Just Wrong? Or just WEIRD? Investigating the prevalence of Moral Dumbfounding in non-Western samples

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Author note

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Abstract

Moral dumbfounding is the phenomenon that is observed when people defend a moral judgement even though they cannot provide a reason for this judgement. Dumbfounded responding may include admitting to not having reasons, or the use of unsupported declarations (e.g., “It’s just wrong”) as justification for a judgement. Published evidence for dumbfounding has drawn exclusively on samples of WEIRD backgrounds (Western, educated, industrialised, rich, and democratic), and it remains unclear whether the phenomenon is generalilsable to other populations. In three studies we apply a standardised moral dumbfounding task, and show evidence for moral dumbfounding in a Chinese sample (Study 1), an Indian sample (Study 2), and a mixed sample primarily from North Africa and the Middle East (MENA region, Study 3).

Keywords: Moral Dumbfounding, WEIRD, Moral Judgement, China, India, MENA

Word count: 8,265

Just Wrong? Or just WEIRD? Investigating the prevalence of Moral Dumbfounding in non-Western samples

The phenomenon of moral dumbfounding occurs when people defend a moral judgement even though they cannot provide a reason in support of this judgement (Haidt, Björklund, & Murphy, 2000; McHugh et al., 2017). It typically manifests as an explicit admission of not having reasons, or the use of unsupported declarations (e.g., "It's just wrong") as a justification for a judgement. For almost two decades, evidence for moral dumbfounding was limited to a single study, unpublished in peer reviewed form, and with a total sample of $N = 30$ (Haidt et al., 2000). This meant that, while the phenomenon was widely discussed in the literature, its existence was not well supported by empirical evidence. Recent work (McHugh et al., 2017; 2020), has provided additional evidence for the existence moral dumbfounding, demonstrating that it can be reliably elicited (though perhaps it not as widespread as previously assumed, see Royzman, Kim, & Leeman, 2015; McHugh et al., 2020).

Despite this recent work, it remains unclear how universal or generalizable the phenomenon is. Current evidence is limited to research involving exclusively WEIRD (Western, educated, industrialised, rich, and democratic, see Henrich, Heine, & Norenzayan, 2010) samples. The purpose of the current research is to extend research on moral dumbfounding beyond these exclusively WEIRD contexts. Specifically we test for the presence of moral dumbfounding in a Chinese sample (Study 1), in an Indian sample (Study 2), and in a mixed sample from the MENA (Middle East, North Africa) region (Study 3).

Evidence for Moral Dumbfounding

The earliest documented evidence for dumbfounded responding on moral issues comes from a study by Haidt, Koller, and Dias (1993). In this study participants were asked to judge a range of moral scenarios. In addition, participants were asked to justify their judgements. Some

scenarios were potentially offensive but ostensibly harmless (e.g., a family eating their family dog after it was killed by a car; cutting up and using the national flag to clean a bathroom). Haidt et al. (1993) found that some participants struggled to provide justifications for their judgements, and in some cases, resorted to providing unsupported declarations as justification, e.g., "Because it's wrong to eat your dog" (Haidt et al., 1993, p. 632).

In a later study this type of responding was investigated specifically, and the term *moral dumbfounding* was coined (Haidt et al., 2000). In a series of interviews, Haidt et al. (2000) presented participants with moral scenarios depicting taboo behaviours that did not result in any harm. These scenarios (referred to as *intuition* scenarios, e.g., consensual sibling incest using contraception) were designed to appear intuitively "wrong" but the absence of any resultant harm meant that providing a reason for judging the behaviour as wrong was difficult for participants. Responses to these *intuition* scenarios were contrasted against responses to a traditional *reasoning* scenario (e.g. the classic *Heinz* dilemma, in which Heinz could not afford drugs priced at 10 times the cost price, and steals drugs to save his wife's life). Participants were able to justify their judgements of the *reasoning* scenario, however, for the *intuition* scenarios participants struggled to provide reasons for their judgements, presenting as morally dumbfounded.

While Haidt et al. (2000) appeared to provide evidence for moral dumbfounding, this study did not provide standardised methods for systematically eliciting moral dumbfounding. More crucially, this work did not identify a formal measure of dumbfounded responding. Later work by McHugh et al. (2017) addressed both of these limitations. Replicating and extending the original work by Haidt et al. (2000), McHugh et al. (2017) identified two measurable responses that were indicative of moral dumbfounding: admissions of not having reasons, and the use of unsupported declarations as justification for a judgement. Furthermore, McHugh et al. (2017) developed a computer-based task that reliably elicited these responses, thus providing both

additional evidence for moral dumbfounding, and the means to study it more systematically, and on a larger scale.

Competing Interpretations of Moral Dumbfounding

The dominant interpretation of moral dumbfounding presents it as evidence for the intuitive nature of moral judgements, over more rationalist perspectives (see Haidt, 2001). According to this view, moral judgements are based on intuitions rather than on principles or reasons. Recent theorists (e.g., Royzman et al., 2015) have challenged this interpretation, arguing that moral judgements, even in the dumbfounding paradigm, are based on reasons or principles. Some of these challenges are theoretical (e.g., Sneddon, 2007; Dwyer, 2009; Guglielmo, 2018; Jacobson, 2012; Wielenberg, 2014), while others include empirical work testing assumptions relevant to dumbfounding (e.g., Gray, Schein, & Ward, 2014; Gray & Keeney, 2015), or testing the dumbfounding paradigm directly (e.g., Stanley, Yin, & Sinnott-Armstrong, 2019; Royzman et al., 2015). A common theme permeating these challenges is that moral dumbfounding is not a *real* phenomenon, and that the responding observed emerges as a consequence of the experimental paradigm.

The strongest challenges to the dumbfounding paradigm, appear to empirically demonstrate that people's judgements in the dumbfounding paradigm may be attributed to specific reasons, e.g., either harm-based (believing an action may cause harm) reasons or norm-based (breaking a moral norm is inherently wrong) reasons (see, Royzman et al., 2015; Stanley et al., 2019). However, addressing key methodological limitations in Royzman et al. (2015), McHugh et al. (2020) demonstrated critical inconsistencies in people's responding that undermine these reason based explanations. Participants do not articulate or consistently apply harm-based reasons/principles, nor do they articulate norm-based reasons/principles with sufficient consistency to provide evidence that these reasons are guiding their judgements in the

dumbfounding paradigm (see McHugh et al., 2020). These findings provide additional evidence that moral dumbfounding is indeed a real phenomenon, though perhaps it is not as widespread as earlier reports suggest.

Moral Dumbfounding and Moral Universals

It is well established that moral judgement, moral development, and moral values can vary across cultures and across countries (Haidt et al., 1993; Vasquez, Keltner, Ebenbach, & Banaszynski, 2001; Vasudev & Hummel, 1987). There have been some attempts to develop taxonomies of moral values or systems that can be applied cross culturally or across different countries (e.g., Haidt & Joseph, 2008; Shweder, Much, Mahapatra, & Park, 1997). However, the evidence for the universality of these approaches is inconsistent, leading some theorists to conclude that there are no moral universals (e.g., Davis et al., 2015; Doris & Plakias, 2008; Machery & Mallon, 2010; Prinz, 2008a, 2008b).

At present the evidence for moral dumbfounding is based exclusively on studies involving participants from WEIRD (Henrich et al., 2010) samples. This presents a key limitation of our understanding of the phenomenon, such that it is not clear whether the phenomenon exists in other contexts. Despite the limited generalizability of moral dumbfounding, the existence of the phenomenon has informed inferences about the nature of the cognitive processes that underlie moral judgement (e.g., Haidt, 2001). The generalizability of these inferences would be undermined significantly if moral dumbfounding is unique to specific samples. The current studies aim to address this limitation and extend the study of moral dumbfounding to participants from non-Western countries.

Individual and Cultural Differences

Given that this is the first study of moral dumbfounding in a non-Western setting, we additionally investigated the potential influence of culturally relevant individual differences on

moral dumbfounding. A measure that is widely regarded as one of the most prominent dimensions that varies with culture is individualism/collectivism (Renzhi, Shuqiao, Abela, Leibovitch, & Mingfan, 2013), therefore we included the individualism-collectivism scale (ICS: Triandis & Gelfand, 2011; Li & Aksoy, 2007; Renzhi et al., 2013) for exploratory purposes. This scale includes four dimensions: collectivism, individualism, horizontal, vertical. Collectivism is characterized by common goals, interpersonal relationships, social dependencies and connections. Individualism emphasizes individual goals and independence. Horizontal refers to egalitarianism, while vertical emphasizes authority, principles, and hierarchy (Triandis, & Gelfand, 2011). Regarding the specific combinations of these dimensions, vertical collectivism (VC) maintains the authoritative structure within the organization, supporting self-sacrifice and competition outside the organization. In addition to treating the self as part of the organization, horizontal collectivism (HC) also emphasizes the equality of members within the group. Vertical individualism (VI) means the increase of achievement based on individualism, with emphasis on independence and placing the self on any interpersonal relationship. Horizontal individualism (HI) refers to the addition of universal values based on individualism, and independence is to maintain a certain meaning or freedom within a principle (Triandis, & Gelfand, 2011).

The Current Research

In response to the WEIRD-centric nature of research on moral dumbfounding, we present three studies, extending research on moral dumbfounding to non-Western samples. In Study 1 we assess whether or not moral dumbfounding can be elicited in a Chinese sample. In Study 2 we investigate whether or not moral dumbfounding can be found in an Indian sample. In Study 3 we test for moral dumbfounding in a sample primarily from MENA region.

Study 1 - Chinese Sample

The primary aim of Study 1 was to investigate if, and how, moral dumbfounding is elicited in a Chinese sample. Furthermore, we measure individual differences in individualism / collectivism and test for a possible relationship between these dimensions and dumbfounded responding.

Method

Participants and design. Study 1 was a frequency based design, and an attempted replication of McHugh et al. (2017). The aim of Study 1 was to identify if dumbfounded responding could be evoked in a Chinese context. Results are primarily descriptive. We have included exploratory analyses investigating the possible influence of individualism/collectivism (Triandis, & Gelfand, 2011) on responding.

