Journal of Moral Education, 2014
Vol. 43, No. 4, 395–412, http://dx.doi.org/10.1080/03057240.2014.953043

Routledge
Taylor & Francis Group

Moral rationality and intuition: An exploration of relationships between the Defining Issues Test and the Moral Foundations Questionnaire

Rebecca J. Glover, Prathiba Natesan, Jie Wang, Danielle Rohr, Lauri McAfee-Etheridge, Dana D. Booker, James Bishop, David Lee, Cory Kildare and Minwei Wu
Department of Educational Psychology, University of North Texas, Texas, USA

Explorations of relationships between Haidt's Moral Foundations Questionnaire (MFQ) and indices of moral decision-making assessed by the Defining Issues Test have been limited to correlational analyses. This study used Harm, Fairness, Ingroup, Authority and Purity to predict overall moral judgment and individual Defining Issues Test-2 (DIT-2) schema scores using responses from 222 undergraduates. Relationships were not confirmed between the separate foundations and the DIT-2 indices. Using the MFQ moral judgment items only, confirmatory factor analyses confirmed higher order constructs called Individualizing and Binding foundations. Structural models using these higher order factors fitted the data well, and findings indicated that the Binding foundations significantly positively predicted Maintaining Norms and negatively predicted both overall moral judgment (N2) and the Postconventional Schema. Neither Individualizing nor Binding foundations significantly predicted Personal Interest. While moral judgments assessed by DIT-2 may not be evoking the MFQ foundations, findings here suggest the MFQ may not be a suitable measure for capturing more advanced moral functioning.

Keywords: moral reasoning, moral intuition, moral foundations

Rebecca J. Glover, Department of Educational Psychology, University of North Texas; Prathiba Natesan, Department of Educational Psychology, University of North Texas; Jie Wang, Department of Educational Psychology, University of North Texas; Danielle Rohr, Department of Educational Psychology, University of North Texas; Lauri McAfee-Etheridge, Department of Educational Psychology, University of North Texas; Dana D. Booker, Department of Educational Psychology, University of North Texas; James Bishop, Department of Educational Psychology, University of North Texas; David Lee, Department of Educational Psychology, University of North Texas; Cory Kildare, Department of Educational Psychology, University of North Texas; Minwei Wu, Department of Educational Psychology, University of North Texas. Correspondence concerning this article should be addressed to Rebecca J. Glover, College of Education, Department of Educational Psychology, University of North Texas, Denton, TX76203, USA. Email: becky.glover@unt.edu

Turiel (1983, p. 3) defined morality as 'prescriptive judgments of justice, rights and welfare pertaining to how people ought to relate to each other'. Grounded in Kohlberg's (Colby & Kohlberg, 1987) cognitive developmental perspective, much research in the moral domain has focused on aspects of moral reasoning related to the individual's understanding of social relationships as well as the ability to form and evaluate social judgments (Turiel, 2010).

This rationalist approach to moral functioning coming from philosophy stresses deliberate reflection in decision-making, emphasizing impartial perspective-taking and consideration of universal principles (Rawls, 1971). The cognitive development research paradigm in psychology built on these views in terms of both explicit reasoning and the capacity to cognitively move outside status quo thinking to consider alternative perspectives in light of universal principles (particularly justice) being signs of more sophisticated development (Kohlberg, 1984; Piaget, 1932). Cognitive development research has found both age and education consistently related to moral reasoning sophistication (Rest, 1986), with higher (postconventional) scores predicting attitudes toward social issues and public policy (Rest, Narvaez, Bebeau, & Thoma, 1999).

