

## Measuring students' justificatory reasoning approaches

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A fundamental role of education is to equip students with sound justificatory reasoning capacities to support one's beliefs or actions and to guide rational decisions about complex problems. However, empirical research into justificatory reasoning among students is virtually non-existent and this impedes education research. This study illustrated the measurement of justificatory reasoning ability and investigated how tertiary students might use different justificatory reasoning forms (absolutism, relativism and evaluativism) depending on the reasoned domain, a controversial domain versus a moral domain. It further tested how different justificatory approaches might relate to varying willingness to engage in argumentation, as well as how they might engender beliefs with different strength of convictions. The results suggest that absolutism was preferred for moral domain, whereas relativism was preferred for controversial domain. However, those who used evaluativism were most willing to engage in discourse to defend their beliefs, and their engendered beliefs were also the strongest. Besides demonstrating how justificatory reasoning may be measured quantitatively, the study provides guidance to educators on designing curriculum to develop justificatory reasoning ability. The findings also suggest that educators should not unconditionally focus on developing evaluativism in students, supposedly the highest form of justificatory reasoning.

### Introduction

Drawing on Piaget's (1972) epistemological theory of intellectual development and beliefs about knowledge, educators have emphasised the value of developing advanced forms of reasoning in individuals (for a comprehensive reviews, see Collins, 2004; Hofer & Pintrich, 1997). One such form of reasoning approach is justificatory reasoning, the ways in which individuals defend their beliefs and opinions (Bråten, Brandmo & Kammerer, 2018; Gillies & Boyle, 2005; Köymen, Mammen & Tomasello, 2016; Nagel, 2015). The development of justificatory reasoning occurs in a three-stage sequence. Briefly, at the most primitive stage, an approach based on *absolutism* supports claims by referencing an authority or a societal norm; at the next stage, *relativism* reasoning denies the very possibility of absolute justification, and regards all beliefs to be equally valid; finally at the developmental endpoint, an *evaluativism* approach points to empirical evidence and logical argument in an attempt to justify beliefs (Kuhn, 1992; Kuhn, Cheney & Weinstock, 2000; Kuhn & Udell, 2003; Soong, Lee & John, 2012).

Dewey (1966) argued that in order for a society to advance, individuals must be able to challenge society's democratic imperatives through sound reasoning. Indeed, researchers

have stressed the importance of inculcating justificatory reasoning skills in students as future members of society (Knight & Collins, 2006; Kuhn et al., 2000; Perry, 1970). Despite this importance, researchers have consistently lamented that current practices in tertiary institutions to develop justificatory reasoning skills among students are grossly inadequate, and most students exhibit significant weakness in this skill by the end of their studies (Kuhn et al., 2000; Larsen, 2004; Perry, 1970; Soong et al., 2012; Walker et al., 2009). It does not help that research, especially empirical ones, into justificatory reasoning is scarce.

Within an Asian Pacific higher education context, this study attempts to shed light on the extent of Asian students' justificatory reasoning skills. Understanding when and how tertiary students apply different justificatory reasoning approaches will guide educators in formulating programs and curriculum to develop students' ability to use different forms of justificatory reasoning, depending on the reasoned domain. Sharpening students' reasoning ability is also important to their development of other skills including critical thinking (Bråten et al., 2018), socialisation (Nagel, 2015), decision making (Köymen, Rosenbaum, & Tomasello, 2014), and even teaching skills (Ding & Wang, 2018).

Specifically, our study seeks answers to three questions. First, although evaluativism is regarded as the highest form of cognitive reasoning (Knight & Collins, 2006; Kuhn et al., 2000; Walker et al., 2009), we question whether people necessarily always use an evaluativistic approach even when they have attained that developmental stage. Second, people possess varying tendencies to engage in argumentation (Infante & Rancer, 1982; Soong et al., 2012). We therefore question whether different justificatory reasoning approaches engender varying degrees of willingness to engage in argumentation. Third, we attempt to determine the strength of the underpinning beliefs of each justificatory reasoning approach. That is, would people adopting a particular justificatory reasoning approach hold stronger or weaker convictions about a reasoned domain, compared to those who use other approaches?