A total of 165 individuals participated. Participants were undergraduate and postgraduate students at Luoyang Normal University (China). All participants were Chinese citizens. One part of the sample, including 42 participants (34 female, 8 male, 0 other; M_{age} = 21.43, min = 18, max = 27, *SD* = 1.74), completed four scenarios, described in the next section. Another part of the sample, including 123 participants (75 female, 48 male, 0 other; M_{age} = 22.06, min = 18, max = 45, *SD* = 3.76) completed only the *Cannibal* scenario (for clarity these studies are reported separately as Study 1a and Study 1b). Participation was voluntary and participants were not reimbursed for their participation.

Procedure and materials. Data were collected through the Chinese language online survey software Wenjuanxing ("Wenjuanxing," 2006). Participants were provided with a link to the online survey. The first page of the survey was an information sheet. If participants chose to continue, they proceeded to the second page, the consent form. Participants could only proceed to

the remainder of the survey if they provided consent. After that, participants were presented with some basic demographic questions.

The procedure and materials for the moral dumbfounding task were taken directly from McHugh et al. (2017). These were translated into Chinese by a member of the research team whose native language was Chinese. Back translation methodology was used to ensure that the original meaning of the content was not compromised and that the scales were culturally adaptive (Brislin, 1970). Four moral judgement scenarios were used, two "intuition" scenarios: *Incest*, *Cannibal*, and two "reasoning" scenarios *Trolley*, *Heinz* (taken from McHugh et al., 2017, see Appendix A).

Moral dumbfounding task. The basic procedure for moral dumbfounding tasks is as follows. Participants are presented with a scenario to read. They are then asked to rate, on a 7-point Likert scale (1 = *Morally wrong*; 4 = *Neutral*; 7 = *Morally right*), how right or wrong they regarded the behaviour described in the scenario. Following this participants are asked to rate their confidence in their judgement (again on a 7-point Likert scale, 1 = *Extremely doubtful*; 4 = *Neutral*; 7 = *Extremely Confident*). Participants are then presented with a series of counterarguments, which refuted commonly used justifications for rating the behaviours as "wrong" (see Appendix B). After each counter-argument, participants are asked "Do you (still) think it is wrong?", with a binary "yes/no" response option; and then they are asked "Do you have a reason for your judgement?", with three possible response option "Yes, I have a reason", "No I have no reason", and "Unsure". This sequence was repeated for each of the three counter-arguments.

Dumbfounding is measured using the "critical slide" which contains a statement defending the behaviour, and a question asking how the behaviour could be wrong (see Appendix C). There are three possible answer options: (a) "There is nothing wrong"; (b) an admission of not having

reasons ("It's wrong but I can't think of a reason"); and finally a judgement with accompanying justification (c) "It's wrong and I can provide a valid reason". The selecting of option (b), the admission of not having reasons, is taken to be a dumbfounded response. Participants who selected (c) were promoted to type a reason on the next page. The order of these response options was randomised.

Following the critical slide, participants rated the behaviour again, and completed the post-discussion questionnaire devised by Haidt et al. (2000). They were required to rate on a 7-point Likert scale how sure they were about their judgement; how much they changed their mind; how confused and how irritated they were; to what extent their judgement was based on reason, and to what extent on "gut" feeling (see Appendix D). This process is repeated in full for each moral scenario. The order of presentation of the moral scenarios was randomised.

Coding reasons. While there is a strong theoretical and empirical case for coding the reasons provided for unsupported declarations or tautological responses, as dumbfounded responses (see McHugh et al., 2017), this approach has been challenged by claims that these responses constitute the expression of a normative position (e.g., Royzman et al., 2015). In response to this challenge, we adopt an "admission of not having reasons" as the only measure of moral dumbfounding in these studies. While this measure provides a more conservative estimate of the prevalence of moral dumbfounding, it provides a considerably less ambiguous estimate.

Individualism-collectivism scale. Following the dumbfounding task, participants completed the individualism-collectivism scale (Renzhi et al., 2013, see Appendix E). This sixteen-item scale includes four sub-scales: Vertical Collectivism (VC), Horizontal Collectivism (HC), Vertical Individualism (VI) and Horizontal Individualism (HI). The responses were recorded on a 9-point Likert scale ranging from 1 = *strongly disagree*, to 9 = *strongly agree*. The reliabilities for the four subscales are as follows, Study 1a: VI, $\alpha = .59$; VC, $\alpha = .53$; HC, $\alpha = .42$;

HI, α = .81; Study 1b: VI, α = .53; VC, α = .50; HC, α = .55; HI, α = .67. The entire study lasted approximately twenty minutes.

Results and Discussion

Judgements of the scenarios. The mean initial ratings for each scenario are as follows: M_{Heinz} = 4.76, SD_{Heinz} = 2.07; $M_{Cannibal}$ = 1.52, $SD_{Cannibal}$ = 1.13; M_{Incest} = 2.88, SD_{Incest} = 2.23; $M_{Trolley}$ = 3.29, $SD_{Trolley}$ = 1.95. The mean revised ratings are as follows: M_{Heinz} = 4.74, SD_{Heinz} = 2.04; $M_{Cannibal}$ = 1.60, $SD_{Cannibal}$ = 1.08; M_{Incest} = 2.90, SD_{Incest} = 2.13; $M_{Trolley}$ = 3.36, $SD_{Trolley}$ = 2.03. The proportion of wrong, neutral, and ok, judgements are displayed in Table 1.

Table 1:

Valence of initial and revised judgements for each scenario for each study

		Heinz		Trolley		Incest/Promise		Cannibal/Dog	
		N	percent	N	percent	N	percent	N	percent
Study 1a	Initial: Wrong	9	21.43%	17	40.48%	25	59.52%	37	88.1%
	Initial: Neutral	13	30.95%	19	45.24%	8	19.05%	4	9.52%
	Initial: ok	20	47.62%	6	14.29%	9	21.43%	1	2.38%
	Revised: Wrong	10	23.81%	19	45.24%	23	54.76%	37	88.1%
	Revised: Neutral	12	28.57%	14	33.33%	10	23.81%	5	11.9%
	Revised: ok	20	47.62%	9	21.43%	9	21.43%	0	0%
Study 1b	Initial: Wrong	-	-	-	-	-	-	84	68.29%
	Initial: Neutral	-	-	-	-	-	-	21	17.07%
	Initial: OK	-	-	-	-	-	-	18	14.63%
	Revised: Wrong	-	-	-	-	-	-	80	65.04%
	Revised: Neutral	-	-	-	-	-	-	28	22.76%
	Revised: OK	-	-	-	-	-	-	15	12.2%
Study 2	Initial: Wrong	130	71.82%	125	69.06%	115	63.54%	144	79.56%
	Initial: Neutral	16	8.84%	18	9.94%	44	24.31%	27	14.92%
	Initial: ok	35	19.34%	38	20.99%	22	12.15%	10	5.52%
	Revised: Wrong	138	76.24%	123	67.96%	109	60.22%	145	80.11%
	Revised: Neutral	12	6.63%	22	12.15%	37	20.44%	24	13.26%
	Revised: ok	31	17.13%	36	19.89%	35	19.34%	12	6.63%
Study 3	Initial: Wrong	147	58.1%	142	56.13%	75	29.64%	162	64.03%
	Initial: Neutral	33	13.04%	38	15.02%	93	36.76%	30	11.86%
	Initial: ok	35	13.83%	33	13.04%	60	23.72%	23	9.09%
	Revised: Wrong	139	54.94%	130	51.38%	47	18.58%	158	62.45%
	Revised: Neutral	35	13.83%	48	18.97%	91	35.97%	29	11.46%
	Revised: ok	36	14.23%	32	12.65%	85	33.6%	23	9.09%

Note: Study1a and Study 1b are initial and additional Chinese samples, Study 2 is an Indian sample, Study 3 sample is primarily from MENA.

A paired samples t-test revealed no differences in the ratings of behaviours from time one to time two, *Heinz*, (p = .958); *Cannibal*, (p = .768); *Incest*, (p = .960); *Trolley*, (p = .870).

A one-way ANOVA revealed significant differences in initial judgements depending on scenario, $F(3, 164) = 20.77$, $p < .001$, partial $\eta^2 = .275$. Tukey's post-hoc pairwise comparison revealed that judgements in the *Heinz* dilemma were significantly more favourable than for each of the other scenarios: *Cannibal*, $p < .001$, *Incest*, $p < .001$, *Trolley*, $p = .003$; while judgements of *Cannibal* were significantly more harsh than all other scenarios: *Heinz*, $p < .001$, *Incest*, $p = .007$. *Trolley*, $p < .001$; there was no significant difference between initial judgements of *Incest* and of *Trolley*, $p = .762$.

A one-way ANOVA revealed the same pattern of differences in revised judgements depending on scenario, $F(3, 164) = 20.19$, $p < .001$, partial $\eta^2 = .270$. Again, Tukey's post-hoc pairwise comparison revealed that judgements in the *Heinz* dilemma were significantly more favourable than for each of the other scenarios: *Cannibal*, $p < .001$, *Incest*, $p < .001$, *Trolley*, $p = .005$; while judgements of *Cannibal* were significantly more harsh than all other scenarios: *Heinz*, $p < .001$, *Incest*, $p = .009$. *Trolley*, $p < .001$; there was no significant difference between revised judgements of *Incest* and of *Trolley*, $p = .685$.

Measuring dumbfounding. Participants who selected the admission of not having reasons were identified as dumbfounded. Across the four scenarios (Study 1a), 21 participants (50%) provided a dumbfounded response at least once. In Study 1b, 47 participants, (38.21%) provided a dumbfounded response for the *Cannibal* scenario. Table 2 shows the number and percentage of participants who selected each response for each scenario across Studies 1a and 1b. Figure 1 shows this information for Study 1a, while Figure 2 additionally includes the responses for Study1b. Crucially for the current study, a series of z-tests indicated that rates of dumbfounded responding for each scenario in Study 1a were significantly greater than zero,

Heinz: $z = 2.97$, $p = .003$; *Trolley*: $z = 3.17$, $p = .001$; *Incest*: $z = 2.76$, $p = .006$; *Cannibal*: $z = 3.92$, $p < .001$. Similarly rates of dumbfounded responding in Study 1b were significantly greater than zero for the *Cannibal* scenario, $z = 7.62$, $p < .001$.

