

INTELLECTUAL HUMILITY AND POLITICAL BELIEF BIAS

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INTELLECTUAL HUMILITY AND POLITICAL BELIEF BIAS

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DECLARATION OF ORIGINALITY

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ABSTRACT

Intellectual Humility and Political Belief Bias

Intellectual humility (IH) is the tendency to recognize that one's beliefs may be wrong. The main goals for the first study of this thesis were to replicate and expand upon a previous exploratory finding, IH's negative relationship with right-wing political orientation, by measuring different aspects of ideology and comparing various perspectives from political psychology literature. IH was not related to political orientation or social conservatism (at least not robustly enough), but it was negatively linked to right-wing authoritarianism. An exploratory analysis also showed that IH was lower in participants who saw ideology as more central for their self-definition. Dogmatism explained both relationships via its negative relationship with IH. The second study aimed to test the validity of an IH scale that was previously adapted to Turkish — General Intellectual Humility Scale — using a syllogism task. Research on syllogistic reasoning has shown that people are affected by the believability of conclusions when evaluating their logical validity; this phenomenon is referred to as belief bias. Contrary to expectations, IH was not negatively related to belief bias. The second study also found that left-wing ideology and analytic thinking were seemingly linked to a reverse belief bias (i.e., participants were more likely to endorse a statement as logically valid when it did not align with their prior beliefs) but these effects disappeared when taking stimulus characteristics into account.

ÖZET

Entelektüel Tevazu ve Politik İnanç Önyargısı

Kişinin kendi inançlarının yanlış olabileceğini kabullenme eğilimi entelektüel tevazu (ET) olarak adlandırılmaktadır. Önceki bir çalışmada, ET'nin sağcı siyasi yönelimle negatif ilişkisi bulunmuştur. Bu tezin ilk çalışmasının temel amaçları, bu keşif bulgusunu replike etmenin yanında ideolojinin farklı yönlerini ölçerek ve politik psikoloji literatüründen çeşitli perspektifleri karşılaştırarak genişletmek olmuştur. Çalışmada ET'nin siyasi yönelim veya sosyal muhafazakârlıkla sağlam bir ilişkisi bulunamamıştır, ancak sağcı otoriterlikle negatif ilişkisi bulunmuştur. Aynı zamanda, kendini ideolojisiyle tanımlamayı önemseyen katılımcılarda ET'nin daha düşük olduğu da görülmüştür. Bu iki ilişkinin, ET'nin dogmacılık ile olan negatif ilişkisinden kaynaklandığı bulunmuştur. İkinci çalışma, daha önce Türkçeye uyarlanmış bir IH ölçeğinin (Genel Entelektüel Tevazu Ölçeği) geçerliliğini tasım (*syllogism*) formatındaki argümanları kullanarak test etmeyi amaçlamıştır. Tasımların sonuç cümlelerinin inandırıcı olup olmaması, insanların mantıksal geçerlilik yargılarını etkilemektedir. Bu durum inanç önyargısı olarak adlandırılmıştır. Beklentilerin aksine, ET'nin inanç önyargısı ile olumsuz ilişkisi bulunamamıştır. İkinci çalışmada ayrıca sol ideolojinin ve analitik düşüncenin ters inanç önyargısıyla (katılımcıların inançlarına ters düşen argümanları onaylamaya daha eğilimli oluşu) ilişkili olduğu görülse de, uyaran özellikleri dikkate alındığında bu etkilerin kaybolduğu anlaşılmıştır.

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CHAPTER 1

INTRODUCTION

Intellectual humility (IH) is the tendency to properly evaluate the limitations of one's beliefs and to recognize that these beliefs might be wrong (Leary et al., 2017; Whitcomb, Battaly, Baehr, & Howard-Snyder, 2017). In a previous project (Güngör, Şencan, & Sarıbay, 2019, unpublished), we adapted two measures that best matched our conceptualization of IH: General Intellectual Humility Scale (GIHS; Leary et al., 2017) and Limitations-Owning Intellectual Humility Scale (LOIHS; Haggard et al., 2018). An exploratory analysis showed that conservative participants tended to report lower IH. The first study of this thesis aimed to check the reliability of this finding, while adapting different theoretical positions from political psychology to IH and testing each of them. Additionally, I tested whether the IH differences in ideological self-placement will generalize to issue-based ideology measures, such as Right-Wing Authoritarianism (Altemeyer, 1996) and social conservatism.

Turkish adaptations of GIHS and LOIHS both correlated positively with Openness to Experience (John, Donahue, & Kentle, 1991) and negatively with Closed-Mindedness (Webster & Kruglanski, 1994), which served as preliminary evidence for their validity. But given that these are all self-report scales, validity can be better established by linking IH scores to a behavioral measure that is not affected by social desirability. The first aim of the second study was to see whether IH would predict less belief bias in syllogistic reasoning tasks. The second was to apply the same political psychology perspectives from the first study and compare different hypotheses on how ideology would relate to belief bias. Another question to explore

was whether IH and ideology would interact when predicting belief bias, such that IH's expected protective effect against belief bias would work differently for people with different ideologies.

Both studies were designed beforehand, and their data collection periods were quite close to each other. They were conducted within a tight schedule, affected by the author's graduation deadlines and the measures taken for the COVID-19 pandemic. The analyses for both were done around the same time. Since the second study was not done as a follow-up after what is learned from the first one, I thought that it would be better to reflect that situation in a single discussion section for both studies.

1.1 Intellectual humility and ideology

IH is presumed to have a potential role in alleviating the increasingly polarized political discourse, by making people more tolerant of opposing viewpoints (Leary et al., 2017; Porter & Schumann, 2018). For example, Stanley, Sinclair and Seli (2020) showed that intellectually humble people were less likely to denigrate people who think differently on political issues. But how is this trait distributed across the political spectrum? For the first goal of the first study, I started by comparing GIHS's correlation with the one-item measure of political orientation in the Güngör et al. (2019) study with the rest of the literature to interpret whether it would hold up. Previous work did not find ideological differences in general IH (Leary et al., 2017; Porter & Schumann, 2018). Despite the lack of overall difference in IH, Leary et al. (Study 3, 2017) also showed that higher IH made Republicans react more positively to a hypothetical political candidate who changed his views; low-IH Republicans

displayed more negative reactions compared to Democrats and Independents, whose reactions were not predicted by IH. A recent study by Krumrei-Mancuso and Newman (2020) found that conservatives displayed lower IH when the participants were instructed to think about their political beliefs when completing the IH scale.

Even though these were somewhat mixed findings, the case for a relationship between conservatism and low-IH could still be made, given that other correlates of conservatism such as dogmatism, closed-mindedness and low-Openness (Jost, Glaser, Kruglanski, & Sulloway, 2003b) negatively correlate with IH measures (Haggard et al., 2018; Hoyle, Davisson, Diebels, & Leary, 2016; Leary et al., 2017). The theoretical position that links conservatism to epistemic and existential needs is called “ideological asymmetry” or “rigidity-of-the-right” (Jost, 2017; Jost et al., 2003b)). According to this view, people’s needs to manage uncertainty and threat lead them to adopt certain viewpoints over others. Opposition to social change and equality are defined as the pillars of conservatism that appeal to people who highly need certainty and security. IH may be related to the same core needs as well. Especially people with high needs to manage uncertainty may not “afford” to attend to their intellectual limitations, or to be confused by listening to opposing viewpoints. If these people are also motivated to resist equality and change, which were in fact linked to conservatism in Turkish samples (Sarıbay et al., 2017), it would not be surprising for the negative relationship between conservatism and IH to replicate.

The second perspective that we may call “contingent asymmetry” or “moderated asymmetry” asserts that the link between the psychological and ideological positions depends on the topic, the political context, and how people

interact with that context (see Federico & Malka, 2018 for a review). For example, the rigidity-of-the-right model suggests that the need for security would direct people to right-wing economic attitudes, since these justify the existing inequalities (Jost et al., 2017). However, a cross-national analysis by Malka and colleagues (2014) showed that although epistemic and existential needs predicted social conservatism, they were also linked to left-wing economic views in many countries, where political actors combine issues differently. Within a country, the strength of the link between needs and political attitudes are determined by factors that allow or motivate people to take a look at the “menu” offered by the political elites (Malka & Soto, 2015) and have a consistent stance across issues, so that they can express their personality. Some examples of these moderators are education (Federico & Tagar, 2014; Osborne & Sibley, 2015), interest in politics (Kimmelmeier, 2007), and political identity centrality (Federico & Ekstrom, 2018). When applied to IH, the contingent asymmetry approach would expect such factors, which lead people to be more politically engaged, to moderate the IH-ideology relationship, such that personality would be more predictive of political attitudes among the politically engaged compared to the unengaged. For the first study, the moderator I used to test this hypothesis was political identity centrality, which directly taps into the motivation to express oneself with politics. Thus, we would expect that the negative link between IH and conservatism would be stronger among people who see their political identity as important, compared to the ones that do not.

The third view which has often been pitted against the asymmetry view is called the “rigidity-of-the-extreme” (Zmigrod, 2020) or “ideologue” (Tetlock, 1989). Its proponents suggest that the need to manage uncertainty would draw people to

extreme ideologies on both ends of the political spectrum (Greenberg & Jonas, 2003; van Prooijen & Krouwel, 2019). Indeed, extremists do have a simpler view of the political landscape (Lammers, Koch, Conway, & Brandt, 2017), think that they know better than others (Toner, Leary, Asher, & Jongman-Sereno, 2013), and display mental inflexibility on behavioral tasks (Zmigrod, Rentfrow, & Robbins, 2019, 2020). Since these features are unlikely to coincide with proper attention to one's own intellectual limitations, this perspective would predict a reverse u-shaped relationship, such that those on the extreme right and extreme left will show less IH than the moderates. An integration of rigidity-of-the-right and rigidity-of-the-extreme approaches may also suggest some variants of this quadratic pattern. Jost and colleagues (2003a) argued that although both left-wing and right-wing movements can be dogmatic and rigid, leftists will be more open-minded on average, because left-wing movements are generally more supportive of social change. This hypothesis can be applied to IH in two ways. The first is that those on the moderate left will have the highest IH (Tetlock, 1984), i.e., the peak of the reverse u-shape will shift leftwards. The second is that the effect of ideological extremity on IH will be more pronounced for the conservatives, i.e., the line will be steeper on the right-side of the political spectrum (see Figure 2c in Jost et al., 2003a).

Finally, there is the null hypothesis which states that there will be no relationship between IH and ideology; everyone across the political spectrum can be intellectually humble or arrogant. This would not necessarily mean that IH has no relevance to politics; it just may be hard to map it on the left-right axis in a given political environment. If people do not feel represented on either side of the spectrum, the proposed relationships (i.e. linear or quadratic link between IH and

ideology) can be masked. Let us assume that epistemic and existential needs (which could determine IH) guide people toward certain attitudes, as the asymmetry hypotheses suggest. Politicians from opposite sides may strategically declare support for the same policy if they compete for the same group of voters. A person who takes a certain political position that expresses their epistemic needs but hears the same words from both sides may end up confused and become skeptical of politics. Or let us assume that mentally rigid people (who would be low in IH) are drawn to extremes. These people can still take extreme positions on several issues, but if these issues are not in the same ideological package (metaphor borrowed from Federico & Malka, 2018), they may not want to position themselves on either side. Or since the internet can offer polarization and conflict in any topic, people who would have ended up on ideological extremes can instead express their dogmatism in non-political areas, like becoming a football fanatic or picking a side in the Apple vs. Android debate. Of course, these scenarios are too complicated to know beforehand in a way that allows us to predict a null result. But I made one null prediction due to the same challenge of mapping political attitudes on the left-right scale: I expected IH to have no relationship with economic conservatism, because the latter was a poor predictor of right-wing self-placement (Sarıbay & Yılmaz, 2018).

Apart from clarifying the IH-ideology relationship, the first study also aimed to replicate two findings, one from the broader literature on IH and one from our previous project. The first one was the negative link between dogmatism and IH. The literature seemed somewhat consistent on this (Haggard et al., 2018; Hoyle et al., 2016; Leary et al., 2017), so establishing the same relationship using the Turkish adaptation of GIHS would support its validity. The second finding was IH's negative

correlation with religiosity from Güngör et al. (2019). Previous work on IH and religiosity found inconsistent results. Hopkin and colleagues (2014) found that the most and the least religious reported lower IH. Krumrei-Mancuso (2018) found the opposite pattern, such that IH was higher at the extremes. Leary et al. (2017) found no quadratic or linear pattern. If dogmatism is related to IH, as suggested by the literature, we can try using it as a proxy for low-IH to make a prediction about whether religiosity and IH are related in our sample. Research with Western samples showed that religious fundamentalism predicted dogmatism (Altemeyer, 2002; Bronstein, Pennycook, Bear, Rand, & Cannon, 2019). This relationship was replicated in a mostly Muslim Turkish sample (Tolunay, 2001). Assuming that IH will be negatively related to dogmatism, we may expect that the negative link between IH and religiosity will replicate.

1.2 Intellectual humility and belief bias

Arguments in the form of two premises and a conclusion are called syllogisms (Khemlani & Johnson-Laird, 2012), e.g., (Premise 1) “All A are B.” (Premise 2) “No C are B.” (Conclusion) “No C are A.” The rules of logic are supposed to dictate what necessarily follows from the premises and what does not, but human reasoning does not always align with them. Early research on factors that affect the perceived validity has identified an atmosphere effect (Woodworth & Sells, 1935), where the positivity and negativity of premises influence the conclusion. The effect of conclusion believability was first referred to as another kind of atmosphere effect (Morgan & Morton, 1944), but it later got its own term: “belief bias” (Evans, Barston, & Pollard, 1983). Participants may reject an unbelievable conclusion that

logically follows from the premises or accept a believable one that does not [example of an unbelievable but valid conclusion: (P1) “All mammals can walk.” (P2) “Whales are mammals.” (C) “Whales can walk.”]. As I will mention in the next section, the effect of believability is not limited to statements that are obviously true or false; belief bias is also induced by one’s personal beliefs, such as political attitudes.

Although syllogisms do not exactly mimic the content one encounters in everyday life, performance on the task is related to measures of cognitive ability and effortful or open-minded thinking (Pennycook, Cheyne, Koehler, & Fugelsang, 2013; Sá, West, & Stanovich, 1999; Stanovich & West, 1998; but also see Thompson & Evans, 2012). Similarly, a study by Zmigrod and colleagues (2019) showed that intelligence and cognitive flexibility made up for each other in predicting IH: high cognitive flexibility was linked to higher IH for people with lower intelligence, whereas intelligence predicted higher IH for people with lower flexibility. Assuming that both IH and resistance to belief bias are related to cognitive ability and thinking dispositions, it is reasonable to expect that belief bias performance can serve as a behavioral predictor of IH. Another feature that makes this task suitable is the use of logic for evaluating participants’ responses. One might argue that it is not biased to not change your mind after reading a short piece of evidence that contradicts your beliefs (e.g., Lord, Ross, & Lepper, 1979 and other similar manipulations in social psychology studies). But here, the rules are clear enough to identify bias, regardless of how justified the prior belief is. Indeed, sticking to objective rules is proposed as one of the ways by which IH could reduce biases (Samuelson & Church, 2015). IH is about properly evaluating the limitations of one’s beliefs (Whitcomb et al., 2017) and

these could be judged better when it is based on some principle (in this case, logic). IH could make someone more likely to recognize that, although the beliefs may have served them well before, they might be limited now given the rules of that particular task. Thus, an intellectually humble person may be less likely to let prior beliefs affect their judgment when they conflict with the principles.

There was no direct empirical evidence on how IH influences belief bias before this thesis, so I used dogmatism as a proxy for low-IH, just as I did to infer the relationship between IH and religiosity. Martin (2008) showed that low dogmatism was related to less belief bias and more sensitivity to logical validity. Bettinghaus and colleagues (1970) found no effect of dogmatism on syllogisms with neutral content, but this could be due to low and high dogmatism groups having similar reasoning ability scores in the pretest. With controversial content, low-dogmatism group scored higher overall; they also performed better than high-dogmatism participants on conflicting (i. e., valid-unbelievable and invalid-believable) syllogisms. Bettinghaus et al. also manipulated the source that syllogisms were attributed to, which might serve as a cue for argument soundness. Less dogmatic participants performed better than more dogmatic ones when source positivity and validity conflicted (i.e., when invalid syllogisms were presented by positive sources, and when valid syllogisms were presented by negative ones). Like dogmatism, we could expect IH to be more helpful in conditions (such as charged content) that trigger affect-based reasoning (i.e., “hot cognition”; Redlawsk, 2002).

Apart from the main effect of believability, researchers also observed an interaction of validity and believability, such that participants made better validity judgments with unbelievable conclusions compared to believable ones (Evans et al.,

1983). This interaction resembles the phenomenon of motivated skepticism, where people apply stricter criteria to information they do not want to hear (Ditto & Lopez, 1992; Ditto, Munro, Apanovitch, Scepansky, & Lockhart, 2003). Some researchers, who analyzed the syllogism data with signal detection theory models, argued that this validity-believability interaction was an artefact of the traditional methods (Dube, Rotello, & Heit, 2010; Heit & Rotello, 2014). However, a recent meta-analysis concluded that even if this effect was not universal, it could be observed as a function of individual differences, using appropriate models (Trippas et al., 2018). Effortful thinking (measured by Cognitive Reflection Test; Frederick, 2005) was one such predictor of interaction, even though it was negatively associated with belief bias (Trippas, Pennycook, Verde, & Handley, 2015; but also see Calvillo et al., 2019). IH did not correlate with CRT in Güngör et al. (2019), but it was associated with another construct that could lead to being harsher critics of others. GIHS positively correlated with the Social Vigilantism Scale (Saucier & Webster, 2010) items that expressed contempt toward ignorant people (e.g. “Some people just believe stupid things.”). Since the limitations-owning account of IH (Whitcomb et al., 2017) is based on how one attends to limitations of one’s own beliefs, it does not explicitly forbid being judgmental towards others’ beliefs. Yet, this relationship was not expected or found in the literature (Haggard et al., 2018; Leary et al., 2017). This confusing finding is not sufficient to form a clear hypothesis about IH and interaction component on the syllogism task but carries some potential for exploratory analyses.

1.3 Ideology and belief bias

As mentioned above, research on belief bias did not only deal with universally believable or unbelievable statements, but also controversial ones. During World War II, Morgan and Morton (1944) used syllogisms with war-related content; they suggested that the syllogism task could be used to measure participants' attitudes on controversial topics without the influence of social desirability biases. Indeed, studies that looked at attitudes have found that they predicted belief bias (Janis & Frick, 1943), from general political attitudes (Lefford, 1946) to ones in specific topics such as race (Thistlethwaite, 1950), Soviet Russia (Gorden, 1953; Henle & Michael, 1956), or unions (Lynn & Williams, 1990).

More relevant for our purposes is another line of research that dealt with who is susceptible to belief bias, whether the syllogisms are political or not. Several studies looked at religiosity as a predictor. Feather (1964) found that compared to anti-religious participants, pro-religious ones had higher belief bias on religious syllogisms and lower accuracy on neutral syllogisms with no believability manipulation. Pennycook et al. (2013) and Nuutinen et al. (2015) showed that religious people showed more belief bias on syllogisms with neutral content. Interestingly, religiosity was not related to performance for political syllogisms in Nuutinen et al.'s (2015) sample, even though these included a religiously-charged topic like abortion. In a mostly Catholic Slovak sample, Čavojová (2018) found that Christians showed more belief bias compared to non-religious participants on abortion-related syllogisms.

Recent work sought to predict belief bias from participant ideology. Nuutinen and colleagues (2015) found that conservatives showed higher belief bias on political

sylogisms, based on believability ratings for each conclusion. Calvillo et al. (2019) did not measure believability, but calculated belief bias and interaction indices for each political camp (i.e., coding conservative sounding conclusions as believable for conservative bias index and vice versa). Belief indices correlated with participant ideology, such that both camps were more likely to accept syllogisms that favored their views. Overall, their sample showed a liberal bias, even though liberals were not overrepresented. Calvillo et al.'s explanation was that, for moderates, liberal conclusions may have sounded more socially desirable. Finally, across three large samples (total N = 2,898), Gampa et al. (2019) found mixed results for ideological differences in belief bias. They also found a small interaction effect, such that liberals performed better with valid-liberal and invalid-conservative syllogisms and vice versa.

Overall, it seemed clear that religiosity can be linked to belief bias in the second study, but the findings were inconsistent for political orientation. Still, I aimed to adapt each theoretical perspective, reviewed in the first study, to belief bias and compare them to each other, while keeping in mind that the ideological asymmetries found with self-report measures of open-mindedness (Jost et al., 2003b) may not readily translate to behavioral measures of bias (Ditto et al., 2019) or prejudice (Brandt et al., 2015; Brandt & Crawford, 2019; Crawford, 2014). The last research question was whether IH's expected protective effect against belief bias would work similarly for both sides of the political spectrum or one side would benefit more from IH, as conservatives did on a different task in the 3rd study of Leary et al. (2017). Although it sounds simple to verbally pit these against each other, their statistical expressions would be highly dependent on the belief bias-

ideology patterns. For example, consider one scenario where there is no linear or quadratic relationship between ideology and belief bias among high-IH individuals, but low-IH individuals show more belief bias as they become more ideologically extreme. Another scenario could be that high-IH individuals show less belief bias compared to low-IH ones, but the ideology-belief bias patterns would be the same in both groups. Although both sides of the political spectrum would similarly benefit from IH in both scenarios, the first one would mean a Believability * Ideology * IH interaction, whereas the latter would not. Because of this complexity, and the lack of prior evidence pointing to a clear direction, I decided to examine this question with exploratory analyses.

CHAPTER 2

STUDY 1

This main goal of this study was to investigate how IH relates to ideology, as well as beliefs and traits that are tangentially related to ideology (i.e., dogmatism and religiosity). It also served as a stepping stone for the next study by allowing me to collect ratings for stimuli to be shown in Study 2, without interfering with the task itself. Finally, this study allowed me to replicate previous findings that was unrelated to the main goal of this study (see Materials).

2.1 Hypotheses

To examine the IH-ideology relationship, theoretical approaches from political psychology literature that are reviewed above were considered. Although the asymmetry hypothesis was the most credible, due to the previous finding from our lab, I tested each of these competing hypotheses:

H1 (asymmetry i.e., rigidity-of-the-right): IH will be negatively related to conservatism/right-wing ideology.

H2 (moderated asymmetry): IH will negatively predict conservatism/right-wing ideology, but there will be an interaction between IH and political identity centrality, such that the ideological asymmetry in IH will be greater among those who see their political identity as more central.

H3 (rigidity-of-the-extreme): There will be a reverse U-shaped relationship between IH and ideology, such that those on the extreme ends of the ideological spectrum will have lower IH than those closer to the center.

H4 (integration of rigidity-of-the-right and rigidity-of-the-extreme hypotheses):

There will be a reverse U-shaped relationship between IH and ideology, such that extremists will report lower IH, but the slope will be steeper on the right side of the breaking point.

H5 (the null): There will be no linear or quadratic relationship between IH and ideology.

The main measure of ideology in all hypotheses was the 7-point ideological self-placement question. But the same analyses were also conducted on RWA and social conservatism since these were expected to behave like the main measure.

There was one additional hypothesis about IH and ideology:

H6: There will be no relationship between IH and economic conservatism.

Hypotheses related to the secondary goal of this study were as follows:

H7: IH will be negatively related to dogmatism.

H8: IH will be negatively related to religiosity.

All hypotheses were pre-registered before data collection started. The pre-registration can be found at <https://osf.io/g5ke8>.