## **Literature review**

### **The three forms of justificatory reasoning**

Educators have emphasised the development of justificatory reasoning as an important goal of education. Stemming from early works on epistemological theories of intellectual development (Kohlberg, 1969; Perry, 1970; Piaget, 1972), justificatory reasoning is defined as the ability to justify one's beliefs and actions based on "arguments that are both logically cogent (i.e. which have true premises and which are either inductively strong or deductively valid) and ethically grounded (i.e. with premises which express appropriate regard for the welfare of others)" (Collins, 2004, p. 18).

Researchers generally concur that there are three forms of justificatory reasoning (Kuhn, 1992; Kuhn & Udell, 2003; Soong et al., 2012). These three approaches are viewed as epistemological levels that constitute a developmental sequence, from absolutism (the appeal to authority approach), through relativism (the view that all beliefs have equal

validity), and finally to evaluativism (when justification is based objectively on evidence and reason). The first form, *absolutism*, supports claims by referencing external authority or norm on a subject matter. The rationale is that if a view is endorsed by a perceived authority or is commonly regarded as a societal norm, then the view must be correct. However, justifying a claim by association to an external authority or norm may result in an erroneous judgement, especially when the justification simply relies on studying or observing the supposed authority or norm. Indeed, Hanson (1958) cautioned against relying on observations as facts because of the fallibility of human observations. To Hanson, what we observe should not be coloured by our specific beliefs about the world. Consequently, some researchers consider absolutism as the most primitive form of justificatory reasoning (Knight & Collins, 2006; Walker et al., 2009).

Disagreeing with the view that there is an absolute right or wrong in every situation, the second form of justificatory reasoning, *relativism*, regards all differing claims as equally tenable. Relativists relocate “the source of knowledge from the known object to the knowing subject, hence becoming aware of the uncertain, subjective nature of knowing” (Kuhn et al., 2000, p. 310). They recognise the right to subjective opinion, and deny the very possibility of justifying one particular view. This is similar to Hofstede’s (1991, p. 7) assertion, when describing a collectivistic culture, that “the search for Truth is irrelevant, because there is no need for a single and absolute Truth.” As Rachels (2000) pointed out, mere difference does not in itself imply that there is no independent standard of moral rightness.

Indeed, it is this standard which exemplifies the basis for evaluativism, the third form of justificatory reasoning. The underpinning principle of evaluativism is that viewpoints can be compared and evaluated on the basis of observable evidence and logical reasoning (Kuhn, 1992; Kuhn & Udell, 2003). As Kuhn et al. (2000) put it, while evaluativists acknowledge the potential uncertainty of knowledge, they support a particular viewpoint by integrating objective knowledge into the evaluation. Evaluativists welcome or even encourage genuine interchanges with those who hold conflicting opinions, and acknowledge the possibility that they themselves might come to modify their beliefs as a result of these interchanges. It may also involve a process of ethical decision-making, balancing current interests against those of others, including those of future generations.

Beyond developing justificatory reasoning skills, students should also develop a disposition to engage in justificatory reasoning (Soong et al., 2012; Zhang, Beach & Sheng, 2016). Indeed, the progression from absolutism, through relativism, to evaluativism represents a transformation from naïve to sophisticated reasoning that encourages or even requires engaging in argumentation (Soong et al., 2012). Hence, viewpoints should be evaluated on the basis of evidence and reason, and the failure to engage in such justification can even bring with it social dangers. For example, Kuhn and Udell (2003) showed that by allowing students to engage verbally with their peers, they developed cognitive competencies in argumentative strategies by devising claims and counter claims. It thus seems that encouraging individuals to engage widely in discussion of controversial issues will in turn serve to strengthen their justificatory reasoning skills (Lipman, 1984).

## Methods

### The sample

We asked Business undergraduates in Taylor's University, a full-fledged private university in Malaysia's capital city of Kuala Lumpur, to respond to a survey regarding their beliefs about two different domains, astrology and adultery. The University offers science and social science degree programs at both undergraduate and postgraduate levels. The language of instruction for all programs is English; this study was conducted entirely in English.

One hundred and eleven undergraduate students answered a pen-and-paper survey before proceeding to perform an implicit association test (IAT); the purpose and procedure of the IAT are described later. Of the 111 participants, 11 cases were deleted because justificatory reasoning scores for the three approaches were identical, meaning that the participants just picked the same option (e.g., the second option) across all three scenarios. Of the remaining 100 cases, 63 were female and 37 were male. Their ages ranged from 19 to 25, with a mean of 20.8 and a median of 21. As Malaysia is a multi-ethnic country, participants also self-reported their ethnicity. Of the 100 participants, 81 were of Chinese origin, while the remaining 19 were of Indian origin; later, we showed that there were no statistical differences between the two ethnic groups. No personal identifying information was collected, and no course credits were given for the voluntary participation. Students were briefed that the survey was academic.

