to the right of the statement. If the statement is extremely characteristic of you or of what you believe about yourself (very much like you) please click on the dot furthest to the right next to the statement.

	Extremely uncharacteristic of me	Somewhat uncharacteristic of me	Uncertain	Somewhat characteristic of me	Extremely characteristic of me
I would prefer complex over simple problems.	0	0	0	0	0
I like to have the responsibility of handling a situation that requires a lot of thinking.	0	0	\bigcirc	0	\bigcirc
Thinking is not my idea of fun.	0	\bigcirc	\bigcirc	\bigcirc	\bigcirc
I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.	0	\bigcirc	0	0	\bigcirc
I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.	0	0	\bigcirc	0	\bigcirc
I find satisfaction in deliberating hard and for long hours.	0	\bigcirc	\bigcirc	\bigcirc	\bigcirc
I only think as hard as I have to.	0	\bigcirc	\bigcirc	\bigcirc	\bigcirc
I prefer to think about small daily projects over long term projects.	0	0	\bigcirc	0	\bigcirc
I like tasks that require little thought once I've learned them.	0	0	\bigcirc	0	\bigcirc

	Extremely uncharacteristic of me	Somewhat uncharacteristic of me	Uncertain	Somewhat characteristic of me	Extremely characteristic of me
The idea of relying on thought to make my way to the top appeals to me.	0	0	0	0	0
I really enjoy a task that involves coming up with new solutions to problems.	0	\bigcirc	0	0	\bigcirc
Learning new ways to think doesn't excite me very much.	0	\bigcirc	\bigcirc	\bigcirc	\bigcirc
I prefer my life to be filled with puzzles that I must solve.	0	\bigcirc	\bigcirc	\bigcirc	\bigcirc
The notion of thinking abstractly is appealing to me.	0	\bigcirc	\bigcirc	\bigcirc	\bigcirc
I would prefer a task that is intellectual, difficult, and important over one that is somewhat important but does not require much thought.	0	0	\bigcirc	0	0
I feel relief rather than satisfaction after completing a task that requires a lot of mental effort.	0	\bigcirc	0	0	\bigcirc
It's enough for me that something gets the job done; I don't care how or why it works.	0	\bigcirc	\bigcirc	\bigcirc	\bigcirc
I usually end up deliberating about issues even when they do not affect me personally.	0	\bigcirc	\bigcirc	0	\bigcirc
○ Non-binary					
Non-binary How old are you?					
 Non-binary How old are you? Which subject are you studying? (e.g. Medicin 	e)				
Non-binary How old are you? Which subject are you studying? (e.g. Medicin	e)				
 Non-binary How old are you? Which subject are you studying? (e.g. Medicin Were you at any point distracted by for instance survey? 	e) ce your phone, T	⁻V, people or s	somethin	g else while	e taking this
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 Non-binary How old are you? Which subject are you studying? (e.g. Medicin Were you at any point distracted by for instance survey? Yes No 	e) ce your phone, T	⁻V, people or s	somethin	g else while	taking this

Appendix D

Teleological Form

Consent

Please test your judgement and decision-making skills. There are 32 slightly different tasks assessing judgement and decision-making, followed by a confidence rating and at the end a memory test. It should take 25-35 min

Yes, I consent and my data can be used for research

O Yes, I consent but my data shall not be used for research

Wordsum

We want to know how people guess the meaning of words that they rarely or never use. You will be presented with some words in capital letters that you may or may not know the meaning of, along with five other random words. Your task is to find the word that best describes or goes well with the capital letter word.

Here is an example:

BEAST afraid, words, large, animal, separate

The correct answer in this instance is "animal" as that is the word that resembles beast the most.

Space		
🔿 school		
🔿 noon		
⊖ captain		
🔘 room		

- board
- don't know

BROADEN

⊖ efface	
🔿 make level	
⊖ elapse	
🔿 embroider	
🔿 widen	

O don't know

EMANATE

- O populate
- free
- prominent
- 🔘 rival
- ⊖ come
- 🔘 don't know

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EDIBLE

- ⊖ auspicious
- eligible
- $\bigcirc\,$ fit to eat
- \bigcirc sagacious
- able to speak
- 🔘 don't know

ANIMOSITY

- hatred
- \bigcirc animation
- disobedience
- diversity
- friendship
- 🔘 don't know

PACT

- O puissance
- remonstrance
- agreement
- skillet
- ⊖ pressure
- 🔘 don't know

CLOISTERED

- ⊖ miniature
- O bunched
- \bigcirc arched
- ⊖ malady
- \bigcirc secluded
- O don't know

CAPRICE

value
a star
grimace
whim
inducement
don't know

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ACCUSTOM				
🔘 disappoint				
customary				
 encounter 				
◯ get used to				
⊖ business				
⊖ don't know				
0				
ALLUSION				
○ reference				
⊖ dream				
⊖ eulogy				
⊖ illusion				
🔘 aria				
🔘 don't know				
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eleo01				
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At the time i provided	a my answer, i teit.			
	Guessing	Fairly c	ertain	Certain, I'm right
Was the answer imm	odiately obvious to y	(QU)2		
Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat acree	Strongly agree
leo02				
Potatoes contain sta	rch because they are	ow in the ground		
	False		True	

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At the time I provided	my answer, I felt:			

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Please fill in the mis replicate be Please fill in the mis Potatoes contain Please fill in the mis Snowflakes are wh Please fill in the mis Kyes open Please fill in the mis	essing word form a prevention of the secause they are micro- essing word form a preventive because they greater because they are sesing word form a preventive because they are management of the secause the	viously presented statem scopic" viously presented statem row in the ground" viously presented statem de of metal" viously presented statem	ent: ent: ent:	