2.2 Method

2.2.1 Participants

Participants were Boğaziçi University undergraduates who were taking introductory psychology courses. Participation was compensated for by course credit and participants were informed that they could receive monetary reward if they were selected for the second study. The minimum number of participants was based on the

smallest effect size from Güngör et al. (2019) that are of primary interest. This happened to be the GIHS - religiosity relationship, $r = -.21$. According to G*Power (v 3.1.9.2; Faul et al., 2007), 236 participants are required to achieve 95% power to find this effect when $\alpha = .05$ (one-tail). After the minimum sample size was reached, data collection was going to stop when either of the two conditions was met: reaching the deadline of April 27th or the sample size needed to reliably replicate the smallest effect of secondary interest from Güngör et al. (2019). The latter was based on the counterintuitive relationship between GIHS and Disdain subscale of Social Vigilantism ($r = .16$). Since the relationship could be expected in the opposite direction (as Leary et al., 2017 did), it required a two-tailed test; this put us at 497 participants to obtain 95% power when $\alpha = .05$.

Data collection stopped at the proposed deadline, with 295 non-duplicate entries. Participants who failed the attention check question (see Procedure) and those who completed the survey either too fast or too slow¹ were removed from the analyses. Final sample consisted of 272 participants (116 men, 154 women, 2 non-binary, $M_{age} = 20.56$), which would allow us to detect a correlation of $\rho = .198$ with 95% power when $\alpha = .05$.

¹ Surveys that were submitted in under 10 minutes and over 3 hours were filtered out. These upper and lower limits were not specified in the pre-registration because it was difficult to estimate what a sensible pace would be for participants, as the quarantine might affect people's attention spans differently. Although having an acceptable range is necessary, the exact bounds are arbitrary. Hence, the readers can change this line in the code (to be uploaded to <https://osf.io/zr3x8/>) to set their own time limits: "study1 <- study1[study1\$Duration..in.seconds. > 600 & study1\$Duration..in.seconds. < 7200,]". The results were virtually identical when I ran the analyses without filtering for time.

2.2.2 Materials

2.2.2.1 Materials related to the main hypotheses

General Intellectual Humility Scale (GIHS; Leary et al., 2017) is a 6-item, single factor IH measure with 5-point Likert type scale was adapted to Turkish in a previous project (Güngör et al., 2019). Since it showed better correlations (compared to LOIHS) with our variables of interest in that project, hypotheses and the power analysis for the first study were based on this scale ($\alpha = .78$) (Appendix A).

For ideology, participants completed social ($\alpha = .86$) and economic conservatism ($\alpha = .76$) measures from Yılmaz & Sarıbay (2018), in addition to the one-item political orientation question (Appendix B). Another ideology measure was Right-Wing Authoritarianism (RWA; Altemeyer, 1996). RWA is a measure of attitudes towards preserving traditional values and hostility toward groups that go against them. Krumrei-Mancuso (2018) suggested that it might mediate the IH-religiosity relationship. It contains 22 items and uses a 9-point Likert scale ($\alpha = .92$, Appendix C). Turkish adaptations of ideology measures (except for the one-item self-placement question) were taken from <https://www.moralintuitionslab.com/materials>. Participants were also asked to choose a category that best defines their ideology (conservative, social democrat, nationalist, etc.) and then to answer, “How important is it for you to define yourself with this category?” This question was used as a proxy for political identity centrality.

For religiosity, participants answered the question “Do you consider yourself to be a religious person?” on a 7-point Likert type scale (Appendix B). Participants

also filled out the dogmatism scale (Tolunay, 2001; Appendix D), which was a combination of original items and items taken from various other measures including Rokeach's (1960) Dogmatism scale and California F scale (Titus & Hollander, 1957). It was included to replicate IH's negative correlation with Dogmatism (Haggard et al., 2018; Hoyle et al., 2016; Leary et al., 2017) ($\alpha = .63$). Finally, participants were asked several demographic questions such as their gender, age, ethnicity, socioeconomic status (SES) during childhood, hometown size (Appendix E).

2.2.2.2 Materials related to the second study

I collected believability ratings for the conclusions in the syllogism task which would be solved by participants in Study 2 (Appendix F). Participants answered the question "How much do you believe in or agree with this statement?" on a scale of 1 to 10 for the conclusions. Since the opposite of the same sentence would be used to manipulate believability, participants rated 16 conclusions for 32 syllogisms: 4 believable and 4 unbelievable conclusions for the non-political ones, 4 liberal and 4 conservative conclusions for the political ones. Non-political conclusions served as fillers because people were not expected to meaningfully vary in their beliefs. But the political ones were used in the second study to code believability. Although I expect belief in political conclusions to correlate with political orientation, these would not be perfect correlations because people may differ in their motivation to align their views on each topic to reach a coherent ideological position (Converse, 2006). Belief ratings allowed me to code the believability for each participant without having to assume it from ideological self-placement.

Another measure that was included for the second study was the Specific Intellectual Humility Scale by Hoyle and colleagues (2016). Abbreviated version of this measure uses a 5-point scale and consists of 3 items (Appendix G). This scale was adapted to Turkish for this project. Participants were instructed to fill out these scales for each syllogism topic (cross-border military operations, $\alpha = .77$; capital punishment, $\alpha = .87$; mandatory military service, $\alpha = .82$; alcohol consumption, $\alpha = .79$; animals, $\alpha = .79$; vehicles, $\alpha = .82$; plants, $\alpha = .79$;) based on their responses in the previous page (believability ratings).

The final measure that was included for the second study was the Cognitive Reflection Test (CRT; Frederick, 2005; Thomson & Oppenheimer, 2016). CRT measures the tendency to engage in reflective thinking versus intuitive thinking (Appendix H). The original scale is composed of 3 questions with “baits” that immediately jump to mind; participants have to resist this intuitive answer to eventually find the correct one (e.g. “If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?”, the intuitive and wrong answer is 100 and the reflective and correct answer is 5). Trippas and colleagues (2015) showed that CRT predicted less belief bias but more motivated reasoning (i.e., better performance in unbelievable conclusions than believable ones). Calvillo et al. (2019) found that CRT scores predicted better sensitivity to validity for both political and non-political syllogisms, but they were not related to belief bias for either type of content. CRT would allow me to test if these results held up in the second study. Alongside the original scale, I also included the CRT-2 (Thomson & Oppenheimer, 2016; scale taken from <https://www.moralintuitionslab.com/materials>), which depends less on numeracy.

2.2.2.3 Materials to replicate findings unrelated to this study

Although the Analysis-Holism Scale (AHS; Choi, Koo, & Choi, 2007) was not directly related to the questions of this study, it was included to replicate the positive relationship between IH and holistic thinking that was found in GÜngör et al. (2019). AHS is a measure of holistic thinking — a cultural thinking style that encompasses attention to context, expectation of constant and non-linear change, tolerance of contradictions and a more complex understanding of causality (Appendix I). These principles, grounded in Chinese philosophy (Peng & Nisbett, 1999; Peng, Spencer-Rodgers, & Nian, 2006; Spencer-Rodgers, Anderson, Ma-Kellams, Wang, & Peng, 2018), are measured with 4 subscales: Causality, ($\alpha = .83$; e.g., “Everything in the world is intertwined in a causal relationship.”), Attitude Toward Contradictions ($\alpha = .71$; e.g., “It is more desirable to take the middle ground than go to extremes.”), Perception of Change [$\alpha = .73$; e.g., “Every phenomenon in the world moves in predictable directions.” (reverse coded)] and Locus of Attention ($\alpha = .83$; e.g., “The whole, rather than its parts, should be considered in order to understand a phenomenon.”). This scale was first adapted to Turkish and modified in Sarıbay, Şencan, & GÜngör (2018, unpublished); this version has 29 items in total and uses a 7-point Likert scale (also see <https://osf.io/q8vey/> for the modifications). Results for this scale and other measures in this subsection won't be reported in this thesis but they will be reported in the manuscript for the relevant project (α for the whole scale = .79).

Another measure of secondary interest was the Limitations-Owning Intellectual Humility Scale (LOIHS; Haggard et al., 2018; Appendix J). Like GIHS, this scale was also adapted to Turkish for GÜngör et al. (2019). Although it was not

the primary measure of IH for this study, it was included to replicate the IH-holistic thinking relationship in GÜngör et al. It uses a 9-point Likert scale and has 3 subscales with 4 items in each: Love of Learning ($\alpha = .70$; e.g., “If I do not understand something, I try to get clear about what exactly is confusing to me.”), Appropriate Discomfort with Limitations [$\alpha = .61$; e.g., “I tend to get defensive about my intellectual limitations and weaknesses.” (reverse coded)], and Owning Limitations ($\alpha = .67$; e.g., “When someone points out a mistake in my thinking, I am quick to admit that I was wrong.”) (α for the whole scale = $.71$).

Self-Deception subscale of Social Desirability Scale (SD; Akin, 2010) was another variable in the model in GÜngör et al. (2019) that we want to replicate (i.e., IH-AHS relationship). This 13-item subscale is similar to the one in Paulhus’ (1988) Balanced Inventory of Desirable Responding. It measures overconfidence in one’s decisions and reasoning ($\alpha = .70$, Appendix K).

Lastly, Study 1 included Social Vigilantism (SV; Saucier & Webster, 2010), which measures how much a person believes that their ideas are superior and must be adopted by others (Appendix L). Leary et al. (2017) and Haggard et al. (2018) both found null relationships between SV and IH; these results were inconsistent with the predictions of the former, but confirmed those of the latter (see Whitcomb et al., 2017 for a discussion of why IH should be unrelated to the estimation of intellectual strengths). GÜngör et al. (2019) similarly found a null result, but also conducted confirmatory and exploratory factor analyses to show that it might be more productive to divide SV into 3 subscales: Responsibility for Educating Others ($\alpha = .75$; e.g., “I feel a social obligation to voice my opinion.”), Imposing One’s Ideas ($\alpha = .62$; e.g., “If everyone saw things the way that I do, the world would be a better

place.”, Disdain toward the Ignorant ($\alpha = .73$; e.g., “There are a lot of ignorant people in society.”). It was included in this study to replicate the positive GIHS-Disdain relationship in Güngör et al. (2019). Results for this scale, like AHS, will be reported elsewhere (α for the whole scale = .82).

2.2.3 Procedure

The survey for the study was compiled using Qualtrics. Participants reached the survey link through the university’s research participation system and completed the study online. Since this study also aimed to replicate the IH-holism relationship in Güngör et al. (2019), AHS and the two IH measures were presented first in randomized order, similar to the previous study. Following this block, RWA, SV, SD and CRT were presented in random order. All items within the mentioned scales were randomized. SD also included an attention check question; participants were asked to rate “I have never ridden in a car.” on a 5-point Likert type scale ranging from “Does not describe me at all” to “Absolutely describes me”. Participants who selected the midpoint and above were filtered out. After this block, participants rated the believability of conclusions and completed the specific IH measures for each topic. Then they completed the measures for ideology (self-placement, social and economic conservatism, centrality), religiosity, and demographics. Syllogism conclusions and the items in the social and economic conservatism scales were also randomized within each scale.

2.2.4 Data analysis

Data for both studies were cleaned, wrangled, and analyzed using R (Version 3.5.1; R Core Team, 2018).

2.3 Results

2.3.1 Analyses for the main hypotheses

I will first go through the four hypotheses from political psychology literature (asymmetry, moderated asymmetry, rigidity-of-the-extreme, and the integration of asymmetry and rigidity-of-the-extreme) and report the results for the main ideology measure (self-placement) and auxiliary ones that were expected to behave similarly to it (Right-Wing Authoritarianism, social conservatism). For the symmetry (i.e., the null) hypothesis, I will report the equivalence tests for the variables on which I did not find support for the first four hypotheses, and the one ideology variable that I did not expect to correlate with IH (economic conservatism).

As stated in the pre-registration, one-tailed Pearson's correlation tests were conducted to test the asymmetry (i.e., rigidity-of-the-right) hypothesis. The data did not show any support for a relationship between IH and the one-item ideological self-placement, $r = -.01$, $t(261) = -0.16$, $p = .437$. However, RWA negatively correlated with IH, $r = -.20$, $t(270) = -3.31$, $p = .001$. Social conservatism was negatively related to IH as well, though the effect was small, $r = -.12$, $t(269) = -1.93$, $p = .027$.

However, scatterplots and diagnostic measures suggested that multivariate outliers influenced these estimates. I used the Minimum Covariance Determinant (MCD) described in Leys et al. (2018), to detect and remove the outliers. MCD75 was the

variant recommended by Leys et al. (2018), as it was the best estimator of the true correlation (compared to classic Mahalanobis and MCD50) when outliers made up less than 25% of the data. Based on MCD75, outliers made up 0.76%, 5.88%, and 12.92% of the subsamples for GIHS's correlations with political orientation, RWA, and social conservatism, respectively. After these cases were removed, the result for self-placement remained similar, $r = -.03$, $t(259) = -0.44$, $p = .329$, whereas RWA-IH relationship became smaller, $r = -.15$, $t(254) = -2.44$, $p = .008$, and IH's correlation with social conservatism disappeared, $r = -.02$, $t(234) = -0.30$, $p = .381$. Since the cleaning procedure was not pre-registered, I provide both the cleaned and uncleaned plots in Figure 1.

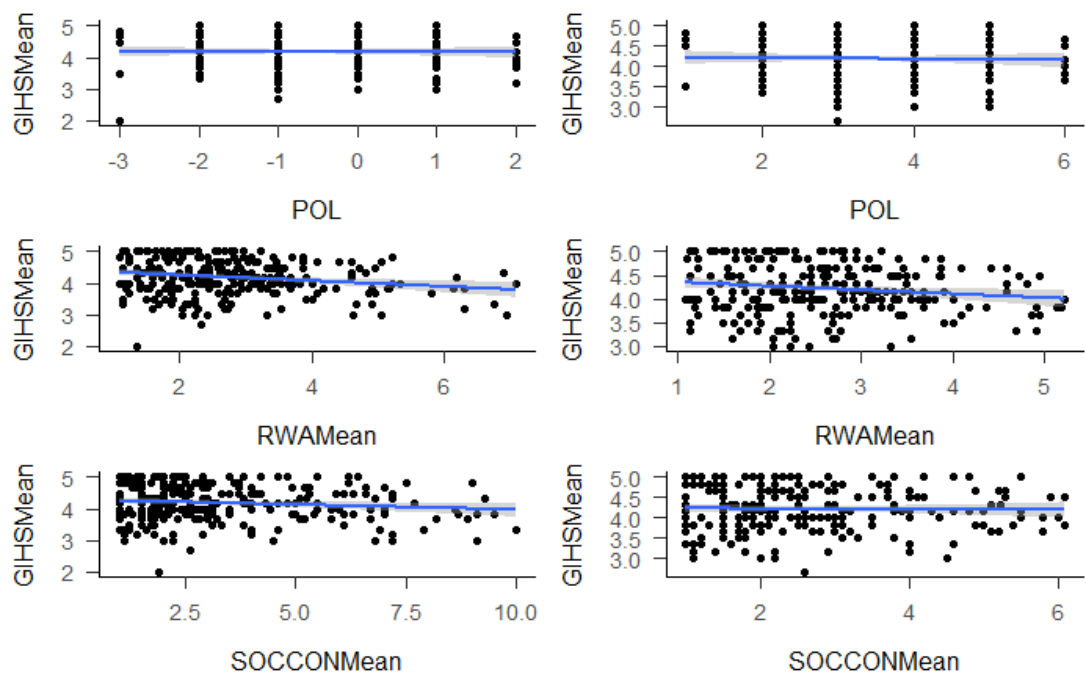


Fig. 1 IH's relationship with ideology variables before (left panel) and after (right panel) cleaning

Moderated asymmetry hypothesis was tested using regression models with ideology measures as the outcome variable. IH, political identity centrality, and their

interaction were entered as predictors,² as specified in the pre-registration.

Interaction of IH and political identity centrality did not predict any variance in ideological self-placement, $b = 0.05$, 95% CI [-0.06, 0.16], $t(259) = 0.91$, $p = .366$, RWA, $b = 0.01$, 95% CI [-0.10, 0.13], $t(266) = 0.24$, $p = .808$, or social conservatism, $b = -0.06$, 95% CI [-0.26, 0.15], $t(266) = -0.53$, $p = .598$.

Rigidity-of-the-extreme hypothesis was tested using the two-lines test (Simonsohn, 2018); IH was the outcome variable while ideology measures were the predictors. As the figures 2, 3 and 4 show, IH had no quadratic relationship with any of the ideology variables. Hence, testing the integration of rigidity-of-the-right and rigidity-of-the-extreme hypotheses was not applicable.

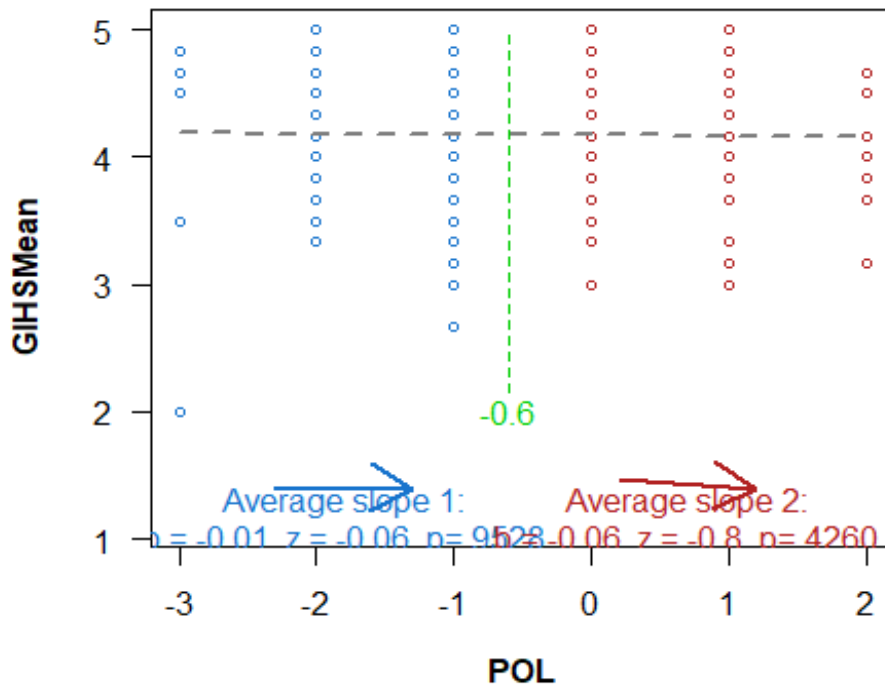


Fig. 2 Two-lines test for ideological self-placement (x axis) predicting IH (y axis)

² GIHS and political identity centrality were mean centered.

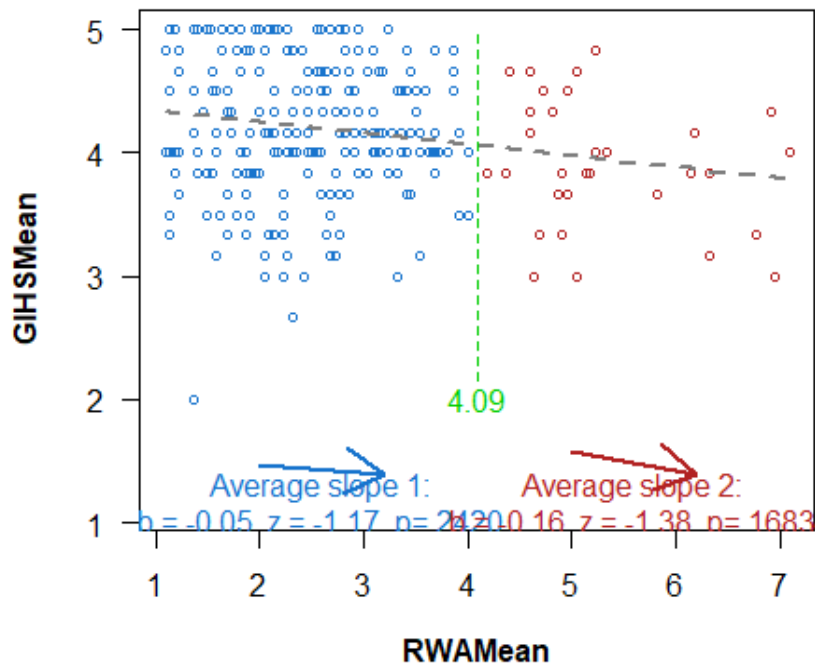


Fig. 3 Two-lines test for right-wing authoritarianism (x axis) predicting IH (y axis)

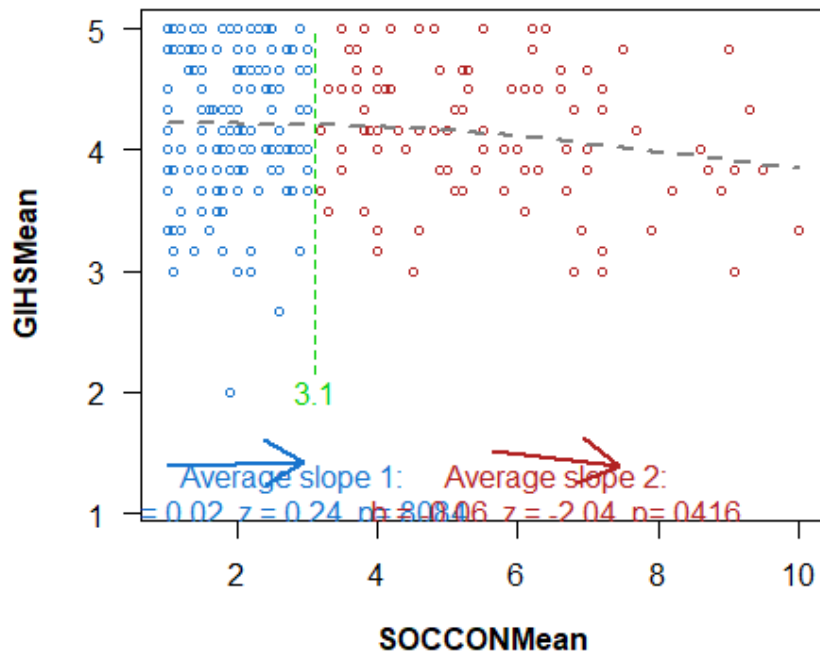


Fig. 4 Two-lines test for social conservatism (x axis) predicting IH (y axis)

There was only one variable, economic conservatism, whose relationship with IH was explicitly predicted to support the symmetry (i.e., the null) hypothesis. Indeed, I found no evidence of a linear ($t(258) = -0.67, p = .503$) or quadratic relationship ($p = .213$ for the average slope 1, $p = .213$ for slope 2). Apart from economic conservatism, the analyses on ideological self-placement and social conservatism also showed no support (or only weak support, in the case of the latter) for any of the preceding hypotheses. But since null results do not necessarily imply the absence of an effect, I conducted equivalence tests (Lakens, 2017) to see if these effects in fact supported the symmetry hypothesis. For the equivalence bounds, I decided to use a round number between the smallest effect of primary interest from the previous project ($r = .21$) and the smallest effect that can be detected with the final sample ($r = .198$, given that $1 - \beta = .95$ and $\alpha = .05$), so I set them to $r = -.2$ and $.2$. The tests showed that, effectively, IH had no relationship with ideological self-placement ($p = .002$ for the lower bound, $p < .001$ for the upper bound), social conservatism ($p = .003$ for the lower bound, $p < .001$ for the upper bound), or economic conservatism ($p = .005$ for the lower bound, $p < .001$ for the upper bound).³

As predicted, IH negatively correlated with dogmatism, $r = -.45$, $t(269) = -8.30, p < .001$. Results were similar after removing multivariate outliers, $r = -.44, t(266) = -8.05, p < .001$.

In our previous project we had found that IH was negatively linked to religiosity, but this exploratory finding did not replicate in this sample, $r = -.03$,

³ All equivalence tests were done on subsets of data which were cleaned of multivariate outliers based on MCD75 (Leys et al., 2018).

$t(267) = -0.44, p = .331$. An equivalence test showed that the effect was indeed statistically equivalent to zero ($p = .009$ for the lower bound, $p < .001$ for the upper bound).