Table 2:

Observed frequency and percentage of each of the responses: dumbfounded, nothing wrong, and reasons provided for each scenario for each study

		Heinz		Trolley		Incest/Promise		Cannibal/Dog	
		N	percent	N	percent	N	percent	N	percent
Study 1a	Nothing wrong	14	33.33%	11	26.19%	19	45.24%	5	11.9%
	Dumbfounded	8	19.05%	9	21.43%	7	16.67%	13	30.95%
	Reasons	20	47.62%	22	52.38%	16	38.1%	24	57.14%
Study 1b	Nothing wrong	-	-	-	-	-	-	19	15.45%
	Dumbfounded	-	-	-	-	-	-	47	38.21%
	Reasons	-	-	-	-	-	-	57	46.34%
Study 2	Nothing wrong	49	27.07%	41	22.65%	72	39.78%	33	18.23%
	Dumbfounded	20	11.05%	47	25.97%	33	18.23%	44	24.31%
	Reasons	112	61.88%	93	51.38%	76	41.99%	104	57.46%
Study 3	Nothing wrong	58	22.92%	36	14.23%	159	62.85%	44	17.39%
	Dumbfounded	30	11.86%	48	18.97%	22	8.7%	41	16.21%
	Reasons	123	48.62%	126	49.8%	44	17.39%	130	51.38%

Figure 1.

Rates of each type of response for each scenario in the Chinese Sample (N = 42)

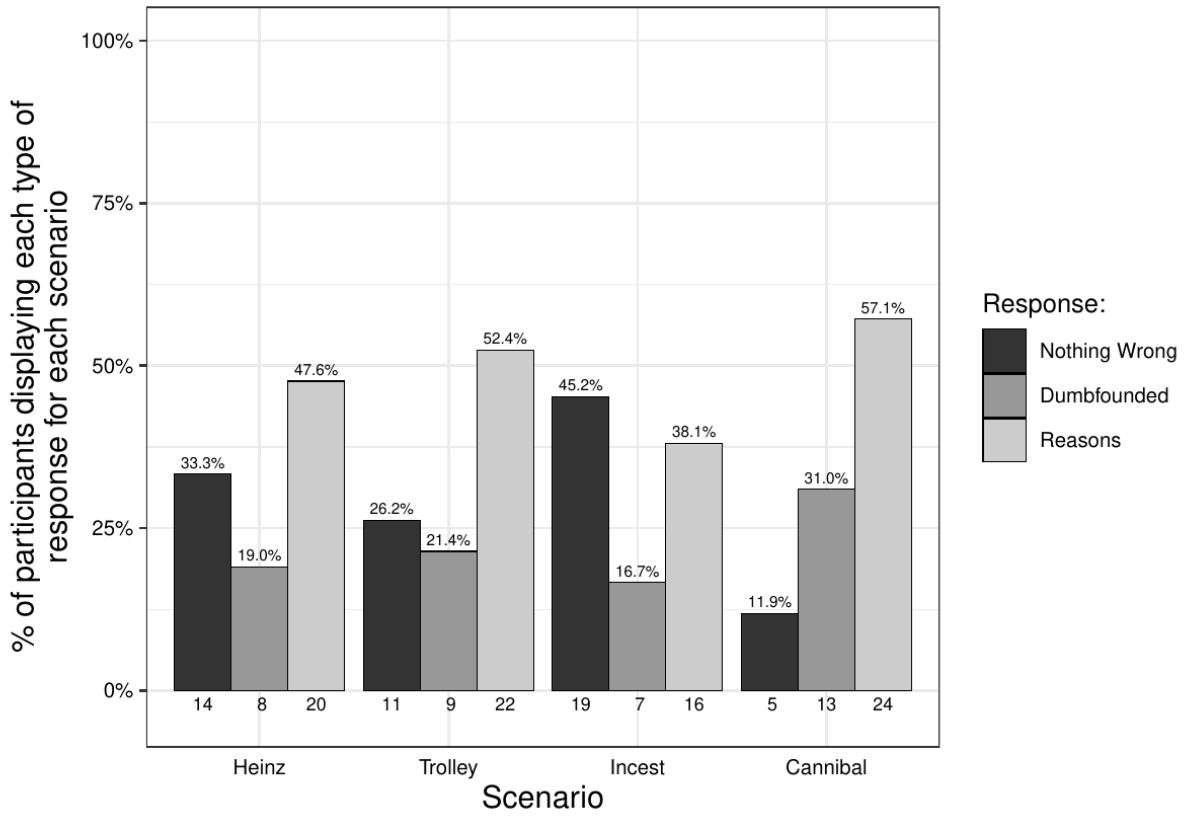
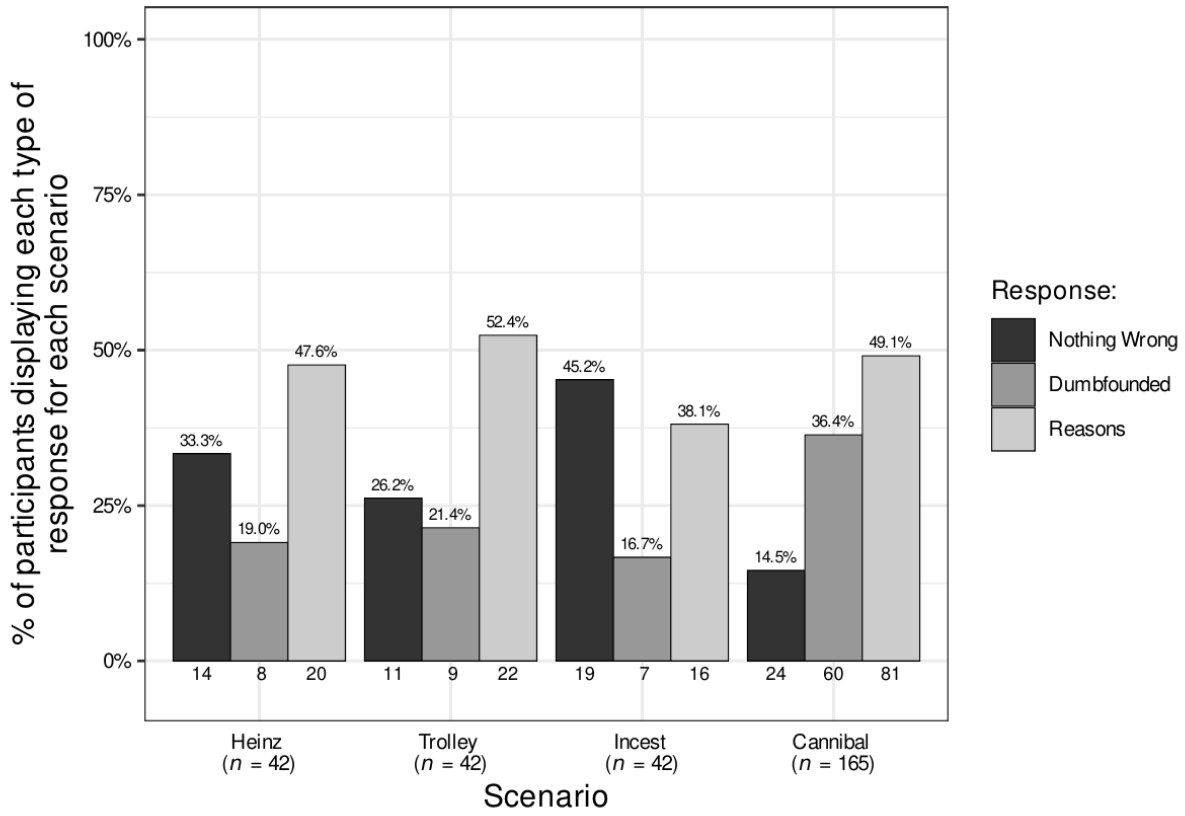


Figure 2.

Rates of each type of response for each scenario in the Chinese Sample (including additional data on Cannibal scenario)



There was no significant difference in observed rates of dumbfounded responding depending on which scenario was being discussed, $\chi^2(6, N = 253) = 12.34$, $p = .055$. Similarly, there was no influence of type of scenario (reasoning vs intuition) on rates of dumbfounded responding $\chi^2(2, N = 253) = 0.31$, $p = .855$.

We found clear evidence for dumbfounded responding in our Chinese sample. Interestingly, while the *Incest* scenario is generally regarded as the most reliable for eliciting moral dumbfounding in Western samples (e.g., Royzman et al., 2015), *Cannibal* appeared to be the scenario most likely to elicit dumbfounding in this sample. While this difference in responding to the critical slide is not statistically significant, we did observe significantly harsher

judgements for *Cannibal* than for the other scenarios. The pattern of responding to the critical slide is therefore not surprising. Furthermore, it is possible that the small sample size meant that our study was not sufficiently powered to detect differences in responding to the critical slide. As such, we note that the converging evidence across three measures (initial judgement, revised judgement, and critical slide), point towards topics surrounding death and respect for the dead as being more relevant in this Chinese sample. This is consistent with existing research on the death taboo, and the significance and conceptualisation of death in Chinese culture (e.g., Selin & Rakoff, 2019; Wu & Lu, 2011). This interpretation is further corroborated by analysis of the open-ended responses, with 20 participants (47.62%) providing statements such as "Jennifer eating human flesh is an immoral and uncivilized behaviour". For incest scenario, lower rates of moral dumbfounded responding in comparison to the West (e.g., McHugh et al., 2017), perhaps could be attributed to sibling sexual relations is not illegal in China (Read, 2014). This suggests that while Western participants appear to be more inclined to moralise, and present as dumbfounded for, the *Incest* scenario, it appears (from our sample) that it is the *Cannibal* scenario that is of greater concern to Chinese participants.

Individual differences. A hierarchical linear regression was conducted to test the possible relationship between ICS (Renzhi et al., 2013), and susceptibility to dumbfounding. Susceptibility to dumbfounding was operationalised by creating a new variable representing the number of times each participant provided a dumbfounded response across the four scenarios. This measure was included as our outcome variable, and the four sub-scales of ICS were included as predictor variables. The overall model did not significantly predict susceptibility to dumbfounding, $R^2 = .09$, $F(4,37) = 0.95$, $p = .448$.

We conducted a series of multinomial logistic regressions to investigate the possible relationship between ICS (Renzhi et al., 2013) and responding to each of the scenarios

individually. Response to the critical slide scenario was the dependent variable for each scenario, and the four sub-scales of the ICS were included as predictor variables.

The overall model did not significantly predict responses for any of the scenarios in Study 1a (*Heinz*, $p = .233$; *Trolley*, $p = .201$; *Incest*, $p = .084$; *Cannibal*, $p = .554$). Similarly in Study 1b, the overall model did not significantly predict responses to the critical slide for the *Cannibal* scenario ($p = .204$).

