Faith in Reason: developing a survey measure of belief in the rationality of others

Tom Stafford[1], Junyan Zhu[2], & Katharine Dommett[2]

[1] Department of Psychology, University of Sheffield, UK
[2] Department of Politics and International Relations, University of Sheffield, UK

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What we believe about other people matters. It is not enough that others *are* trustworthy, reasonable or well intentioned. Successful coordination, as well as individual wellbeing, benefit when we also *perceive* others as trustworthy, reasonable or well intentioned. While standard measures of trust and benevolence exist, there is no standard measure of the generalised belief in the rationality or reasonableness of other people. Here, we present the development and testing of a scale to directly measure this attitude. Using a representative sample of 1869 UK adults, we test dimensionality and consistency of the scale items. We show that the refined, six-item, scale is associated with, but not entirely determined by, generalised trust in other people. Our "Faith in Reason" scale shows large individual differences, but the average tendency is slightly on the side of endorsing, rather than rejecting, sentiments such as "The typical person is often irrational".

Introduction

Rationality

> *All our dignity consists then in thought. By it we must elevate ourselves, and not by space and time which we cannot fill. Let us endeavour then to think well; this is the principle of morality.*
> Pascal (1669/1910)

The nature of human reason is a perennial topic. Human rationality has often been praised ("Man is but a reed, the most feeble thing in nature, but he is a thinking reed," Pascal, 1669/1910), but so have its failures condemned been by many different thinkers.

An influential account of human reasoning is provided by the heuristics and biases programme (Kahneman, Slovic, & Tversky, 1982), which uses the ideal of economic rationality as a standard to define actual human reasoning against. From this perspective human reasoning appears riddled with biases, but much of this effect is due to the adoption of the standards of utility theory, formal logic and precise statistical reasoning against which to define error. Critics have questions the appropriateness of these standards (e.g. Gigerenzer & Gaissmaier, 2011). The logic of controlled experiments allows researchers to isolate and emphasise quirks in human reasoning, while backgrounding reason-responsiveness (Stafford, 2014). Accordingly, the psychology literature may overemphasise the role of error, bias and motivated reasoning (Stafford, 2020). The debate has been so heated in the cognitive sciences that 'Rationality Wars' (Samuels, Stich, & Bishop, 2002) have been declared over the definition of rationality that might reasonably used as a standard against which to judge human reasoning.

Mercier and Sperber's (2011) Argumentative Theory of Reason provides an interactionist, rather than individualist account of human reasoning, which emphasises the social context in which human reasoning evolved. This account sug-

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Correspondence concerning this article should be addressed to Tom Stafford, Department of Psychology, University of Sheffield, Sheffield, UK. E-mail: t.stafford@sheffield.ac.uk

gests, among other things, the importance of dialogue based argumentation in changing beliefs (Brand & Stafford, 2022; Karadzhov, Stafford, & Vlachos, 2022) and the validity of incorporating social factors like the status, trustworthiness or expertise of a source of information in the reasoning process (Eiser, Stafford, Henneberry, & Catney, 2009).

Criteria of reason

So rationality is not a unitary concept, nor one around which there is consensus on the definition of, despite the way it is often evoked in discussion (and particularly in discussion of its negation e.g. "they are being irrational"). That said, core features of rationality have been proposed, and it may be possible to test these as aspects of the 'folk theory' of rationality that exists in the common understanding.

Two primary criteria are '**correspondence**', where beliefs are aligned with reality (in the form of the state of the world or their behaviour), and '**coherence**', where beliefs are aligned with each other (i.e. consistent, but see Sommer, Musolino, and Hemmer (2022)). For more on corresponence and coherance see Dawson and Gregory (2009).

Another criteria of rationalty which can be identified is **insight** into your own beliefs and how they guide behaviour. The rhetorical power of certain celebrated demonstrations of irrationality (e.g. Nisbett & Wilson, 1977) relies on the surprise that people can act, supposedly, unaware of the causes of their behaviour (but see Stafford, 2020).