### Three-part survey questionnaire

Research shows that reasoning approaches may be domain-specific (Buehl, Alexander & Murphy, 2002; Fischer, Chinn, Engelmann & Osborne, 2018; Soong et al., 2012). We chose astrology because it is a controversial domain that is relatively neutral to gender and age, thereby minimising potential response biases. Similarly, we chose adultery, a moral domain, to contrast against astrology. In choosing both domains, we refrained from a more scientific domain such as global warming because participants' potentially different levels of knowledge about the domain may distort the survey outcomes.

#### *Part 1: Justificatory reasoning approaches*

We used the survey instrument developed by Soong et al. (2012) to determine to what extent participants used relativism, absolutism, and evaluativism approaches for the two chosen domains of astrology and adultery. For each topic, participants first read a brief dialogue between two persons discussing the domain. They were then presented with three scenarios, one at a time (see Appendix I and II for the introductory dialogue and the three scenarios). The first scenario proposed that different views about astrology (or adultery) were equally acceptable. The second scenario rested on commonly held norms regarding astrology (or adultery). The third scenario used a factual claim to support an evaluative judgement of astrology (or adultery). Respectively, these scenarios assessed participants' use of relativism, absolutism, and evaluativism approaches to justify their beliefs about the presented scenarios.

Depending on whether they agreed, disagreed, or were unsure with each scenario, participants then selected from a list of three reasons to support their decisions (see Appendix I and II for the reasons). From the collected responses, we similarly followed the scoring method developed by Soong et al. (2012; see the paper for detailed description of the scoring procedure) to capture each participant's tendency to use each of the three justificatory reasoning approaches. Hence, for each domain, a participant had three scores, one for each reasoning approach. Each score ranged from 2 to 9, to represent minimal to maximal display of a particular reasoning approach.

*Part 2: Willingness to engage in argumentation*

To measure participants' willingness to engage in argumentation, we used a 10-item scale adapted from Infante and Rancer (1982). Participants rated each item on a 5-point scale anchored on "Almost never true" to "Almost always true." Table 1 lists the 10 items. The average of the 10 items constituted the factor score for the willingness to engage in discussion of controversial issue.

Table 1: Descriptive statistics of the items in the engage factor (N=100)

|  | Mean* | SD    |
|--|-------|-------|
| I have the ability to argue effectively in discussions of controversial issues.                          | 2.82  | .896  |
| I feel energetic and enthusiastic when I am discussing a controversial issue.                            | 2.18  | 1.011 |
| Discussing a controversial issue helps me think further about the issue.                                 | 2.67  | 1.193 |
| I have a pleasant, good feeling when someone accepts an idea I put forward.                              | 2.59  | 1.155 |
| I enjoy a good argument over a controversial issue.  | 2.53  | 1.025 |
| I enjoy defending my point of view on an issue.  | 2.75  | 1.091 |
| I do not like to miss the opportunity to argue a controversial issue.                                    | 2.99  | 1.074 |
| I consider a discussion in which conflicting views are stated an exciting intellectual challenge.        | 2.68  | 1.097 |
| At the end of an argument on a controversial issue, I look forward to another.                           | 2.64  | .922  |
| I feel excited when I sense that a conversation I am in is leading to a discussion of conflicting views. | 2.62  | 1.145 |

\* 5-point scale anchored on 1 = Almost never true and 5 = Almost always true

*Part 3: Implicit association test (IAT)*

Rooted in the associative network theory of memory (Anderson & Bower, 1973), the implicit association test (IAT) is a commonly used procedure in social psychology to measure the strength of an association between two concepts by measuring the response latencies during a classification task (Greenwald, McGhee & Schwartz, 1998). Possessing satisfactory predictive validity (see meta-analysis by Greenwald, Poehlman, Uhlmann & Banaji, 2009), IAT has been used to measure the strength and association of reasoning processes behind the formation, and subsequent change, of an attitude towards an object (Rydell & McConnell, 2006).