Study 2 - Indian Sample

Having demonstrated dumbfounded responding in a Chinese context, the aim of Study 2 was to assess if dumbfounded responding can be elicited in an Indian context. Furthermore, we introduced an additional individual difference variable. Previous work has indicated a possible link between meaning and morality (e.g., Bellin, 2012; Schnell, 2011), and as such we included the Meaning in Life questionnaire (MLQ; Steger, Kashdan, Sullivan, & Lorentz, 2008) in Study 2

Method

Participants and design. Study 2 was a frequency based attempted replication of McHugh et al. (2017). The aim of Study 2 was to identify if dumbfounded responding could be evoked in an Indian context.

A total sample of 181 (114 female, 64 male, 0 other, 3 declined to report their gender; $M_{age} = 22.96$, min = 18, max = 39, $SD_{age} = 2.42$) participants took part. The breakdown of participants' religion is as follows, Hinduism: $n = 133$, Islam: $n = 4$, Christianity: $n = 7$, Sikhism: $n = 3$, Buddhism: $n = 0$, Jainism: $n = 8$, other: $n = 9$, and 17 participants declined to provide information about their religion. All participants were of Indian nationality, and 158 indicated that they resided in India at the time of completing the survey. Participants were recruited through convenience and snowball sampling.

Procedure and materials. The procedure for Study 2 was the same as for Study 1, with some minor changes. Given the diversity of languages in India, and the high proficiency of English among Indian nationals, all written materials were presented in English. The survey was programmed and presented using Qualtrics. The demographic information recorded additionally included religion, given the prominence and diversity of religions in Indian society. The reliabilities for the four subscales of the ICS are as follows: VC, $\alpha = .78$; VI, $\alpha = .55$; HC, $\alpha = .70$; HI, $\alpha = .78$. We also included the meaning in life questionnaire (MLQ: Steger, Kashdan, Sullivan, & Lorentz, 2008) in Study 2. The reliabilities for the subscales of the MLQ are as follows: MLQ: Presence, $\alpha = .81$; MLQ: Search, $\alpha = .80$. The entire study lasted twenty to twenty-five minutes.

Results and Discussion

Judgements of the scenarios. The mean initial ratings for each scenario were as follows: $M_{Heinz} = 2.59$, $SD_{Heinz} = 1.86$; $M_{Cannibal} = 2.07$, $SD_{Cannibal} = 1.46$; $M_{Incest} = 2.64$, $SD_{Incest} = 1.83$; $M_{Trolley} = 2.82$, $SD_{Trolley} = 1.84$. The mean revised ratings for each scenario are as follows: $M_{Heinz} = 2.62$, $SD_{Heinz} = 1.82$; $M_{Cannibal} = 2.11$, $SD_{Cannibal} = 1.44$; $M_{Incest} = 2.92$, $SD_{Incest} = 1.93$; $M_{Trolley} = 2.82$, $SD_{Trolley} = 1.80$. The proportion of wrong, neutral, and ok, judgements for each scenario are displayed in Table 1.

A paired samples t-test revealed no differences in the ratings of behaviours from time one to time two for any of the scenarios (*Heinz*, $p = .842$; *Cannibal*, $p = .772$; *Incest*, $p = .162$; *Trolley*, $p = .977$).

A one-way ANOVA revealed significant differences in initial judgements depending on scenario, $F(3, 720) = 6.14$, $p < .001$, partial $\eta^2 = .025$. Tukey's post-hoc pairwise comparison revealed that judgements of *Cannibal* were significantly more harsh than all other scenarios: *Heinz*, $p = .026$, *Incest*, $p = .010$. *Trolley*, $p < .001$; there were no significant differences in the

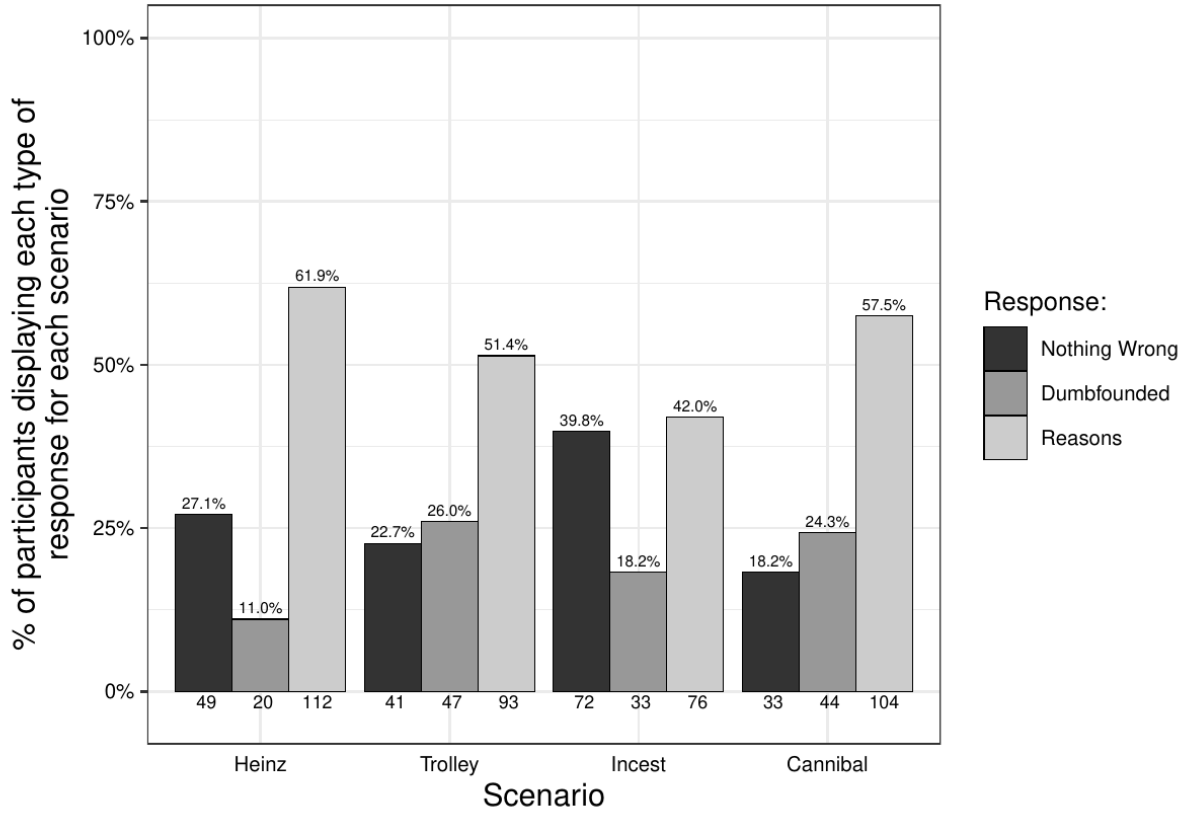
ratings of the other scenarios, *Heinz*/*Incest*, $p = .991$, *Heinz*/*Trolley*, $p = .589$, *Incest*/*Trolley*, $p = .773$.

A one-way ANOVA revealed the same pattern of differences in revised judgements depending on scenario, $F(3, 720) = 7.61$, $p < .001$, partial $\eta^2 = .031$. Again, Tukey's post-hoc pairwise comparison revealed that judgements of *Cannibal* were significantly more harsh than all other scenarios: *Heinz*, $p = .028$, *Incest*, $p < .001$. *Trolley*, $p < .001$; there were no significant differences in the ratings of the other scenarios, *Heinz*/*Incest*, $p = .387$, *Heinz*/*Trolley*, $p = .703$, *Incest*/*Trolley*, $p = .957$.

Measuring dumbfounding. Participants who selected the admission of not having reasons were identified as dumbfounded. Across the four scenarios 89 participants (49.17%) provided a dumbfounded response at least once. Table 2 and Figure 3 show the number and percentage of participants who selected each response for each scenario. Rates of dumbfounded responding for each scenario in Study 2 were significantly greater than zero, *Heinz*: $z = 4.60$, $p < .001$; *Trolley*: $z = 7.35$, $p < .001$; *Incest*: $z = 6.03$, $p < .001$; *Cannibal*: $z = 7.08$, $p < .001$, thus providing evidence for moral dumbfounding in our Indian sample.

Figure 3.

Rates of each type of response for each scenario in the Indian Sample (N = 181)



A chi-square test for independence revealed significant differences in responses to the critical slide depending on which scenario was being discussed in Study 2, $\chi^2(6, N = 181) = 37.48$, $p < .001$. Table 3 shows the observed counts, expected counts and standardised residuals for each response for each scenario. For *Heinz*, people were significantly better at providing reasons, and significantly less likely to present as dumbfounded; while people were significantly more likely to be dumbfounded by *Trolley* than expected; for *Incest*, people were significantly less likely to provide reasons, and significantly more likely to select “There is nothing wrong” than expected; finally for *Cannibal* significantly fewer than expected selected “There is nothing wrong”.

The observed variability was not related to the type of scenario (intuition vs reasoning), with no relationship between type of scenario and response to the critical slide being observed, $\chi^2(2, N = 181) = 3.47, p = .176$.

Table 3:

Observed counts, expected counts, and standardised residuals for each response to the critical slide depending on Scenario

Response		Heinz	Trolley	Incest	Cannibal
Nothing Wrong	Observed count	49	41	72	33
	Expected count	48.75	48.75	48.75	48.75
	Standardised residuals	0.05	-1.5	4.5**	-3.05*
Dumbfounded	Observed count	20	47	33	44
	Expected count	36	36	36	36
	Standardised residuals	-3.44**	2.37*	-0.65	1.72
Reason	Observed count	112	93	76	104
	Expected count	96.25	96.25	96.25	96.25
	Standardised residuals	2.71*	-0.56	-3.48**	1.33

*p < .05; **p < .001

Study 2 provided evidence that dumbfounded responding can be elicited in an Indian sample. Interestingly, the *Cannibal* appeared to be of more concern to the participants in this sample than the *Incest* scenario. Indeed, the proportion of participants selecting "there is nothing wrong" for the *Incest* scenario was significantly greater (72 participants; 39.78%) than for the other scenarios. Similar to Study 1, incest being more prevalent (Yadav & Pasricha, 2019) and legal (Read, 2014) in India may have led to this response. This also appears to be higher than reported in previous studies involving Western samples, however there is notable fluctuation in the selecting of this response for the *Incest* scenario, ranging from 16.7% (McHugh et al., 2017, Study 3a) to 32.4% (McHugh et al., 2020, Study 2). Regarding the *Cannibal* scenario, it appears the relative importance of death observed in Study 1 is similarly present in our Study 2 sample,

pointing towards potentially important cultural differences that should be considered in future studies.