2.3.2 Exploratory analyses

I had set out to test whether IH would interact with political identity centrality when predicting ideology (moderated asymmetry hypothesis), but I had not made a prediction about how IH itself would relate to seeing one's political identity as important. Participants who saw it important to define themselves with their political identity reported less IH, $r = -.21, 95\% \text{ CI } [-.32, -.10], t(268) = -3.58, p < .001$, and more dogmatism, $r = .30, 95\% \text{ CI } [.19, .41], t(267) = 5.22, p < .001$.

Then, I built 3 models with political identity centrality as the outcome, to see how each ideology measure was related to it. Ideological self-placement had a quadratic relationship with political identity centrality, in which people on the extremes saw their political identity as more central, $b = 7.83, 95\% \text{ CI } [4.23, 11.43], t(260) = 4.28, p < .001$ (Figure 5, also see Figure 6 for the two-lines test that confirm the pattern). RWA had a positive linear relationship with centrality, $b = 8.83, 95\% \text{ CI } [5.22, 12.43], t(267) = 4.82, p < .001$, but no quadratic one, $b = 2.92, 95\% \text{ CI } [-0.66, 6.50], t(267) = 1.61, p = .110$. Finally, social conservatism had both a positive linear relationship, $b = 6.22, 95\% \text{ CI } [2.59, 9.86], t(267) = 3.37, p = .001$, and a quadratic one, $b = 6.22, 95\% \text{ CI } [2.59, 9.86], t(267) = 3.37, p = .001$.

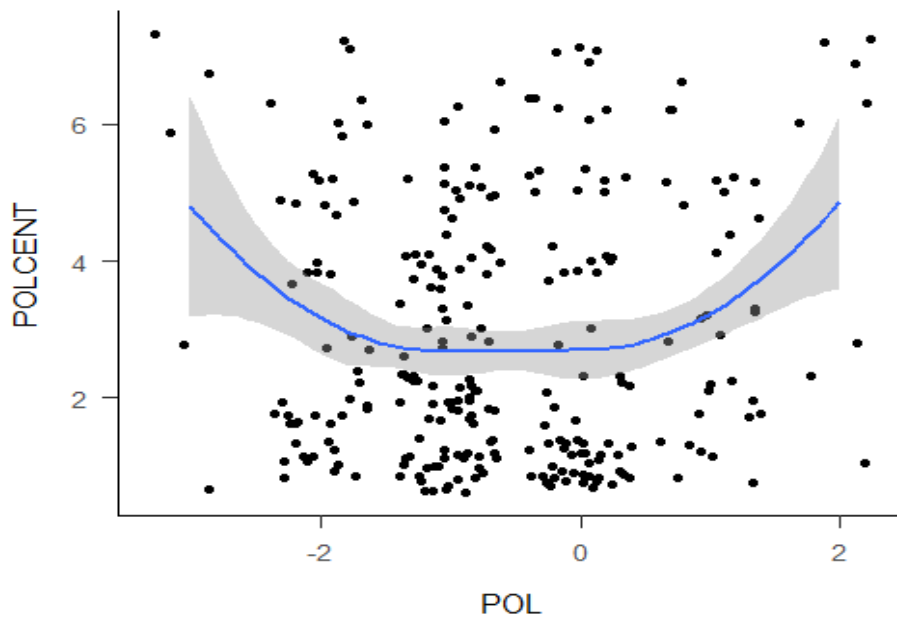


Fig. 5 Quadratic relationship between ideological self-placement (x axis) and political identity centrality (y axis)

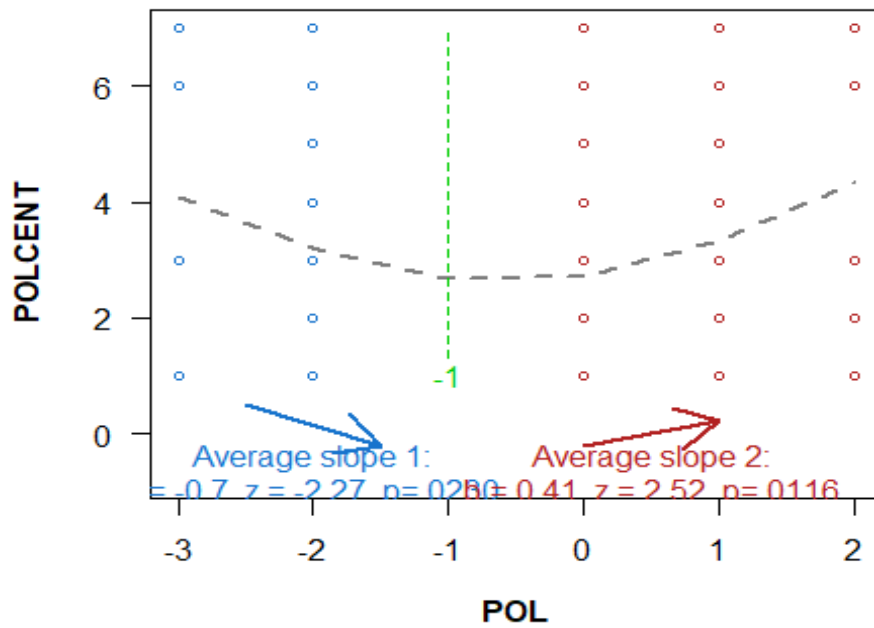


Fig. 6 Two-lines test for ideological self-placement (x axis) predicting political identity centrality (y axis)

As figures 7 and 8 show, centrality increased with conservatism for the scores above the midpoint, but the pattern became complicated on the lower end of the scale. This might mean that people who described themselves as moderates on the ideological self-placement item had more liberal views on social issues. If centrality was the real predictor of ideological differences on IH, then moderates and liberals being lumped together at one end of the scale might explain the higher presence of outliers in the linear IH-social conservatism model, and why it stopped being significant after cleaning.

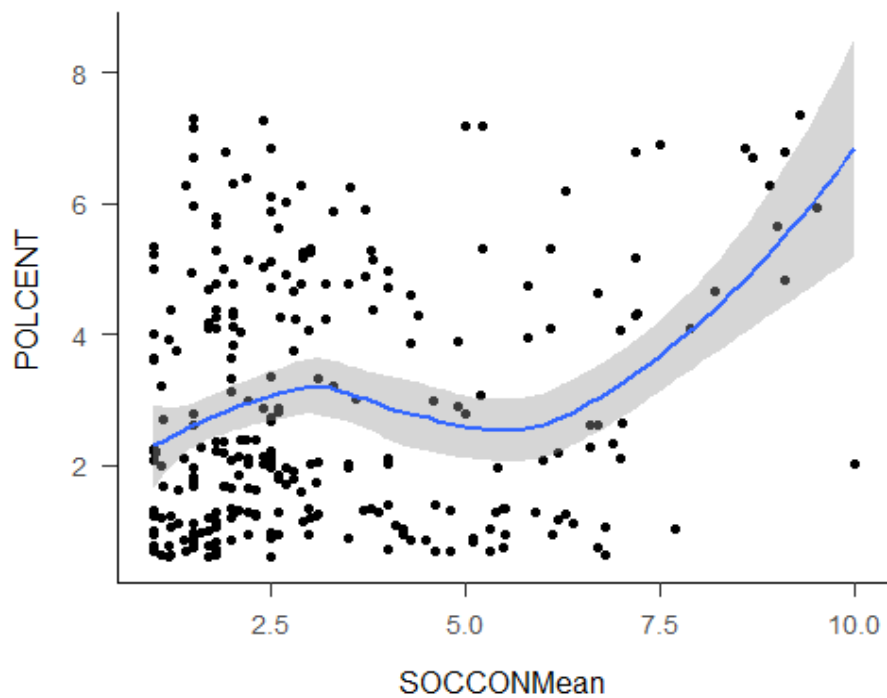


Fig. 7 Linear and quadratic relationship between social conservatism (x axis) and political identity centrality (y axis)

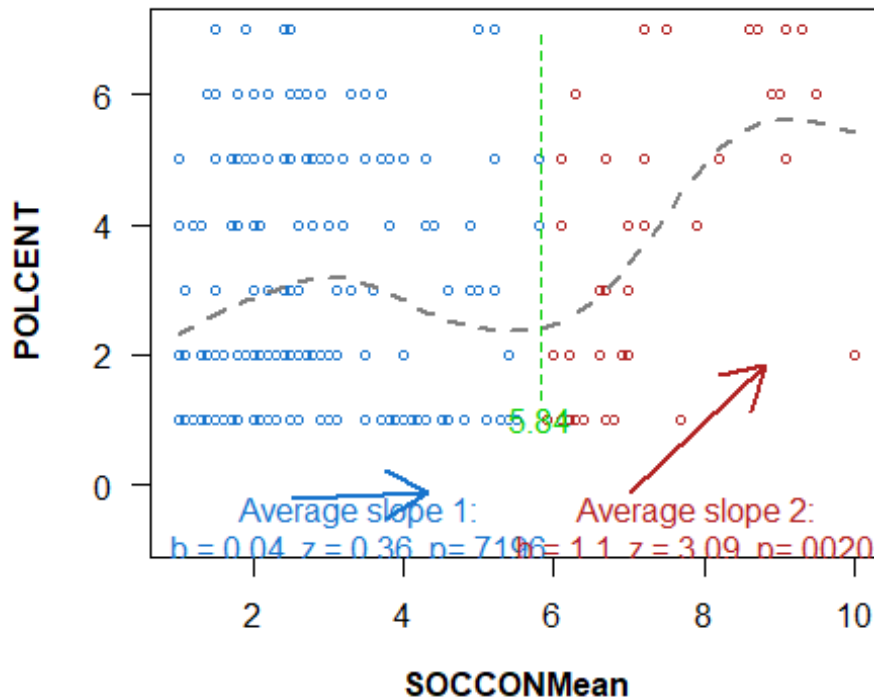


Fig. 8 Two-lines test for social conservatism (x axis) predicting political identity centrality (y axis)

I built another model to see if political identity centrality could explain the IH-RWA relationship. Even after adjusting for centrality, RWA still explained some variance, $b = -0.07$, 95% CI $[-0.12, -0.01]$, $t(267) = -2.40$, $p = .017$. I wondered if this was due to the intensity of authoritarianism that went beyond just being a partisan, or to its direction (i.e., right-wing ideology). I thought that dogmatism might explain the intensity part. When dogmatism was entered in the model, centrality and RWA no longer predicted IH ($t(265) = -1.16$, $p = .247$ for centrality, $t(265) = -1.07$, $p = .286$). Thus, if I am correct in assuming that dogmatism is a purer measure of the intensity/inflexibility component of RWA, then it appears that it is this component, rather than the right-wing content of RWA that is associated with IH.

Finally, I looked at how dogmatism was distributed across the political spectrum. Although there was a barely-significant quadratic relationship, $b = 0.85$, 95% CI [0.04, 1.67], $t(259) = 2.08$, $p = .039$, this pattern was not supported in the two-lines test (Figure 9).

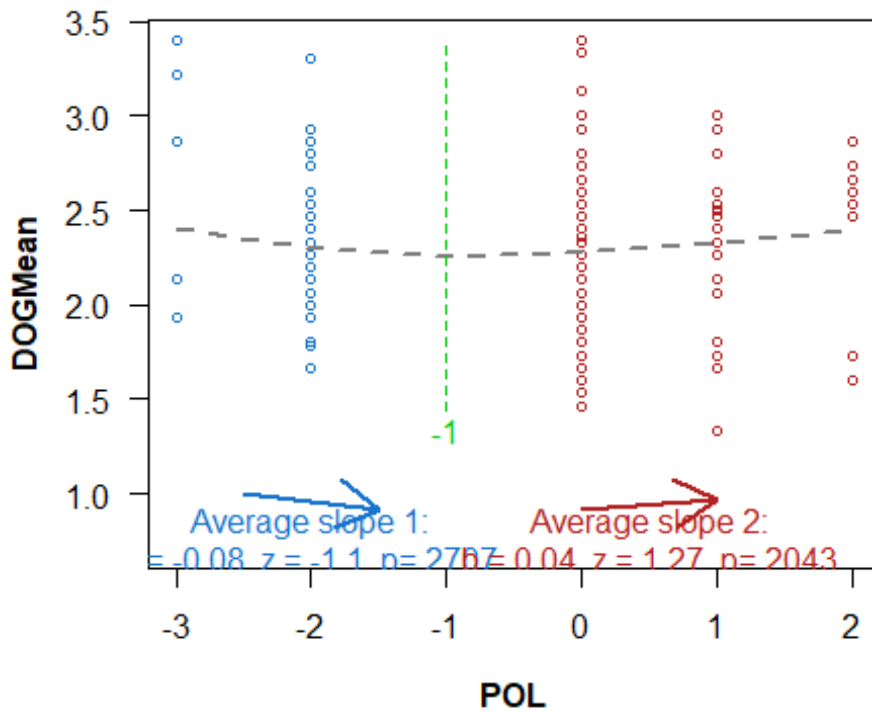


Fig. 9 Two-lines test for ideological self-placement (x axis) predicting dogmatism (y axis)

CHAPTER 3

STUDY 2

The main purpose of this study was to examine whether self-reported IH scores could predict performance in a behavioral task, in this case the syllogism task. The second aim was to adapt the perspectives from political psychology to the study of belief bias. Finally, I wanted to replicate previous findings on how beliefs and thought styles (e.g., religiosity, dogmatism, analytic thinking) are linked to belief bias.

3.1 Hypotheses

I had two predictions regarding IH and belief bias, which were derived from the theoretical construct of IH and previous work on dogmatism and belief bias:

H1: IH will predict less belief bias.

H2: Magnitude of the negative IH - belief bias association will be greater on syllogisms with political content, compared to the ones with non-political content.

Similar to the first study, hypotheses about ideology and belief bias were adapted from political psychology literature. I compared them against each other, without making a prediction about which one will find support:

H3 (asymmetry i.e., rigidity-of-the-right): Conservatives will show more belief bias compared to liberals.

H4 (moderated asymmetry): Belief bias will be positively related to conservatism/right-wing ideology, but the relationship will interact with political

identity centrality, such that the ideological asymmetry in belief bias will be greater among those who see their political identity as more central.⁴

H5 (rigidity-of-the-extreme): There will be a quadratic relationship between belief bias and ideology, such that those on the extreme ends of the ideological spectrum will show more belief bias than those closer to the center.

H6 (integration of rigidity-of-the-right and rigidity-of-the-extreme hypotheses):

There will be a quadratic relationship between belief bias and ideology, such that extremists will show more belief bias, but the slope will be steeper on the right side of the breaking point.

H7 (the null): There will be no linear or quadratic relationship between belief bias and ideology.

The other set of hypotheses, which were not directly related to the main research questions but tested to replicate previous findings, were as follows:

H8: Religiosity will predict more belief bias.

H9: Dogmatism will predict more belief bias.

H10: Analytic thinking will predict less belief bias.

H11: Analytic thinking will interact with validity and believability, as in Trippas et al. (2015), such that analytic thinkers will make better judgments when conclusions are unbelievable.

⁴ Hypotheses related to political psychology in Study 2 were adapted from the ones in Study 1. In the pre-registration document, this hypothesis was mistyped as “Belief bias will be *negatively* related to conservatism”. This is because the moderated asymmetry hypotheses predicted that IH would be negatively related to conservatism and I forgot to change the adjective. Readers who know that this hypothesis is supposed to be a modified version of the rigidity-of-the-right view would see the obvious mistake here, but I still apologize for the confusion.

Lastly, there were the questions that were meant to be tested with exploratory analyses. The first was whether IH would interact with ideology in predicting belief bias. The second was whether IH or ideology would predict the “interaction effect” from syllogistic reasoning literature (see last paragraph in the “Intellectual Humility and Belief Bias” section).

All of the hypotheses, as well as the exploratory analyses, were pre-registered at <https://osf.io/8vnhk>. Due to COVID-19 related scheduling turmoil, and the correspondence for much needed advice to build the right model⁵, pre-registration was done while data collection was still underway. The data was accessed before pre-registration only to determine who has completed the study, so that reminders could be sent to the rest of the subject pool. The data was not analyzed or wrangled until after the end of data collection.

3.2 Methods

3.2.1 Participants

Participants from the first study were selected for the second study based on the following inclusion criteria: having filled out the GIHS without missing data, having answered the one-item ideological self-placement question, having reported their beliefs toward the syllogism conclusions that would be used in this study without missing data, and having correctly answered the attention check question. 269 students from Study 1 who fit these criteria received a Qualtrics link for Study 2. Participation was compensated for by course credit. Additionally, participants were

⁵ I am grateful to Henrik Singmann for his help.

informed that if they answered all of the questions, they would enter a raffle to win one of 5 Amazon gift cards each worth 100 TL.

Sample size was determined by time constraints. Even though there was not a predetermined minimum sample size, a round of reminders was sent to encourage participation a week after data collection started. The survey link was deactivated on the specified deadline (May 5th), chosen to allow timely completion of this thesis. Out of 159 non-duplicate entries with complete validity responses, participants who failed the training check question (see Procedure) and the ones who had received formal logic training were excluded. Data from the 123 participants were put into analysis.

3.2.2 Materials

Participants solved 32 simple syllogisms, half with political content and half with non-political content (Appendix M). They all used universal quantifiers (All/None) except where the items cannot be quantified (as is the case with almost all of the political syllogisms). Four kinds of deductions for valid and invalid conclusions are as follows: (1) “All A are B. All C are A. All C are B.” (modus ponens, valid), (2) “All A are B. No C are B. No C are A.” (modus tollens, valid), (3) “All A are B. No C are A. No C are B.” (denial of the antecedent, invalid), (4) “All A are B. All C are B. All C are A.” (affirming the consequent, invalid) Non-political syllogisms were adapted from Calvillo et al. (2019) whereas political syllogisms were produced by our lab members. For these new syllogisms, we tried to ensure that the premises were neutral or vague enough to sound plausible and left the controversial statements for the conclusion. This would allow us to maximize the effect we want to observe, since

unbelievable premises (i.e., “warning signals”) decrease belief bias (Hilscher, 2014; Thompson, 1996). Political syllogisms were on four topics: alcohol consumption, capital punishment, cross-border military operations, and compulsory military service. Believability ratings for political statements in all topics correlated with political orientation in the expected directions. The effects sizes for the two conclusions on each topic were as follows: $r_s = .38 - .39$ for cross-border operations, $r_s = .30 - .30$ for capital punishment, $r_s = .22 - .26$ for mandatory military service, $r_s = .41 - .45$ for alcohol, all $p_s < .001$. Each political topic had 4 syllogisms, one for each validity-ideology combination (valid-conservative, invalid-conservative, valid-liberal, invalid-liberal). 8 of the non-political syllogisms were about animals, 4 of them were about vehicles and the remaining 4 were on plants. Each topic (both political and non-political) was designed to have all four kinds of deductions mentioned above. Due to researcher error that was recognized after data collection had already started, syllogisms on plants were missing the fourth type (affirming the consequent) and instead had 2 of the second type (denial of the antecedent); validity and believability combinations remained balanced.

3.2.3 Procedure

Participants solved the task on Qualtrics’ web platform. Participants first went through a training session (Appendix N and O), then they judged the validity of 32 syllogisms and rated their confidence in their judgments. They saw one syllogism and two questions on each page. The first question was “In your opinion, is the conclusion logically valid?”, to which they were asked to give a binary response (“Logically valid/invalid”). The second one was “How confident are you in your

answer?”, for which they were asked to select one of three options: “Very confident”, “Moderately confident”, “Not confident”.

After the task, the participants were asked to judge the validity of another syllogism, designed to check if they remember what they were supposed to do in the task (Appendix P). They were explicitly told to remember the rules they saw in the training task, and then asked to judge the validity of this syllogism: “Humans have eight legs. Octopuses are not humans. Therefore, octopuses do not have eight legs.” “Invalid” is the correct answer here but it is also what the participants would choose if they acted on believability (octopus tentacles are referred to as “legs” in everyday Turkish, so the conclusion is not believable). If the participants chose this option, they saw a follow-up question: “In your opinion, why is the conclusion logically invalid?” They could choose one or many of three options: 1. “Because humans do not have eight legs.” 2. “Because octopuses have eight legs.” 3. “Because the conclusion ‘Octopuses do not have eight legs’ cannot be derived from the given premises.” The participants were instructed to only take the relationship between the premises and conclusion, and ignore whether the content is believable or not. Therefore, checking any option other than the last one would show that the participant either forgot or had not understood the instructions; these participants were removed from the analyses. Lastly, participants were asked “Have you received university-level formal logic training?”.⁶

⁶ Materials for Study 2, as well as those of Study 1, received the approval of Boğaziçi University Ethics Committee (Appendix Q).

3.2.4 Design and analysis

The study employed a mixed experimental design, in which the dependent variable was the perceived validity of the syllogisms (i.e., participant's judgments as "valid" or "invalid"). IH, ideology, dogmatism, religiosity, and analytic thinking were the between-subjects variables, though not all of them were analyzed in the same model. Within-subjects variables were validity (valid vs. invalid), believability (believable vs. unbelievable), content (political vs. non-political), topic (alcohol consumption, capital punishment, cross-border military operations, compulsory military service, animals, vehicles, plants), and syllogism type (i.e., whether the first or second component of the first premise is included in the second premise).

Hypotheses on syllogistic reasoning were tested using hierarchical Bayesian probit models, following the advice from Trippas and colleagues (2018), with weakly-informative priors for all effects, using the *rstanarm* package (Goodrich, Gabry, Ali, & Brilleman, 2020). Perceived validity was the outcome variable in all models. 95% credible intervals of posterior distributions were used to make inferences. Validity, believability, the content (political vs. non-political) of conclusions, and all of the variables mentioned in the Hypotheses section (IH, ideology, political identity centrality, belief strength, religiosity, dogmatism, CRT) were entered as fixed-effects. The values for these variables had to be constrained within -1 and 1. To do that, scores from Likert-type scales were transformed to have the midpoint of the scale as zero, and the end points as -1 and 1. CRT scores were mean centered. Participants were entered as a random-effect, i.e., participants' individual deviations from the intercept, from the main effects of validity and believability, and from the interaction of validity and believability were assumed to

distribute normally. Syllogism type and topics were not entered as random-effects since the number of levels were low, but they were entered as fixed-effects in separate models to see if a certain effect was sensitive to their interaction. Initial values were entered as 0.5 or 0.1 to allow for easier computation.

In these models, belief bias refers to the effect of conclusion believability on perceived validity, i.e. saying “valid” to a believable conclusion (or saying “invalid” to an unbelievable conclusion) regardless of its actual validity. Hence, the hypotheses regarding belief bias corresponds to the interaction of conclusion believability with the specified variable. For example, “IH will predict less belief bias” refers to a Believability * IH interaction. Each model had validity, believability, content (or topic), and their interactions as the base predictors. The variables that were thought to affect syllogistic reasoning were entered such that they would interact with all of the base predictors.

3.3 Results

3.3.1 Analyses related to main hypotheses

The two hypotheses regarding IH and belief bias were tested in the same model in which validity, believability, content, and IH, with all of their combined interactions, were entered as predictors. In this model and all models that followed, the main effects of validity, [.69, 1.05], and believability, [.09, .32], on endorsement were present. This means that the participants could distinguish valid from invalid judgments and showed belief bias. These are reported only once to establish the

general features of the task and will not be reported for other models, because the hypotheses are concerned with what interacts with believability or validity.

The data did not support either of the two hypotheses on IH: there was no evidence for a Believability * IH interaction, [-.25, .09], or a Believability * IH * Content interaction, [-.13, .20].