Please fill in the missing word form a previously presented statement:
" are built so that cities have landmarks"
Please fill in the missing word form a previously presented statement:
"Houses have in order to make dogs bark"
Please fill in the missing word form a previously presented statement:
"I amps shine brightly so that they can produce "
Please fill in the missing word form a proviously presented statement:
"Kittens have soft fur so that people will want to them"
Discos fill in the mission word form a manipush, and and at the ments
Please fill in the missing word form a previously presented statement:
Please fill in the missing word form a proviously presented statement:
"The sun makes light so that plants can "
Please fill in the missing word form a provisually presented statements
"The sup sets because discourages predeters"
The sun sets because discourages predators
Disease fill in the mission word form a previously presented statements
Please fill in the missing word form a previously presented statement:
The earth rotates around the sun so that it can receive
Please fill in the missing word form a previously presented statement:
"Grass grows so that herbivores can on it"

	ang word form a previously presented statement:	
Molecules fuse in o	rder to create"	
lease fill in the miss	sing word form a previously presented statement:	
mutate in or	der to become drug resistant"	
lease fill in the miss	sing word form a previously presented statement:	
Oceans dissolve	in order to retain ocean minerals"	
lagge fill in the mice	sing ward form a providually presented atotomout	
lease fill in the miss	sing word form a previously presented statement:	
en (1. 1. 1.		
The earth has an oz	one layer in order to protect it from"	
The earth has an oz	one layer in order to protect it from"	
The earth has an oz	one layer in order to protect it from"	
The earth has an oz Please fill in the mise	one layer in order to protect it from"	
The earth has an oz lease fill in the miss Birds transfer	one layer in order to protect it from" sing word form a previously presented statement: in order to help plants reproduce"	
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The earth has an oz lease fill in the miss Birds transfer	one layer in order to protect it from" sing word form a previously presented statement: in order to help plants reproduce"	
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The earth has an oz Please fill in the miss Birds transfer Please fill in the miss Glaciers compact _	one layer in order to protect it from" sing word form a previously presented statement:in order to help plants reproduce" sing word form a previously presented statement:in order to conserve volume"	
The earth has an oz lease fill in the miss Birds transfer lease fill in the miss Glaciers compact _ lease fill in the miss	one layer in order to protect it from" sing word form a previously presented statement:	
The earth has an oz lease fill in the miss Birds transfer lease fill in the miss Glaciers compact lease fill in the miss	one layer in order to protect it from" sing word form a previously presented statement:in order to help plants reproduce" sing word form a previously presented statement:in order to conserve volume" sing word form a previously presented statement:in order to a previously presented statement:	
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The earth has an oz lease fill in the miss Birds transfer lease fill in the miss Glaciers compact lease fill in the miss	one layer in order to protect it from" sing word form a previously presented statement:in order to help plants reproduce" sing word form a previously presented statement:in order to conserve volume" sing word form a previously presented statement: wers in order to aid pollination"	
The earth has an oz Please fill in the miss Birds transfer Please fill in the miss Glaciers compact Please fill in the miss frequent flow	one layer in order to protect it from" sing word form a previously presented statement:in order to help plants reproduce" sing word form a previously presented statement:in order to conserve volume" sing word form a previously presented statement: wers in order to aid pollination" sing word form a previously presented statement:	

"People wear	in order to see more clearly"
Nacco fill in the m	issing word form a provincely presented atotements
	because auger is a main ingradient"
Please fill in the m	issing word form a previously presented statement.
'l eaves change co	olor because deteriorates"
Leaves change of	
Place fill in the m	issing word form a provinuely presented statement:
"Cigorottop produ	issing word form a previously presented statement.
Cigarettes produc	
Please fill in the m	issing word form a previously presented statement:
"Objects fall down	wards because they are affected by"
Please fill in the m	Issing word form a previously presented statement:
'Magnets stick tog	ether because their attract"
Please fill in the m	issing word form a previously presented statement:
lcicles melt becau	increases"
Please fill in the m	issing word form a previously presented statement:
" happen in	order to help celebrate special occasions"
Please fill in the m	issing word form a previously presented statement:

Please fill in the missing word form a previously presented statement:

"Alarm clocks _____ in order to wake people up"

NfC-18i

For each of the statements below, please indicate whether or not the statement is characteristic of you or of what you believe. For example, if the statement is extremely uncharacteristic of you or of what you believe about yourself (not at all like you) please click on the first dot to the right of the statement. If the statement is extremely characteristic of you or of what you believe about yourself (very much like you) please click on the dot furthest to the right next to the statement.

	Extremely uncharacteristic of me	Somewhat uncharacteristic of me	Uncertain	Somewhat characteristic of me	Extremely characteristic of me
I would prefer complex over simple problems.	0	0	0	0	0
I like to have the responsibility of handling a situation that requires a lot of thinking.	\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
Thinking is not my idea of fun.	\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.	\bigcirc	\bigcirc	\bigcirc	0	\bigcirc
I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.	\bigcirc	\bigcirc	\bigcirc	0	\bigcirc
I find satisfaction in deliberating hard and for long hours.	\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
I only think as hard as I have to.	\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
I prefer to think about small daily projects over long term ones.	\bigcirc	\bigcirc	\bigcirc	0	\bigcirc
I like tasks that require little thought once I've learned them.	\bigcirc	\bigcirc	\bigcirc	0	\bigcirc
The idea of relying on thought to make my way to the top appeals to me.	\bigcirc	\bigcirc	\bigcirc	0	\bigcirc
I really enjoy a task that involves coming up with new solutions to problems.	\bigcirc	\bigcirc	\bigcirc	0	\bigcirc
Learning new ways to think doesn't excite me very much.	\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
I prefer my life to be filled with puzzles that I must solve.	\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
The notion of thinking abstractly is appealing to me.	\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
I would prefer a task that is intellectual, difficult, and important over one that is somewhat important but does not require much thought.	0	0	0	0	0
I feel relief rather than satisfaction after completing a task that requires a lot of mental effort.	0	\bigcirc	\bigcirc	0	\bigcirc
It's enough for me that something gets the job done; I don't care how or why it works.	0	\bigcirc	\bigcirc	0	0
I usually end up deliberating about issues even when they do not affect me personally.	0	0	0	0	\bigcirc

Pers

What is your gender?

Female

Male

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O Non-binary

How old are you?

Appendix E

Syllogism Form

Consent

Please test your judgement and decision-making skills. There are 32 slightly different tasks assessing judgement and decision-making, followed by a confidence rating and at the end a memory test. It should take 35-45 min

O Yes, I consent and my data can be used for research

O Yes, I consent but my data shall not be used for research

Wordsum

We want to know how people guess the meaning of words that they rarely or never use. You will be presented with some words in capital letters that you may or may not know the meaning of, along with five other random words. Your task is to find the word that best describes or goes well with the capital letter word.

Here is an example:

BEAST afraid, words, large, animal, separate

The correct answer in this instance is "animal" as that is the word that resembles beast the most.