Finally, susceptibility to **influence** is a key aspect of rationality (Mercier, 2020). This can be positively construed - to be rational is to be responsive to reasons, persuadable by evidence and so on. And it can be negative construed - to be irrational is to be gullible, or stubborn in the face of good reasons to change your mind.

So core features of rationality include coherence, correspondence, susceptibility to influence and insight into causes of ones actions. The extent to which these features form a coherent whole in the minds of the general public, and can meaningfully be asked about questions about is a primary question of this paper.

Consequence of a lack of faith in reason

Investigating folk conceptions of rationality is not just interesting in its own right, individual's beliefs about the rationality of others may be important for a number of other core beliefs and behaviours.

Second order effects of disinformation. The generalised belief that others are well informed and reasonable is foundational to democracy. Recent concerns around misinformation may have second order effects, undermining democracy not by generating a misinformed populace, but by generating a populace that believes others are misunformed or unreasonable (Karpf, 2019). Alarmism around misinformation may potentially lower trust in institutions (Hoes, Clemm von Hohenberg, Gessler, Wojcieszak, & Qian, 2022), increase skepticism about democracy (Jungherr & Rauchfleisch, 2022; Nisbet, Mortenson, & Li, 2021), or foster calls of tighter media regulation (Lee, 2021). Altay and Acerbi (2023) have shown that the threat of misinformation is directly related to the perceptions of others' gullibility.

Third person effect. There is an established literature of the perception of media influence on others (Perloff, 2002; Sun, Pan, & Shen, 2008). The 'third person effect', proposed by Davison (1983), is the phenomenon whereby many people believe others are more susceptible to influence than themselves. The third person effect was proposed as a root cause of censorship instincts and this has been confirmed by subsequent empricial investigations (Feng & Guo, 2012; Olshansky & Landrum, 2020).

Two caveats around the third person effect. Lyons (2022) has recently argued that - for many people - a third person effect of greater media influence on others rather than the self will be an accurate perception. Chung and Moon (2016) have argued that the driving factor in many so-called third person effects is the perception of others (as highly influenced), rather than the discrepancy with first person perception per se.

Generalised trust & value of democracy

Generalised trust is the belief that, 'most people can be trusted' (Brehm & Rahn, 1997; Paxton, 1999). It is reflected in standard items in long running time series surveys such as the World Values Survey (Inglehart & Team, 2023) an the General Social Survey (General Social Survey Team, 2023). Generalised trust is an aspect of social capital, broadly conceived (Putnam, 2000) and as such as an important aspect of wellbeing and the health of society (Cohn, Maréchal, Tannenbaum, & Zünd, 2019). Given the recognised importance of generalised trust, it is nature to ask how other beliefs feed into this belief. Why do we trust others? Do we trust them intellectually as well as morally? Do we think other people are able to work things out for themselves, to display good judgement? Do we trust the typical person to avoid being manipulated, to respond to arguments, to reason their way to good enough decisions? In short, is generalised trust informed by beliefs about the rationality or reasonableness of others?

Similarly, attitudes to demoracy may mutually inform beliefs about the reasonableness of one's fellow citizens. One standardised measure of attitude to democracy is the item from

the World Values Survey (Inglehart & Team, 2023) which asks 'How important is it for you to live in a country that is governed democratically?'.

Lack of existing measures

To our knowledge, no existing scale directly measures belief in reasoning. There are scales which measure related concepts, or concepts which are plausible antecedents or consequences of belief in the reasonableness of our fellow citizens. In addition to the measures of generalised trust discussed above, there are also measures of conspiracy beliefs or mentality (see Swami et al., 2017 for a brief review) including those which explicitly try to distinguish conspiracist from rational skepticism (Stojanov, Bering, & Halberstadt, 2020; Stojanov & Halberstadt, 2019). These do not direct assess rationality, and again could be viewed a more alike to measuring a consequence of rationality or a lack of it (i.e. due to manipulation or credulity).