Haidt (Graham et al., 2011) has argued that this traditional perspective of morality has missed important aspects of the moral domain because of its almost exclusive focus on issues related to Fairness and Harm (indeed, Kohlberg placed justice as a central value) and challenged researchers to 'Go beyond harm and fairness!' (Haidt & Kesebir, 2010, p. 824). Incorporating discussions of loyalty, duty and self-control, Haidt proposed an alternative perspective of moral functioning focused less on justice reasoning and more on what he described as the functions of the moral system, that is, 'interlocking sets of values, virtues, norms, practices, identities, institutions, technologies, and evolved psychological mechanisms that work together to suppress or regulate selfishness and make cooperative social life possible' (Haidt & Kesebir, 2010, p. 800). Presenting the Social Intuitionist Model (SIM), Haidt (2001) envisions moral functioning largely as an unconscious process or moral intuition. Moral intuition is a type of cognition, although not a type of reasoning, according to Haidt, who argues that most moral judgments occur automatically and effortlessly as the result of moral intuitions and not as a direct product of reason.

Haidt and colleagues (Haidt & Kesebir, 2010) initially identified five moral foundations: Harm (i.e., regard for the suffering of others), Fairness (i.e., concern for unfair treatment, justice and rights), Ingroup (i.e., regard for loyalty, self-sacrifice and betrayal), Authority (i.e., issues related to social order, respect, fulfillment of duties related to role) and Purity (i.e., issues related to virtues of chastity and disgust). Haidt (2008) further categorized these foundations into two moral systems: one focuses on the rights and welfare of individuals (i.e., the *individualizing* approach) and the other focuses on group-binding loyalty as well as duty and self-control (i.e., the *binding* approach). Harm and Fairness are considered the individualizing foundations, while the binding foundations have been identified as those of Ingroup, Authority and Purity (Graham, Haidt, & Nosek, 2009).

Although Haidt (2012) has more recently revised the five foundations into six (i.e., Care/Harm, Fairness/Cheating, Liberty/Oppression, Loyalty/Betrayal, Authority/Subversion and Sanctity/Degradation), research regarding the SIM has been generated by responses to the Moral Foundations Questionnaire (MFQ) (www.YourMorals.org) which assesses the original five foundations. Using structural equation modeling, Graham et al. (2009) created latent variable models to assess the ability of political identity to predict use of Haidt's five foundations while controlling for age, sex, household income and education. In these analyses, two models were created: one that included moral relevance items (self-theories about moral judgment; e.g., *Whether or not someone did something to betray his or her group*) from the MFQ, and a second that included moral judgment items (concrete instances of moral judgment; e.g., *It is more important to be a team player than to express oneself*) (Table 1). Graham et al. (2011) contend that the moral judgment items function to more 'strongly trigger' the five sets of moral intuitions. Their findings indicated that individuals with more liberal political attitudes tended to be more focused on issues related to Harm and Fairness, endorsing the individualizing foundations, whereas individuals with more conservative political attitudes appeared to equally utilize all five foundations, hence endorsing both the individualizing and binding approaches (Graham et al., 2009). While these models confirmed relationships between the demographic variables and Haidt's foundations, neither examined relationships between the five foundations and a traditional measure of moral functioning.

In her appraisal of both the rationalist and the SIM approaches, Narvaez (2010) argues that the rationalist approach (from philosophers) historically emphasized a priori reasoning, narrowly focusing on conscious, explicit moral cognition. She criticized Haidt's intuitionist approach, on the other hand, for 'oversimplifying moral functioning' in that it provides a rather 'broad and imprecise discussion' of intuition (Narvaez, 2010, p. 165) and fails to take into consideration the many complexities of situational moral decision-making, which requires the partnership of both intuition and deliberation. Narvaez argued that Rest et al.'s (1999) neo-Kohlbergian view of moral judgment (using the Defining Issues Test - DIT) refocused the examination of moral reasoning away from verbalization towards measurement of tacit knowledge that develops prior to explicit, verbalizable understanding (measured by Kohlberg's Moral Judgment Interview). Like the MFQ, the DIT also measures implicit understanding. With the DIT, tacit knowledge is measured via schemas (generalized knowledge structures evoked by or applied to the situation) which include the Personal Interest Schema (PIS), representative of reasoning reflected in Kohlberg's Stages 2 and 3; the Maintaining Norms Schema (MNS), representative of Kohlberg's Stage 4; and the Postconventional Schema (PCS), drawn from Kohlberg's Stages 5 and 6 but is more inclusive (Narvaez & Bock, 2002; Thoma, 2006).