Space			
🔘 school			
🔘 noon			
⊖ captain			
🔘 room			

- board
- O don't know

BROADEN

- efface
 make level
 elapse
 embroider
 widen
- O don't know

EMANATE

- O populate
- free
- O prominent
- 🔘 rival
- ⊖ come
- don't know

EDIBLE

- ⊖ auspicious
- eligible
- fit to eat
- \bigcirc sagacious
- able to speak
- 🔘 don't know

ANIMOSITY

- hatred
- \bigcirc animation
- disobedience
- diversity
- friendship
- 🔘 don't know

PACT

- O puissance
- remonstrance
- agreement
- skillet
- ⊖ pressure
- 🔘 don't know

CLOISTERED

- ⊖ miniature
- O bunched
- \bigcirc arched
- ⊖ malady
- \bigcirc secluded
- O don't know

CAPRICE

value
a star
grimace
whim
inducement
don't know

ACCUSTOM

- disappoint
- Customary
- encounter
- ⊖ get used to
- ⊖ business
- don't know

ALLUSION

- reference
- ⊖ dream
- eulogy
- illusion
- 🔿 aria
- don't know

Information

In the following task you will be presented with two premises and one conclusion. Your task is to evaluate whether the conclusion is true or false, based on the premises. It is important to set aside the facts you already know to be true in the real world and only focus on the premises you have been given.

You will also be asked to rate your level of confidence and whether the conclusion is in line with your view of the world.

SylloVU01

Premise 1: All things that are smoked are good for health Premise 2: Cigarettes are smoked

	False		True	
	0		0	
t the time I provided	d my answer, I felt:			
	Guessing	Fairly	certain	Certain I'm right
the conclusion in I	ine with your view of	the world?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
Definitely not			-	-

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		-	Taua	
			i rue	
	-			
t the time I provide	d my answer, I felt:			
	Guessing	Fairly	certain	Certain I'm right
the conclusion in	line with your view of	f the world?		
	,			
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
Definitely not	Probably not	Might or might not	Probably yes O True	Definitely yes
Definitely not OgismVU03 remise 1: All mamn remise 2: Whales a onclusion: Whales	Probably not Probably not O nals walk re mammals walk False O d my answer, I felt:	Might or might not	Probably yes True	Definitely yes
Definitely not	Probably not	Might or might not	Probably yes True Certain	Certain I'm right
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
Definitely not OgismVU03 remise 1: All mamn remise 2: Whales a onclusion: Whales t the time I provide the conclusion in Definitely not O	Probably not	Might or might not O Fairly of Fairly of Might or might not O	Probably yes	Definitely yes
,				
---	---	---	----------------------	----------------------------------
	False		True	
	\bigcirc		\bigcirc	
At the time I provided	my answer, I felt:			
	Guessing	Fairly	certain	Certain I'm right
	0	,		0
s the conclusion in li	ne with your view of	f the world?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
ogismVU05				
<u> </u>				
Promise 1: All grapes	are rine			
Premise 2: Everything	g ripe glows in the d	ark		
	5 - 1 - 5			
Senelusien, All grone	s alow in the dark			
conclusion: All grape	s giow in the dark			
conclusion: All grape	False		True	
	False		True	
	False		True	
At the time I provided	False		True	
At the time I provided	False	Fairly	True O	Certain I'm right
At the time I provided	False	Fairly	True O	Certain I'm right
At the time I provided	False	Fairly	True	Certain I'm right
At the time I provided	False	Fairly	True	Certain I'm right
At the time I provided	False	Fairly o	True O	Certain I'm right
At the time I provided	False	Fairly	True O	Certain I'm right
At the time I provided	False	Fairly	True O	Certain I'm right
At the time I provided	False	Fairly	True O	Certain I'm right
At the time I provided	False	Fairly of the world?	True O	Certain I'm right
At the time I provided	False The my answer, I felt: Guessing	Fairly of the world?	True	Certain I'm right
At the time I provided	False Telse	Fairly of f the world?	Certain Probably yes	Certain I'm right
At the time I provided	False	Fairly of find the world?	Probably yes	Certain I'm right
At the time I provided	False	Fairly of find the world?	True	Certain I'm right
At the time I provided	False	Fairly of the world?	True	Certain I'm right
At the time I provided	False	Fairly of find the world?	True	Certain I'm right
At the time I provided	False	Fairly of the world?	True	Certain I'm right
At the time I provided S the conclusion in Ii Definitely not O O O O O O O O O O O O O O O O O O O	False	Fairly of the world?	Probably yes	Certain I'm right
At the time I provided S the conclusion in Ii Definitely not O O O O O O O O O O O O O O O O O O O	False False Guessing New With Your view of Probably not Fre batteries are trees	Fairly of f the world? Might or might not	True	Certain I'm right
At the time I provided S the conclusion in Ii Definitely not O O O O O O O O O O O O O O O O O O O	False False Guessing New With Your View of Probably not Probably not Fre batteries are trees s are batteries	Fairly of f the world? Might or might not	True	Certain I'm right Definitely yes
At the time I provided At the time I provided S the conclusion in Ii Definitely not O O O O O O O O O O O O O O O O O O O	False False Guessing ne with your view of Probably not Probably not Fre batteries are trees s are batteries False	Fairly of the world?	Probably yes	Certain I'm right
At the time I provided At the time I provided s the conclusion in li Definitely not ogismVU06 Premise 1: All trees a Premise 2: All apples Conclusion: All apple	False False Guessing New With your view of Probably not Probably not Fre batteries are trees S are batteries False False	Fairly of the world?	True	Certain I'm right Definitely yes
At the time I provided At the time I provided S the conclusion in Ii Definitely not O O O O O O O O O O O O O O O O O O O	False	Fairly of the world?	True	Certain I'm right

	Guessing	Fairly	certain	Certain I'm right
s the conclusion in li	ne with your view of	the world?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
0	0	\bigcirc	0	0
ogismVU07				
Premise 1: No edible Premise 2: Some jum	product is a toadstoo ping mushrooms are	ol toadstools		
Conclusion: Some jur	False	e not edible	True	
	0		\bigcirc	
At the time I provided	my answer, I felt:			
	Guessing	Fairly	certain	Certain I'm right
s the conclusion in li	ne with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in li Definitely not	ne with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in li Definitely not O ogismVU08	ne with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in li Definitely not O ogismVU08 Premise 1: All raspbe Premise 2: No bluebe	ne with your view of Probably not O	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in li Definitely not O ogismVU08 Premise 1: All raspbe Premise 2: No bluebe Conclusion: Some ve	ne with your view of Probably not O Probably not Probably not Probably not	the world? Might or might not	Probably yes O	Definitely yes
s the conclusion in li Definitely not O ogismVU08 Premise 1: All raspbe Premise 2: No bluebe Conclusion: Some ve	ne with your view of Probably not O Probably not O Probably not O Probably not O Fraise False	the world? Might or might not	Probably yes O True	Definitely yes
s the conclusion in li Definitely not O ogismVU08 Premise 1: All raspbe Premise 2: No bluebe Conclusion: Some ve	ne with your view of Probably not O Probably not Setables that speak F False	the world? Might or might not	Probably yes O Es True	Definitely yes
s the conclusion in li Definitely not O ogismVU08 Premise 1: All raspbe Premise 2: No bluebe Conclusion: Some ve	ne with your view of Probably not rries speak Polish rries are raspberries getables that speak F False False my answer, I felt:	the world? Might or might not	Probably yes O ES True	Definitely yes
s the conclusion in li Definitely not O ogismVU08 Premise 1: All raspbe Premise 2: No bluebe Conclusion: Some ve	ne with your view of Probably not rries speak Polish rries are raspberries getables that speak F False False my answer, I felt:	the world? Might or might not	Probably yes es True	Definitely yes
s the conclusion in li Definitely not O ogismVU08 Premise 1: All raspbe Premise 2: No bluebe Conclusion: Some ve	ne with your view of Probably not O rries speak Polish rries are raspberries getables that speak F False O my answer, I felt:	the world? Might or might not	Probably yes es True	Definitely yes