Some researchers have looked at what they call 'cynical beliefs about human nature' (e.g. Stavrova & Ehlebracht, 2016), but these, again, do not touch on reason or rationality as a cause of cynicism. Instead, scale items are similar to generalised trust/distrust measures.

Other studies have looked at beliefs about human nature (e.g. Furnham, Johnson, & Rawles, 1985). These have questions which focus on the role of biology, genetics and/or heredity on psychological traits. For example, asking if participants believe personality is entirely caused by a person's genetics. Again, these scales do not directly assess beliefs about human reason, although they do assess beliefs which may plausibly affect beliefs about human reason.

Summary

In summary, generalised belief in the rationality or reasonableness of others is interesting in its own right, in relation to longstanding debates in the cognitive sciences about the definition of rationality and due to plausible relation to other atittudes recognised of importance, such as generalised trust. To our knowledge, no scale exists which directly measures this generalised belief. To develop, refine and explore such a scale is the purpose of the current study.

Method

Sample

The questions were asked as part of a larger survey experiment (Zhu, Dommett, & Stafford, submitted), in which participants were asked to view adverts which appeared on Facebook during the 2019 UK general election. Participants were recruited via the online platform Prolific. In terms of age, gender, regional dispersion and political affiliations participants reflected a representative sample of UK adults. Data was collected on 2022-08-20. Full details are give in Zhu et al. (submitted).

Item development

In order to develop the scale items, we developed eight items, informed by the debates in cognitive science around the nature of rationality (see introduction). Half of these were positively framed, to reflect endorsement of human's tendency towards rationality and reasonableness. Half were negatively framed, to reflect endorsement of a tendency towards irrationality and unreasonableness. Items, their framing (positive/negative) and the aspect of rationality they were designed to capture are shown in Table 1.

In all analyses negatively framed items were reverse coded, so that numerically higher scores always reflect greater endorsement of human rationality, across all items. An attention check item was included in the scale (also shown in Table 1).

Other items

Other items we report from the original survey are a measure of generalised trust ('Generally speaking, would you say that most people can be trusted?'), support for democracy ('How important is it for you to live in a country that is governed democratically?') and a measure of the Third Person Effect in the context of political advertising. This was calculated as the average response to six linked items about the influence of election advertising on the typical voter, with wording of the form specifically "Thinking about the impact of political parties' election messages on the typical voter, to what extent do you agree or disagree that it helps to: - Raise their awareness of political issues; Raise their awareness of political candidates or parties; Prompt them to share messages related to the election; Prompt them to vote/ register to vote; Persuade them to change who you are planning to vote for; Influence how they feel about political opponents'. We also report demographic questions (age, sex, education)

Preregistration

Our analysis is supported by formal preregistration of hypothesis and data analyses practices (OSF preregistration link: https://osf.io/y9kjg/?view_only=609cd46aab534e4c866c16b3ef29c510). Note that the bulk of this preregistration concerns the analyses reported in Zhu et al. (submitted).

Table 1
Scale item wording

Item	Framing	Aspect	Wording
R1	negative	general	The typical person is often irrational
R2	negative	corresponence	People are often misinformed on important issues
R3	negative	influence	People are too easily manipulated
R4	negative	insight	People often act for reasons they don't understand or endorse
R5	positive	influence	The average person can be persuaded to change their mind if given good reasons
R6	positive	correspondence	Most people hold accurate views about the world
A	NA	ATTN CHECK	For this question please click the middle option, 'neutral', to show you are paying attention
R7	positive	coherance	An individual's beliefs about the world are generally coherent
R8	positive	coherance	People's behaviour is generally consistent with their beliefs

Note. Response was on a 7 point Likert scale from (1 = "Strongly Disagree", 7 = "Strongly Agree"). Items 1,2,3 and 4 reverse coded so that for all items higher scores represented stronger faith in reason.

Preregistration supports the accurate identification of confirmatory versus exploratory analyses. The nature of scale development is necessarily exploratory, but the preregistration allows readers confirm what was intended and expected before data was collected.