Individual differences. A hierarchical linear regression was conducted to test the possible relationship between ICS (Triandis, & Gelfand, 2011), MLQ (Steger et al., 2008), and susceptibility to dumbfounding. As in Study 1a, we created a new variable by calculating the number of times each participant provided a dumbfounded response, and used this variable as a measure of participants' susceptibility to dumbfounding. This measure was our outcome variable, and the four sub-scales of ICS, along with both sub-scales of the MLQ, were included as predictor variables. The overall model was a significant predictor of susceptibility to dumbfounding $R^2 = .07$, $F(6,174) = 2.29$, $p = .037$, with Vertical Individualism as the only variable making a significant contribution to the model, $b = -0.02$, 95% CI $[-0.05, 0.00]$, $t(174) = -2.02$, $p = .045$, see Table 4.

Table 4:

Study 2: Predictors of susceptibility to moral dumbfounding

Predictor	b	95% CI	$t(174)$	p
Intercept	1.60	[0.48, 2.72]	2.82	.005
VC	0.02	[0.00, 0.05]	1.96	.051
HC	0.00	[−0.04, 0.03]	-0.20	.846
VI	-0.02	[−0.05, 0.00]	-2.02	.045
HI	-0.03	[−0.06, 0.00]	-1.70	.090
MLQ Presence	-0.01	[−0.04, 0.01]	-1.12	.263
MLQ Search	0.01	[−0.02, 0.05]	0.93	.352

We conducted a series of multinomial logistic regressions to investigate the possible relationship between ICS (Triandis, & Gelfand, 2011) and responding to each of the scenarios individually. Response to the critical slide scenario was the dependent variable for each scenario, and the four sub-scales of the ICS were included as predictor variables.

The overall model did not significantly predict responses for the *Heinz* dilemma, $\chi^2(12, N = 181) = 13.48$, $p = .335$, the observed power was 0.67; neither did the model significantly predict responses for the *Trolley* scenario, $\chi^2(12, N = 181) = 12.15$, $p = .433$, the observed power was 0.61.

Interestingly, the overall model significantly predicted responses for the *Incest* scenario, $\chi^2(12, N = 181) = 26.05$, $p = .011$, the observed power was 0.95, explaining between 10.69% (Cox and Snell R square) and 14.45% (Nagelkerke R squared) of the variance in responses to the critical slide. The only significant predictors in the model were Horizontal Individualism, and Vertical Collectivism. As HI increased, participants were significantly more likely to select "there is nothing wrong" than to provide reasons for their judgement, Wald = 7.29, $p = .007$, odds ratio = 1.11, 95% CI [1.03, 1.20]. As VC increased, participants were significantly less likely to present as dumbfounded than to provide reasons, Wald = 4.93, $p = .026$, odds ratio = 0.92, 95% CI [0.85, 1.00].

The overall model also significantly predicted responses for the *Cannibal* scenario, $\chi^2(12, N = 181) = 23.22$, $p = .026$, the observed power was 0.92, explaining between 6.42% (Cox and Snell R square) and 10.47% (Nagelkerke R squared) of the variance in responses to the critical slide. Meaning in Life: Presence (Steger et al., 2008) was the only significant predictor in the model, as Meaning in Life: Presence, increased, participants were significantly less likely to present as dumbfounded than to provide reasons, Wald = 5.96, $p = .015$, odds ratio = 0.92, 95% CI [0.87, 0.98].

Study 3 - Mixed Sample

Having demonstrated dumbfounded responding in targeted samples in two different countries, the aim of Study 3 was to investigate if dumbfounded responding could be elicited in a more diverse sample recruited from a range of non-Western countries.

Method

Participants and design. Study 3 was a frequency based attempted replication of McHugh et al. (2017). The aim of Study 3 was to identify if dumbfounded responding could be evoked in a mixed sample of participants from a selection of non-Western countries, primarily North Africa and the Middle East.

An initial sample of four-hundred-and-sixty-three participants were recruited for Study 3. Some participants did not provide full responses for all four scenarios (the total number of participants who completed the Critical Slide for all four scenarios was $n = 192$. In removing participants with missing data, we retained all participants who completed the Critical Slide for at least one scenario. Following this, we were left with a total sample of $N = 264$ (160 female, 97 male, 3 other, 4 declined to report their gender; $M_{age} = 28$, min = 18, max = 68, $SD_{age} = 12.68$).

The countries represented in our sample are as follows, Algeria ($n = 2$), Bahrain ($n = 5$), Bangladesh ($n = 2$), Egypt ($n = 25$), India ($n = 21$), Iran ($n = 2$), Iraq ($n = 9$), Israel ($n = 1$), Jordan ($n = 9$), Kuwait ($n = 5$), Lebanon ($n = 31$), Libya ($n = 14$), Morocco ($n = 1$), Oman ($n = 1$), Pakistan ($n = 8$), Palestine ($n = 14$), Philippines ($n = 13$), Saudi Arabia ($n = 1$), South Africa ($n = 1$), Sri Lanka ($n = 3$), Sudan ($n = 33$), Syria ($n = 30$), UAE ($n = 21$), Yemen ($n = 1$).

Our target sample was participants from non-Western countries. As such we removed 11 participants who reported being from Western countries, UK ($n = 3$), USA ($n = 1$), Canada ($n = 2$), Germany ($n = 1$), Portugal ($n = 1$), Netherlands ($n = 1$), and participants who did not provide a country of origin ($n = 2$). This left a total sample of $N = 253$ (154 female, 92 male, 3 other, 4 declined to report their gender; $M_{age} = 28.05$, min = 18, max = 68, $SD_{age} = 12.54$). The breakdown of participants' nationalities is displayed in Table 5. The breakdown of participants' religions is as follows, Islam: $n = 168$, Christianity: $n = 46$, Hinduism: $n = 7$, other: $n = 20$, and 12 participants declined to provide their religion.

Procedure and materials. The procedure for Study 3 was largely the same as Study 2, with some key changes. Data collection was conducted in collaboration with Middlesex University Dubai, and participants were recruited through opportunity and snowball sampling by undergraduate students. Given the potentially sensitive and offensive nature of some of the traditional dumbfounding scenarios (*Incest* and *Cannibal*), we replaced these scenarios with scenarios less likely to cause offence: *Promise* and *Dog* (see Appendix A).

The survey was programmed and presented using Qualtrics. The demographic information recorded additionally included participants' nationality. We also included a filter question in an attempt to limit responses of participants from WEIRD countries. As in Study 2, we also included the ICS (Triandis, & Gelfand, 2011), and the meaning in life questionnaire (MLQ: Steger et al., 2008). The reliabilities for the four subscales of the ICS are as follows: VC, $\alpha = .80$; VI, $\alpha = .72$; HC, $\alpha = .76$; HI, $\alpha = .80$. The reliabilities for the subscales of the MLQ are as follows: MLQ: Presence, $\alpha = .90$; MLQ: Search, $\alpha = .81$. The entire study lasted twenty to twenty-five minutes.

Results and Discussion

Judgements of the scenarios. The mean initial ratings for each scenario were as follows: $M_{Heinz} = 2.69$, $SD_{Heinz} = 1.80$; $M_{Dog} = 2.19$, $SD_{Dog} = 1.80$; $M_{Promise} = 3.92$, $SD_{Promise} = 1.66$; $M_{Trolley} = 2.59$, $SD_{Trolley} = 1.88$. The mean revised ratings for each scenario are as follows: $M_{Heinz} = 2.87$, $SD_{Heinz} = 1.75$; $M_{Dog} = 2.26$, $SD_{Dog} = 1.83$; $M_{Promise} = 4.38$, $SD_{Promise} = 1.64$; $M_{Trolley} = 2.88$, $SD_{Trolley} = 1.90$. The proportion of wrong, neutral, and ok, judgements for each scenario are displayed in Table 1.

A paired samples t-test revealed no differences in the ratings of behaviours from time one to time two for *Heinz*, $t(423.00) = -1.04$, $p = .300$, $d = 0.10$; *Dog*, $t(422.39) = -0.40$, $p = .687$, $d = 0.04$; or *Trolley*, $t(420.79) = -1.57$, $p = .116$, $d = 0.15$. In contrast, participants revised ratings of

Promise (M = 4.38, SD = 1.64) were significantly more favourable than their initial ratings M = 3.92, SD = 1.66, $t(448.94) = -2.99$, $p = .003$, $d = 0.28$

A one-way ANOVA revealed significant differences in initial judgements depending on scenario, $F(3, 867) = 39.15$, $p < .001$, partial $\eta^2 = .119$. Tukey's post-hoc pairwise comparison revealed that judgements of *Promise* were significantly more favourable than all other scenarios: *Heinz*, $p < .001$, *Dog*, $p < .001$. *Trolley*, $p < .001$; *Heinz* was rated significantly more favourably than *Dog*, = .017 there were no significant differences in the ratings of the other scenarios, *Heinz*/*Trolley*, $p = .927$, *Dog*/*Trolley*, $p = .094$.

A one-way ANOVA revealed a similar pattern of differences in revised judgements depending on scenario, $F(3, 849) = 56.42$, $p < .001$, partial $\eta^2 = .166$. Again, Tukey's post-hoc pairwise comparison revealed that judgements of *Promise* were significantly more favourable than all other scenarios: *Heinz*, $p < .001$, *Dog*, $p < .001$. *Trolley*, $p < .001$; and judgements of *Dog* were significantly more harsh than both *Heinz*, $p = .002$ and *Trolley*, $p = .002$; all there were no significant differences in ratings of *Heinz* and *Trolley*, $p = 1.000$.

Measuring dumbfounding. Participants who selected the admission of not having reasons were identified as dumbfounded. Across the four scenarios 99 participants (39.13%) provided a dumbfounded response at least once. Table 2 and Figure 4 show the number and percentage of participants who selected each response for each scenario. Rates of dumbfounded responding for each scenario in Study 2 were significantly greater than zero, *Heinz*: $z = 5.68$, $p < .001$; *Trolley*: $z = 7.36$, $p < .001$; *Promise*: $z = 4.81$, $p < .001$; *Dog*: $z = 6.68$, $p < .001$, thus providing evidence for moral dumbfounding in our mixed MENA sample.