	Guessing	Fairly	certain	Certain I'm right
s the conclusion in li	ine with your view of	the world?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
0	0	U	\bigcirc	\bigcirc
ogismVB09				
remise 1: All grasse remise 2: Everything	s are green g green is alive			
onclusion: All grass	ses are alive		T	
t the time I provided	l my answer, I felt:			
	Guessing	Fairly	certain	Certain I'm righ
the conclusion in li	ine with your view of	the world?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
\bigcirc	\bigcirc	()	()	\bigcirc
⊖ >gismVB10	0	0	0	0
OgismVB10	0	0	0	0
O ogismVB10 remise 1: All plums remise 2: All Mirabe	have seeds lle prunes are plums	0	0	0
O ogismVB10 remise 1: All plums remise 2: All Mirabe onclusion: All Mirab	have seeds lle prunes are plums selle prunes have see	ds	0	0
O ogismVB10 remise 1: All plums remise 2: All Mirabe conclusion: All Mirab	have seeds lie prunes are plums pelle prunes have see False	ن) eds	True	0
O ogismVB10 remise 1: All plums remise 2: All Mirabe onclusion: All Mirab	have seeds le prunes are plums belle prunes have see False	 eds	U True	0
O pgismVB10 remise 1: All plums remise 2: All Mirabe onclusion: All Mirab	have seeds le prunes are plums pelle prunes have see False O	 eds	() True ()	0
ogismVB10 remise 1: All plums remise 2: All Mirabe onclusion: All Mirab	have seeds lle prunes are plums pelle prunes have see False O	ن eds	() True ()	0
ogismVB10 remise 1: All plums remise 2: All Mirabe onclusion: All Mirab	have seeds lile prunes are plums pelle prunes have see False O	c) :ds	() True ()	0

	Cuccong	Fairly d	certain	Certain I'm right
s the conclusion in I	line with your view of	the world?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
0	0	0	0	0
ogismVB11				
Premise 1: No rabbit Premise 2: Some due	s have colorful feathe cks have colorful featl	rs ners		
Conclusion: Some d	ucks are not rabbits		True	
			\bigcirc	
t the time I provided	d my answer, I felt:			
	Guessing	Fairly	certain	Certain I'm righ
s the conclusion in I Definitely not	line with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in I Definitely not O DgismVB12	line with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in I Definitely not O ogismVB12 Premise 1: All moths Premise 2: No bats a	Ine with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in I Definitely not O ogismVB12 Premise 1: All moths Premise 2: No bats a Conclusion: Some an	Ine with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in I Definitely not O ogismVB12 Premise 1: All moths Premise 2: No bats a Conclusion: Some an	line with your view of Probably not offly at night a fly at night re moths nimals that fly at night False	the world? Might or might not	Probably yes O True	Definitely yes
s the conclusion in I Definitely not ogismVB12 Premise 1: All moths Premise 2: No bats a Conclusion: Some an	line with your view of Probably not offly at night a fly at night irre moths nimals that fly at night False	the world? Might or might not	Probably yes O True	Definitely yes
s the conclusion in I Definitely not ogismVB12 Yremise 1: All moths Yremise 2: No bats a Conclusion: Some an	line with your view of Probably not Galaxies fly at night are moths nimals that fly at night False Galaxies False Galaxies fly at night False	the world? Might or might not	Probably yes O True	Definitely yes
s the conclusion in I Definitely not O ogismVB12 Premise 1: All moths Premise 2: No bats a Conclusion: Some an	line with your view of Probably not offly at night are moths nimals that fly at night False o d my answer, I felt:	the world? Might or might not	Probably yes O True	Definitely yes
s the conclusion in I Definitely not ogismVB12 Premise 1: All moths Premise 2: No bats a Conclusion: Some an	line with your view of Probably not fly at night are moths nimals that fly at night False d my answer, I felt:	the world? Might or might not	Probably yes True	Definitely yes
s the conclusion in I Definitely not O ogismVB12 Premise 1: All moths Premise 2: No bats a Conclusion: Some an	line with your view of Probably not offly at night a fly at night a fly at night False o d my answer, I felt:	the world? Might or might not	Probably yes O True	Definitely yes

	Guessing	Fairly certain	Certain	I'm right
s the conclusion in li	ine with your view of	the world?		
Definitely not	Probably not	Might or might not	Probab l y yes	Definitely yes
0	0	0	0	0
logismVB13				
Premise 1: All womer Premise 2: Some of w	n's rights should be s vomen's rights are ab	upported oortions		
Conclusion: Some ab	oortions should be su	ipported		
	False		True	
	\bigcirc		0	
At the time I provided	I my answer, I felt:	Fairly	certain	Certain I'm right
	-			-
s the conclusion in li	ine with your view of	the world?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
0		_		
logismVB14 Premise 1: Some fetu	ises should be proted	cted		
ogismVB14 Premise 1: Some fetu Premise 2: All fetuses	ises should be protec s are human beings	cted		
logismVB14 Premise 1: Some fetu Premise 2: All fetuses Conclusion: Some hu	ises should be protects are human beings uman beings should l	cted be protected	True	
ogismVB14 Premise 1: Some fetu Premise 2: All fetuses Conclusion: Some hu	uses should be protects are human beings uman beings should l False	cted pe protected	True	
ogismVB14 Premise 1: Some fetu Premise 2: All fetuses Conclusion: Some hu	uses should be protects are human beings uman beings should l False	cted be protected	True	
Premise 1: Some fetu Premise 2: All fetuses Conclusion: Some hu	ises should be protects are human beings uman beings should l False O	cted be protected	True	
ogismVB14 Premise 1: Some fetu Premise 2: All fetuses Conclusion: Some hu	ises should be protects are human beings iman beings should l False O	cted be protected	True	
ogismVB14 Premise 1: Some fetu Premise 2: All fetuses Conclusion: Some hu	ises should be protects are human beings iman beings should l False O	cted be protected	True	