Reproducibility

Data availability: The analysis code and anonymised response data which supports all results are openly available https://github.com/tomstafford/faithinreason

This repository contains the files used to generate this report, which is in the form of a 'reproducible manuscript', a document which generates the analysis it reports, and so combines sharing, documenting and reporting an analysis in a single set of project files (Allaire et al., 2020 ; Aust & Barth, 2020).

Results

Initial characterisations

Our data consist of 1881 participants who completed our online survey. 6 failed an attention check and were removed, leaving a final sample of 1875. Inital inspection suggested that a range of responses were obtain. For example, Figure **??** shows that the first item of the scale received the full range of responses from "Strongly disagree" to "Strongly agree".

Scale development: assessing dimensionality & item selection

Cronbach's alpha for all eight items is 0.72, which is often taken to reflect good-to-acceptable scale consistency. A leave-one-out procedure suggests that Cronbach's Alpha decreases for omission of all items except item 5, without which the Cronbach's Alpha of the remaining 7 items is 0.78. The caveat to this is that, properly, Cronbach's Alpha should be measured *after* confirmation of unidimensionality.

Table 2
Summary statistics for each item

Item	mean	median	min	max	SD
R1	4.15	4.00	1.00	7.00	1.34
R2	2.54	3.00	1.00	7.00	1.11
R3	2.55	3.00	1.00	7.00	1.07
R4	2.88	3.00	1.00	7.00	1.14
R5	5.05	5.00	1.00	7.00	1.16
R6	3.54	4.00	1.00	7.00	1.23
R7	4.09	4.00	1.00	7.00	1.12
R8	4.62	5.00	1.00	7.00	1.19

Note. Items 1,2,3 and 4 are reverse coded, so lower scores imply stronger endorsement of the question framing (but lower faith in reason)

A conventional method for assessing dimensionality is factor analysis. Figure 1 shows the scree plot for the eight items. The result is ambiguous, since there is one main factor but a second factor which falls just below the traditional cut-off an eigenvalue of 1.

Mokken Analysis. To understand the dimensional structure of our items, we turn to Mokken Analysis, part of the item response theory framework (Sijtsma & Ark, 2017; Van Schuur, 2011). Very loosely, Mokken analysis tests scale items against a model which assumes that items are monotonically ordered on a single dimension, with some afford-

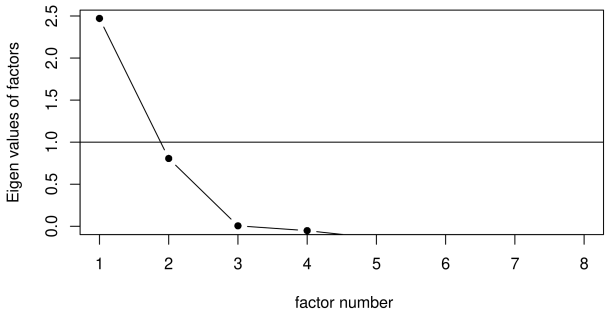

Figure 1. Factor analysis for 8 items of the Faith in Reason scale

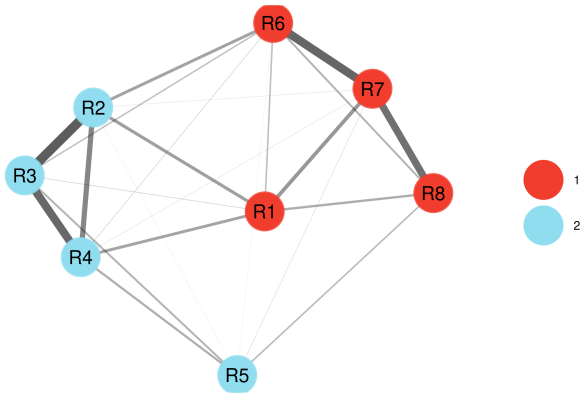

Figure 2. Exploratory Graph Analysis (EGA) of all items.

ing higher responses and others affording lower responses, with this item property consistent across participants, who also vary in their propensity to give high or low responses. Violations of this model indicate that items do fit on a single dimension and so should not be combined in the same scale.