Asymmetry (i.e., rigidity-of-the-right) hypothesis, in this task, would entail that conservatives show more belief bias compared to liberals. This would mean a Believability * Ideology interaction, but since it is possible that the difference could only be observed with political syllogisms (as in Nuutinen et al., 2014), it would be wise to check the Believability * Ideology * Content interaction as well. There indeed was a three-way interaction, [.04, .31], but as the Figure 10 shows, the pattern did not exactly align with the rigidity-of-the-right hypothesis. For non-political syllogisms (left panel), participants were more likely to perceive believable conclusions as valid and vice versa, but ideology did not predict belief bias ([-.50, .40] for believable statements, [-.28, .53] for unbelievable). However, for political syllogisms, liberals were more likely to respond “valid” to conclusions that they did not believe, [-.89, -.19], so much so that this resulted in a reverse belief bias effect where they were more likely to accept politically-incongruent statements than congruent ones. When the results were broken down for each position on the political spectrum, reverse belief bias in political syllogisms was present for participants who were very liberal ([.40, 1.12]), liberal ([.32, .82]), somewhat liberal ([.25, .57]) and middle-of-the-road ([.06, .36]), whereas there was no evidence of belief bias (reverse

or not) for somewhat conservative ([-.22, .24]) and conservative ([-.50, .18]) participants.⁷

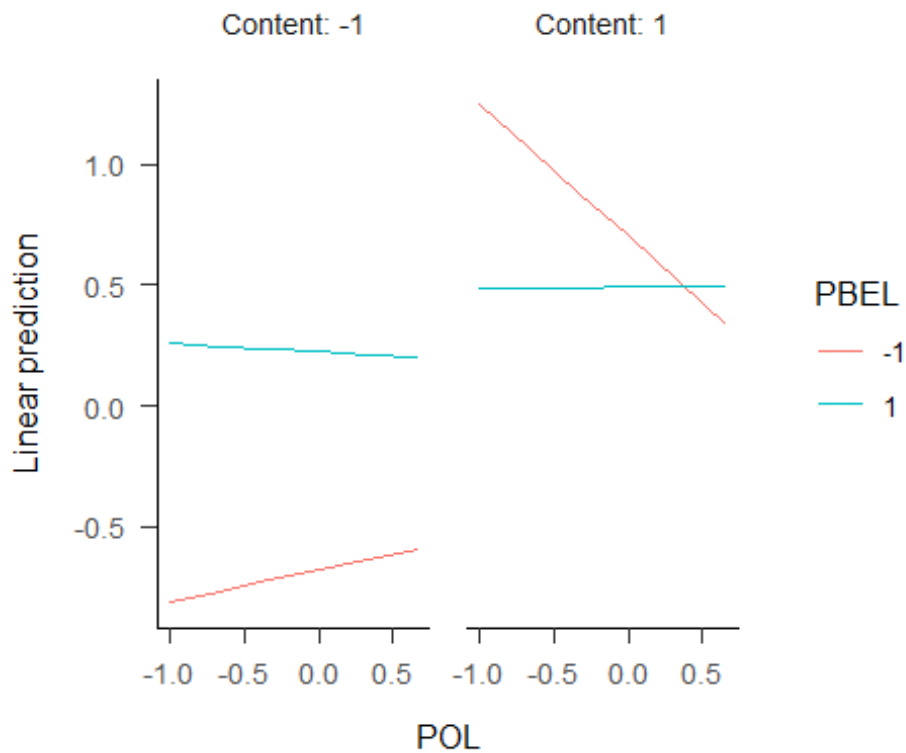


Fig. 10 Likelihood of endorsement (y axis) depending on ideological self-placement (x axis), conclusion believability (red line = unbelievable, blue line = believable), and content (non-political on the left, political on the right)

I decided to further break down the Believability * Ideology interaction by each political topic (Figure 11). Liberals' higher endorsement of politically incongruent conclusions could be observed in syllogisms about alcohol consumption, [-1.71, -.19], and cross-border military operations, [-1.75, -.42]. However, ideology was not related to reverse belief bias in syllogisms about death penalty, [-.84, .61], or

⁷ There were no participants in this sample who selected the "very conservative" option.

mandatory military service, [-1.17, .18]. Ideology did not predict endorsement of politically congruent statements in any of the topics.

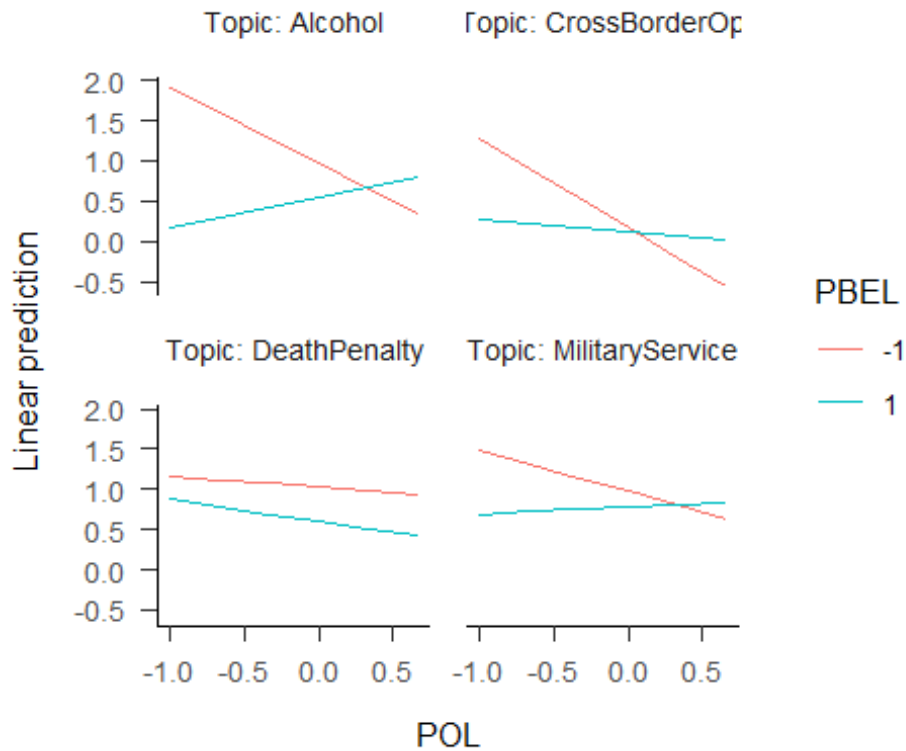


Fig. 11 Likelihood of endorsement (y axis) depending on ideological self-placement (x axis), conclusion believability (red line = unbelievable, blue line = believable) and topic

Recognizing the effect of content on endorsement, independent of participant ideology, might help us shed further light on this pattern. Although liberal participants showed a reverse belief bias, participants across the political spectrum were more likely to endorse political conclusions, whether it aligned with their prior beliefs or not, [.36, .47]. This increase in endorsement for political syllogisms was much more pronounced for conclusions that the participants did not believe, [-1.67, -1.34], than for the ones they did, [-.43, -.11]. Also, a follow-up model with belief strength ratings (which were only coded for the political syllogisms) showed that belief strength *increased* the likelihood of endorsement for incongruent conclusions,

[.02, .30] (Figure 12). My best explanation was that participants, who found the task hard and perhaps deduced its aim, might have consistently endorsed the politically incongruent statements to appear unbiased. Such motivation is not surprising for Boğaziçi University students, who are competitive and take their performance on psychological tasks seriously, as observed many times by researchers who have used the participant pool. They are also a group whose social identity centrally involves such elements as being socio-politically progressive, cognitively flexible, and unbiased.

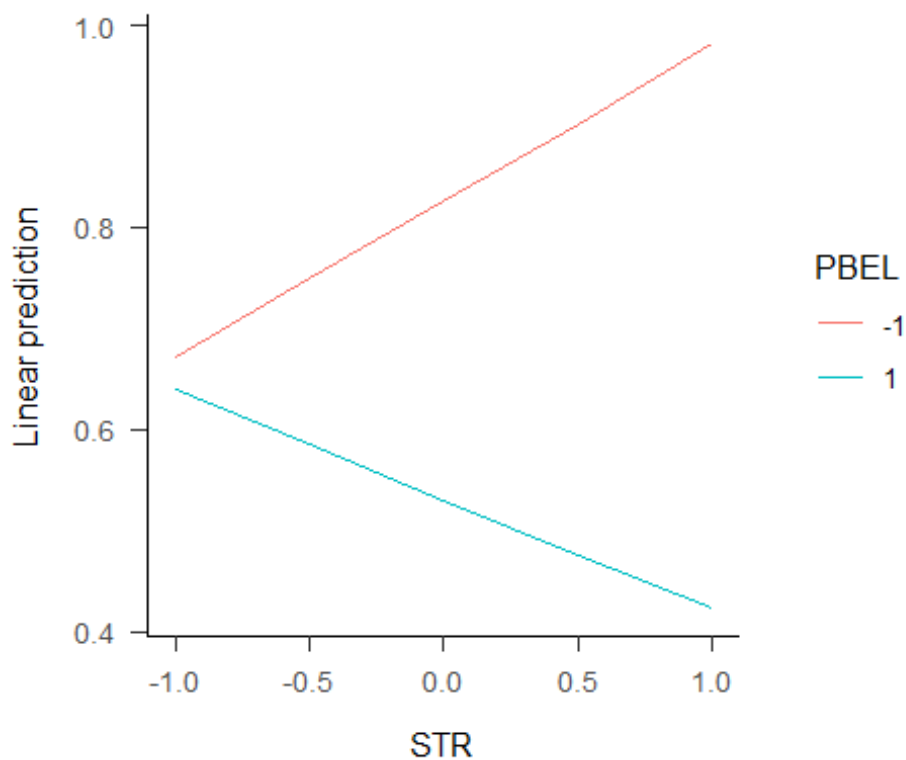


Fig. 12 Likelihood of endorsement (y axis) depending on belief strength (x axis), conclusion believability (red line = unbelievable, blue line = believable) and topic

The overcorrection strategy was somewhat convincing if you were familiar with the sample, but the ideology question remained: why did liberals use this

strategy more? Before attempting political explanations, I decided to search for other predictors of syllogism task performance that were also related to ideology. Effortful thinking was one of them; it interacted with believability and content, [-.35, -.02], and it was negatively related to conservatism in the first sample, $r = -.13$, 95% CI [-.25, -.01], $t(261) = -2.17$, $p = .031$.⁸ As Figure 13 shows, effortful thinking predicted the endorsement of politically incongruent statements, [.22, 1.10], but not the congruent ones, [-.36, .54]. Since the CRT and ideology patterns fit like a glove, I entered the two in the same model⁹ to see if effortful thinking could fully explain the effect of ideology. This was indeed the case: CRT still interacted with believability and content, [-.35, -.00], but ideology no longer did, [-.03, .11].

It made some sense that the same thinking style that allowed people to resist belief bias (Trippas et al., 2015) could make them overcorrect, but it was not entirely satisfactory. “If you do not agree with the conclusion, hit ‘valid’” was not a hard strategy to require mental effort, and why would there be variation among people when everyone was able to engage in it? To see if it may be due to perceived difficulty of the syllogisms, I entered a variable that led to worse accuracy in Gampa et al. (2019): syllogism structure. Participants in Gampa et al. (2019) displayed worse performance with modus tollens type syllogisms compared to modus ponens types. When syllogism structure was controlled for, neither CRT nor ideology predicted belief bias.¹⁰

⁸ Effortful thinking measure used for both the correlation and the syllogism task model was the original Cognitive Reflection Test (Frederick, 2005), not the verbal version (CRT-2; Thomson & Oppenheimer, 2016).

⁹ As in other models, these two variables were entered such that they could interact with each other and all of the base predictors. Ideological self-placement was divided to three levels (liberal, moderate, conservative) for easier interpretation in case they interacted.

¹⁰ By belief bias, I refer to conclusion believability combined with other variables except conclusion validity. CRT and ideology did not interact with believability without interacting with validity. There

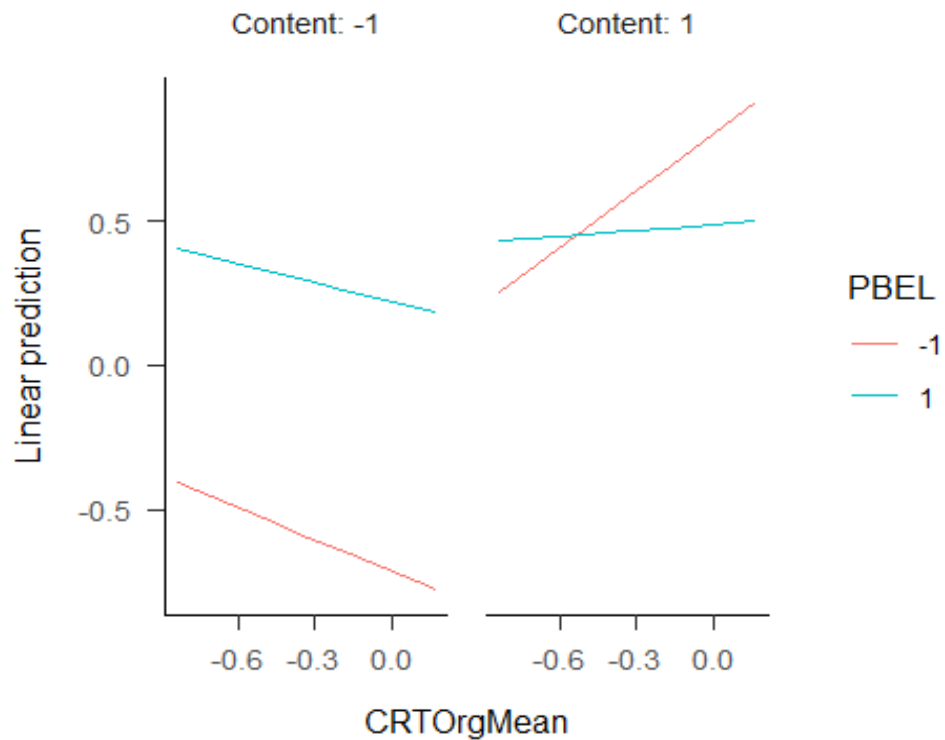


Fig. 13 Likelihood of endorsement (y axis) depending on analytic thinking (x axis), conclusion believability (red line = unbelievable, blue line = believable), and content (non-political on the left, political on the right)

Although testing the asymmetry hypothesis turned out to be very confusing, the rest were more straightforward. To test the moderated asymmetry hypothesis, political identity centrality was entered with ideology. There was no Believability * Ideology * Centrality interaction, [-.02, .20]; these did not interact with content either, [-.10, .11]. What is also intriguing is that ideology¹¹ did not predict belief bias in this model. Rigidity-of-the-extreme hypothesis was tested in a model with both the linear and quadratic term for ideology. The quadratic term did not interact with believability, [-3.44, 2.83]; nor did the two interact with content [-2.92, 3.19].

was a full six-way interaction in the model that was so complicated that it became irrelevant to the main research question, so I do not attempt to explain it here.

¹¹ Ideological self-placement was divided to three levels (liberal, moderate, conservative) for easier interpretation in case they interacted.

Because of this, testing the integration of asymmetry and extremism hypotheses was not applicable.

Religiosity interacted with believability and content, [.02, .15]. But similar to left-wing ideology, low religiosity predicted reverse belief bias, as shown in Figure 14 ([-.36, -.01] for congruent political conclusions, [-.07, .29] for incongruent political conclusions).

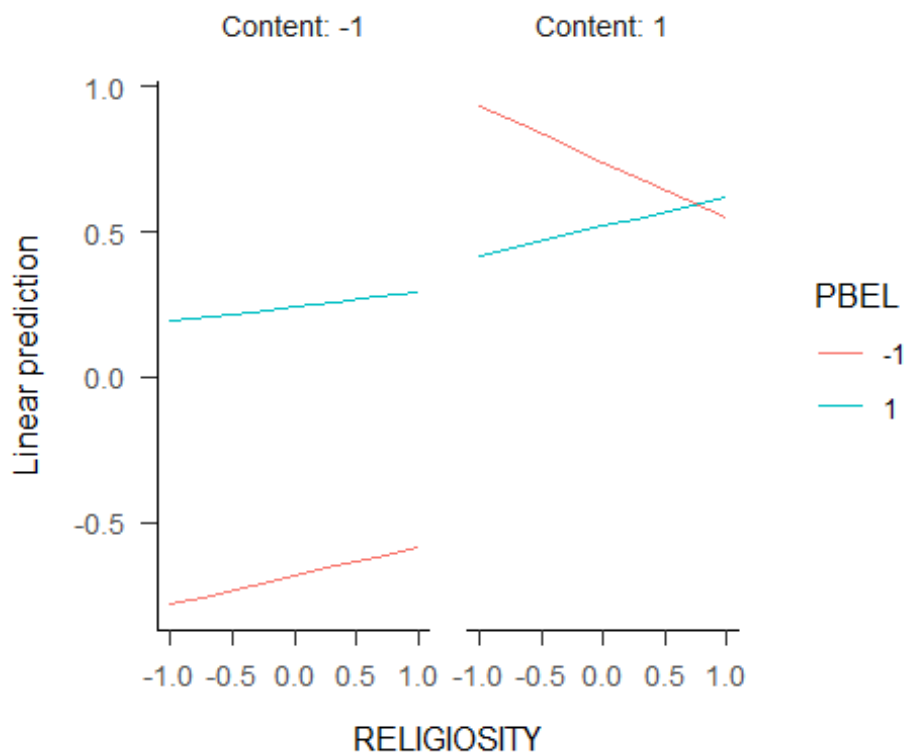


Fig. 14 Likelihood of endorsement (y axis) depending on religiosity (x axis), conclusion believability (red line = unbelievable, blue line = believable), and content (non-political on the left, political on the right)

Contrary to expectations, dogmatism did not predict belief bias. Dogmatism did not interact with believability, [-.20, .28]; it did not have a three-way interaction with believability and content either, [-.28, .18].

As reported above, effortful thinking, measured with the original Cognitive Reflection Test (Frederick, 2005), was related to reverse belief bias, although this finding was not very stable. Contrary to expectations, effortful thinking did not interact with validity and believability, [-.21, .13]; this did not depend on content, [-.19, .15]. When the original CRT scores were combined with CRT-2 (Thomson & Oppenheimer, 2016) scores, it did not predict belief bias, [-.40, .10]. No three-way interaction with content was observed either, [-.40, .08].

3.3.2 Exploratory analyses

Confirmatory analyses failed to show support for IH's protective effect against belief bias. To explore whether this depends on participant ideology, IH and ideology were entered in a model with the base predictors. There was no IH * Ideology * Believability interaction, [-.14, .36], nor a four-way interaction that includes content, [-.23, .23].

The second question I wanted to explore was whether IH or ideology would predict the so-called "interaction effect" (Evans et al., 1983). All of the analyses for Study 2 have dealt with interactions, but this specific term from syllogistic reasoning literature refers to performing (i.e., distinguishing valid from invalid conclusions) better when the conclusion is unbelievable rather than believable. The previous model involving IH and ideology did not link these to belief bias, but there was a five-way interaction of Believability * Validity * Content * Ideology * IH, [-.61, -.15]. While the Figure 15 shows complex patterns, follow-up analyses showed that IH did not meaningfully predict endorsement in any of these cases. The interaction apparently came from the differences in IH slopes among ideologies in one specific

case: invalid political conclusions that were incongruent with participants' beliefs (bottom left). Effect of IH for liberals differed from its effect for moderates [.01, 1.81], and conservatives [.01, 3.62], while moderates and conservatives also differed from each other [.01, 1.81]. However, as with other cases, GIHS did not predict endorsement for liberals, [-.04, 1.80], moderates, [-.79, .72], or conservatives, [-2.38, .34]. So IH did work differently for people with different ideologies, but those differences did not really matter.

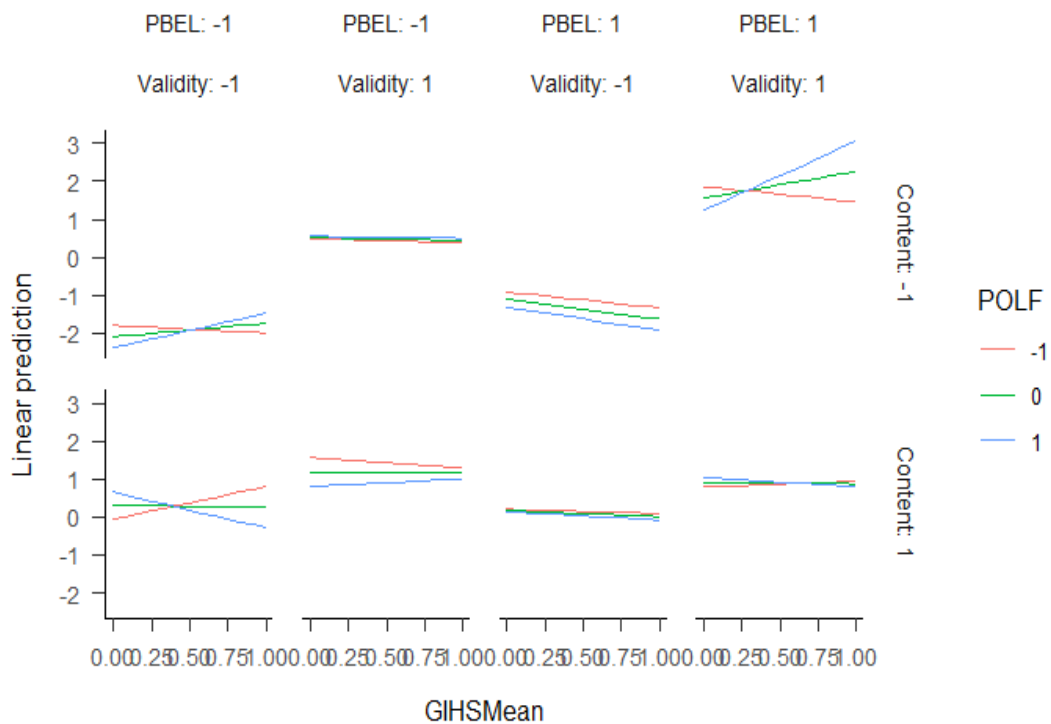


Fig. 15 Likelihood of endorsement (y axis) depending on IH (x axis), participant ideology (red line = left-wing, green line = moderate, blue line = right-wing), conclusion believability (PBEL: -1 = unbelievable, PBEL:1 = believable), conclusion validity (-1 = invalid, 1 = valid), and content (non-political on top panel, political at the bottom)

Seeing that the general IH did not help against belief bias, I built a model to explore whether Specific Intellectual Humility scores were related to performance in

their respective topics. Specific IH interacted with believability and validity for the vehicles topic only, [.23, 6.28]. In this topic, IH predicted better performance for believable conclusions by increasing the likelihood of endorsing valid conclusions (Figure 16), [.38, 26.09]. However, given that the effect was limited to one topic and the credible interval was too wide, this may likely be a fluke.