	Guessing	Fairly	certain	Certain I'm right
s the conclusion in li	ine with your view of	the world?		
Definitely not	Probably not	Might or might not	Probably yes	Definite l y yes
0	0	0	0	0
ogismVB15				
Premise 1: Some dog Premise 2: All dogs a	is are not mastiffs re mammals			
Conclusion: Some ma	ammals are not mast	iffs	True	
	\bigcirc		0	
t the time I provided	l my answer, I felt:			
	Guessing	Fairly	certain	Certain I'm righ
s the conclusion in li	ine with your view of	the world?		
s the conclusion in li Definitely not	ine with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in li Definitely not O ogismVB16 Premise 1: All pigs ar Premise 2: Some carr	ine with your view of Probably not O	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in li Definitely not O ogismVB16 Premise 1: All pigs ar Premise 2: Some carr Conclusion: Some car	ine with your view of Probably not O re mammals nivores are pigs	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in li Definitely not O ogismVB16 Premise 1: All pigs ar Premise 2: Some carr Conclusion: Some ca	ine with your view of Probably not O Te mammals nivores are pigs arnivores are mamma False	the world? Might or might not	Probably yes O	Definitely yes
s the conclusion in li Definitely not O ogismVB16 Premise 1: All pigs ar Premise 2: Some carr conclusion: Some ca	ine with your view of Probably not O The mammals nivores are pigs arnivores are mamma False	the world? Might or might not	Probably yes O True	Definitely yes
s the conclusion in li Definitely not O ogismVB16 Premise 1: All pigs ar Premise 2: Some car Conclusion: Some car Conclusion: Some car	ine with your view of Probably not O re mammals nivores are pigs mivores are mamma False O I my answer, I felt:	the world? Might or might not	Probably yes True	Definitely yes
s the conclusion in li Definitely not O ogismVB16 Premise 1: All pigs ar Premise 2: Some carr Conclusion: Some carr Conclusion: Some carr	ine with your view of Probably not O re mammals nivores are pigs arnivores are mamma False O I my answer, I felt:	the world? Might or might not	Probably yes True	Definitely yes
s the conclusion in li Definitely not O ogismVB16 Premise 1: All pigs ar Premise 2: Some carr Conclusion: Some carr Conclusion: Some carr	ine with your view of Probably not O Probably not Probably not Pr	the world? Might or might not	Probably yes True	Definitely yes

	Guessing	Fairly	certain	Certain I'm right
s the conclusion in li	ne with your view of t	he world?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
0	0	0	0	0
ogismIB17				
Premise 1: All unemp Premise 2: Rockefelle	loyed people are poor er is not unemployed	r		
Conclusion: Rockefe	ller is not poor		True	
	\bigcirc		0	
at the time I provided	my answer, I felt:			
	Guessing	Fairly	certain	Certain I'm right
s the conclusion in li	ne with your view of t	he world?	Probably yes	Definitely yes
s the conclusion in li Definitely not	ne with your view of t Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in li Definitely not O ogismIB18 Premise 1: All flowers Premise 2: Roses hav	ne with your view of t Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in li Definitely not O ogismIB18 Premise 1: All flowers Premise 2: Roses hav Conclusion: Roses an	ne with your view of t Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in li Definitely not O ogismIB18 Premise 1: All flowers Premise 2: Roses hav Conclusion: Roses an	ne with your view of t Probably not O s have petals ve petals re flowers False	he world? Might or might not	Probably yes O	Definitely yes
s the conclusion in li Definitely not O ogismIB18 Premise 1: All flowers Premise 2: Roses hav Conclusion: Roses an	ine with your view of t Probably not O shave petals re flowers False O	the world? Might or might not	Probably yes True	Definitely yes
s the conclusion in li Definitely not ogismIB18 Premise 1: All flowers Premise 2: Roses hav conclusion: Roses and conclusion: Roses and	ine with your view of t Probably not O shave petals ve petals re flowers False O	the world? Might or might not	Probably yes O True	Definitely yes
s the conclusion in li Definitely not O ogismIB18 Premise 1: All flowers Premise 2: Roses hav Conclusion: Roses and Conclusion: Roses and	ine with your view of t Probably not O shave petals re flowers False O I my answer, I felt:	he world? Might or might not	Probably yes O True	Definitely yes
s the conclusion in li Definitely not O ogismIB18 Premise 1: All flowers Premise 2: Roses hav Conclusion: Roses and Conclusion: Roses and	ine with your view of t Probably not Shave petals re flowers False Shase Market State Stat	the world? Might or might not	Probably yes True	Definitely yes

	Guessing	Fairly	certain	Certain I'm righ
the conclusion in	line with your view of	the world?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
\bigcirc	\bigcirc	0	\bigcirc	\bigcirc
ogismIB19				
remise 1: All easte remise 2: Canada i	ern countries are comn is not an eastern coun	nunist try		
onclusion: Canada	a is not communist			
	False		True	
t the time I provide	ed my answer, I felt:			
	Guessing	Fairly	certain	Certain I'm righ
the conclusion in	line with your view of	the world?		
the conclusion in Definitely not	line with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
the conclusion in Definitely not	line with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
the conclusion in Definitely not	line with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
the conclusion in Definitely not	line with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
the conclusion in Definitely not OgismIB20 remise 1: All thinger remise 2: Automot	Iine with your view of Probably not O s that have a motor ne biles need oil	the world? Might or might not	Probably yes	Definitely yes
the conclusion in Definitely not O Definitely not Definitely not Definitely not O Definitely not O Definitely not O Definitely not O Definitely not O Definitely not Definitely not Definitely not Definite	Iine with your view of Probably not O s that have a motor ne biles need oil obiles have motors	the world? Might or might not	Probably yes	Definitely yes
the conclusion in Definitely not OgismIB20 remise 1: All things remise 2: Automotion onclusion: Automotion	Iine with your view of Probably not O s that have a motor ne biles need oil obiles have motors	the world? Might or might not	Probably yes	Definitely yes
the conclusion in Definitely not OpismIB20 remise 1: All things remise 2: Automotion onclusion: Automotion False True	Iine with your view of Probably not O s that have a motor ne biles need oil obiles have motors	the world? Might or might not	Probably yes	Definitely yes
the conclusion in Definitely not OgismIB20 remise 1: All things remise 2: Automotion onclusion: Automotion) False) True	Iine with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
the conclusion in Definitely not OgismIB20 remise 1: All things remise 2: Automot onclusion: Automot) False) True	I line with your view of Probably not S that have a motor ne biles need oil obiles have motors	the world? Might or might not	Probably yes	Definitely yes