In Mokken Analysis, the items with low Loevinger's coefficient of homogeneity (*Hi*), a criterion for scalability, are dropped. A rule of thumb is that *Hi* must be higher than 0.3 to be kept in the scale. Applying this criterion suggests items 1 to 4, 6 and 7 should be kept, and 5 and 8 dropped. This yields a scale of six items, with an overall H coefficient of 0.410, indicating a medium-strong scalability.

However, following Sijtsma and Ark (2017) it is possible to explore sensitivity of this result to different thresholds. Accordingly, with a threshold of 0.35 Mokken scale analysis supports the grouping of the items into two scales (One, items 1,2,3,4 and Two, items 6,7,8, with item 5 fitting in neither scale). This is consonent with the factor analysis which identified a second factor of below threshold salience.

Exploratory graph analysis. Exploratory Graph Analysis [EGA; Golino, Shi, et al. (2020);Golino, Christensen, and Moulder (2020)] can also be applied to understand dimensional structure in our scale items. EGA allows a visualisation of the network formed by scale items, with items which correlate clustered together. EGA also identifies undelrying 'communities' of items.

Figure 2 shows an EGA for the 8 potential items. Like the use of leave-of-out Cronbach's alpha and the Mokken scale analysis, this suggests Item 5 is distant from the other items. The EGA identifies two communities, grouping Item 1 with Items 6, 7 and 8 and Items 2,3,4 and 5.

The Faith in Reason scale

Taking these analyses into consideration, we opt to construct a single scale, dropping items 5 and 8. We do this with some hesitation, given that the results from all methods of dimensionality analysis (conventional factor analysis, Mokken scale analysis and EGA) all suggest that a two-dimensional structure may exist (and/or evidence for two dimensional structure is only just sub threshold, depending on how you wish to position the statement ontologically).

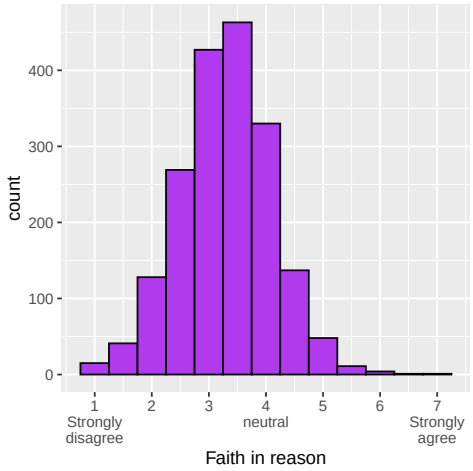

Figure 3. Histogram of mean of responses to all rationality items

Averaging across items 1,2,3,4,6 and 7 gives us our Faith in Reason scale. The average score across these six items was 3.29, a summary statistic which suggests that the typical view of other people weighted to being slightly less, rather than slightly more, reasonable. The distribution is shown in Figure 3.

Relation to other variables

We now turn to ask how scores on this scale are associated with our other measures. Figure 4 shows there is no strong association with level of formal education.

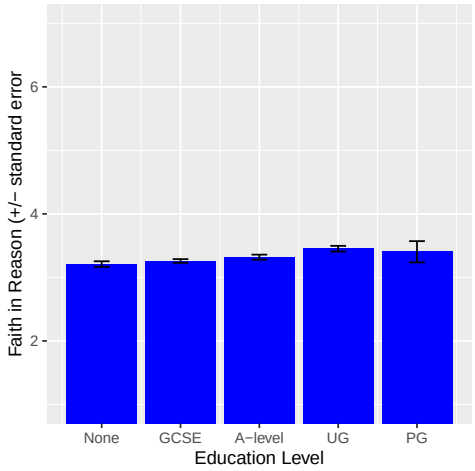

Figure 4. Education level and Faith in Reason

Figure 5 shows no strong relation between need for democracy and faith in reason.