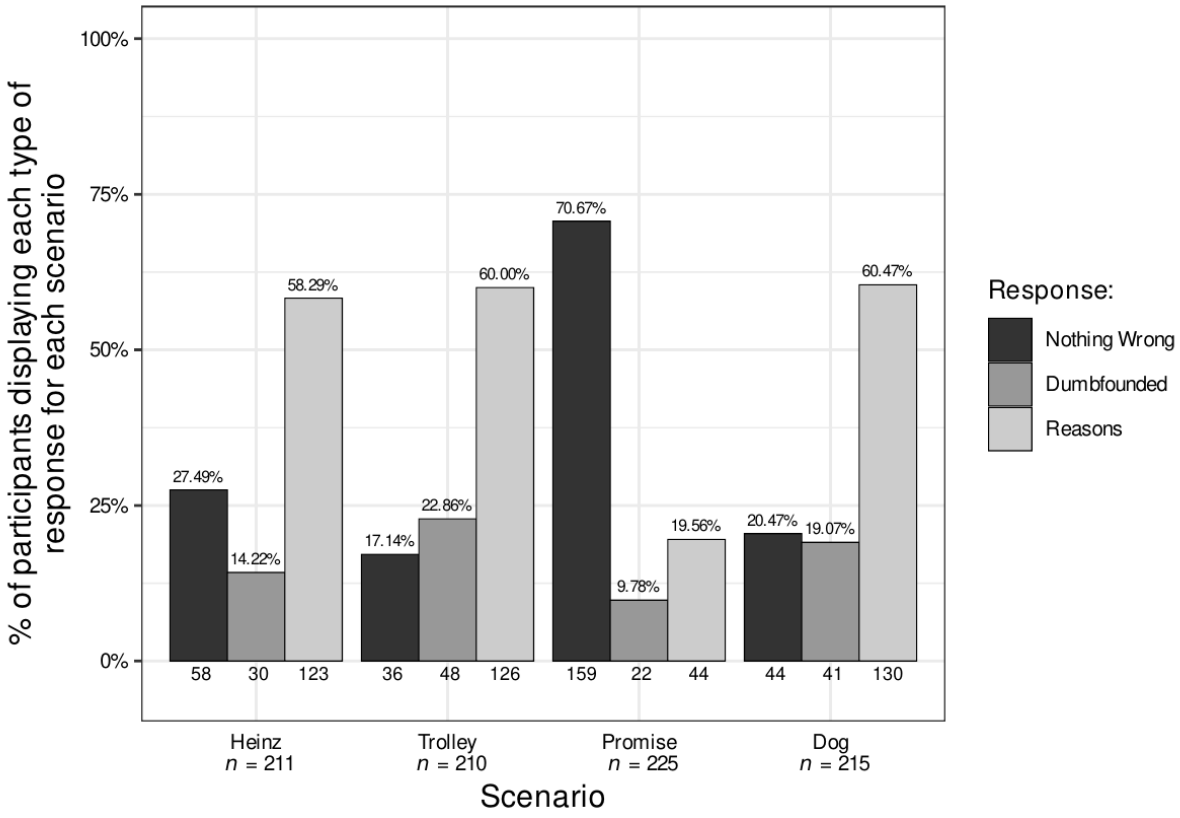


Figure 4.

Rates of each type of response for each scenario in the Mixed Sample

A chi-square test for independence revealed significant differences in responses to the critical slide depending on which scenario was being discussed, $\chi^2(6, N = 253) = 186.20$, $p < .001$. Table 6 shows the observed counts, expected counts and standardised residuals for each response for each scenario. For *Heinz*, *Dog*, and *Trolley*, people were significantly more likely to provide reasons and less likely to select "there is nothing wrong" than expected by chance. In contrast, for *Promise* participants were more likely to select "there is nothing wrong" than to present as dumbfounded, or to present as dumbfounded or provide reasons. We note that this finding may have been confounded by the responses to *Promise*, however the result holds when *Promise* is excluded from the analysis, $\chi^2(4, N = 253) = 9.73$, $p < .001$. Study 3 provided further

evidence that dumbfounded responding can be elicited in non-Western samples. Furthermore, the use of alternative scenarios provide evidence that moral dumbfounding can be elicited by a broader range of scenarios than normally demonstrated in the existing literature.

Table 6:

Observed counts, expected counts, and standardised residuals for each response to the critical slide depending on Scenario

Response		Dog	Heinz	Promise	Trolley
Nothing Wrong	Observed count	44	58	159	36
	Expected count	74	73	78	72
	Standardised residuals	-5**	-2.46*	13.28**	-6.08**
Dumbfounded	Observed count	41	30	22	48
	Expected count	35	35	37	34
	Standardised residuals	1.23	-0.98	-3.11*	2.92*
Reason	Observed count	130	123	44	126
	Expected count	106	104	111	103
	Standardised residuals	3.84**	3.06*	-10.32**	3.62**

*$p < .05$; **$p < .001$

Individual differences. A hierarchical linear regression was conducted to test the possible relationship between ICS (Triandis, & Gelfand, 2011), MLQ (Steger et al., 2008), and susceptibility to dumbfounding. As in Studies 1 and 2, susceptibility to dumbfounding was operationalized by calculating the number of times a participant provided a dumbfounded response. With this measure as the outcome variable, we included the four sub-scales of ICS, along with both sub-scales of the MLQ, as predictor variables in a multinomial logistic regression model. The overall model did not predict susceptibility to dumbfounding, $R^2 = .06$, $F(6,168) = 1.90$, $p = .084$ in Study 3.

We conducted a series of multinomial logistic regressions to investigate the possible relationship between ICS (Triandis, & Gelfand, 2011) and MLQ (Steger et al., 2008), and

responding to each of the scenarios individually. Response to the critical slide scenario was the dependent variable for each scenario, and the four sub-scales of the ICS, along with the two sub-scales of the MLQ were included as predictor variables.

The overall model predicted responses for the *Heinz* dilemma, $\chi^2(12, N = 194) = 23.04$, $p = .027$, the observed power was 0.92, explaining between 6.89% (Cox and Snell R square) and 10.13% (Nagelkerke R squared) of the variance in responses to the critical slide. The only significant predictors in the model were Vertical Individualism, and Meaning in Life: Search. As VI increased, participants were significantly more likely to select "there is nothing wrong" than to provide reasons for their judgement, Wald = 7.06, $p = .438$, odds ratio = 0.98, 95% CI [1.02, 1.14]. As Meaning in Life: Search increased, participants were significantly more likely to present as dumbfounded than to provide reasons, Wald = 3.96, $p = .653$, odds ratio = 1.02, 95% CI [1.00, 1.16].

The overall models did not significantly predict responses for any of the other scenarios: *Trolley*, $\chi^2(12, N = 184) = 11.98$, $p = .447$, the observed power was 0.60; *Promise*, $\chi^2(12, N = 184) = 20.35$, $p = .061$, the observed power was 0.87; *Dog*, $\chi^2(12, N = 184) = 9.27$, $p = .680$, the observed power was 0.47.

General Discussion

The primary aim of the current studies was to investigate if moral dumbfounding is present and how it materialises in non-Western samples. Across three studies, we adopted previously standardised materials and procedure for eliciting and measuring moral dumbfounding (McHugh et al., 2017), and tested whether dumbfounded responding could be elicited in a Chinese sample (Study 1), in an Indian Sample (Study 2), and a mixed sample primarily from MENA region (Study 3). In order to minimise ambiguity and increase confidence in our results, we employed a conservative measure of dumbfounded responding in all three studies.

Participants were only identified as dumbfounded if they identified a behaviour as wrong and admitted to not having reasons for their judgement. Despite using this conservative measure, we found evidence for moral dumbfounding in all three samples. Our studies are the first to examine dumbfounded responding in a non-Western context, demonstrating that moral dumbfounding is not unique to WEIRD samples, and providing further evidence from a global perspective suggesting that dumbfounding is indeed a real phenomenon and materialises differently between cultures.

Study 1 showed no significant variation in rates of dumbfounded responding depending on scenario in our Chinese sample - though this may be due to an underpowered small sample.[1] In Study 2 we found significant variability in responding depending on scenario, with lower rates of dumbfounding for *Heinz*. In Study 3, using different scenarios, we again found significant variability depending on scenario. Interestingly, in Study 2, we found higher rates of dumbfounding of *Trolley*, whereas previous research involving WEIRD samples has found *Cannibal* and *Incest* to be more likely to elicit dumbfounded responding than *Trolley* (McHugh et al., 2017). This provides some evidence that there may be cultural differences in the types of scenarios that lead to dumbfounding. One possible implication of this is that moral dumbfounding is not linked to specific content, but is also dependent on the specific cultural context. That is, some scenarios elicit higher rates of moral dumbfounding in some cultures, while in other cultures different scenarios appear to elicit higher rates of moral dumbfounding.

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[1] We note that, although not statistically significant, the *Cannibal* scenario appeared to elicit more dumbfounded responding in the Chinese sample

This could be extended to the distinction between intuition scenarios and reasoning scenarios proposed by Haidt et al. (2000), such that this distinction varies across cultures. Understanding this cultural variability may provide an insight into how different moral content may lead to dumbfounding which in turn could inform our understanding of the cognitive processes that underlie moral dumbfounding, and moral judgement more generally.

Individual Differences and Dumbfounded Responding

In addition to testing for the existence of moral dumbfounding in non-Western samples, we investigated the possible relationship between dumbfounded responding and ICS (Renzhi et al., 2013; Triandis, & Gelfand, 2011: Studies 1 and 2) and MLQ (Steger et al., 2008: Study 2). Study 1 revealed no significant relationship between ICS and (a) overall susceptibility to dumbfounding, or (b) responses for each scenario individually.