	Guessing	Fairly	certain	Certain I'm right
s the conclusion in I	ine with your view of	the world?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
0	0	0	0	0
ogismIB21				
Premise 1: All the wo Premise 2: All the fru	rmy fruits fall from th its that fall from the t	ne tree ree are overripe		
Conclusion: All over	ripe fruits are wormy		True	
	\bigcirc		0	
At the time I provided	d my answer, I felt:			
	Guessing	Fairly	certain	Certain I'm righ
the conclusion in l	ine with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
5 the conclusion in I Definitely not	ine with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in I Definitely not O DegismIB22	ine with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in I Definitely not O ogismIB22 Premise 1: Everythin Premise 2: Everythin	ine with your view of Probably not O g healthy is sour g yellow is healthy	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in I Definitely not O ogismIB22 Premise 1: Everythin Premise 2: Everythin Conclusion: Everythin	ine with your view of Probably not O g healthy is sour g yellow is healthy ing sour is yellow	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in I Definitely not O Definitely not O Definitely not O SogismIB22 Premise 1: Everythin Premise 2: Everythin Conclusion: Everythi	ine with your view of Probably not O g healthy is sour g yellow is healthy ing sour is yellow False	the world? Might or might not	Probably yes O	Definitely yes
s the conclusion in I Definitely not O ogismIB22 Premise 1: Everythin Premise 2: Everythin Conclusion: Everythi	ine with your view of Probably not g healthy is sour g yellow is healthy ing sour is yellow False	the world? Might or might not	Probably yes O True	Definitely yes
s the conclusion in I Definitely not ogismIB22 Premise 1: Everythin Premise 2: Everythin Conclusion: Everythin	ine with your view of Probably not G g healthy is sour g yellow is healthy ing sour is yellow False G hamy answer, I felt:	the world? Might or might not	Probably yes True	Definitely yes
s the conclusion in I Definitely not ogismIB22 remise 1: Everythin remise 2: Everythin conclusion: Everythin	ine with your view of Probably not g healthy is sour g yellow is healthy ing sour is yellow False Same answer, I felt:	the world? Might or might not	Probably yes True	Definitely yes
s the conclusion in I Definitely not ogismIB22 Premise 1: Everythin Premise 2: Everythin Conclusion: Everythin	ine with your view of Probably not g healthy is sour g yellow is healthy ing sour is yellow False Start of the sour False	the world? Might or might not	Probably yes True	Definitely yes

	Guessing	Fairly	certain	Certain I'm right
s the conclusion in I	ine with your view of	the world?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
ogismIB23				
remise 1: No hare is remise 2: Some dev conclusion: Some ha	s a fox vious animals are foxe ares are not devious	95		
	False		True	
	0		0	
t the time I provided	d my answer, I felt:			
	Guessing	Fairly	certain	Certain I'm right
the conclusion in I	line with your view of	the world?		
the conclusion in l Definitely not	line with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in I Definitely not OgismIB24 Premise 1: Some hur Premise 2: All fetuse	ine with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in I Definitely not O ogismIB24 Premise 1: Some hur remise 2: All fetuse conclusion: Some fe	ine with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in I Definitely not OgismIB24 Premise 1: Some hur Premise 2: All fetuse Conclusion: Some fe	ine with your view of Probably not	the world? Might or might not	Probably yes O True	Definitely yes
the conclusion in I Definitely not OgismIB24 remise 1: Some hur remise 2: All fetuse onclusion: Some fe	hine with your view of Probably not Probably not Sare human beings Probably not False	the world? Might or might not	Probably yes O True	Definitely yes
t the time I provided	hine with your view of Probably not Probably not Sare human beings Probably not False Sare human beings Probably not Sare human beings Probably not Probably not Sare human beings Probably not Probably not	the world? Might or might not	Probably yes O True	Definitely yes
t the time I provided	hine with your view of Probably not Probably not False Human beings Probably not False C Human beings Probably not C Human beings Probably not Probably not	the world? Might or might not	Probably yes True	Definitely yes
s the conclusion in I Definitely not ogismIB24 remise 1: Some hur remise 2: All fetuse conclusion: Some fe	ine with your view of Probably not O man beings should be s are human beings etuses should be prote False O d my answer, I felt:	the world? Might or might not	Probably yes True	Definitely yes

	Guessing	Fairly	certain	Certain I'm right
s the conclusion in I	ine with your view of	the world?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
0	0	0	0	\bigcirc
ogismIU25				
Premise 1: Everythin Premise 2: No living	g that runs breathes frog is running			
Conclusion: Some liv	ving frogs do not brea	the	True	
	\bigcirc		0	
at the time I provided	d my answer, I felt:			
	Guessing	Fairly	certain	Certain I'm right
s the conclusion in I	ine with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in I Definitely not	ine with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in I Definitely not O ogismIU26	ine with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in I Definitely not O ogismIU26 Premise 1: All kids ha	ine with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in I Definitely not O ogismIU26 Premise 1: All kids ha Premise 2: All toys at Conclusion: All thing	ine with your view of Probably not O ave toys re made from wood us made from wood ar	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in I Definitely not O ogismIU26 Premise 1: All kids ha Premise 2: All toys an Conclusion: All thing	ine with your view of Probably not	the world? Might or might not	Probably yes O	Definitely yes
s the conclusion in I Definitely not O ogismIU26 Premise 1: All kids ha Premise 2: All toys an Conclusion: All thing	ine with your view of Probably not O ave toys re made from wood ar False	the world? Might or might not	Probably yes O True	Definitely yes
s the conclusion in I Definitely not O ogismIU26 Premise 1: All kids ha Premise 2: All toys an Conclusion: All thing	ine with your view of Probably not O ave toys re made from wood as made from wood ar False O d my answer, I felt:	the world? Might or might not	Probably yes O True	Definitely yes
s the conclusion in I Definitely not O ogismIU26 Premise 1: All kids ha Premise 2: All toys an Conclusion: All thing	ine with your view of Probably not O ave toys re made from wood as made from wood ar False O d my answer, I felt:	the world? Might or might not	Probably yes True	Definitely yes
s the conclusion in I Definitely not O ogismIU26 Premise 1: All kids ha Premise 2: All toys an Conclusion: All thing	ine with your view of Probably not Probably not Save toys re made from wood ar False Same from wood ar False Same from wood ar Same from wood ar	the world? Might or might not	Probably yes True	Definitely yes