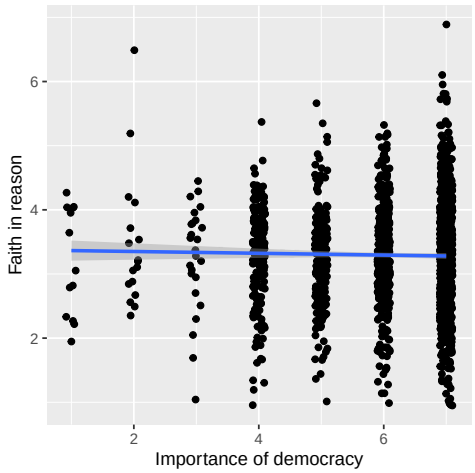

Figure 5. Scatterplot of Need for Democracy vs Faith in Reason. Linear fit shown. Note 0.1 jitter applied to x-axes values to allow visualisation of point density.

Figure 6 shows some association between generalised trust and faith in reason.

There is a convincing lack of association between the Third Person Effect and Faith in Reason (Figure 7.

To test these associations in conjunction we first review the correlations (Table @ref{tab:regressions}) and then construct a simple linear regression, which confirms that although all faith in reason can be predicted, to a modest

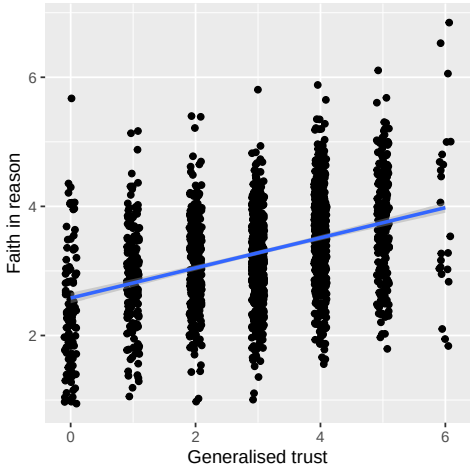

Figure 6. Scatterplot of Generalised Trust against Faith in Reason. Linear fit shown. Note 0.1 jitter applied to x-axes values to allow visualisation of point density

amount, from these other variables (R^2 = 0.18‘). Education level and Need for Democracy predict, albeit with a small coefficient, faith in reason. Generalised trust has a modest association. The Third Person Effect has no association.

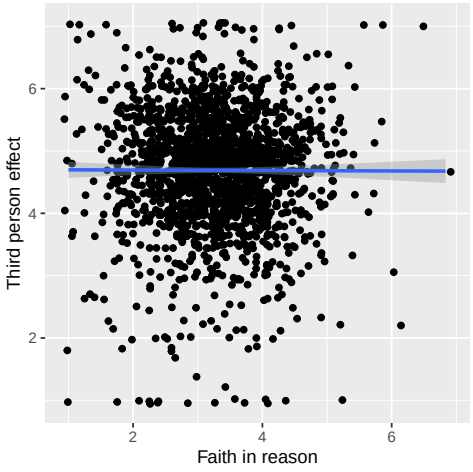

Figure 7. Scatterplot of Faith in Reason scores against Third Person Effect score. Note 0.1 jitter applied to x-axes values to allow visualisation of point density

Discussion

This paper arose out of a note published online (Stafford, 2022) which we cite for completeness and by way of allowing it to be checked that the intention of the study has been consistent between conceptualisation and publication.

scale development

Issues with scale development and validity testing are usefully reviewed in Flake and Fried (2020); Clark and Watson (2019); Boateng, Neilands, Frongillo, Melgar-Quiñonez, and Young (2018). With the current report we do not pretend to have completed scale development and testing. We merely report the beginnings of the development of a scale for measuring belief in the rationality or reasonableness of the typical citizen.

Wither misinformation

Deflationary accounts of misinformation (Mercier, 2020; Nyhan, 2020)

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