In Study 2 we found that Vertical Individualism (Triandis, & Gelfand, 2011) was related to susceptibility to dumbfounded responding, with those scoring high in Vertical Individualism, being less likely to present as dumbfounded. It is possible that this observed relationship emerged as a result of participants' relative motivations to do well in the task of providing reasons. Previous research (McHugh et al., 2017) provides suggestive evidence that a dumbfounded response is aversive, that people are motivated to appear consistent. This consistency can be successfully achieved by providing a reason for a judgement, or by revising a judgement and selecting "there is nothing wrong". In contrast, providing a dumbfounded response may be seen as failing to present as consistent. The items in the Vertical Individualism sub-scale appear to provide a measure of people's motivations to do well in relation to others (e.g., "It is important that I do my job better than others"; "When another person does better than I do, I get tense and aroused"). However, it is possible that this sub-scale additionally provides an indication of people's motivations for success (e.g., "Winning is everything"). As such people who are more

motivated to "succeed" in general, may be more motivated to avoid the perceived failure associated with a dumbfounded response. This interpretation is merely speculative, and follow up studies should investigate this in more detail.

In Study 2 we also found evidence that responses to specific scenarios were related to the individual difference variables measured. Responses to the *Incest* scenario were predicted by Horizontal Individualism and Vertical Collectivism (Triandis, & Gelfand, 2011). It is possible that this relationship emerges as a result of the *content* of the scenario rather than providing an insight into the cognitive processes involved in moral dumbfounding. Participants scoring higher in Horizontal Individualism were more likely to select "There is nothing wrong" than to provide a reason for their judgement. It appears that HI is linked with the valence of participants' judgements of *Incest* rather than whether or not it leads to dumbfounding. A key consideration in the *Incest* scenario is the importance of individual autonomy. Similarly, the items in the HI sub-scale appear to relate to individual autonomy (e.g., "I rely on myself most of the time; I rarely rely on others", "I often do 'my own thing'", Triandis, & Gelfand, 2011). As such it is not surprising that participants who score highly on HI, place higher value on individual autonomy when considering the *Incest* scenario.

Furthermore, three of the four Vertical Collectivism (Triandis, & Gelfand, 2011) items specifically relate to the importance of the family, thus providing an indirect measure of the degree to which people value the family unit. Participants who scored higher in VC were more likely to present as dumbfounded than to provide reasons for their judgement of the *Incest* scenario. It is likely that participants who score higher in VC regard the family as particularly important, and the *Incest* scenario presents an affront to the family. As such, these participants may perceive the actions of Julie and Mark as a threat to something that they value, but may not

be able to articulate this as a reason for their judgement (e.g., it is too abstract, or they do not think it is an "acceptable" reason).

Finally, Meaning in Life: Presence (Steger et al., 2008), was related to responses to the *Cannibal* scenario, such that participants who scored higher in Meaning in Life: Presence were more likely to provide reasons for their judgements then to present as dumbfounded by *Cannibal*. Again this is likely due to the specific content, rather than informing the cognitive processes involved. It could be argued that the *Cannibal* scenario involves considerations about the value of life. Participants who score higher in Meaning in Life: Presence, have given consideration to the meaning (and by extension, value) of life (e.g., "I understand my life's meaning"). It seems that this reflection life's meaning may provide people with the necessary justifications/arguments/resources to articulate why they disapprove of *Cannibal*.

Study 3 did not find any relationship between susceptibility to dumbfounded responding and either ICS (Triandis, & Gelfand, 2011) or MLQ (Steger et al., 2008). We did find that Vertical Individualism predicted selecting "There is nothing wrong" for the *Heinz* dilemma. The content of the scenario may provide an explanation for this observed relationship. Participants were judging the behaviour of the Druggist, who charged an extremely high price for the drug he developed. The druggist's behaviour is consistent with individualistic values, and it is not surprising that participants who score higher on this individualism measure endorse the behaviour of the druggist. Study 3 also found that participants who scored higher in Meaning in Life: Search were more likely to be dumbfounded than to provide reasons for their judgement. Perhaps people who are were still searching for meaning in life had less developed ideas of this moral dilemma.

Limitations and Future directions

A key limitation in the current studies is the sample make up. Participants in Study 1 were recruited through a University in China, participants in Study 2 were university graduates in

India, who also were proficient in English, and participants in Study 3 were recruited through snowball sampling via a University setting. This means that our samples are not necessarily representative of their respective population. Furthermore, most of the participants were University graduates or students living in metropolitan cities with Western influence and higher levels of education, leading to a significant challenge to our stated aim of recruiting from non-Western samples.

The moral foreign language effect (Cipolletti, McFarlane, & Weissglass, 2016) means that the use of an English language survey in Studies 2 and 3 is another potential limitation. Previous research has shown that people appear to make more utilitarian judgements when moral scenarios are presented in another language (Costa et al., 2014). In the case of the *Intuition* scenarios, this could potentially lead to a higher number of participants selecting "There is nothing wrong", rather than presenting as dumbfounded. Despite this potential confound, dumbfounded responding was observed for all scenarios in Studies 2 and 3.

Our studies were not intended as a systematic investigation of cultural differences in evaluation of specific moral content (there are other research programmes dedicated to this, e.g., Haidt & Joseph, 2008; Narvaez, 2016; Shweder et al., 1997). Here, we applied existing methods in three novel contexts, to assess whether or not moral dumbfounding can be elicited in these under-studied contexts. We found evidence for moral dumbfounding in a Chinese sample, an Indian sample and a mixed sample. Our results provided some evidence for cultural variation (e.g., the relative importance of the death taboo, moral or legal understanding of incest), that may inform the development of future research programmes.

Conclusion

Previous research on moral dumbfounding has exclusively studied WEIRD participants. This poses a challenge to the generalisability of the phenomenon. In three studies we tested

whether or not dumbfounded responding could be elicited in non-Western samples. We found evidence for moral dumbfounding in all three samples. Our findings provide some evidence that moral dumbfounding may emerge as a consequence of the nature of moral knowledge - that is, the cognitive processes that underlie the making of moral judgements seem to lead to the emergence of moral dumbfounding in diverse samples. This suggests that further study of the phenomenon, in diverse samples, may provide unique insights into the cognitive mechanisms that govern moral judgements.

Data Accessibility Statement

All participant data, and analysis scripts can be found on this paper's project page on the Open Science Framework at https://osf.io/2h3k7/?view_only=0e36ba29fd3c453f9ae6507b0ebbb8fc.

We used R (Version 4.0.3; R Core Team, 2017) and the R-packages *corrplot2017* (Wei & Simko, 2017), *DescTools* (Version 0.99.37; Signorell et al., 2019), *desnum* (Version 0.1.1; McHugh, 2017), *dfidx* (Version 0.0.3; Croissant, 2020), *dplyr* (Version 1.0.1; Wickham, Francois, Henry, & Müller, 2017), *forcats* (Version 0.5.0; Wickham, 2020), *foreign* (Version 0.8.80; R Core Team, 2018), *ggplot2* (Version 3.3.2; Wickham, 2009), *haven* (Version 2.3.1; Wickham & Miller, 2020), *koRpus* (Version 0.11.5; Michalke, 2018a, 2019), *koRpus.lang.en* (Version 0.1.3; Michalke, 2019), *lsr* (Version 0.5; Navarro, 2015), *mlogit* (Version 1.1.0; Croissant, 2019), *nnet* (Version 7.3.14; Venables & Ripley, 2002), *papaja* (Version 0.1.0.9997; Aust & Barth, 2020), *psych* (Version 2.0.7; Revelle, 2020), *purrr* (Version 0.3.4; Henry & Wickham, 2020), *pwr* (Version 1.3.0; Champely, 2018), *readr* (Version 1.3.1; Wickham et al., 2018), *readxl* (Version 1.3.1; Wickham & Bryan, 2019), *reshape2* (Version 1.4.4; Wickham, 2007), *rstatix* (Version 0.6.0; Kassambara, 2020), *scales* (Version 1.1.1; Wickham, 2018), *shiny* (Version 1.5.0; Chang, Cheng, Allaire, Xie, & McPherson, 2017), *sjstats* (Version 0.18.0;

Lüdecke, 2019), *stringr* (Version 1.4.0; Wickham, 2019), *sylly* (Version 0.1.5; Michalke, 2018b), *tibble* (Version 3.0.3; Müller & Wickham, 2017), *tidyr* (Version 1.1.1; Wickham & Henry, 2020), and *tidyverse* (Version 1.3.0; Wickham, Averick, et al., 2019) for all our analyses.

References

Aust, F., & Barth, M. (2020). *Papaja: Create APA manuscripts with R Markdown*. Manual.

Bellin, Z. (2012). The quest to capture personal meaning in psychology. *International Journal of Existential Psychology and Psychotherapy*, *4*(1), 27.

Champely, S. (2018). *Pwr: Basic Functions for Power Analysis*.

Chang, W., Cheng, J., Allaire, J. J., Xie, Y., & McPherson, J. (2017). *Shiny: Web Application Framework for R*.

Cipolletti, H., McFarlane, S., & Weissglass, C. (2016). The Moral Foreign-Language Effect. *Philosophical Psychology*, *29*(1), 23–40. https://doi.org/10.1080/09515089.2014.993063

Costa, A., Foucart, A., Hayakawa, S., Aparici, M., Apesteguia, J., Heafner, J., & Keysar, B. (2014). Your Morals Depend on Language. *PLOS ONE*, *9*(4), e94842. https://doi.org/10.1371/journal.pone.0094842

Croissant, Y. (2019). *Mlogit: Multinomial Logit Models*.

Croissant, Y. (2020). *Dfidx: Indexed data frames*. Manual.

Davis, D. E., Rice, K., Van Tongeren, D. R., Hook, J. N., DeBlaere, C., Worthington, E. L. J., & Choe, E. (2015). The Moral Foundations Hypothesis Does Not Replicate Well in Black

Samples. *Journal of Personality and Social Psychology*. https://doi.org/10.1037/pspp0000056

Doris, J. M., & Plakias, A. (2008). How to Argue about Disagreement: Evaluative Diversity and Moral Realism. In W. Sinnott-Armstrong (Ed.), *Moral psychology Volume 2, The cognitive science of morality: Intuition and diversity* (pp. 47–76). London: MIT.

Dwyer, S. (2009). Moral Dumbfounding and the Linguistic Analogy: Methodological Implications for the Study of Moral Judgment. *Mind & Language*, *24*(3), 274–296. https://doi.org/10.1111/j.1468-0017.2009.01363.x

Signorell, A., Aho, K., Anderegg, N., Aragon, T., Arppe, A., Baddeley, A., ... & Chessel, D. (2019). DescTools: tools for descriptive statistics. 2019. *R package version 0.99*, *24*.