In this study, we similarly used IAT to determine which particular reasoning approach produced the strongest beliefs about astrology, the controversial domain. We used only the controversial domain for three reasons. First, as opposed to a factual domain (which would bias towards evaluativism) or a moral domain (which would bias towards

absolutism), a controversial domain is likely to see participants using different justificatory reasoning approaches (Kuhn et al., 2000; Soong et al., 2012). Second, we only used one domain because an IAT procedure takes time and respondent fatigue may set in should they be required to perform more than one IAT. Third, performing multiple IAT might lead to learning effects and hence would bias the test outcomes.

To perform the test, we followed the standard five-block design prescribed by Greenwald et al. (1998; 2003). Three were practice blocks and two were measurement blocks. Each block contained 10 trials, and response times were recorded for the measurement blocks only. The two target concepts were “astrology” and “astronomy”. The classification task for the concepts comprised 10 stimuli, five representing astrology concepts (e.g., the zodiac sign Aries, crystal ball gazing) and five representing astronomy concepts (e.g., the solar system, the planet Mars). The associated attributes were “fact” and “fiction”. The classification task for the attributes used 10 stimuli, five of which were facts (e.g., February is the shortest month) and five were fiction (e.g., accidents always happen on Friday 13th).

Prior to starting the test, the participants were told that this was a classification task and that they were to read the instructions on the laptop carefully. They were also told that they would first be given a trial run to familiarise them with the test, and that they were to respond to the classification tasks as quickly as possible. The appearance order of the stimuli was randomised. Each participant took an average of 15 minutes to complete the entire IAT procedure, including the briefing and training steps. Upon completing the tasks, the response times were calculated as *D-scores* following Greenwald et al.'s (2003) procedure. A higher D-score indicates a shorter response latency, implying a stronger link between a concept (astrology or astronomy) and attribute (fact or fiction).

## Results and discussion

Prior to reporting the main results, we ran various tests to determine whether sample characteristics had biased the justificatory reasoning scores. A Mann-Whitney test and a Kruskal-Wallis test found no significant differences across gender and ethnicity, respectively, for all forms of justificatory reasoning in the two domains (all  $p > .05$ ). Age and the reasoning forms were also not significantly correlated, except for adultery's absolutism scores (Kendall's  $\tau = .296$ ;  $p < .001$ ).

### Using different forms of justificatory reasoning

First, we reported the mean values of the different reasoning approaches for the two domains, adultery and astrology. As Table 2 shows, absolutism was the highest for adultery, as we had expected. By contrast, relativism was the highest for astrology, although we had predicted that evaluativism would be the highest; evaluativism was the next highest for astrology. Table 3 further confirms that with the exception of the relativism-evaluativism pair for adultery, participants possessed significantly different scores for each justificatory reasoning approach within each domains.

Table 2: Mean values of different justificatory reasoning approaches

|           |              | Mean | SD    | Rank |
|-----------|--------------|------|-------|------|
| Adultery  | Absolutism   | 6.32 | 2.352 | 1    |
|           | Relativism   | 5.44 | 2.443 | 2    |
|           | Evaluativism | 5.11 | 2.251 | 3    |
| Astrology | Relativism   | 7.23 | 1.808 | 1    |
|           | Evaluativism | 6.37 | 1.894 | 2    |
|           | Absolutism   | 5.19 | 1.873 | 3    |

Table 3: Wilcoxon related-sample tests of justificatory reasoning scores

|           |                           | Mean diff. | Z scores |
|-----------|---------------------------|------------|----------|
| Adultery  | Relativism - Absolutism   | -.880      | -1.984*  |
|           | Relativism - Evaluativism | .330       | 1.252    |
|           | Absolutism - Evaluativism | 1.210      | 2.776**  |
| Astrology | Relativism - Absolutism   | 2.040      | 6.861**  |
|           | Relativism - Evaluativism | .860       | 2.791**  |
|           | Absolutism - Evaluativism | -1.180     | -3.801** |

Notes: (2-tailed) \*  $p < 0.025$ , \*\*  $p < 0.005$

The finding that absolutism (mean = 6.32) is the highest for adultery is consistent with Kuhn et al.'s (2000) contention that absolutism tends to prevail in value or moral issues. It thus appears that people inherently possess strong convictions on what is morally right or wrong based on societal norms. Furthermore, this viewpoint is most probably well ingrained in a person's belief system way before he or she enters university, and attempts to alter this stance may be futile or backfire.