	Guessing	Fairly	certain	Certain I'm right
s the conclusion in li	ine with your view of	the world?		
Definitely not	Probably not	Might or might not	Probab l y yes	Definitely yes
0	0	0	0	0
ogismIU27				
remise 1: All ants ha remise 2: Everything	ave wings g winged sings			
conclusion: Everythi	ng that sings is an ar False	nt	True	
	0		0	
t the time I provided	l my answer, I felt:			
	Guessing	Fairly	certain	Certain I'm right
s the conclusion in li	ine with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in li Definitely not	ine with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in li Definitely not O DgismIU28	ine with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in li Definitely not O ogismIU28 Premise 1: All parrots Premise 2: All red bir	ine with your view of Probably not O	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in li Definitely not O ogismIU28 Premise 1: All parrots Premise 2: All red bir Conclusion: Everythi	ine with your view of Probably not O s have horns ds are parrots ng with horns is a rea	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in li Definitely not O ogismIU28 Premise 1: All parrots Premise 2: All red bir Conclusion: Everythi	ine with your view of Probably not	the world? Might or might not	Probably yes O True	Definitely yes
s the conclusion in li Definitely not O ogismIU28 Premise 1: All parrots Premise 2: All red bir Conclusion: Everythi	ine with your view of Probably not O s have horns ds are parrots ng with horns is a ree False	the world? Might or might not	Probably yes O True	Definitely yes
s the conclusion in li Definitely not O ogismIU28 Premise 1: All parrots Premise 2: All red bir Conclusion: Everythi	ine with your view of Probably not O s have horns ds are parrots ng with horns is a red False O	the world? Might or might not	Probably yes True	Definitely yes
s the conclusion in li Definitely not ogismIU28 remise 1: All parrots remise 2: All red bir conclusion: Everythi	ine with your view of Probably not O s have horns ds are parrots ng with horns is a red False O	the world? Might or might not	Probably yes True	Definitely yes
s the conclusion in li Definitely not O ogismIU28 Premise 1: All parrots Premise 2: All red bin Conclusion: Everythi	ine with your view of Probably not O s have horns ds are parrots ng with horns is a real False O I my answer, I felt:	the world? Might or might not	Probably yes O True	Definitely yes

	Guessing	Fairly	certain	Certain I'm right
s the conclusion in I	line with your view of	the world?		
Definitely not	Probably not	Might or might not	Probab l y yes	Definite l y yes
\bigcirc	0	0	0	0
ogismIU29				
Premise 1: No smilin Premise 2: Some pre	ng apples grow on bus etty berries grow on bu	hes ushes		
Conclusion: Some s	miling apples are not False	pretty berries	True	
	0		0	
At the time I provide	d my answer, I felt:			
	Guessing	Fairly	certain	Certain I'm righ
the conclusion in	line with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
5 the conclusion in Definitely not	line with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in Definitely not	line with your view of Probably not O oach lives in houses sty bugs live in houses	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in I Definitely not O ogismIU30 remise 1: No cockre remise 2: Some nas	line with your view of Probably not O oach lives in houses sty bugs live in house ockroaches are not na	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in l Definitely not O ogismIU30 Premise 1: No cockro Premise 2: Some nas Conclusion: Some co	Iine with your view of Probably not O O O O O O O O O O O D O O O D O	the world? Might or might not	Probably yes O	Definitely yes
s the conclusion in l Definitely not O ogismIU30 Premise 1: No cockre Premise 2: Some nas	Iine with your view of Probably not O O O O O O O C False O	the world? Might or might not	Probably yes O True	Definitely yes
s the conclusion in l Definitely not O ogismIU30 remise 1: No cockre remise 2: Some nas conclusion: Some co t the time I provided	line with your view of Probably not O oach lives in houses sty bugs live in house ockroaches are not na False O d my answer, I felt:	the world? Might or might not	Probably yes O True	Definitely yes
s the conclusion in l Definitely not ogismIU30 remise 1: No cockre remise 2: Some nas conclusion: Some co t the time I provided	line with your view of Probably not O oach lives in houses sty bugs live in house ockroaches are not na False O d my answer, I felt:	the world? Might or might not	Probably yes True	Definitely yes
s the conclusion in l Definitely not ogismIU30 remise 1: No cockro remise 2: Some nas onclusion: Some co t the time I provided	Iine with your view of Probably not O oach lives in houses sty bugs live in house ockroaches are not na False O d my answer, I felt:	the world? Might or might not	Probably yes True	Definitely yes

	Guessing	Fairly	certain	Certain I'm right
s the conclusion in I	ine with your view of	the world?		
Definitely not	Probably not	Might or might not	Probab l y yes	Definitely yes
0	0	0	0	0
ogismIU31				
Premise 1: All tigers Premise 2: No horse	have two tails is a tiger			
Conclusion: Some he	False	o tails	True	
	0		\bigcirc	
at the time I provided	d my answer, I felt:			
	Guessing	Fairly	certain	Certain I'm right
s the conclusion in I	ine with your view of	the world?		
s the conclusion in I Definitely not ◯	ine with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in I Definitely not O ogismIU32	ine with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in I Definitely not O ogismIU32 Premise 1: All munch Premise 2: No penny	ine with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in I Definitely not O ogismIU32 Premise 1: All munch Premise 2: No penny Conclusion: Some pe	ine with your view of Probably not	the world? Might or might not	Probably yes	Definitely yes
s the conclusion in I Definitely not O ogismIU32 Premise 1: All munch Premise 2: No penny Conclusion: Some pe	ine with your view of Probably not O Probably not Sis a munchin Probably not Sis a munchin Probably not Sis a munchin Probably not Sis a munchin False	the world? Might or might not	Probably yes O True	Definitely yes
s the conclusion in I Definitely not O ogismIU32 Premise 1: All munch Premise 2: No penny Conclusion: Some pe	ine with your view of Probably not O hins wear hats is a munchin ennies do not wear hat False	the world? Might or might not	Probably yes True	Definitely yes
s the conclusion in I Definitely not O ogismIU32 Premise 1: All munch Premise 2: No penny Conclusion: Some period conclusion: Some period	ine with your view of Probably not O hins wear hats is a munchin ennies do not wear hat False O d my answer, I felt:	the world? Might or might not	Probably yes True	Definitely yes
s the conclusion in I Definitely not O ogismIU32 Premise 1: All munch Premise 2: No penny Conclusion: Some po	ine with your view of Probably not O hins wear hats is a munchin ennies do not wear hat False O d my answer, I felt:	the world? Might or might not	Probably yes True	Definitely yes
s the conclusion in I Definitely not OgismIU32 Premise 1: All munch Premise 2: No penny Conclusion: Some po	ine with your view of Probably not O hins wear hats is a munchin ennies do not wear hat False O d my answer, I felt:	the world? Might or might not	Probably yes True	Definitely yes