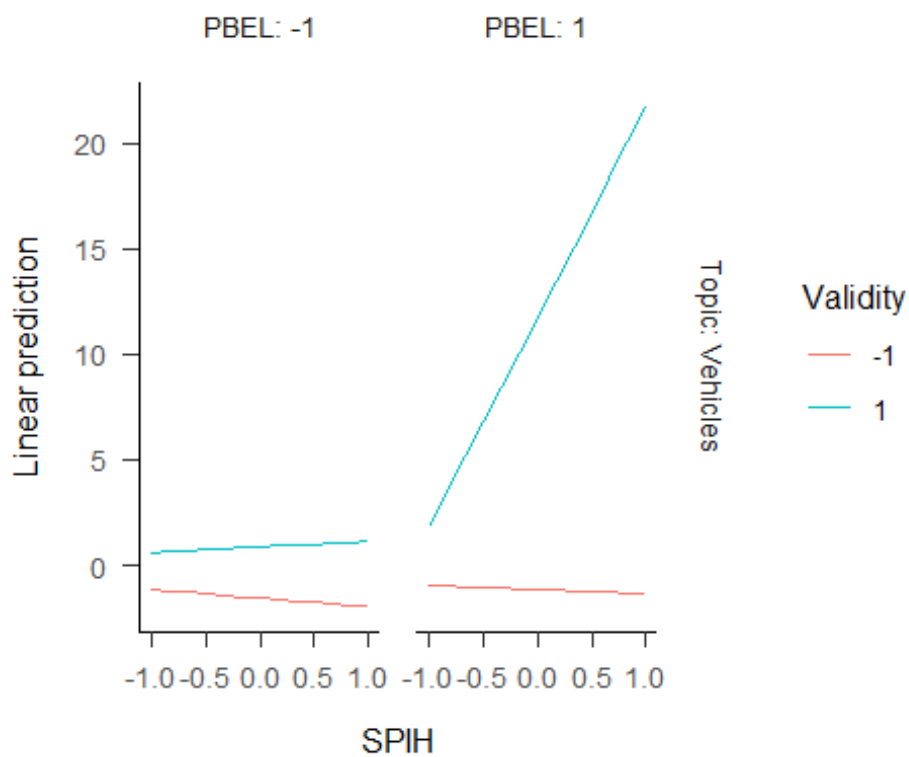


Fig. 16 Likelihood of endorsement (y axis) for syllogisms on the topic of vehicles, depending on specific IH (x axis), conclusion believability (left panel = unbelievable, right panel = believable), and conclusion validity (red line = invalid, blue line = valid)

CHAPTER 4

CONCLUSION

The first study found that IH was not related to where people placed themselves on the broader left-right political spectrum, or how religious they were. However, authoritarian right-wingers and people who see their political identity as an important part of who they are were lower in IH. These results were best explained by the link between dogmatism and IH. In the second study, neither IH nor dogmatism predicted susceptibility to belief bias. However, there was a very strange pattern: participants were more likely to endorse political conclusions as valid when it did not suit their beliefs. This reverse belief bias phenomenon was never seen in the literature before, and it is thought to be unique to our sample. Left-wingers, analytic thinkers, and less religious people were more likely to engage in reverse belief bias, but this may have depended on stimulus characteristics. I will try to put these results into context.

The first thing to admit is that our previous finding on IH and ideology did not survive an adequately powered replication that used a very similar sample. This would be bad news for some approaches that would expect a stable and straightforward relationship, but the ones that focus more on contextual factors may have an explanation. For instance, contingent asymmetry view notes that when the political environment becomes polarizing and rich in information, as is the case with election periods, the link between psychological needs and political preferences becomes strengthened (Federico & Malka, 2018). Data collection for the previous project started after Turkey's ruling party contested Istanbul's local election results, and it ended about a week after the controversial announcement for repeating the

election (Galip, 2019). This project's data was collected during the COVID-19 pandemic, and Fahrettin Koca, the Minister of Health who appeared on TV every night, received high approval ratings across the board and became the most favored politician (Haberler.com, 2020; Lıcalı, 2020; Selvi, 2020). The contrast in polarization between the two time periods might account for the difference in results. A less polarized environment, which may have given people fewer reasons and opportunities to express their personalities with their political attitudes, might have masked the relationship between IH and ideology.

Secondly, I must acknowledge the limitations of the sample, which may have contributed to my failure to find evidence for some effects. As mentioned, sample size and student participants were appropriate for replicating the previous finding in line with the asymmetry hypothesis, but not for testing the contingent asymmetry hypothesis, given that detecting interactions (unless a cross-over pattern is predicted) requires much larger samples (Simonsohn, 2014; Sorolla, 2018). For example, Federico and Ekstrom (2018) used a nationally representative sample of 1,511 Americans, whereas Study 1 involved 272 students. So even if we assumed the effect of IH would be comparable to that of the personality variables in Federico and Ekstrom (2018), Study 1's power was lower. Time constraints prevented me to reach an adequate sample for more ambitious analyses. Moreover, even if the sample was larger, the population from which the sample was drawn could still have been a problem. The median value of political orientation in our student sample was -1 (moderate left), whereas the median political identity centrality was 2 (from a range of 1 through 7). Especially the skew in centrality, i.e., the not having enough people high in centrality, might have prevented us from detecting its moderating effect.

Moreover, IH's relationships with political identity centrality, RWA, and dogmatism needs to be discussed. A seemingly ideological asymmetry in IH turned out to be due to dogmatism, which could be more or less found across the political spectrum. Since dogmatism was a known correlate of IH (Haggard et al., 2018; Hopkin et al., 2014; Leary et al., 2017), this may not have advanced our knowledge of IH, but it is certainly instructive about the measurement of ideology. I was mistaken to assume that the three ideology measures (self-placement, RWA, social conservatism) would be similar because higher scores would mean more conservatism. The focus on relative scores and the use of proxy measures for political attitudes has been criticized before by Reyna (2017). As the exploratory analyses with political identity centrality showed, one end of a scale may not show the same level of investment in politics for all measures. For the self-placement item, both extremes saw politics as a defining feature of who they are, but this was only true for the right side of the scale in RWA, while those on the low-end of social conservatism were a mixed bag compared to the high-scorers. This is crucial for those who want to test a kind of ideological extremity hypothesis, if a variable such as political identity centrality is seen as a mediator of the effect of ideology on political ingroup bias, for example. If one end of an attitude measure does not necessarily represent an extreme, researchers must find some other measure that better maps out the political alignments (assuming the ideological left-right holds up in the studied country).

The results in the second study were even more difficult to grasp. On non-political stimuli, the task worked in line with the literature, such that validity and belief effects were present. On political syllogisms, however, the expected pattern of

belief bias flipped: people across the board, more often than not, accepted the conclusions they did not believe in. Liberals went further and engaged in a reverse belief bias, i.e., they were more likely to endorse belief-incongruent conclusions than congruent ones. Liberals' reverse belief bias was apparently explained by their higher levels of analytic thinking. I proposed that the increased endorsement for incongruent political content might be a strategy to appear unbiased. If so, the reason for the reverse belief bias of analytic thinkers may be that they devised the point of the experiment sooner and started using the strategy earlier. But it also brings another question: if they figured out the research question why they did not apply that strategy to non-political syllogisms? Also the fact that the effect of a participant characteristic (ideology or analytic thinking) was wiped out by a stimulus characteristic (syllogism type) that did not vary between participants was mysterious.

Although we did have a peculiar sample, it would still be wise to own the potential faults in the materials. Producing the syllogisms was the most difficult part of the project because I wanted to keep the premises somewhat believable for everyone and give the controversial statement at the end (for reasons discussed in the Materials section of Study 2). This greatly limited the range of topics that can be included, because for most of the politicized issues, the premises would need to include subjective value judgments that might already introduce the believability effect. The topics that we ended up with may not have been polarizing enough to evoke the pattern that we sought after. At the end, since the task might have been compromised, it appears futile to further discuss why IH did not predict performance, or why previous effects of dogmatism, religiosity or analytic thinking were not replicated.

The studies could not pin IH at a certain point on the political spectrum, failed to support the validity of the Turkish adaptation of GIHS using a behavioral task, and revealed some potential problems with ideology measures. Future research should study IH's potential relationship with Left-Wing Authoritarianism (Conway III, Houck, Gornick, & Repke, 2018) in conjunction with RWA to make sure whether low-IH predicts the direction of political attitudes or being dogmatic about any ideology. Additionally, if researchers want to show IH's predictive power in a real reasoning task, it might be better to use behavioral tasks that do not feel like "tasks" that measure performance, so that participants would engage with given arguments on their own terms. Finally, political psychology researchers should be more attentive to the effects of the immediate political context and use measures that correctly map the different positions within that context.

The efforts to map intellectual humility on the political spectrum proved inconclusive. Although there was some evidence that linked low-IH to right-wing ideology, this was better explained by dogmatism, rather than the direction of ideology. The negative relationship between IH and dogmatism, found in the first study, replicated a finding from the literature in a non-WEIRD (Henrich, Heine, & Norenzayan, 2010) sample, as well as complementing previous work on the validity of the Turkish adaptation of the General Intellectual Humility Scale. However, the attempt to find a behavioral task that was linked to IH proved unsuccessful. Overall, these studies make valuable contributions to the study of IH in the context of political psychology.

APPENDIX A

GENERAL INTELLECTUAL HUMILITY SCALE

Lütfen aşağıdaki ifadelere katılıp katılmadığınızı belirtiniz.

(Please indicate how much you agree with the statements below.)

1 2 3 4 5

Kesinlikle
katılmıyorum
(Absolutely agree)

Kesinlikle
katılıyorum
(Absolutely disagree)

1. Kendi fikirlerimi, duruşumu ve bakış açımı sorgularım, çünkü hatalı olabilirler.
(I question my own opinions, positions, and viewpoints because they could be wrong.)
2. Yeni bulgularla karşılaştığımda fikirlerimi tekrar gözden geçiririm.
(I reconsider my opinions when presented with new evidence.)
3. Kendiminkilerden farklı fikirlerin değerini takdir ederim.
(I recognize the value in opinions that are different from my own.)
4. İnançlarımın ve tutumlarımın yanlış olabileceğini kabul ederim.
(I accept that my beliefs and attitudes may be wrong.)
5. Fikirlerimle çelişen bulgularla karşılaştığımda fikrimi değiştirmeye açığımdır.
(In the face of conflicting evidence, I am open to changing my opinions.)
6. Doğru olduğunu düşündüğüm şeylere ters düşen yeni bilgiler keşfetmeyi severim.
(I like finding out new information that differs from what I already think is true.)

APPENDIX B

IDEOLOGY AND RELIGIOSITY MEASURES

Ideological Self-Placement

Siyasi konularda “sol”dan ve “sağ”dan bahsedildiğini sık sık duyuyoruz. Aşağıda bir sol-sağ cetveli var. Burada “1” en solu, “7” ise en sağ gösteriyor. Sizin kendi görüşleriniz bu cetvelin neresinde yer alır?

(We often hear about "left" and "right" in political discussions. Below is a left-right scale. Here, "1" shows the far left and "7" shows the far right. Where do your own views stand on this scale?)

1-----2-----3-----4-----5-----6-----7

Aşırı sol

Orta

Aşırı sağ

(Far left)

(Moderate)

(Far right)

1. Politik görüşünüz aşağıdaki kategorilerden hangisine daha yakındır?

(Which of these labels best define your political views?)

Sosyal Demokrat (*Social democrat*) Kemalist Sosyalist (*Socialist*)

Muhafazakâr Demokrat (*Conservative democrat*) Liberal

İslamcı (*Islamist*) Apolitik (*Apolitical*) Ülkücü (*Ultranationalist*) Diğer (lütfen

belirtiniz) _____ (*Other – please indicate*)

2. Kendinizi bu kategoriyle tanımlamak sizin için ne kadar önemlidir?

(How important is it to you to define yourself with this category?)

1-----2-----3-----4-----5-----6-----7

Hiç önemli değildir

Çok önemlidir

(not at all important)

(very important)

Religiosity Items

1. Kendinizi dindar/inanan biri olarak nitelendirir misiniz?

(Do you consider yourself to be a religious person?)

1-----2-----3-----4-----5-----6-----7

Hiç dindar değilim

Evet, çok dindarım

(I'm not religious at all)

(Yes, I am very religious)

2. Aşağıdakilerden hangisi sizin dini/inanç sisteminizi en iyi ifade etmektedir?

(Which of these labels best define your religious/spiritual beliefs?)

Tanrı'ya inanmam (Ateistim) (I don't believe in God – I'm an atheist) Tanrı'ya inanıyor ama bir dini tercih etmiyorum

(I believe in God but I don't follow a religion) Müslümanım (Sünni)

(I'm a Muslim – Sunni) Müslümanım (Alevi) (I'm a Muslim – Alevi)

Müslümanım (diğer bir mezhep) (I'm a Muslim – Another sect) Hristiyanım

(I'm a Christian) Yahudiyim (I'm Jewish)

Diğer _____ (Other)

Social Conservatism Scale

Lütfen aşağıdaki ifadelere ne kadar karşı olup olmadığınızı belirtiniz.

(Please indicate how much you stand against the following items)

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Hiç karşı değilim

Nötr

Tamamen karşıyım

(Not at all against it)

(Neutral)

(Totally against it)

1. Gönüllü ötenaziye (Voluntary euthanasia)

2. Eşcinsel evliliğe (Gay marriage)

3. Evlilik öncesi cinsel ilişkiye (*Premarital sex*)
4. Kürtajı bütünüyle yasaklamaya (*Prohibiting abortion altogether*)
5. Esrar içiminin serbest bırakılmasına (*Legalizing marijuana*)
6. Genç insanların ebeveynlerinin izni olmadan doğum kontrol konusunda bilgilendirilmelerine
(*Young people getting informed about birth control without their parents' permission*)
7. Bir kız ve bir erkeğin evlenmeden aynı evde yaşamasına
(*An unmarried couple living together*)
8. Birisinin bankaya yatırdığı para üzerinden faiz elde etmesine
(*Interest income*)
9. Kız ve erkek çocuklarının karma bir eğitim almasına (*Coeducation*)
10. Osmanlıca dersinin tüm liselerde zorunlu ders olarak okutulmasına
(*Mandatory Ottoman course in all high schools*)

Economic Conservatism Scale

Lütfen aşağıda yazılanları dikkatlice okuyunuz ve her ifadeye ne kadar katıldığınızı 1'den 7'ye kadar olan ölçekte işaretleyiniz.

(Please carefully read the following and indicate how much you agree with each statement on a scale of 1 to 7)

1-----2-----3-----4-----5-----6-----7

Kesinlikle

Kararsızım

Kesinlikle

katılmıyorum

katılıyorum

(Absolutely disagree)

(Can't decide)

(Absolutely agree)

1. Hemen her alanda devletten çok daha verimli ve başarılı çalıştığı için özel teşebbüs daha iyidir.

(Private enterprise is better because it works much more efficiently and successfully than the state in almost every field.)

2. Devlet ekonomiye müdahale etmemelidir.

(The state should not interfere with the economy.)

3. Devlet küçüldükçe bireylerin özgürlüğü artar.

(As the state gets smaller, the freedom of individuals increases.)

4. Özel okullar daha kaliteli eğitim verdiği için devlet okulları özel sektöre devredilmelidir.

(Because private schools offer higher quality education, public schools should be transferred to the private sector.)

5. Devletin ekonomik planlama yetkisi arttıkça rejim diktatörlüğe dönüşür.

(As the state's economic planning authority increases, the regime becomes a dictatorship.)

6. Devlet dediğimiz kurum giderek daha az vergi toplamaya ve daha az hizmet etmeye doğru gitmelidir.

(The institution, which we call the state, should go towards collecting less taxes and serving less.)

7. Zengin insanların yatırım yapmaları için teşvikler arttırılmalıdır.

(Incentives should be increased for rich people to invest.)

8. Hayırseverlik devletin değil, kişilerin sorumluluğudur, dolayısıyla devlet halka yardımseverlikte bulunmamalıdır.

(Philanthropy is the responsibility of the individuals, not the state, therefore the state should not help people.)

9. Devlet gelir eşitsizliğini düzeltmek için zenginlerden daha çok, fakirlerden ise daha az vergi almalıdır.

(The state should take more taxes from the rich and less from the poor to alleviate income inequality.)

10. Ekonomik geliri düşük olan insanların sağlık harcamaları bütünüyle devlet tarafından karşılanmalıdır.

(Health expenditures of people with low economic income should be fully covered by the state.)

11. Devlet eğer özel teşebbüsleri tamamen serbest bırakırsa, onlar işçilere her türlü zulmü yapabilirler.

(If the state gives total freedom to private enterprises, they can exploit the workers in all sorts of ways.)

12. Devletin giderek küçülmesi, gelir eşitsizliğini daha da arttırır.

(The gradual degrowth of the state further increases income inequality.)

13. Devlet sosyal eşitliđi sađlamak adına ekonomiye müdahale etmelidir.

(The state should intervene in the economy in order to achieve social equality.)

14. Özelleştirme uygulamaları zenginlerden yanadır ve yasaklanmalıdır.

(Privatization practices benefit the rich and should be prohibited.)

15. Evsiz insanlara ya da sokak çocuklarına bakmak devletin bir numaralı görevidir.

(Caring for homeless people or children is the number one duty of the state.)

16. Devlet insanlara daha iyi bir yaşam standardı vermek için her türlü harcamayı yapmalıdır.

(The government should make all kinds of spending to give people a better standard of living.)

APPENDIX C

RIGHT-WING AUTHORITARIANISM SCALE

Lütfen aşağıdaki ifadelere katılıp katılmadığınızı belirtiniz.

(Please indicate how much you agree with the following statements.)

1 2 3 4 5 6 7 8 9

Kesinlikle

Kesinlikle

katılmıyorum

katılıyorum

(Absolutely disagree)

(Absolutely agree)

1. Mevcut otorite, genel olarak pek çok şeyde haklı çıkarken, radikaller ve her şeye karşı çıkanlar cehaletlerini sergileyen boşboğazlardır.

(While the current authority is right about many things in general, radicals and those who oppose everything are idiots who display their ignorance.)

2. Kadınlar, evlendiklerinde eşlerine itaat edeceklerine dair söz vermelidirler.

(Women should promise that they will obey their spouses when they get married.)

3. Ülkemizin, bütünlüğümüze kasteden radikal yönelimleri ve kötülükleri ortadan kaldırmak için ne gerekiyorsa yapabilecek güçlü bir lidere ihtiyacı var.

(Our country needs a strong leader who can do whatever it takes to eliminate radical trends and evil.)

4. Eşcinseller ve lezbiyenler, herhangi biri kadar sağlıklı ve ahlaklıdır.

(Gays and lesbians are as healthy and moral as anyone.)

5. Yönetimdeki saygın otoritelere ve dini yargılara güvenmek, toplumumuzda zihin karıştırmaya uğraşan “gürültücü ayak takımını” dinlemekten daima daha iyidir.

(It is always better to rely on respected authorities and religious rules than to listen to the "noisy mobs" who are trying to confuse our society.)

6. Hiç kuşkusuz, mevcut dinsel öğretilere isyan edenler ve ateistler düzenli olarak camiye gidenler kadar iyi ve erdemlidirler.

(Undoubtedly, those who rebel against existing religious teachings and atheists are as good and virtuous as those who regularly go to the mosque.)

7. Ülkemizi krizlerden kurtarmak için, geleneksel değerlerimize dönmek, sert liderleri iş başına getirmek ve kötü fikirleri yayanları susturmak gerekmektedir.

(In order to save our country from the crises, it is necessary to return to our traditional values, to bring tough leaders to work and to silence those who spread bad ideas.)

8. Çıplaklar kampının olmasında yanlış bir şey yoktur.

(There is nothing wrong with having a nudist camp.)

9. Birçok kişiyi tedirgin etse bile ülkemizin, geleneksel uygulamalara karşı çıkma cesareti gösterebilen özgür düşünceli bireylere ihtiyacı var.

(Even if it makes many people nervous, our country needs free-minded individuals who have the courage to oppose traditional practices.)

10. İnançlarımızı ve ahlaki yapımızı yiyip bitiren geleneksel olmayan değerleri zamanında yok etmezsek, günün birinde ülkemiz yıkılacak.

(If we do not destroy the unconventional values that corrode our beliefs and moral structure, our country will be destroyed one day.)

11. Kendilerini herkesten farklı kılabacak olsa bile bireyler, yaşam tarzlarını, dini inançlarını ve cinsel yönelimlerini kendileri belirlemelidir.

(Individuals should determine their lifestyle, religious beliefs, and sexual orientation, even if they are different from everyone else.)

12. Eski moda adetler ve değerler hala en iyi yaşama biçimini gösteriyor.

(Old-fashioned customs and values still show the best way to live.)

13. Kadınların siyasi, sosyal ve ekonomik alanlarda daha aktif rollere sahip olması, okullarda din derslerinin isteğe bağlı olması ve hayvan hakları için yeni düzenlemeler yapılmasını talep ederek mevcut yasalara ve çoğunluğun görüşlerine karşı çıkanlara hayranlık duymalısınız.

(You should admire those who oppose existing laws and the majority's views, demanding that women have more active roles in political, social and economic areas, that religious classes in schools become optional and that new regulations should be enacted to protect animal rights.)

14. Ülkemiz, kötülükleri yok ederek bizi doğru yola getirecek güçlü ve kararlı bir lidere ihtiyaç duymaktadır. *(Our country needs a strong and determined leader who will take us on the right path by destroying evil.)*

15. Ülkemizin en iyi bireyleri hükümete karşı çıkan, dini eleştiren ve doğal kabul edilen şeyleri göz ardı edebilenlerdir.

(The best individuals in our country are those who oppose the government, criticize religion, and ignore what is considered natural.)

16. Krtaj, pornografi ve evlilik konusunda Allah'ın koyduęu yasalar ok ge olmadan titizlikle uygulanmalı ve bu yasaları ihlal edenler Őiddetle cezalandırılmalıdır.

(The laws of God on abortion, pornography and marriage should be implemented meticulously before it's too late, and those who violate these laws should be punished with violence.)

17. Bugn lkemizde dini deęerlerden yoksun, kendi amaları iin lkeyi yıkmaya alıŐan ve otorite tarafından mutlaka etkisizleŐtirilmeleri gereken radikal ve ahlaksız birok kiŐi var.

(Today, there are many radical and immoral people in our country that lack religious values, who try to destroy the country for their own purposes and that must be neutralized by the authority.)

18. Kadının yeri, nerede olmak istiyorsa orasıdır. Kadının kocasına ve toplumsal geleneklere itaat etmek zorunda kaldıęı gnler artık gemiŐte kalmıŐtır.

(A woman's place is wherever she wants to be. The days when the woman had to obey her husband and social traditions are a thing of the past.)

19. Atalarımızın yaptıklarıyla onur duyarsak, otoritenin yapmamızı istediklerini yaparsak ve her Őeyi berbat eden rk elmaları ayıklarsak lkemiz mthiŐ olur.

(If we are honored with what our ancestors did, if we did what the authority wanted us to do, and if we extract the rotten apples that ruined everything, our country would be great.)

20. YaŐamak iin bir tek doęru yol yoktur; herkes kendi yolunu kendi izmelidir.

(There is no right way to live; everyone should make their own way.)

21. Feministler ve homoseksüeller, geleneksel aile değerlerine karşı koyabilecek kadar cesur oldukları için takdir edilmelidirler.

(Feminists and homosexuals should be appreciated for being brave enough to resist traditional family values.)

22. Bu ülkede işler, sorun çıkaran gruplar seslerini keser ve kendi gruplarının toplumdaki geleneksel yerini kabullenirlerse, biraz daha iyiye gidecektir.

(In this country, things will get a little better if troubling groups shut their mouths and accept their traditional place in society.)

APPENDIX D
DOGMATISM SCALE

Lütfen aşağıdaki ifadelere katılıp katılmadığınızı belirtiniz.

(Please indicate how much you agree with the statements below.)

1 2 3 4 5

Kesinlikle

Kesinlikle

katılmıyorum

katılıyorum

(Absolutely disagree)

(Absolutely agree)

1. Benim için yalnızca bir tek doğru vardır. *(There is only one truth for me.)*

2. Pek çok insan kendisi için neyin doğru olduğunu bilmiyor.

(Many people do not know what's right for them.)

3. Benimsediğim düşünceyi ve inancı yaygınlaştırmak için çoğunlukla güç kullanmamın gerekli olabileceğini düşünüyorum.

(I think it may be mostly necessary to use force to spread the thoughts and beliefs I have adopted.)

4. İnsanların fikirlerini özgürce ifade etmeye hakkı olduğuna inanıyorum.

(I believe that people have the right to express their opinions freely.)

5. Bir başkası benim dile getirdiğim gerçeği kabul etmeyecek olsa kan beynime sızrar. *(I get very angry if someone else does not accept the fact that I have told.)*

6. Benimsediğim inanç ve düşüncelerin doğruluğuna kanaatim tamdır; fakat dünyada var olan çok değişik felsefi ideolojilerin de doğru bir yanının olabileceğini düşünüyorum.