By contrast, the highest form of justificatory reasoning for astrology was relativism followed by evaluativism. Although Kuhn et al. (2000) had predicted that evaluativism would prevail as the primary form of reasoning within this domain, a plausible explanation on the strength of relativism is the collectivistic culture of Malaysian students. Compared to individualistic individuals, collectivistic individuals tend to subjugate the individual-self to the collective-self and make a group their fundamental focus (Hofstede, 2001). Substantive research into individualism-collectivism in education has also established that Eastern students are more collectivistic than their Western counterparts (Kiyama & Harper, 2018; McBride, Xiang, Wittenburg & Shen, 2002), and that Eastern students tend to hold on to their cultural norms of preferring group harmony to pursuing individual outcomes (Fukuyama & Greenfield, 1983; Soong et al., 2012). This collectivistic culture thus impinges upon how participants interpret claims and consequently prefer relativism to support their viewpoints.

However, this finding that relativism (mean = 7.23) is the highest reasoning form for astrology should not overshadow the fact that participants also used evaluativism substantially (mean = 6.37). This result is encouraging in that for a domain such as astrology which can be refuted with scientific evidence, it shows that students are capable of and well equipped with evaluativism skills to argue their case. As importantly, the

collective results of the different reasoning forms between the two domains clearly highlight that individuals do possess different justificatory reasoning capabilities and will use the form they deem most appropriate when articulating their viewpoints in different domains.

The above results – that the preferred reasoning form differs between controversial and moral domains – suggest that educators should not impose the view that evaluativism is unconditionally the best reasoning approach in all cultural settings. Rather, understanding students' cultural norms may help educators develop better teaching and assessment practices (Biggs, 2009; Kiyama & Harper, 2018). Fukuyama and Greenfield (1983p. 431) aptly sum up this issue by cautioning that as students may differ in “norms of spontaneity, confrontation, and openness of expression, understanding the underlying cultural differences may avoid the ethnocentric trap of seeing assertions as uniformly superior or most appropriate means of expression.”

Two other findings are also noteworthy. First, the low preference that participants gave to absolutism with astrology suggests that they acknowledged the absence of an external and objective truth to astrology. Second, the low relativism and evaluativism scores for adultery (mean of 5.44 and 5.11 respectively) implies that participants did not believe that moral issues could maintain a balanced view or be empirically justified. Instead, they tended to see such issues with a clear demarcation between right and wrong.

### **Relating justificatory reasoning approach to argumentation**

The relationships among justificatory reasoning, the willingness to engage in argumentation, and the strength of the reasoned beliefs were tested for the controversial domain (astrology) using bivariate correlation tests. Prior to discussing the findings for these relationships, it is noteworthy that the mean scores for the items in the argumentation factor were all below the mid-point of 3 (on a 5-point scale). This is consistent with studies which suggest that Asian students are less willing to engage in argumentation, possibly because of their collectivistic background (Fukuyama & Greenfield, 1983; Soong et al., 2012).

The results in Table 4 suggests that for participants who favoured an evaluativism approach to reasoning were also more willing to engage in argumentations with their peers regarding controversial matters. Indeed, willingness to engage in argumentation was only significantly related to evaluativism, and not to the other two justificatory reasoning forms.

As described earlier, the response times of implicit association tests (IAT) are expressed as D-scores (Greenwald et al., 2003), whereby a higher D-score indicates a shorter response latency and implies a stronger association between two presented concepts. As Table 4 shows, the relationship between IAT D-scores was significant for evaluativism, but not for relativism and absolutism, implying that evaluative beliefs may be more entrenched in memory storage once they are learnt.

Table 4: Kendall's correlation statistics with justificatory reasoning scores

|                        | ENGAGE factor<br>( <i>tau</i> value) | IAT D-scores<br>( <i>tau</i> value) |
|------------------------|--------------------------------------|-------------------------------------|
| Astrology Relativism   | -.108                                | -.027                               |
| Astrology Absolutism   | -.078                                | -.064                               |
| Astrology Evaluativism | .228**                               | .147*                               |

Notes: \*\*  $p < .01$ , \*  $p < .05$

To further shed light on these results, we ran within-subject tests by first categorising the participants into one of three categories depending on which justificatory reasoning approach they scored the highest. The majority of the 100 participants used a relativism approach to justify their convictions about astrology (see Table 5). Only a handful of participants were absolutists, and their justificatory reasoning and ENGAGE factor scores were also the lowest among the three approaches. Interestingly, although the evaluativism category did not have the most participants, these participants possessed the highest mean score for justificatory reasoning, IAT D-scores and ENGAGE factor.