	Guessing	Fairly	certain	Certain I'm right
the conclusion in li	ne with your view of	the world?		
Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
0	0	0	0	0
all				
/rite down as many o	capital letter words y	ou can remember from	the word comparisor	n task in the w" or choose from
ne lower case letter v	words from the same	task.		
				ŗ
				11
ill in the missing wo	rd from a previous fa	ict:		
All things that are	are good for hea	llth"		
ill in the missing wo	rd from a previous fa	oct:		
All animals with four	leas are "			
				1
ill in the missing wo	rd from a previous fa	ict:		
Fill in the missing wo Whales are'	rd from a previous fa	ict:		
⁻ ill in the missing wo 'Whales are''	rd from a previous fa	ict:		
Fill in the missing wo	rd from a previous fa	ict:		
Fill in the missing wo "Whales are" Fill in the missing wo	rd from a previous fa	remise:		
Fill in the missing wo Whales are' Fill in the missing wo	rd from a previous fa rd from a previous p ter''	remise:		
Fill in the missing wo Whales are' Fill in the missing wo	rd from a previous fa rd from a previous p ter''	remise:		
Fill in the missing wo Whales are' Fill in the missing wo	rd from a previous fa rd from a previous p ter"	remise:		
Fill in the missing wo Whales are"	rd from a previous fa rd from a previous p ter''	remise:		
Fill in the missing wo	rd from a previous fa rd from a previous p ter" rd from a previous p	remise:		

3.2023, 11:14	Qualtrics Survey Software
Fill in the missing word from a previous premise:	
'All trees are'	
Fill in the missing word from a previous premise:	
"Some iumping are toadstools"	
Fill in the missing word from a providus promise:	
"All respherice speak "	
Fill in the missing word from a previous premise:	
"Everything green is"	
Fill in the missing word from a previous premise:	
"All Mirabelle prunes are"	
Fill in the missing word from a previous premise:	
"No have colorful feathers"	
Fill in the missing word from a previous premise:	
"No are moths"	
Fill in the missing word from a previous premise:	
"Some of women's rights are"	
Fill in the missing word from a previous premise:	
"All are human beings"	

Fill	in	the	missing	word	from a	i previ	ous	premise	э:
------	----	-----	---------	------	--------	---------	-----	---------	----

"Some dogs are not _____

Fill in the missing word from a previous premise:

"Some carnivores are _____"

Fill in the missing word from a previous premise:

"All unemployed people are _____"

Fill in the missing word from a previous premise:

"Roses have _____

Fill in the missing word from a previous premise:

'_____ is not an eastern country"

Fill in the missing word from a previous premise:

"Automobiles need ____

Fill in the missing word from a previous premise:

"All the fruits that fall from the tree are _____

Fill in the missing word from a previous premise:

"Everything sour is _____

Fill in the missing word from a previous premise:	
"No is a fox"	
Fill in the missing word from a previous premise:	
"Some fatuses should be	
Fill in the missing word from a previous premise:	
"No living frog is"	
Fill in the missing word from a previous premise:	
"All kids have"	
Fill in the missing word from a previous premise:	
"All ants have"	
Fill in the missing word from a previous premise:	
"All parrots have "	
Fill in the missing word from a previous premise:	
"No apples grow on bushes"	
Fill in the missing word from a previous premise:	
"Some nasty live in houses"	
Fill in the missing word from a previous premise:	
"All tigers have two "	

Fill in the missing word from a previous premise:

"No _____ is a munchin"

NfC-18i

For each of the statements below, please indicate whether or not the statement is characteristic of you or of what you believe. For example, if the statement is extremely uncharacteristic of you or of what you believe about yourself (not at all like you) please click on the first dot to the right of the statement. If the statement is extremely characteristic of you or of what you believe about yourself (very much like you) please click on the dot furthest to the right next to the statement.

	Extremely uncharacteristic of me	Somewhat uncharacteristic of me	Uncertain	Somewhat characteristic of me	Extremely characteristic of me
I would prefer complex over simple problems.	0	0	0	0	0
I like to have the responsibility of handling a situation that requires a lot of thinking.	\bigcirc	\bigcirc	\bigcirc	0	\bigcirc
Thinking is not my idea of fun.	\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.	\bigcirc	\bigcirc	\bigcirc	0	\bigcirc
I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.	\bigcirc	\bigcirc	\bigcirc	0	\bigcirc
I find satisfaction in deliberating hard and for long hours.	\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
I only think as hard as I have to.	\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
I prefer to think about small daily projects over long term ones.	\bigcirc	\bigcirc	\bigcirc	0	\bigcirc
I like tasks that require little thought once I've learned them.	\bigcirc	\bigcirc	\bigcirc	0	\bigcirc
The idea of relying on thought to make my way to the top appeals to me.	\bigcirc	\bigcirc	\bigcirc	0	\bigcirc
I really enjoy a task that involves coming up with new solutions to problems.	\bigcirc	\bigcirc	\bigcirc	0	\bigcirc
Learning new ways to think doesn't excite me very much.	\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
I prefer my life to be filled with puzzles that I must solve.	\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
The notion of thinking abstractly is appealing to me.	\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
I would prefer a task that is intellectual, difficult, and important over one that is somewhat important but does not require much thought.	0	0	\bigcirc	0	0
I feel relief rather than satisfaction after completing a task that requires a lot of mental effort.	0	\bigcirc	\bigcirc	0	\bigcirc
It's enough for me that something gets the job done; I don't care how or why it works.	0	\bigcirc	\bigcirc	0	0
I usually end up deliberating about issues even when they do not affect me personally.	0	0	0	0	\bigcirc

Pers

What is your gender?

Female

Male

https://uitpsych.eu.qualtrics.com/Q/EditSection/Blocks/Ajax/GetSurveyPrintPreview?ContextSurveyID=SV_87ixeAuqyHronZ4&ContextLibraryI... 23/24

0,						
How old are you	?					
Did you write do	wn notes du	ing this test	to help you	remember?		
Did you write do	wn notes du	ing this test	to help you	remember?		