(I am convinced that the beliefs and thoughts I have adopted are correct; but I think that many different philosophical ideologies that exist in the world may have a point.)

7. Politik ya da ideolojik düşmanlarımızla uzlaşmamız, kendi tarafımıza ihanet etmek demektir.

(Compromise with our political or ideological enemies means betrayal on our side.)

8. İki tür insan vardır: Gerçek düşmanları ve gerçek taraftarları.

(There are two types of people: The enemies of the truth and those who side with the truth.)

9. Bazı insanlardan sahip oldukları inanç ve fikirler nedeniyle nefret ediyorum.

(I hate some people for their beliefs and ideas.)

10. Hararetli tartışmalar esnasında kendi fikirlerime çok fazla yoğunlaştığımdan diğerlerinin sözlerini dikkatle takip edemiyorum.

(During heated discussions, I cannot follow the words of others carefully, as I concentrate too much on my own ideas.)

11. Aynı fikirlere sahip olduğumuz kişilere açıkça saldırmak büyük bir suçtur.

(It is a great crime to openly attack those who share our ideas.)

12. Toplumsal ve ahlaki sorunları tartıştığım birçok kişi maalesef neler olup bittiğinden haberdar değil.

(Unfortunately, many people I discuss social and moral issues are not aware of what is going on.)

13. İyİ bir yaşAm sürmek için benimle aynı fikir ve zevklere sahip olan kişilerle yakınlık kurmam gerektiğine inanıyorum.

(I believe that in order to lead a good life, I need to get closer to people who have the same ideas and tastes as me.)

14. Otoriteye saygı ve büyüklere itaat çocuklara öğretilmesi gereken başlıca değerlerdendir.

(Respect for authority and obedience to adults are key values that should be taught to children.)

15. Yeni ve farklı durumlarla karşılaşmaktan ve onlara uyum sağlamaya çalışmaktan zevk alırım.

(I enjoy encountering new and different situations and trying to adapt to them.)

APPENDIX E
DEMOGRAPHICS

1. Cinsiyetiniz (*Your gender*):
K E Diğ er (lütfen belirtiniz) (*M – F – Other – please indicate*):

2. Yaş ınız (*Your age*): _____
3. Çocukluğ unuzdaki gelir seviyeniz
4. (*Socioeconomic status during childhood*):
Çok iyi İyi Fena Değ il Kötü Çok Kötü
(*Very good – Good – Not bad – Bad – Very bad*)
5. En uzun süreyle yaşad ığınız yer (*Place you lived the longest*):
Büyükşehir Şehir Kasaba Belde Köy
(*Metropolis – City – Town – Province – Village*)
6. Aş ağıdakilerden hangisi etnik kimliğ inizi en iyi tanımlar?
(*Which category below best describes your ethnic identity?*)
Türk Kürt Ermeni Rum Arap Kafkas Balkan Diğ er: _____
(*Turkish – Kurdish – Armenian – Rum – Arab – Caucasian – Balkan – Other*)

APPENDIX F

SYLLOGISM CONCLUSIONS

Aşağıdaki cümleleri ne kadar inandırıcı buluyor veya bu cümlelere katılıyorsunuz?

(How much do you believe in or agree with the statements below?)

1	2	3	4	5	6	7	8	9	10
	Kesinlikle								Kesinlikle
	katılmıyorum								katılıyorum
	/ inanmıyorum								/ inanıyorum

(Absolutely disagree/don't believe)

(Absolutely agree/believe)

1. Sınır ötesi hareketler ülkeye faydalıdır.

(Cross-border operations are good for the country)

2. Sınır ötesi hareketler ülkeye faydalı eylemler değildir.

(Cross-border operations are not actions that are good for the country)

3. İdam cezası adil değildir. *(Capital punishment is not fair.)*

4. İdam cezası adaletin sağlanmasına katkıda bulunur.

(Capital punishment ensures justice.)

5. Zorunlu askerlik ülkeye yarar sağlar.

(Mandatory military service benefits the country.)

6. Zorunlu askerlik ülkenin güvenliğini sağlayamaz.

(Mandatory military service cannot ensure the security of the country.)

7. Alkol toplum içinde kullanılabilir.

(People should be able to consume alcohol in public.)

8. Alkol tüketiminin devlet tarafından kısıtlanması gerekir.

(Alcohol consumption needs to be limited by the government.)

9. Bülbüllerin tüyleri vardır. *(Nightingales have feathers.)*

10. Balinalar yürüyebilir. *(Whales can walk.)*

11. Kediler hayvandır. *(Cats are animals.)*

12. Yılanlar ineştir. *(Snakes are cows.)*

13. Otomobillerin motoru vardır. *(Automobiles have engines.)*

14. Motosiklet kullanmak için ehliyet gerekmez.

(A license is not needed to ride a motorcycle.)

15. Elmalar muz değildir. *(Apples are not bananas.)*

16. Elmaların suya ihtiyacı yoktur. *(Apples do not need water.)*

APPENDIX G

SPECIFIC INTELLECTUAL HUMILITY SCALE

Lütfen sayfanın en başında verdiğiniz cevapları göz önünde bulundurarak aşağıdaki ifadelere ne kadar katıldığınızı belirtiniz.

(Please indicate how much you agree with the statements below based on your answers on top of the page.)

1	2	3	4	5
Kesinlikle				Kesinlikle
katılmıyorum				katılıyorum
<i>(Absolutely disagree)</i>				<i>(Absolutely agree)</i>

1. ____ hakkındaki bugünkü görüşlerim bir gün yanlış çıkabilir.

(My views about _____ today may someday turn out to be wrong.)

2. Konu ____ hakkındaki görüşlerime gelince bazı bulguları görmezden geliyor olabilirim.

(When it comes to my views about _____ I may be overlooking evidence.)

3. ____ hakkındaki görüşlerim yeni bir delil veya bilgi ile değişebilir.

(My views about _____ may change with additional evidence or information.)

Topics that fill in the blanks:

1. İdam cezası (*Capital punishment*)

2. Sınır ötesi hareketler (*Cross-border operations*)

3. Alkol tüketimi (*Alcohol consumption*)

4. Zorunlu askerlik (*Mandatory military service*)
5. Hayvanlar (*Animals*)
6. Motorlu tařıtlar (*Vehicles*)
7. Bitkiler (*Plants*)

APPENDIX H

COGNITIVE REFLECTION TEST

1. Bir beyzbol sopası ve bir beyzbol topu 1.10 TL tutuyor. Beyzbol sopası, beyzbol topundan 1.00 TL daha pahalı. Buna göre beyzbol topunun fiyatı nedir?
(kuruş cinsinden)

*(A ball and a bat costs 1.10 TL. The bat is 1.00 TL more expensive than the ball.
How much does the ball cost?)*

2. 5 makine 5 parçayı 5 dakikada üretiyor. Buna göre 100 makine 100 parçayı kaç dakikada üretir?

(5 machines make 5 widgets in 5 minutes. How many minutes does it take for 100 machines to make 100 widgets?)

3. Bir gölün belli bir alanı nilüfer yapraklarıyla kaplıdır. Bu alanın büyüklüğü her gün iki katına çıkmaktadır. 48 günde bu alan gölün tamamını kapladığına göre, kaç günde gölün yarısını kaplar?

(A certain area of a lake is covered with lotus leaves. The size of this area doubles every day. If this area covers the entire lake in 48 days, how many days does it take to cover half the lake?)

4. Siz bir koşu yarışındasınız ve ikinci olan kişiyi geçtiniz. Kaçınca sıraya yükselirsiniz?

(You are in a race and you just beat the person who was in the second place. What is your placing now?)

5. Bir çiftlikte 15 tane koyun var. 8 tanesi hariç hepsi öldü, geriye kaç tane kaldı?

(There are 15 sheep on a farm. All but eight are dead, how many are left?)

6. Ayşe'nin babasının 3 tane çocuğu var. İlk iki çocuğunun adı Eylül ve Ekim ise üçüncü çocuğunun adı nedir?

(Ayşe's father has 3 children. If the names of the first two children are Eylül and Ekim, what is the name of the third child?)

7. 3 metre derinliğinde, 3 metre uzunluğunda, 3 metre genişliğinde (boş) bir çukurun içinde kaç metreküp toprak vardır?

(How many cubic meters of soil are there in a 3-meter-deep, 3 meter long, 3 meter wide (empty) pit?)

APPENDIX I
ANALYSIS-HOLISM SCALE

Lütfen aşağıdaki ifadelere katılıp katılmadığınızı belirtiniz.

(Please indicate how much you agree with the statements below.)

1 2 3 4 5 6 7

Kesinlikle

Kesinlikle

katılmıyorum

katılıyorum

(Absolutely disagree)

(Absolutely agree)

1. Evrendeki her şey bir şekilde birbiriyle ilişkilidir.

(Everything in the universe is somehow related to each other.)

2. Hiçbir şey ilişkisiz değildir. *(Nothing is unrelated.)*

3. Dünyadaki her şey nedensel bir ilişkiyle iç içe geçmiştir.

(Everything in the world is intertwined in a causal relationship.)

4. Evrenin herhangi bir unsurundaki ufak bir değişiklik bile öteki unsurlarda önemli değişimlere yol açabilir.

(Even a small change in any element of the universe can lead to significant alterations in other elements.)

5. Her ne kadar bazı nedenleri bilinmese de, her olayın çok sayıda nedeni vardır.

(Any phenomenon has numerous numbers of causes, although some of the causes are not known.)

6. Her ne kadar bazıları bilinemez de olsa, her olay sayısız sonuç doğurur.
(Any phenomenon entails a numerous number of consequences, although some of them may not be known.)
7. İlk bakışta ilişkisiz gibi görünen iki olayın birbirine bir nedenler zinciriyle bağlı olması muhtemeldir.
(It is likely that the two events that seem unrelated at first glance are connected by a chain of causes.)
8. Aşırıya kaçmaktansa orta yolu bulmak daha caziptir.
(It is more desirable to take the middle ground than go to extremes.)
9. İnsanlar aralarında anlaşmazlık olduğunda, uzlaşmak ve herkesin fikrine kucak açmak için yollar aramalıdır.
(When disagreement exists among people, they should search for ways to compromise and embrace everyone's opinions.)
10. Birinin görüşleri bir başkasınıninkilerle ters düştüğünde uzlaşma noktası bulmak, kimin haklı/haksız olduğunu tartışmaktan daha önemlidir.
(It is more important to find a point of compromise than to debate who is right/wrong, when one's opinions conflict with other's opinions.)
11. Kendinden farklı görüştekilerle anlaşmazlık içinde olmaktansa, uyum içinde olmak daha caziptir.
(It is desirable to be in harmony, rather than in discord, with others of different opinions than one's own.)
12. Bir tartışmada orta yolu seçmekten kaçınılmalıdır.
(Choosing a middle ground in an argument should be avoided.)
13. Aşırıya kaçmaktan kaçınmalıyız. *(We should avoid going to extremes.)*

14. Birçok mesele birbirine zıt gözükken doğruları aynı anda barındıracak kadar inceliklidir.
- (Many issues are sufficiently sophisticated to accommodate lines that seem opposite to each other at the same time.)*
15. Evrendeki her şey birbirine zıt özellikler barındırabilir.
- (Everything in the universe can have opposing features.)*
16. Bir şeyin belli bir özellikle nitelendirilmesi, karşıt bir özelliğe de sahip olmasına engel değildir.
- (The characterization of something with a certain feature does not prevent it from having an opposite feature.)*
17. Çok olumlu gözükken bir olgu veya kavram, çoğu zaman içinde olumsuzu da barındırır.
- (A phenomenon or concept that seems very positive often includes something negative.)*
18. Başımıza gelen olumsuz olayların çoğu aslında ileride doğacak olumlu etkilerin de tohumunu içinde taşır.
- (Most of the negative events that happen to us also contain the seeds of positive effects that will arise in the future.)*
19. Dünyadaki bütün olaylar öngörülebilir doğrultuda gelişir.
- (Every phenomenon in the world moves in predictable directions.)*
20. Şu anda başarılı bir hayat yaşayan bir insan, başarılı olmaya devam edecektir.
- (A person who is currently living a successful life will continue to stay successful.)*

21. Şu anda dürüst olan bir kişi gelecekte dürüst kalacaktır.
(An individual who is currently honest will stay honest in the future.)
22. Eğer bir olay belli bir yönde geliyorsa, o yönde gitmeye devam edecektir.
(If an event is moving toward a certain direction, it will continue to move toward that direction.)
23. Mevcut durumlar her an değişebilir.
(Current situations can change at any time.)
24. Gelecek olaylar mevcut durumlara dayanarak öngörülebilir.
(Future events are predictable based on present situations.)
25. Sürekli artış gösteren bir durumun artmaya devam etmesi düşüş göstermesinden daha olasıdır.
(If something constantly increases, it is more likely to continue to increase than to decrease.)
26. Bir olguyu anlamak için parçalarındansa bütünü göz önüne alınmalıdır.
(The whole, rather than its parts, should be considered in order to understand a phenomenon.)
27. Parçalardansa bütüne dikkat etmek daha önemlidir.
(It is more important to pay attention to the whole than its parts.)
28. Bütün, parçalarının toplamından daha büyüktür.
(The whole is greater than the sum of its parts.)
29. Ayrıntılardansa bütün bir bağlama dikkat etmek daha önemlidir.
(It is more important to pay attention to the whole context rather than the details.)

30. Büyük resmi hesaba katmadan parçaları anlamak mümkün değildir.

(It is not possible to understand the parts without considering the whole picture.)

31. Birinin davranışını anlamak için kişiliğinin yanı sıra karşı karşıya kaldığı durumu da göz önünde bulundurmalıyız.

(We should consider the situation a person is faced with, as well as his/her personality, in order to understand one's behavior.)

32. Sonradan fark ettiğimiz bir detay, bir olguya bakışımızı kökten değiştirebilir.

(A detail that we noticed later can radically change our view of a phenomenon.)

33. Bir sistem bozulduğunda bozuk parçaya odaklanmak tüm sisteme odaklanmak daha gereklidir.

(When a system fails, it is more necessary to focus on the defective part than to focus on the entire system.)

APPENDIX J

LIMITATIONS-OWNING INTELLECTUAL HUMILITY SCALE

Lütfen aşağıdaki ifadelere katılıp katılmadığınızı belirtiniz.

(Please indicate how much you agree with the statements below.)

1 2 3 4 5 6 7 8 9

Kesinlikle

Kesinlikle

katılmıyorum

katılıyorum

(Absolutely disagree)

(Absolutely agree)

1. Bir şeyi anlamadığımda çözmek için gayret ederim.

(When I don't understand something, I try hard to figure it out.)

2. Öğrenmeyi severim. *(I love learning.)*

3. Bir şeyi anlamazsam, kafamı karıştıran şeyin tam olarak ne olduğunu netleştirmeye çalışırım.

(If I don't understand something, I try to get clear about what exactly is confusing to me.)

4. Hakikate önem veririm. *(I care about truth.)*

5. Bilgimin kısıtlılığını düşününce rahatsız hissederim.

(When I think about the limitations of what I know, I feel uncomfortable.)

6. Entelektüel açıdan sahip olduğum zayıflıklarına gereğinden fazla odaklanırım. *(I focus on my intellectual weaknesses too much.)*

7. Entelektüel açıdan sahip olduğum kısıtlılıklar ve zayıflıklar söz konusu olduğunda savunmaya geçerim.

(I tend to get defensive about my intellectual limitations and weaknesses.)

8. Bir alanda entelektüel açıdan zayıf olduğumu fark edersem diğer alanlardaki entelektüel becerilerimden de şüphelenmeye meyilliyim.

(When I know that I have an intellectual weakness in one area, I tend to doubt my intellectual abilities in other areas as well.)

9. Birisi düşüncemdeki bir hataya dikkat çektiğinde, hatalı olduğumu kabul etmede gecikmem.

(When someone points out a mistake in my thinking, I am quick to admit that I was wrong.)

10. Entelektüel açıdan sahip olduğum kısıtlamaları kabullenmede gecikmem.

(I am quick to acknowledge my intellectual limitations.)

11. Yanılgıya düştüğümü kabul etmekte zorlanırım.

(I have a hard time admitting when one of my beliefs is mistaken.)

12. Entelektüel açıdan sahip olduğum kısıtlamaları kabullenirken rahat

hissederim. *(I feel comfortable admitting my intellectual limitations.)*

APPENDIX K

SOCIAL DESIRABILITY SCALE

Lütfen aşağıdaki ifadelerin size ne kadar uygun olduğunu belirtiniz.

(Please indicate how much these statements suit your personality.)

1

2

3

4

5

Hiç uygun değil

Tamamen uygun

(Not at all suits me)

(Totally suits me)

1. Verdiğim kararlardan dolayı asla pişmanlık duymam.

(I never regret the decisions I make.)

2. Bana yönelik eleştirileri her zaman dikkate alırım.

(I always consider the criticism towards me.)

3. Bir şeyi kafama koyduğumda diğer insanlar nadiren fikrimi değiştirebilir.

(When I decide I'm going to do something, other people can rarely change my mind.)

4. Kendi kaderimi yazabileceğimi düşünürüm.

(I think I can write my own destiny.)

5. Verdiğim kararlara çok güvenirim. *(I have high confidence in my decisions.)*

6. Diğer insanların benim hakkımda ne düşündüğünü dikkate almam.

(I do not care what other people think about me.)

7. Kendime karşı her zaman dürüst davranırım. *(I always be honest with myself.)*

8. Tamamen mantıklı bir insanım. *(I am a completely logical person.)*

9. Zihnimi dağıtan bir düşünceden uzaklaşmak benim için zor değildir.

(It is not difficult for me to move away from a thought that distracts me.)

10. Kötü alışkanlıklarımı terk etmek bana zor gelmez.

(It is not difficult for me to quit my bad habits.)

11. Duygularımın yoğunlaşması düşüncelerimde önyargılı olmama neden olmaz.

(Intensity of my emotions does not cause me to be biased in my thoughts.)

12. İnsanlara yönelik ilk izlenimimde yanılmam.

(I am not mistaken in my first impressions of people.)

13. Yaptığım işlerde her zaman doğru adımlar atarım.

(I always take the right steps in the work I do.)

14. Hayatımda hiç arabaya binmedim. *(I have never ridden in a car.)* (attention check)

APPENDIX L

SOCIAL VIGILANTISM SCALE

Lütfen aşağıdaki ifadelere katılıp katılmadığınızı belirtiniz.

(Please indicate how much you agree with the statements below.)

1

2

3

4

5

Kesinlikle

Kesinlikle

katılmıyorum

katılıyorum

(Absolutely disagree)

(Absolutely agree)

1. Diğer insanları aydınlatmanın benim görevim olduğunu hissederim.

(I feel as if it is my duty to enlighten other people.)

2. Fikirlerimin başkalarını eğitmek için kullanılması gerektiğini hissediyorum.

(I feel that my ideas should be used to educate others.)

3. Kendi fikrimi ifade etmenin toplumsal bir vazife olduğunu hissederim.

(I feel a social obligation to voice my opinion.)

4. İnsanların nasıl yaşaması gerektiğine dair her tartışmayı kazanmam gerekir.

(I need to win any argument about how people should live their lives.)

5. Daha zeki ve bilgili insanlar, zekası ve bilgisi daha az olan insanları eğitmekten sorumludur.

(Those people who are more intelligent and informed have a responsibility to educate the people around them who are less intelligent and informed.)

6. Kendimi önemli kararlar alabilecek bir uzman konumunda görmeyi hayal ederim.

(I like to imagine myself in a position of authority so that I could make the important decisions around here.)

7. İnsanların beni dinlemesini sağlamaya çalışırım çünkü söylediğim şeyler çok mantıklıdır.

(I try to get people to listen to me, because what I have to say makes a lot of sense.)

8. Bazı insanlar aptalca şeylere inanır. *(Some people just believe stupid things.)*

9. Toplumda çok fazla cahil insan var.

(There are a lot of ignorant people in society.)

10. Bazı insanlara görüşlerinin yanlış olduğunun söylenmesi gerektiğini düşünüyorum.

(I think that some people need to be told that their point of view is wrong.)

11. Herkes olan biteni benim gördüğüm gibi görse dünya daha güzel bir yer olurdu. *(If everyone saw things the way that I do, the world would be a better place.)*

12. İnsanların bir sorun hakkında taraf seçerken ince noktaları gözden kaçırmaları sinirimi bozuyor.

(It frustrates me that many people fail to consider the finer points of an issue when they take a side.)

13. Sıklıkla insanların fikirlerini sağlam delillere dayandırmadıklarını hissediyorum.

(I often feel that other people do not base their opinions on good evidence.)

APPENDIX M
SYLLOGISM TASK

Lütfen aşağıda gördüğünüz çıkarımları dikkatlice okuyup çıkarılan sonucun mantıklı olup olmadığını ve cevabınıza ne kadar güvendiğinizi işaretleyin. Verilen ilk iki cümlelerin doğru olduğunu kabul etmeniz ve sonucun geçerliliğini buna göre belirlemeniz gerekmektedir.

(Please carefully read the conclusions you see below and indicate whether the conclusion made is logical and how confident you are in your answer. You must accept that the first two sentences are correct and determine the validity of the conclusion accordingly.)

Bu çıkarım mantıken geçerli midir? *(Is this inference logically valid?)*

Mantıken geçerli Mantıken geçersiz *(Logically valid Logically invalid)*

Cevabınızdan ne kadar eminsiniz? *(How confident are you in your answer?)*

Pek emin değilim Biraz eminim Kesinlikle eminim

(I'm not sure I'm somewhat sure I'm absolutely sure)

“Toplum talebi dahilinde olan uygulamalar ülkeye faydalıdır.

Sınır ötesi hareketler toplum talebi dahilindedir.

Sınır ötesi hareketler ülkeye faydalıdır.”

(Policies that are in public demand are beneficial to the country.

Cross-border operations are within public demand.

Cross-border operations are beneficial to the country.)

“Toplum talebi dahilinde olan uygulamalar ülkeye faydalıdır.

Sınır ötesi hareketler toplum talebi dahilinde değildir.

Sınır ötesi hareketler ülkeye faydalı değildir.”

(Policies that are in public demand are beneficial to the country.

Cross-border operations are not within public demand.

Cross-border operations are not beneficial to the country.)

“Ülkeye faydalı olacak eylemler toplumdan geniş destek görür.

Sınır ötesi hareketlar toplumdan geniş destek görür.

Sınır ötesi hareketlar ülkeye faydalı eylemlerdir.”

(Actions that will benefit the country receive broad public support.

Cross-border operations receive broad public support.

Cross-border operations are beneficial actions for the country.)

“Ülkeye faydalı olacak eylemler toplumdan geniş destek görür.

Sınır ötesi hareketlar toplumdan geniş destek görmez

Sınır ötesi hareketlar ülkeye faydalı eylemler değildir.”

(Actions that will benefit the country receive broad public support.

Cross-border operations do not receive broad public support.

Cross-border operations are not beneficial actions for the country.)

“Bir cezanın adil olabilmesi için toplumdan geniş destek görmesi gerekir.

İdam cezası toplumdan geniş destek görmektedir.

İdam cezası adildir.”

(In order for a sentence to be fair, it needs to receive broad public support.

The capital punishment receives broad public support.

The capital punishment is fair.)

“Bir cezanın adil olabilmesi için toplumdan geniş destek görmesi gerekir.

İdam cezası toplumdan geniş destek görmemektedir.

İdam cezası adil değildir.”

(In order for a sentence to be fair, it needs to receive broad public support.

The capital punishment does not receive broad public support.

The capital punishment is not fair.)

“Halkın vicdanını rahatlatan cezalar adaletin sağlanmasına katkıda bulunur.

İdam cezası halkın vicdanını rahatlatır.

İdam cezası adaletin sağlanmasına katkıda bulunur.”

(Penalties that relieve the public conscience contribute to the provision of justice.