Table 5: Mean scores by dominant justificatory reasoning categories

| Dominant category | n  | Mean | SD   | ENGAGE factor | IAT D-scores |
|-------------------|----|------|------|---------------|--------------|
| Evaluativism      | 33 | 8.27 | .801 | 2.815         | 1.0761       |
| Relativism        | 62 | 8.18 | .859 | 2.560         | .5285        |
| Absolutism        | 5  | 7    | .707 | 2.460         | .7274        |

Combined, the results hold some interesting implications. While evaluativism was not the most preferred form of reasoning for the two domains, individuals in the evaluativism category were most willing to engage in argumentation on controversial topics, compared to those from the other two categories. Furthermore, beliefs that were engendered from the evaluativistic reasoning approach were also the strongest. These findings support researchers who propose that tertiary students should develop evaluativism as the highest form of justificatory reasoning even though its use still depends on the domain to be reasoned (Knight & Collins, 2014; Kuhn et al., 2000; Soong et al., 2012). Cultivating evaluativistic thinking in tertiary students will equip them to function optimally as members of a just and democratic society (Knight & Collins, 2006; Kuhn et al., 2000; Nagel, 2015; Perry, 1970). However, the attainment of evaluativistic reasoning skills does not preclude students from using the other two forms of justificatory reasoning approaches. As this study's findings show, the choice of reasoning approach is domain-specific. Indeed, different approaches may even be used concurrently, depending on the reasoned domain (Buehl et al., 2002; Fischer et al., 2018; Soong et al., 2012).

## Conclusions

This exploratory study is one of few attempts to investigate justificatory reasoning empirically. It demonstrates that evaluativism was never the dominant form of reasoning among students, and the choice of reasoning forms depends on the reasoned domain.

When Kuhn (1992) found that the vast majority (more than 85%) of students in a study exhibited either relativism or absolutism reasoning forms, she lamented that the finding was rather remarkably disappointing. Yet, the need for educators to teach for evaluativistic thinking is clear. Unless teachers themselves are conversant with justificatory reasoning, it is unlikely that they will be able to develop such proficiency in their students (Nickerson, 2004). A necessary condition for developing proficiency in justificatory reasoning in students must then be the development of such reasoning skills in educators.

This study possesses several limitations that future research should attempt to address. First, the ethnic makeup of the sample is not representative compared to the country's population; the sample contained no Malay students, whereas ethnic Malays form the majority of the Malaysian population. Future research should use a more varied sample in order to determine whether justificatory reasoning skills differ across ethnicity. Second, all the students in this study were enrolled in a Business undergraduate degree, and students from other degree programs (e.g., STEM or social sciences) may innately possess different skills. It would be of interest to ascertain whether our findings are replicable with students across different degree programs. Finally, a follow-up qualitative research would shed more light on the findings by getting students to further articulate how and why a preferred justificatory reasoning approach would suit their reasoning of different domains.

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## Appendix I: Statements and reasons for astrology

### Brief introduction

Eleanor and Ian are discussing the horoscope section in the newspaper. Eleanor says she really believes the predictions because the positions of the sun, moon and other planets do have an effect on our personalities and future. Ian says he thinks that astrology is a sham and that he can't believe that Eleanor has been taken in by it. They decide to ask their friends what they think about astrology. Their responses are listed on the following pages.

**Scenario 1: Relativism**

What's true or false here depends on your personal opinion; some people think the claims of astrology are true and some don't. So both sides could be right.

*Reasons for disagreement*

1. That the truth or falsity of astrological claims depends on culture.
2. That everybody knows that the claims of astrology are false.
3. That the truth or falsity of astrological claims depends on something other than personal opinion.

*Reasons for unsure*

1. Whether the truth or falsity of astrological claims is just a matter of individual opinion or one's culture.
2. Whether there is anyone who thinks that astrological claims are false.
3. Whether both sides could be right.

*Reasons for agreement*

1. That the truth or falsity of the claims of astrology depends on individual opinion.
2. That some people think that the claims of astrology are true and others don't.
3. That both sides could be right as it has happened to some people I know.

**Scenario 2: Absolutism**

Astrologers have been forecasting the future for centuries, and millions of people still trust in their predictions today, so surely the claims of astrology are true.