Gray, K. J., & Keeney, J. E. (2015). Impure or Just Weird? Scenario Sampling Bias Raises Questions About the Foundation of Morality. *Social Psychological and Personality Science*, *6*(8), 859–868. https://doi.org/10.1177/1948550615592241

Gray, K. J., Schein, C., & Ward, A. F. (2014). The myth of harmless wrongs in moral cognition: Automatic dyadic completion from sin to suffering. *Journal of Experimental Psychology: General*, *143*(4), 1600–1615. https://doi.org/10.1037/a0036149

Guglielmo, S. (2018). Unfounded dumbfounding: How harm and purity undermine evidence for moral dumbfounding. *Cognition*, *170*, 334–337. https://doi.org/10.1016/j.cognition.2017.08.002

Haidt, J. (2001). The emotional dog and its rational tail: A social intuitionist approach to moral judgment. *Psychological Review*, *108*(4), 814–834. https://doi.org/10.1037/0033-295X.108.4.814

Haidt, J., Björklund, F., & Murphy, S. (2000). Moral dumbfounding: When intuition finds no reason. *Unpublished Manuscript, University of Virginia*.

Haidt, J., & Joseph, C. (2008). The moral mind: How five sets of innate intuitions guide the development of many culture-specific virtues, and perhaps even modules. In *The innate mind Volume 3: Foundations and the future.* (pp. 367–391). New York, NY, US: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780195332834.003.0019

Haidt, J., Koller, S. H., & Dias, M. G. (1993). Affect, culture, and morality, or is it wrong to eat your dog? *Journal of Personality and Social Psychology*, *65*(4), 613–628. https://doi.org/10.1037/0022-3514.65.4.613

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). Most people are not WEIRD. *Nature*, *466*(7302), 29–29. https://doi.org/10.1038/466029a

Henry, L., & Wickham, H. (2020). *Purrr: Functional programming tools*. Manual.

Jacobson, D. (2012). Moral Dumbfounding and Moral Stupefaction. In *Oxford studies in normative ethics* (Vol. 2, p. 289).

Kassambara, A. (2020). *Rstatix: Pipe-friendly framework for basic statistical tests*. Manual.

Li, F., & Aksoy, L. (2007). Dimensionality of individualismCollectivism and measurement equivalence of Triandis and Gelfand's scale. *Journal of Business and Psychology*, *21*(3), 313–329. https://doi.org/10.1007/s10869-006-9031-8

Liberman, N., Trope, Y., & Stephan, E. (2007). Psychological distance. In A. W. Kruglanski & E. T. Higgins (Eds.), *Social Psychology: Handbook of Basic Principles*.

Lüdecke, D. (2019). *Sjstats: Statistical Functions for Regression Models (Version 0.17.4)*. https://doi.org/10.5281/zenodo.1284472

Machery, E., & Mallon, R. (2010). Evolution of Morality. In J. M. Doris (Ed.), *The Moral Psychology Handbook* (pp. 3–46). Oxford; New York: Oxford University Press.

McHugh, C. (2017). *Desnum: Creates some useful functions*. Manual.

McHugh, C., McGann, M., Igou, E. R., & Kinsella, E. L. (2017). Searching for Moral Dumbfounding: Identifying Measurable Indicators of Moral Dumbfounding. *Collabra: Psychology*, *3*(1), 1–24. https://doi.org/10.1525/collabra.79

McHugh, C., McGann, M., Igou, E. R., & Kinsella, E. L. (2020). Reasons or rationalizations: The role of principles in the moral dumbfounding paradigm. *Journal of Behavioral Decision Making*, *33*(3), 376–392. https://doi.org/10.1002/bdm.2167

Michalke, M. (2018a). *koRpus: An R Package for Text Analysis*.

Michalke, M. (2018b). *Sylly: Hyphenation and Syllable Counting for Text Analysis*.

Michalke, M. (2019). *koRpus.Lang.En: Language Support for 'koRpus' Package: English*.

Müller, K., & Wickham, H. (2017). *Tibble: Simple Data Frames*.

Narvaez, D. (2016). *Embodied morality: Protectionism, engagement and imagination*. New York, NY: Springer Berlin Heidelberg.

Navarro, D. (2015). *Learning statistics with R: A tutorial for psychology students and other beginners. (Version 0.5).* Adelaide, Australia: University of Adelaide.

Prinz, J. J. (2008a). Is Morality Innate? In *Moral Psychology Volume 1: The evolution of morality adaptations and innateness*. Cambridge, Mass.; London, England: The MIT press.

Prinz, J. J. (2008b). Resisting the Linguistic Analogy: A Commentary on Hauser, Young, and Cushman. In W. Sinnott-Armstrong (Ed.), *Moral psychology Volume 2, The cognitive science of morality: Intuition and diversity* (pp. 157–170). London: MIT.

R Core Team. (2017). *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing.

R Core Team. (2018). *Foreign: Read Data Stored by 'Minitab', 'S', 'SAS', 'SPSS', 'Stata', 'Systat', 'Weka', 'dBase', ...*

Read, D. W. (2014). Incest Taboos and Kinship: A Biological or a Cultural Story? *Reviews in Anthropology*, *43*(2). https://escholarship.org/uc/item/5kf6j344#author

Renzhi, H., Shuqiao, Y., Abela, J. R. Z., Leibovitch, F., & Mingfan, L. (2013). Key Dimensions and Validity of the Chinese Version of the Individualism-Collectivism Scale. *Chinese Studies*, *02*(01), 1. https://doi.org/10.4236/chnstd.2013.21001

Revelle, W. (2020). *Psych: Procedures for psychological, psychometric, and personality research*. Manual, Evanston, Illinois: Northwestern University.

Royzman, E. B., Kim, K., & Leeman, R. F. (2015). The curious tale of Julie and Mark: Unraveling the moral dumbfounding effect. *Judgment and Decision Making*, *10*(4), 296–313.

Schnell, T. (2011). Individual differences in meaning-making: Considering the variety of sources of meaning, their density and diversity. *Personality and Individual Differences*, *51*(5), 667–673. https://doi.org/10.1016/j.paid.2011.06.006

Selin, H., & Rakoff, R. M. (Eds.). (2019). *Death Across Cultures: Death and Dying in Non-Western Cultures* (Vol. 9). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-18826-9

Shweder, R. A., Much, N. C., Mahapatra, M., & Park, L. (1997). The "Big Three" of morality (autonomy, community, divinity) and the "Big Three" explanations of suffering. In A. M. Brandt & P. Rozin (Eds.), *Morality and health* (pp. 119–169). Routledge.

Sneddon, A. (2007). A Social Model of Moral Dumbfounding: Implications for Studying Moral Reasoning and Moral Judgment. *Philosophical Psychology*, *20*(6), 731–748. https://doi.org/10.1080/09515080701694110

Stanley, M. L., Yin, S., & Sinnott-Armstrong, W. (2019). A reason-based explanation for moral dumbfounding. *Judgment and Decision Making*, *14*(2), 10.

Steger, M. F., Kashdan, T. B., Sullivan, B. A., & Lorentz, D. (2008). Understanding the Search for Meaning in Life: Personality, Cognitive Style, and the Dynamic Between Seeking and Experiencing Meaning. *Journal of Personality*, *76*(2), 199–228. https://doi.org/10.1111/j.1467-6494.2007.00484.x

Triandis, H. C., & Gelfand, M. J. (2011). Individualism and Collectivism Scale. American Psychological Association. https://doi.org/10.1037/t01556-000

Vasquez, K., Keltner, D., Ebenbach, D. H., & Banaszynski, T. L. (2001). Cultural Variation and Similarity in Moral Rhetorics: Voices from the Philippines and the United States. *Journal of Cross-Cultural Psychology*, *32*(1), 93–120. https://doi.org/10.1177/0022022101032001010

Vasudev, J., & Hummel, R. C. (1987). Moral Stage Sequence and Principled Reasoning in an Indian Sample. *Human Development*, *30*(2), 105–118. https://doi.org/10.1159/000273170

Venables, W. N., & Ripley, B. D. (2002). *Modern Applied Statistics with S* (Fourth). New York: Springer.

Wei, T., & Simko, V. (2017). *R package "corrplot": Visualization of a correlation matrix*. Manual.

Wenjuanxing. (2006). Changsha Ranxing Information Technology Co., Ltd.

Wickham, H. (2007). Reshaping data with the reshape package. *Journal of Statistical Software*, *21*(12), 1–20.

Wickham, H. (2009). *Ggplot2: Elegant Graphics for Data Analysis*. Springer-Verlag New York.

Wickham, H. (2018). *Scales: Scale Functions for Visualization*.

Wickham, H. (2019). *Stringr: Simple, consistent wrappers for common string operations*. Manual.

Wickham, H. (2020). *Forcats: Tools for working with categorical variables (factors)*. Manual.

Wickham, H., Averick, M., Bryan, J., Chang, W., McGowan, L. D., François, R., … Yutani, H. (2019). Welcome to the tidyverse. *Journal of Open Source Software*, *4*(43), 1686. https://doi.org/10.21105/joss.01686

Wickham, H., & Bryan, J. (2019). *Readxl: Read excel files*. Manual.

Wickham, H., Francois, R., Henry, L., & Müller, K. (2017). *Dplyr: A Grammar of Data Manipulation*.

Wickham, H., & Henry, L. (2020). *Tidyr: Tidy messy data*. Manual.

Wickham, H., Hester, J., & Francois, R. (2018). *Readr: Read rectangular text data*. Manual.

Wickham, H., & Miller, E. (2020). *Haven: Import and export 'SPSS', 'stata' and 'SAS' files*. Manual.

Wielenberg, E. J. (2014). *Robust Ethics: The Metaphysics and Epistemology of Godless Normative Realism*. OUP Oxford.

Wu, A. M. S., & Lu, L.-s. (2011). Cognitive obstacles against organ donation: The influence of negative attitudes, norms, and traditional beliefs on Chinese people's intention to donate organs after death. *Journal of Community & Applied Social Psychology*, *21*(1), 87–93. https://doi.org/10.1002/casp.1054

Yadav, I., & Pasricha, A. (2019). Women Security: Educational Need to Promote Attitudinal Changes for Crime and Violence against Women in India. *IME Journal*, *13*(2), 135. https://doi.org/10.5958/2582-1245.2019.00015.0