The capital punishment relieves the public's conscience.

The capital punishment contributes to justice.)

“Halkın vicdanını rahatlatan cezalar adaletin sağlanmasına katkıda bulunur.

İdam cezası halkın vicdanını rahatlatmaz.

İdam cezası adaletin sağlanmasına katkıda bulunmaz.”

(Penalties that relieve the public conscience contribute to the provision of justice.

The capital punishment does not relieve the public's conscience.

The capital punishment does not contribute to justice.)

“Ordu düzeni verim gözetilerek hazırlandığında ülkeye yarar sağlar.

Zorunlu askerlik ordu düzeni açısından verimli değildir.

Zorunlu askerlik ülkeye yarar sağlamaz.”

(When the order of the military is efficiently designed, it benefits the country.

Compulsory military service is not efficient in terms of military order.

Compulsory military service does not benefit the country.)

“Ordu düzeni verim gözetilerek hazırlandığında ülkeye yarar sağlar.

Zorunlu askerlik ordu düzeni açısından verimlidir.

Zorunlu askerlik ülkeye yarar sağlar.”

(When the order of the military is efficiently designed, it benefits the country.

Compulsory military service is efficient in terms of military order.

Compulsory military service benefits the country.)

“Ülkenin güvenliğini sağlamak için nitelikli askerlerin yetiştirilmesi gerekir.
Zorunlu askerlik nitelikli askerler yetiştirir.
Zorunlu askerlik ülkenin güvenliğini sağlayabilir.”
*(To ensure the security of the country, qualified soldiers must be trained.
Compulsory military service trains qualified soldiers.
Compulsory military service can ensure the security of the country.)*

“Ülkenin güvenliğini sağlamak için nitelikli askerlerin yetiştirilmesi gerekir.
Zorunlu askerlik nitelikli askerler yetiştirmez.
Zorunlu askerlik ülkenin güvenliğini sağlayamaz.”
*(To ensure the security of the country, qualified soldiers must be trained.
Compulsory military service does not train qualified soldiers.
Compulsory military service cannot ensure the security of the country.)*

“İnsanlara kontrolünü kaybettirecek eylemler toplum içinde yapılmamalıdır.
Alkol insanların kontrolünü kaybetmesine neden olur.
Alkol toplum içinde kullanılmamalıdır.”
*(Actions that will cause people to lose control should not be done in public.
Alcohol causes people to lose control.
People should not consume alcohol in public.)*

“İnsanlara kontrolünü kaybettirecek eylemler toplum içinde yapılmamalıdır.
Alkol insanların kontrolünü kaybetmesine neden olmaz.
Alkol toplum içinde kullanılabilir.”
*(Actions that will cause people to lose control should not be done in public.
Alcohol does not cause people to lose control.
People should be able to consume alcohol in public.)*

“Devlet tarafından kısıtlanması gereken eylemler toplumu bir bütün halinde etkileyen eylemlerdir.

Alkol tüketimi toplumu bir bütün halinde etkiler.

Alkol tüketiminin devlet tarafından kısıtlanması gerekir.”

(Actions that must be restricted by the state are actions that affect society as a whole.

Alcohol consumption affects society as a whole.

Alcohol consumption must be restricted by the state.)

“Devlet tarafından kısıtlanması gereken eylemler toplumu bir bütün halinde etkileyen eylemlerdir.

Alkol tüketimi toplumu bir bütün halinde etkilemez.

Alkol tüketiminin devlet tarafından kısıtlanması gerekmez.”

(Actions that must be restricted by the state are actions that affect society as a whole.

Alcohol consumption does not affect society as a whole.

Alcohol consumption does not need to be restricted by the state.)

“Bütün kuşların tüyleri vardır.

Bülbüller kuştur.

Buna göre, bülbüllerin tüyleri vardır.”

(All birds have feathers.

Nightingales are birds.

Therefore, nightingales have feathers.)

“Bütün ineklerin dört ayağı vardır.

Yılanların dört ayağı yoktur.

Bu nedenle, yılanlar inek değildir.”

(All cows have four legs.

Snakes do not have four legs.

Therefore, snakes are not cows.)

“Bütün memeli canlılar/memeliler yürüyebilir.

Balinalar memeli canlılardır/memelidir.

Öyleyse, balinalar yürüyebilir.”

(All mammals can walk.

Whales are mammals.

Therefore, whales can walk.)

“Bütün hayvanlar suyu sever.

Kediler suyu sevmez.

Öyleyse, kediler hayvan değildir.”

(All animals love water.

Cats do not like water.

Therefore, cats are not animals.)

“Her kedinin oksijene ihtiyacı vardır.

Hayvanların oksijene ihtiyacı vardır.

Bu sebeple, kediler hayvandır.”

(Every cat needs oxygen.

Animals need oxygen.

Therefore, cats are animals.)

“İki bacaklı her hayvan yürüyebilir.

Balinalar iki bacaklı canlılar değildir.

Bu sebeple, balinalar yürüyemez.”

(Every two-legged animal can walk.

Whales are not two-legged creatures.

Therefore, whales cannot walk.)

“Bütün inekler hayvandır.

Yılanlar hayvandır.

Öyleyse, yılanlar inehtir.”

(All cows are animals.

Snakes are animals.

Therefore, snakes are cows.)

“Bütün tavuskuşlarının tüyleri vardır.

Bülbüller tavuskuşu değillerdir.

Öyleyse, bülbüllerin tüyleri yoktur.”

(All peacocks have feathers.

Nightingales are not peacocks.

Therefore, the nightingales have no feathers.)

“Motoru olan her şey sualtında çalışabilir.

Otomobiller sualtında çalışamaz.

Öyleyse, otomobillerin motoru yoktur.”

(Anything with an engine can work underwater.

Cars cannot work underwater.

Therefore, cars do not have engines.)

“Motoru olan her şeyin benzine ihtiyacı vardır.

Otomobillerin benzine ihtiyacı vardır.

Öyleyse, otomobillerin motoru vardır.”

(Everything with the engine needs gas.

Cars need gasoline.

Therefore, cars have an engine.)

“Tüm otomobillerin dört tekeri vardır.

Opel Astra bir otomobil modelidir.

Opel Astra'nın dört tekeri vardır.”

(All cars have four wheels.

Opel Astra is a car.

Opel Astra has four wheels.)

“Tüm otomobiller kullanım için ehliyet gerektirir.

Motosiklet otomobil değildir.

Motosiklet kullanım için ehliyet gerektirmez.”

(All cars require a driver's license to drive.

Motorcycles are not cars.

Motorcycles do not require a driver's license.)

“Tüm bitki türleri yeşildir.

Kurbağalar yeşildir.

Kurbağa bir bitki türüdür.”

(All plants are green.

Frogs are green.

Frogs are a kind of plant.)

“Muz kabuğu yenmeyen bir meyvedir.

Elma kabuğu yenen bir meyvedir.

Elmalar muz değildir.”

(Banana is a fruit whose peel is inedible.

Apple is a fruit whose peel is edible.

Apples are not bananas.)

“Her çiçeğin suya ihtiyacı vardır.

Elmalar çiçek değildir.

Öyleyse, elmaların suya ihtiyacı yoktur.”

(Every flower needs water.

Apples are not flowers.

Therefore, apples do not need water.)

“Ağaçta yetişen her meyve yenilir.

Elmalar yenilir.

Öyleyse, elmalar ağaçta yetişen meyvelerdendir.”

(Every fruit that grows on a tree can be eaten.

Apples can be eaten.

Therefore, apples are a kind of fruit that grows on trees.)

APPENDIX N
SYLLOGISM TASK TRAINING

In this study, you will see some inferences about certain topics. You will be asked to indicate whether these conclusions comply with the logic rules.

If the conclusion must be true when we accept the premises taken as true, this conclusion is logically valid. Just because the conclusion is logically valid does not mean its content is correct. Whether an inference is logical or not is related to the relationship between the given premises and the conclusion. Whether the content of sentences is correct or not is another matter.

On the next page, you will read some examples that will help you better understand the relationships between premises and conclusion.

Let us start with the first example:

Example 1: “Anyone who won the lottery has bought a lottery ticket. Ahmet won the lottery. Therefore, Ahmet has bought a lottery ticket.”

This inference is logically valid. The chain of logic followed here is as follows:

Premise 1: If P is Q | Anyone who won the lottery bought a lottery ticket.

Premise 2: P | Ahmet won the lottery.

Conclusion: Therefore, Q | Ahmet bought the lottery ticket.

In this example, when we accept premises as correct, the result must be correct. If everyone who won the lottery has bought a ticket (Premise 1) and Ahmet also won the lottery (Premise 2), then logically he must have bought a lottery ticket (Conclusion). Therefore, the deduction is logically valid.

Example 2: “Anyone who won the lottery has bought a lottery ticket. Ahmet bought the lottery ticket. Therefore, Ahmet won the lottery.”

This inference is logically invalid. The chain of logic followed here is as follows:

Premise 1: If P is Q | Anyone who won the lottery has bought a lottery ticket.

Premise 2: Q | Ahmet bought the lottery ticket.

Conclusion: Therefore, P | Ahmet won the lottery.

In this example, when we accept premises as correct, the conclusion does not have to be true. If everyone who won the lottery has bought a ticket (Premise 1), we cannot say that Ahmet who bought the lottery ticket (Premise 2) won the lottery (Conclusion) because not everyone who bought the ticket wins the lottery. Therefore, the deduction made is logically invalid.

Example 3: “Everyone who won the lottery bought a lottery ticket. Ahmet did not buy a lottery ticket. Therefore, Ahmet did not win the lottery.”

This inference is logically valid. The chain of logic followed here is as follows:

Premise 1: If P is Q | Anyone who won the lottery has bought a lottery ticket.

Premise 2: Not Q | Ahmet did not buy a lottery ticket.

Conclusion: Therefore, not P | Ahmet did not win the lottery.

In this example, when we accept premises as correct, the conclusion must be correct.

If everyone who won the lottery bought a ticket (Premise 1), Ahmet who did not buy a ticket (Premise 2) should not be able to logically win the lottery (Conclusion).

Therefore, the deduction is logically valid.

Example 4: “Everyone who won the lottery has bought a lottery ticket. Ahmet did not win the lottery. Therefore, Ahmet did not buy a lottery ticket.”

This inference is logically invalid. The chain of logic followed here is as follows:

Premise 1: If P is Q | Anyone who won the lottery has bought a lottery ticket.

Premise 2: Not P | Ahmet did not win the lottery.

Conclusion: Therefore, not Q | Ahmet did not buy a lottery ticket.

In this example, when we accept premises as correct, the conclusion does not have to be true. If everyone who won the lottery has bought a ticket (Premise 1), we cannot say that Ahmet, who did not win the lottery (Premise 2), did not buy a ticket (Conclusion) because he may have bought but not have won. Therefore, the deduction made is logically invalid.

As we mentioned at the beginning, whether the conclusion is logical or not is not related to the content of sentences, but to the relationship between premises and conclusion. While the content is correct, inference may be illogical. For example:

Premise 1: All dogs are mammals.

Premise 2: Kangal is a dog.

Conclusion: Ice cream is a dessert.

While ice cream is really a dessert, this has nothing to do with dogs being mammals and the Kangals being dogs. Although the premise and conclusion sentences are factually correct, the conclusion made is invalid because the conclusion statement is independent of the premise, that is, the given proposals do not require such conclusion.

We can think of the opposite of this situation. Although sentences are wrong in content, premises and conclusion can be logically linked. If the conclusion must be true when we accept the premises as correct, the conclusion made is valid. For example:

Premise 1: All fives are fours.

Premise 2: All threes are fives.

Conclusion: All threes are fours.

Although the content of the sentences sounds silly, in this example, the conclusion should be correct when we consider the premises right. If all fives are fours (Premise 1) and all threes are fives (Premise 2), then logically, all threes must also be fours (Conclusion). Since the established chain of logic is correct, the deduction made (although unrealistic) is valid.

We will ask you to solve some examples so that you can practice before proceeding to the actual test. To make sure you learn the rules, you will only be able to get to the next question after you answer the current example correctly. If you answer incorrectly, you will see an explanation for why your answer was wrong.

Please carefully read the inference below and indicate whether it is logically valid.

“X's are Y. Zs are not Y. Therefore, Zs are not X. ”

Logically valid Logically invalid

Please carefully read the inference below and indicate whether it is logically valid.

“A's are B. C's are not A. Therefore, the C's are not B. ”

Logically valid Logically invalid

Please carefully read the inference below and indicate whether it is logically valid.

“The Ks are L. M's are K. Therefore, the M's are L. ”

Logically valid Logically invalid

Please carefully read the inference below and indicate whether it is logically valid.

“D's are F. The G's are F. Therefore, G's are D. ”

Logically valid Logically invalid

Let us recall the rules again: If we accept the given premises correctly, if the result must be correct, this conclusion is logically valid. Just because the conclusion is logically valid does not mean its content is correct. Likewise, the correct content does not mean that the inference is logical. Whether an inference is logical or not is related to the relationship between the premises given and the outcome. Whether the content of the sentences is correct or not is independent from this.

The exercise part ended here. In the original test, you will be asked to indicate whether the conclusions are reasonable, considering the rules you saw in the training section. In addition, you will be asked to indicate how much you trust your answer. When you feel ready, you can start the actual test.

APPENDIX O

SYLLOGISM TASK TRAINING (TURKISH)

Bu çalışmada belli konularda yapılmış bazı çıkarımlar göreceksiniz. Sizden bu çıkarımların mantık kurallarına uyup uymadığını belirtmeniz istenecektir.

Eğer verilen önermeleri doğru kabul ettiğimizde sonuç da doğru olmak zorundaysa, bu çıkarım mantıken geçerlidir. Çıkarılan sonucun mantıken geçerli olması, içeriğinin doğru olduğu anlamına gelmez. Bir çıkarımın mantıklı olup olmayışı, verilen önermeler ve sonuç arasındaki ilişkiyle alakalıdır. Cümlelerin içeriğinin doğru olup olmayışı ayrı bir konudur.

Sonraki sayfada, önermeler ve sonuç arasındaki ilişkileri daha iyi anlamanızı sağlayacak bazı örnekler okuyacaksınız.

İlk örnekle başlayalım:

Örnek 1: “Piyangoyu kazanan herkes piyango bileti almıştır. Ahmet piyangoyu kazanmıştır. Buna göre, Ahmet piyango bileti almıştır.”

Bu çıkarım mantıken geçerlidir. Burada izlenen mantık zinciri aşağıdaki gibidir:

Önerme 1: $P \text{ ise } Q$ | Piyangoyu kazanan herkes piyango bileti almıştır.

Önerme 2: P | Ahmet piyangoyu kazanmıştır.

Sonuç: Buna göre, Q | Ahmet piyango bileti almıştır.

Bu örnekte, önermeleri doğru kabul ettiğimizde sonuç da doğru olmak zorundadır.

Piyangoyu kazanan herkes bilet aldıysa (Önerme 1) ve Ahmet de piyangoyu kazandıysa (Önerme 2) mantıken piyango bileti almış olması gerekir (Sonuç). Bu yüzden yapılan çıkarım mantıken geçerlidir.

Örnek 2: “Piyangoyu kazanan herkes piyango bileti almıştır. Ahmet piyango bileti almıştır. Buna göre, Ahmet piyangoyu kazanmıştır.”

Bu çıkarım mantıken geçersizdir. Burada izlenen mantık zinciri aşağıdaki gibidir:

Önerme 1: $P \text{ ise } Q$ | Piyangoyu kazanan herkes piyango bileti almıştır.

Önerme 2: Q | Ahmet piyango bileti almıştır.

Sonuç: Buna göre, P | Ahmet piyangoyu kazanmıştır.

Bu örnekte, önermeleri doğru kabul ettiğimizde sonuç doğru olmak zorunda değildir.

Piyangoyu kazanan herkes bilet aldıysa (Önerme 1), piyango bileti alan Ahmet'in (Önerme 2) piyangoyu kazandığını (Sonuç) söyleyemeyiz çünkü bilet alan herkes piyangoyu kazanmaz. Bu yüzden yapılan çıkarım mantıken geçersizdir.

Örnek 3: “Piyangoyu kazanan herkes piyango bileti almıştır. Ahmet piyango bileti almamıştır. Buna göre, Ahmet piyangoyu kazanmamıştır.”

Bu çıkarım mantıken geçerlidir. Burada izlenen mantık zinciri aşağıdaki gibidir:

Önerme 1: $P \text{ ise } Q$ | Piyangoyu kazanan herkes piyango bileti almıştır.

Önerme 2: $Q \text{ değil}$ | Ahmet piyango bileti almamıştır.

Sonuç: Buna göre, $P \text{ değil}$ | Ahmet piyangoyu kazanmamıştır.

Bu örnekte, önermeleri doğru kabul ettiğimizde sonuç da doğru olmak zorundadır.

Piyangoyu kazanan herkes bilet aldıysa (Önerme 1), bilet almayan Ahmet'in (Önerme 2) mantıken piyangoyu da kazanmamış (Sonuç) olması gerekir. Bu yüzden yapılan çıkarım mantıken geçerlidir.

Örnek 4: “Piyangoyu kazanan herkes piyango bileti almıştır. Ahmet piyangoyu kazanmamıştır. Buna göre, Ahmet piyango bileti almamıştır.”

Bu çıkarım mantiken geçersizdir. Burada izlenen mantık zinciri aşağıdaki gibidir:

Önerme 1: P ise Q | Piyangoyu kazanan herkes piyango bileti almıştır.

Önerme 2: P değil | Ahmet piyangoyu kazanmamıştır.

Sonuç: Buna göre, Q değil | Ahmet piyango bileti almamıştır.

Bu örnekte, önermeleri doğru kabul ettiğimizde sonuç doğru olmak zorunda değildir.

Piyangoyu kazanan herkes bilet aldıysa (Önerme 1), piyangoyu kazanmayan

Ahmet'in (Önerme 2) bilet almadığını (Sonuç) söyleyemeyiz çünkü bilet almış ama kazanmamış olabilir. Bu yüzden yapılan çıkarım mantiken geçersizdir.

En başta da belirttiğimiz gibi, yapılan çıkarımın mantıklı olup olmayışı cümlelerin içeriğiyle değil, önermeler ve sonuç arasındaki ilişkiyle alakalıdır. İçerik doğru olsa da, çıkarım mantıksız olabilir. Örneğin:

Önerme 1: Bütün köpekler memelidir.

Önerme 2: Kangal bir köpektir.

Sonuç: Dondurma bir tatlıdır.

Dondurma gerçekten bir tatlı olsa da, bunun köpeklerin memeli oluşu ve kangalın köpek oluşuyla bir ilgisi yoktur. Önerme ve sonuç cümleleri doğru olmasına rağmen, sonuç cümlesi önermelerden bağımsız olduğu için, yani verilen önermeler böyle bir sonuç çıkarmayı gerektirmediği için yapılan çıkarım geçersizdir.

Bu durumun tam tersini de düşünebiliriz. Cümleler içerik olarak yanlış olsa da, önermeler ve sonuç birbirine mantıklı bir şekilde bağlanabilir. Önermeleri doğru kabul ettiğimizde sonuç da doğru olmak zorundaysa, yapılan çıkarım geçerlidir.

Örneğin:

Önerme 1: Bütün beşler dördtür.

Önerme 2: Bütün üçler beştir.

Sonuç: Bütün üçler dördtür.

Cümlelerin içeriği kulağa saçma gelse de, bu örnekte önermeleri doğru kabul ettiğimizde sonuç da doğru olmalıdır. Bütün beşler dördse (Önerme 1) ve bütün üçler beşe (Önerme 2), mantıken her üçün aynı zamanda dört olması (Sonuç) gereklidir. Kurulan mantık zinciri doğru olduğu için yapılan çıkarım (gerçekçi olmamasına rağmen) geçerlidir.

Asıl teste geçmeden önce alıştırmaya yapabilmemiz için bazı örnekleri çözmenizi isteyeceğiz. Kuralları öğrendiğinizden emin olmak için yalnızca doğru cevap verdiğinizde sonraki örneğe geçebileceksiniz. Yanlış cevap verdiğiniz takdirde neden yanlış yaptığınızı belirten bir açıklama göreceksiniz.

Lütfen aşağıda yapılan çıkarımı dikkatlice okuyup mantıken geçerli olup olmadığını işaretleyin.

“X'ler Y'dir. Z'ler Y değildir. Öyleyse, Z'ler X değildir.”

○Mantıken geçerli ○Mantıken geçersiz

Lütfen aşağıda yapılan çıkarımı dikkatlice okuyup mantıken geçerli olup olmadığını işaretleyin.

“A'lar B'dir. C'ler A değildir. Öyleyse, C'ler B değildir.”

○Mantıken geçerli ○Mantıken geçersiz

Lütfen aşağıda yapılan çıkarımı dikkatlice okuyup mantıken geçerli olup olmadığını işaretleyin.

“K'ler L'dir. M'ler K'dir. Öyleyse, M'ler L'dir.”

○Mantiken geçerli ○Mantiken geçersiz

Lütfen aşağıda yapılan çıkarımı dikkatlice okuyup mantiken geçerli olup olmadığını işaretleyin.

“D'ler F'dir. G'ler F'dir. Öyleyse, G'ler D'dir.”

○Mantiken geçerli ○Mantiken geçersiz

Kuralları tekrardan hatırlayalım: Eğer verilen önermeleri doğru kabul ettiğimizde sonuç da doğru olmak zorundaysa, bu çıkarım mantiken geçerlidir. Çıkarılan sonucun mantiken geçerli olması, içeriğinin doğru olduğu anlamına gelmez. Aynı şekilde içeriğin doğru oluşu çıkarımın mantıklı olduğu anlamına gelmez. Bir çıkarımın mantıklı olup olmayışı, verilen önermeler ve sonuç arasındaki ilişkiyle alakalıdır. Cümlelerin içeriğinin doğru olup olmayışı bundan bağımsızdır.

Alıştırma kısmı burada sona erdi. Asıl teste sizden, alıştırma kısmında gördüğünüz kuralları dikkate alarak çıkarımların mantıklı olup olmadığını belirtmeniz istenecek. Buna ek olarak cevabınıza ne kadar güvendiğinizi de işaretlemeniz istenecek. Kendinizi hazır hissettiğiniz zaman asıl teste başlayabilirsiniz.

APPENDIX P

PROBES AFTER THE TASK

“İnsanların sekiz bacağı vardır.

Ahtapotlar insan değildir.

Ahtapotların sekiz bacağı yoktur.”

(Humans have eight legs.

Octopuses are not human.

Octopuses do not have eight legs.)

Tamamladığınız görevde size verilen yönergelere göre, yukarıdaki çıkarım mantiken geçerli midir?

(According to the instructions given to you for the task, is the inference above logically valid?)

Mantiken geçerli Mantiken geçersiz (*○ Logically valid ○ Logically invalid*)

(if the participant selects “Logically invalid”):

Sizece yapılan çıkarım neden mantiken geçersizdir?

(Why do you think the inference is logically invalid?)

İnsanların sekiz bacağı olmadığı için (*Because people do not have eight legs*)

Ahtapotların sekiz bacağı olduğu için (*Because octopuses have eight legs*)

Verilen önermelerden "Ahtapotların sekiz bacağı yoktur" sonucu çıkarılamadığı için

(Because the conclusion “Octopuses do not have eight legs” cannot be derived from the given premises)

Üniversite düzeyinde formel mantık dersi aldınız mı?

(Have you taken formal logic lessons at the university level?)