*Reasons for disagreement*

1. That the claims of astrology are false.
2. That these days very few people really trust astrological predictions.
3. That the vast number of people who have trusted astrological predictions has little bearing on the truth or falsity of the claims of astrology.

*Reasons for unsure*

1. Whether the vast number of people who have trusted astrological predictions has any bearing on the truth or falsity of the claims of astrology.
2. Whether people really trust astrological predictions today.
3. Whether the claims made by astrology are true.

*Reasons for agreement*

1. That the vast number of people who have trusted astrological predictions over the centuries shows that the claims of astrology are true.
2. That millions of people over the centuries have trusted the predictions of astrologists.
3. That the claims of astrology can be proven as true.

**Scenario 3: Evaluativism**

There is no scientific evidence to show that the motions of the planets have any effect on individual human behaviour, so the claims of astrology can't be true.

*Reasons for disagreement*

1. That the claims of astrology are true.
2. That it is something other than scientific evidence which determines whether the claims of astrology are true or false.
3. That there is strong scientific evidence to support the claims of astrology.

*Reasons for unsure*

1. Whether scientific evidence can determine the truth or falsity of the claims of astrology.
2. Whether there is strong scientific evidence to support the claims of astrology.
3. Whether the truth and falsity of the claims of astrology is determined by something other than scientific evidence.

*Reasons for agreement*

1. That we should look to scientific evidence to determine the truth or falsity of the claims of astrology.
2. That the claims of astrology are false.
3. That there is no strong scientific evidence to support the claims of astrology.

**Appendix II: Statements and reasons for adultery****Brief introduction**

Sue and Carol are listening to a radio forum about whether adultery is always morally wrong. Convincing arguments are put forward on both sides:

- that it is always wrong for a married person to engage in sexual relations with someone other than his or her spouse, or
- that such behaviour is not always wrong.

Carol and Sue find it hard to decide one way or the other, and go on to discuss the matter with their friends who put forward three different claims, which you will find on the following pages.

**Scenario 1: Relativism**

Some people think that adultery is okay, and others don't. It's just a matter of your personal moral beliefs, so both sides could be right.

*Reasons for disagreement*

1. That right and wrong depends entirely on culture.
2. That no-one really believes that adultery is morally right.
3. That right and wrong depends on more than individual opinion.

*Reasons for unsure*

1. Whether right and wrong either depends on individual opinion or culture or even both.
2. Whether there are individuals who think that adultery is morally wrong.
3. Whether both sides could be right.

*Reasons for agreement*

1. That what is right and wrong is just a matter of individual opinion.
2. That some people think adultery is okay and others don't.
3. That both sides could be right as it has happened to people I know.

**Scenario 2: Absolutism**

Adultery is always wrong because it involves breaking the basic principles which governs the institution of marriage.

*Reasons for disagreement*

1. That it is the law or religion rather than the principles governing the institution of marriage that determines what is right or wrong.
2. That adultery doesn't necessarily involve breaking the principles governing the institution of marriage.
3. That adultery could be sometimes morally right.

*Reasons for unsure*

1. Whether it is the principles governing the institution of marriage that determines the rightness or wrongness of adultery.
2. Whether adultery always involves breaking a basic principle governing the institution of marriage.
3. Whether the rightness or wrongness of adultery is determined by principles of law or religion.

*Reasons for agreement*

1. That adultery is always wrong.
2. That adultery does involve breaking the basic principles governing the institution of marriage.
3. That we should look to the principles governing the institute of marriage to determine whether adultery is right or wrong.

**Scenario 3: Evaluativism**

Sometimes adultery brings about very little harm, and a great deal of happiness, so adultery is morally right sometimes.

*Reasons for disagreement*

1. That adultery is always morally wrong.
2. That if you commit adultery there is a very good chance that you will bring about more harm than happiness.
3. It is something other than the consequences that make adultery morally right or wrong.

*Reasons for unsure*

1. Whether adultery is right whenever it brings about more happiness than harm.
2. Whether adultery is morally right sometimes.
3. Whether adultery ever causes more happiness than harm.

*Reasons for agreement*

1. That adultery is morally right whenever it brings about more happiness than harm to others even if it comes at a cost to you.
2. That sometimes adultery does bring about more happiness than harm.
3. That adultery is morally right whenever it brings about more happiness than harm to you, even at the expense of others.

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