Aldım Almadım (*I have* *I have not*)

APPENDIX Q

ETHICS COMMITTEE APPROVAL

Evrak Tarih ve Sayısı: 26/06/2020-66

T.C.
BOĞAZİÇİ ÜNİVERSİTESİ
SOSYAL VE BEŞERİ BİLİMLER YÜKSEK LİSANS VE DOKTORA TEZLERİ ETİK İNCELEME
KOMİSYONU
TOPLANTI TUTANAĞI

Toplantı Sayısı : 3
Toplantı Tarihi : 06/04/2020
Toplantı Saati : 14:00
Toplantı Yeri : Zoom Sanal Toplantı
Bulunanlar : Prof. Dr. Feyza Çorapçı, Dr. Öğr. Üyesi Yasemin Sohtorik İlkmen, Prof. Dr. Özlem Hesaççı
Karaca, Doç. Dr. Ebru Kaya, Prof. Dr. Fatma Nevra Seggie
Bulunmayanlar :

Mertcan Güngör
Psikoloji

Sayın Araştırmacı,

"Entelektüel tevazu ve politik inanç önyargısı / Intellectual humility and political belief bias" başlıklı projeniz ile ilgili olarak yaptığımız SBB-EAK 2020/17 sayılı başvuru komisyonumuz tarafından 6 Nisan 2020 tarihli toplantıda incelenmiş ve uygun bulunmuştur.

Bu karar tüm üyelerin toplantıya çevrimiçi olarak katılımı ve oybirliği ile alınmıştır. COVID-19 önlemleri kapsamında kurul üyelerinden ıslak imza alınmadığı için bu onam mektubu üye ve raportör olarak Fatma Nevra Seggie tarafından bütün üyeler adına e-imzalanmıştır.

Saygılarımızla, bilgilerinizi rica ederiz.

Prof. Dr. Fatma Nevra SEGGIE
ÜYE

e-imzalıdır
Prof. Dr. Fatma Nevra SEGGIE
Raportör

SOBETİK 3 06/04/2020

Bu belge 5070 sayılı Elektronik İmza Kanununun 5. Maddesi gereğince güvenli elektronik imza ile imzalanmıştır.

REFERENCES

- Akın, A. (2010). İki boyutlu sosyal istenirlik ölçeğinin geliştirilmesi ve psikometrik özelliklerinin araştırılması. *Gazi University Journal of Gazi Educational Faculty*, 30(3), 771-784.
- Altemeyer, B. (1996). *The authoritarian specter*. Cambridge, MA: Harvard University Press.
- Altemeyer, B. (2002). Dogmatic behavior among students: Testing a new measure of dogmatism. *The Journal of Social Psychology*, 142(6), 713–721. doi: 10.1080/00224540209603931
- Bettinghaus, E., Miller, G., & Steinfatt, T. (1970). Source evaluation, syllogistic content, and judgments of logical validity by high- and low-dogmatic persons. *Journal of Personality and Social Psychology*, 16(2), 238–244. doi: 10.1037/h0029864
- Brandt, M. J., Chambers, J. R., Crawford, J. T., Wetherell, G., & Reyna, C. (2015). Bounded openness: The effect of openness to experience on intolerance is moderated by target group conventionality. *Journal of Personality and Social Psychology*, 109(3), 549. doi: 10.1037/pspp0000055
- Brandt, M. J., & Crawford, J. T. (2020). Worldview conflict and prejudice. In B. Gawronski (Ed.), *Advances in Experimental Social Psychology* (Vol. 61, pp. 1–66). doi: 10.1016/bs.aesp.2019.09.002
- Bronstein, M. V., Pennycook, G., Bear, A., Rand, D. G., & Cannon, T. D. (2019). Belief in fake news is associated with delusionality, dogmatism, religious fundamentalism, and reduced analytic thinking. *Journal of Applied Research in Memory and Cognition*, 8(1), 108–117. doi: 10.1016/j.jarmac.2018.09.005
- Calvillo, D. P., Swan, A. B., & Rutchick, A. M. (2019). Ideological belief bias with political syllogisms. *Thinking & Reasoning*, 1–20. doi: 10.1080/13546783.2019.1688188
- Čavojová, V. (2018). When beliefs and logic contradict: Issues of values, religion and culture. In C. Faucher (Ed.), *Advances in Culturally-Aware Intelligent Systems and in Cross-Cultural Psychological Studies* (pp. 367–390). doi: 10.1007/978-3-319-67024-9_17

- Choi, I., Koo, M., & Choi, J. A. (2007). Individual differences in analytic versus holistic thinking. *Personality and Social Psychology Bulletin*, *33*(5), 691–705. doi: 10.1177/0146167206298568
- Converse, P. E. (2006). The nature of belief systems in mass publics (1964). *Critical Review*, *18*(1–3), 1–74. doi: 10.1080/08913810608443650
- Conway III, L. G., Houck, S. C., Gornick, L. J., & Repke, M. A. (2018). Finding the Loch Ness monster: Left-wing authoritarianism in the United States. *Political Psychology*, *39*(5), 1049–1067. doi: 10.1111/pops.12470
- Crawford, J. T. (2014). Ideological symmetries and asymmetries in political intolerance and prejudice toward political activist groups. *Journal of Experimental Social Psychology*, *55*, 284–298. doi: 10.1016/j.jesp.2014.08.002
- Ditto, P. H., Liu, B. S., Clark, C. J., Wojcik, S. P., Chen, E. E., Grady, R. H., ... Zinger, J. F. (2019). At least bias is bipartisan: A meta-analytic comparison of partisan bias in liberals and conservatives. *Perspectives on Psychological Science*, *14*(2), 273–291. doi: 10.1177/1745691617746796
- Ditto, P. H., & Lopez, D. F. (1992). Motivated skepticism: Use of differential decision criteria for preferred and nonpreferred conclusions. *Journal of Personality and Social Psychology*, *63*(4), 568. doi: 10.1037/0022-3514.63.4.568
- Ditto, P. H., Munro, G. D., Apanovitch, A. M., Scepansky, J. A., & Lockhart, L. K. (2003). Spontaneous skepticism: The interplay of motivation and expectation in responses to favorable and unfavorable medical diagnoses. *Personality and Social Psychology Bulletin*, *29*(9), 1120–1132. doi: 10.1177/0146167203254536
- Dube, C., Rotello, C. M., & Heit, E. (2010). Assessing the belief bias effect with ROCs: It's a response bias effect. *Psychological Review*, *117*(3), 831. doi: 10.1037/a0019634
- Evans, J. S. B., Barston, J. L., & Pollard, P. (1983). On the conflict between logic and belief in syllogistic reasoning. *Memory & Cognition*, *11*(3), 295–306. doi: 10.3758/BF03196976
- Feather, N. T. (1964). Acceptance and rejection of arguments in relation to attitude strength, critical ability, and intolerance of inconsistency. *The Journal of Abnormal and Social Psychology*, *69*(2), 127. doi: 10.1037/h0046290

- Federico, C. M., & Ekstrom, P. D. (2018). The political self: How identity aligns preferences with epistemic needs. *Psychological Science*, *29*(6), 901–913. doi: 10.1177/0956797617748679
- Federico, C. M., & Malka, A. (2018). The contingent, contextual nature of the relationship between needs for security and certainty and political preferences: Evidence and implications. *Political Psychology*, *39*, 3–48. doi: 10.1111/pops.12477
- Federico, C. M., & Tagar, M. R. (2014). Zeroing in on the Right: Education and the Partisan Expression of Authoritarianism in the United States. *Political Behavior*, *36*(3), 581–603. doi: 10.1007/s11109-013-9250-4
- Frederick, S. (2005). Cognitive reflection and decision making. *Journal of Economic Perspectives*, *19*(4), 25–42. doi: 10.1257/089533005775196732
- Galip, D. (2019, July). Istanbul election: Remaking of Turkey’s new political landscape? *Stiftung Wissenschaft und Politik*. doi:10.18449/2019C31
- Gampa, A., Wojcik, S. P., Motyl, M., Nosek, B. A., & Ditto, P. H. (2019). (Ideo) Logical Reasoning: Ideology Impairs Sound Reasoning. *Social Psychological and Personality Science*, *10*(8), 1075–1083. doi: 10.1177/1948550619829059
- Goodrich, B., Gabry, J., Ali, I., & Brilleman, S. (2020). *rstanarm: Bayesian applied regression modeling via Stan* (version 2.19.3). Available from <https://mc-stan.org/rstanarm>.
- Gorden, R. L. (1953). The Effect of Attitude toward Russia on Logical Reasoning. *The Journal of Social Psychology*, *37*(1), 103–111. doi: 10.1080/00224545.1953.9921874
- Greenberg, J., & Jonas, E. (2003). Psychological motives and political orientation—the left, the right, and the rigid: Comment on Jost et al.(2003). *Psychological Bulletin*. doi: 10.1037/0033-2909.129.3.376
- Güngör, M., Şencan, R. S., & Sarıbay, S. A. (2019). *Intellectual Humility: Scale validation and an investigation of its relation to holistic thinking*. Unpublished manuscript.
- Haberler.com. (2020). Liderler anketinde Fahrettin Koca sürprizi! Cumhurbaşkanı Erdoğan’ı geride bıraktı. Retrieved June 9, 2020, from <https://www.haberler.com/liderler-anketinde-fahrettin-koca-surprizi-13177811-haberi/>

- Haggard, M., Rowatt, W. C., Leman, J. C., Meagher, B., Moore, C., Fergus, T., ... Howard-Snyder, D. (2018). Finding middle ground between intellectual arrogance and intellectual servility: Development and assessment of the limitations-owning intellectual humility scale. *Personality and Individual Differences, 124*, 184–193. doi: 10.1016/j.paid.2017.12.014
- Heit, E., & Rotello, C. M. (2014). Traditional difference-score analyses of reasoning are flawed. *Cognition, 131*(1), 75–91. doi: 10.1016/j.cognition.2013.12.003
- Henle, M., & Michael, M. (1956). The Influence of Attitudes on Syllogistic Reasoning. *The Journal of Social Psychology, 44*(1), 115–127. doi: 10.1080/00224545.1956.9921907
- Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences, 33*(2–3), 61–83. doi: 10.1017/S0140525X0999152X
- Hilscher, M. (2014). *Attenuating belief bias effects in syllogistic reasoning: The role of belief-content conflict* (Unpublished doctoral dissertation). University of Toronto, Canada.
- Hopkin, C. R., Hoyle, R. H., & Toner, K. (2014). Intellectual humility and reactions to opinions about religious beliefs. *Journal of Psychology and Theology, 42*(1), 50–61. doi: 10.1177/009164711404200106
- Hoyle, R. H., Davisson, E. K., Diebels, K. J., & Leary, M. R. (2016). Holding specific views with humility: Conceptualization and measurement of specific intellectual humility. *Personality and Individual Differences, 97*, 165–172. doi: 10.1016/j.paid.2016.03.043
- Janis, I. L., & Frick, F. (1943). The relationship between attitudes toward conclusions and errors in judging logical validity of syllogisms. *Journal of Experimental Psychology, 33*(1), 73–77. doi: 10.1037/h0060675
- John, O. P., Donahue, E. M., & Kentle, R. L. (1991). *The Big Five Inventory—Versions 4a and 54* [Measurement instrument]. Berkeley, CA: University of California, Berkeley, Institute of Personality and Social Research.
- Jost, J. T. (2017). Ideological asymmetries and the essence of political psychology. *Political Psychology, 38*(2), 167–208. doi: 10.1111/pops.12407

- Jost, J. T., Glaser, J., Kruglanski, A. W., & Sulloway, F. J. (2003a). Exceptions that prove the rule—Using a theory of motivated social cognition to account for ideological incongruities and political anomalies: Reply to Greenberg and Jonas (2003). *Psychological Bulletin*. doi: 10.1037/0033-2909.129.3.383
- Jost, J. T., Glaser, J., Kruglanski, A. W., & Sulloway, F. J. (2003b). Political conservatism as motivated social cognition. *Psychological Bulletin*, 129(3), 339. doi: 10.1037/0033-2909.129.3.339
- Kemmelmeier, M. (2007). Political conservatism, rigidity, and dogmatism in American foreign policy officials: The 1966 Mennis data. *The Journal of Psychology*, 141(1), 77–90. doi: 10.3200/JRLP.141.1.77-90
- Khemlani, S., & Johnson-Laird, P. N. (2012). Theories of the syllogism: A meta-analysis. *Psychological Bulletin*, 138(3), 427. doi: 10.1037/a0026841
- Krumrei-Mancuso, E. J. (2018). Intellectual humility's links to religion and spirituality and the role of authoritarianism. *Personality and Individual Differences*, 130, 65–75. doi: 10.1016/j.paid.2018.03.037
- Krumrei-Mancuso, E. J., & Newman, B. (2020). Intellectual humility in the sociopolitical domain. *Self and Identity*, 0(0), 1–28. doi: 10.1080/15298868.2020.1714711
- Lakens, D. (2017). Equivalence tests: A practical primer for t-tests, correlations, and meta-analyses. *Social Psychological and Personality Science*, 1, 1–8. doi: 10.1177/1948550617697177
- Lammers, J., Koch, A., Conway, P., & Brandt, M. J. (2017). The political domain appears simpler to the politically extreme than to political moderates. *Social Psychological and Personality Science*, 8(6), 612–622. doi: 10.1177/1948550616678456
- Leary, M. R., Diebels, K. J., Davisson, E. K., Jongman-Sereno, K. P., Isherwood, J. C., Raimi, K. T., ... Hoyle, R. H. (2017). Cognitive and interpersonal features of intellectual humility. *Personality and Social Psychology Bulletin*, 43(6), 793–813. doi: 10.1177/0146167217697695
- Lefford, A. (1946). The influence of emotional subject matter on logical reasoning. *The Journal of General Psychology*, 34(2), 127–151. doi: 10.1080/00221309.1946.10544530

- Lıcalı, M. (2020, May 7). Halk, CHP’li belediyelerin yardım kampanyasının engellenmesini desteklemedi. *Cumhuriyet*. Retrieved June 9, 2020, from <https://www.cumhuriyet.com.tr/haber/halk-chpli-belediyelerin-yardim-kampanyasinin-engellenmesini-desteklemedi-1737307>
- Lord, C. G., Ross, L., & Lepper, M. R. (1979). Biased assimilation and attitude polarization: The effects of prior theories on subsequently considered evidence. *Journal of Personality and Social Psychology*, *37*(11), 2098. doi: 10.1037/0022-3514.37.11.2098
- Lynn, M. L., & Williams, R. N. (1990). Belief-bias and labor unions: The effect of strong attitudes on reasoning. *Journal of Organizational Behavior*, *11*(5), 335–343. doi: 10.1002/job.4030110502
- Malka, A., & Soto, C. J. (2015). Rigidity of the economic right? Menu-independent and menu-dependent influences of psychological dispositions on political attitudes. *Current Directions in Psychological Science*, *24*(2), 137–142. doi: 10.1177/0963721414556340
- Malka, A., Soto, C. J., Inzlicht, M., & Leles, Y. (2014). Do needs for security and certainty predict cultural and economic conservatism? A cross-national analysis. *Journal of Personality and Social Psychology*, *106*(6), 1031. doi: 10.1037/a0036170
- Morgan, J. J. B., & Morton, J. T. (1944). The Distortion of Syllogistic Reasoning Produced by Personal Convictions. *The Journal of Social Psychology*, *20*(1), 39–59. doi: 10.1080/00224545.1944.9918830
- Nuutinen, M. R., Wendell, D. G., Matland, R. E., & Morrison, R. G. (2015). *Dual process theory and the political belief bias effect*. Poster presented at the Cognitive Neuroscience Society Annual Meeting, San Francisco, CA.
- Osborne, D., & Sibley, C. G. (2015). Within the limits of civic training: Education moderates the relationship between openness and political attitudes. *Political Psychology*, *36*(3), 295–313. doi: 10.1111/pops.12070
- Paulhus, D. L. (1988). Balanced inventory of desirable responding (BIDR). *Acceptance and Commitment Therapy. Measures Package*, *41*, 79586–7.
- Peng, K., & Nisbett, R. E. (1999). Culture, dialectics, and reasoning about contradiction. *American Psychologist*, *54*(9), 741. doi: 10.1037/0003-066X.54.9.741

- Peng, K., Spencer-Rodgers, J., & Nian, Z. (2006). Naïve dialecticism and the Tao of Chinese thought. In *Indigenous and cultural psychology: Understanding people in context* (pp. 247–262). New York, NY: Springer.
- Pennycook, G., Cheyne, J. A., Koehler, D. J., & Fugelsang, J. A. (2013). Belief bias during reasoning among religious believers and skeptics. *Psychonomic Bulletin & Review*, *20*(4), 806–811. doi: 10.3758/s13423-013-0394-3
- Porter, T., & Schumann, K. (2018). Intellectual humility and openness to the opposing view. *Self and Identity*, *17*(2), 139–162. doi: 10.1080/15298868.2017.1361861
- R Core Team. (2018). *R: A language and environment for statistical computing*. Retrieved from <https://www.R-project.org/>
- Redlawsk, D. P. (2002). Hot cognition or cool consideration? Testing the effects of motivated reasoning on political decision making. *The Journal of Politics*, *64*(4), 1021–1044. doi: 10.1111/1468-2508.00161
- Reyna, C. (2017). Scale Creation, Use and Misuse: How Politics Undermines Measurement. In J. Crawford and L. Jussim (Eds.) *Politics of Social Psychology*. Taylor & Francis.
- Sá, W. C., West, R. F., & Stanovich, K. E. (1999). The domain specificity and generality of belief bias: Searching for a generalizable critical thinking skill. *Journal of Educational Psychology*, *91*(3), 497. doi: 10.1037/0022-0663.91.3.497
- Samuelson, P. L., & Church, I. M. (2015). When cognition turns vicious: Heuristics and biases in light of virtue epistemology. *Philosophical Psychology*, *28*(8), 1095–1113. doi: 10.1080/09515089.2014.904197
- Sarıbay, S. A., Şencan, R. S., & Güngör, M. (2018). *Turkish adaptation of the Analysis-Holism Scale*. Unpublished manuscript.
- Saucier, D. A., & Webster, R. J. (2010). Social vigilantism: Measuring individual differences in belief superiority and resistance to persuasion. *Personality and Social Psychology Bulletin*, *36*(1), 19–32. doi: 10.1177/0146167209346170
- Selvi, A. (2020). Koronavirüs sürecinde anketler ne gösteriyor? *Hürriyet*. Retrieved June 9, 2020, from <https://www.hurriyet.com.tr/yazarlar/abdulkadir-selvi/koronavirus-surecinde-anketler-ne-gosteriyor-41521411>

- Simonsohn, U. (2014, March 12). No-way Interactions. Retrieved July 21, 2020, from Data Colada website: <http://datacolada.org/17>
- Simonsohn, U. (2018). Two Lines: A Valid Alternative to the Invalid Testing of U-Shaped Relationships With Quadratic Regressions: *Advances in Methods and Practices in Psychological Science*. doi: 10.1177/2515245918805755
- Sorolla, R. G. (2018, January 24). Powering Your Interaction. Retrieved July 21, 2020, from Approaching Significance website: <https://approachingblog.wordpress.com/2018/01/24/powering-your-interaction-2/>
- Spencer-Rodgers, J., Anderson, E., Ma-Kellams, C., Wang, C., & Peng, K. (2018). What Is Dialectical Thinking? Conceptualization and Measurement. In J. Spencer-Rodgers & K. Peng (Eds.), *The Psychological and Cultural Foundations of East Asian Cognition: Contradiction, Change, and Holism* (pp. 1–34). New York, NY, US: Oxford University Press.
- Stanley, M. L., Sinclair, A. H., & Seli, P. (2020). Intellectual Humility and Perceptions of Political Opponents. *Journal of Personality*, 0(0), 1-21. doi: 10.1111/jopy.12566
- Stanovich, K. E., & West, R. F. (1998). Individual differences in rational thought. *Journal of Experimental Psychology: General*, 127(2), 161. doi: 10.1037/0096-3445.127.2.161
- Tetlock, P. E. (1984). Cognitive style and political belief systems in the British House of Commons. *Journal of Personality and Social Psychology*, 46(2), 365. doi: 10.1037/0022-3514.46.2.365
- Tetlock, P. E. (1989). Structure and function in political belief systems. In A. R. Pratkanis, S. J. Breckler, & A. G. Greenwald (Eds.), *The third Ohio State University Vol. on attitudes and persuasion. Attitude structure and function* (pp. 129–151). Lawrence Erlbaum Associates, Inc.
- Thistlethwaite, D. (1950). Attitude and structure as factors in the distortion of reasoning. *The Journal of Abnormal and Social Psychology*, 45(3), 442–458. doi: 10.1037/h0060661
- Thompson, V. A. (1996). Reasoning from false premises: The role of soundness in making logical deductions. *Canadian Journal of Experimental Psychology/Revue Canadienne de Psychologie Expérimentale*, 50(3), 315. doi: 10.1037/1196-1961.50.3.315

- Thompson, V. A., & Evans, J. S. B. (2012). Belief bias in informal reasoning. *Thinking & Reasoning, 18*(3), 278–310. doi: 10.1080/13546783.2012.670752
- Thomson, K. S., & Oppenheimer, D. M. (2016). Investigating an alternate form of the cognitive reflection test. *Judgment and Decision Making, 11*(1), 99.
- Tolunay, A. (2001). *The relationship between religiosity, dogmatism and moral reasoning* (Unpublished master's thesis). Boğaziçi University, Istanbul, Turkey.
- Toner, K., Leary, M. R., Asher, M. W., & Jongman-Sereno, K. P. (2013). Feeling superior is a bipartisan issue: Extremity (not direction) of political views predicts perceived belief superiority. *Psychological Science, 24*(12), 2454–2462. doi: 10.1177/0956797613494848
- Trippas, D., Kellen, D., Singmann, H., Pennycook, G., Koehler, D. J., Fugelsang, J. A., & Dubé, C. (2018). Characterizing belief bias in syllogistic reasoning: A hierarchical Bayesian meta-analysis of ROC data. *Psychonomic Bulletin & Review, 25*(6), 2141–2174. doi: 10.3758/s13423-018-1460-7
- Trippas, D., Pennycook, G., Verde, M. F., & Handley, S. J. (2015). Better but still biased: Analytic cognitive style and belief bias. *Thinking & Reasoning, 21*(4), 431–445. doi: 10.1080/13546783.2015.1016450
- van Prooijen, J.-W., & Krouwel, A. P. M. (2019). Psychological Features of Extreme Political Ideologies. *Current Directions in Psychological Science, 28*(2), 159–163. doi: 10.1177/0963721418817755
- Webster, D. M., & Kruglanski, A. W. (1994). Individual differences in need for cognitive closure. *Journal of Personality and Social Psychology, 67*(6), 1049. doi: 10.1037/0022-3514.67.6.1049
- Whitcomb, D., Battaly, H., Baehr, J., & Howard-Snyder, D. (2017). Intellectual humility: Owning our limitations. *Philosophy and Phenomenological Research, 94*(3), 509–539. doi: 10.1111/phpr.12228
- Woodworth, R. S., & Sells, S. B. (1935). An atmosphere effect in formal syllogistic reasoning. *Journal of Experimental Psychology, 18*(4), 451. doi: 10.1037/h0060520
- Zmigrod, L. (2020). The role of cognitive rigidity in political ideologies: Theory, evidence, and future directions. *Current Opinion in Behavioral Sciences, 34*, 34–39. doi: 10.1016/j.cobeha.2019.10.016

Zmigrod, L., Rentfrow, P. J., & Robbins, T. W. (2019). Cognitive inflexibility predicts extremist attitudes. *Frontiers in Psychology, 10*, 989. doi: 10.3389/fpsyg.2019.00989

Zmigrod, L., Rentfrow, P. J., & Robbins, T. W. (2020). The partisan mind: Is extreme political partisanship related to cognitive inflexibility? *Journal of Experimental Psychology: General, 149*(3), 407–418. doi: 10.1037/xge0000661

Zmigrod, L., Zmigrod, S., Rentfrow, P. J., & Robbins, T. W. (2019). The psychological roots of intellectual humility: The role of intelligence and cognitive flexibility. *Personality and Individual Differences, 141*, 200–208. doi: 10.1016/j.paid.2019.01.016