Narvaez (2010) maintains that both deliberation and intuition contribute to the understanding of moral functioning—just how they interact, however, is not clearly understood. Moreover, whereas use of the DIT has provided decades of empirical

Table 1. Items for the five foundations in the Moral Foundations Questionnaire (Graham et al., 2011)

Moral Relevance Items		
Harm	EMO	Whether or not someone suffered emotionally
	WEA	Whether or not someone cared for someone weak or vulnerable
	CRU	Whether or not someone was cruel
Fairness	TRE	Whether or not some people were treated differently from others
	UNF	Whether or not someone acted unfairly
	RIT	Whether or not someone was denied his or her rights
Ingroup	LUV	Whether or not someone's action showed love for his or her country
	BET	Whether or not someone did something to betray his or her group
	LOY	Whether or not someone showed a lack of loyalty
Authority	RES	Whether or not someone showed a lack of respect for authority
	TRA	Whether or not someone conformed to the traditions of society
	CHA	Whether or not an action caused chaos or disorder
Purity	DEC	Whether or not someone violated standards of purity and decency
	DIS	Whether or not someone did something disgusting
	GOD	Whether or not someone acted in a way that God would approve of
Moral Judgment Items		
Harm	ANI	One of the worst things a person could do is hurt a defenseless animal.
	COM	Compassion for those who are suffering is the most crucial virtue.
	KIL	It can never be right to kill a human being.
Fairness	FAI	When the government makes laws, the number one principle should be ensuring that everyone is treated fairly.
	JUS	Justice is the most important requirement for a society
	RIC	I think it's morally wrong that rich children inherit a lot of money while poor children inherit nothing.
Ingroup	HIS	I am proud of my country's history.
	FAM	People should be loyal to their family members, even when they have done something wrong.
	TEA	It is more important to be a team player than to express oneself.
Authority	KID	Respect for authority is something all children need to learn.
	SEX	Men and women each have different roles to play in society.
	SOL	If I were a soldier and disagreed with my commanding officer's orders, I would obey anyway because that is my duty.
Purity	HDG	People should not do things that are disgusting, even if no one is harmed.
	UNN	I would call some acts wrong on the grounds that they are unnatural.
	CHA	Chastity is an important and valuable virtue.

research (see Rest et al., 1999; Thoma, 2006), Haidt's recently created MFQ (Graham et al., 2011) has seen more limited use. While both have been established as reliable and valid instruments, interactions between the two have not been thoroughly investigated. In one published paper with undergraduates, Baril and Wright (2012) conducted two studies to examine these relationships by correlating scores on the MFQ (www.YourMorals.org) with those on the DIT (Rest, 1979) in Study 1, and with those on the DIT-2 (Rest, Narvaez, Thoma, & Bebeau, 1999) in Study 2. Both the DIT and DIT-2 generate overall measures of moral judgment (N2) as well as the three schema scores—PIS, MNS and PCS.

Results from Study 1 indicated weak bivariate correlations between both individualizing foundations and the three schema scores generated by the DIT, but none of the correlations were statistically significant. With regard to the binding foundations, Authority significantly correlated with both MNS ($r = .23$) and PCS ($r = -.24$), and Ingroup significantly correlated with all three schema—PIS (.26), MNS (.24) and PCS (−.40). However, Purity was not significantly correlated with any of the DIT schema scores (Baril & Wright, 2012).

Based on Haidt's theory, Baril and Wright (2012) also generated an Individualizing–Binding (*I–B*) score to represent the difference between the average of participants' *I* foundation scores and *B* scores, arguing that the difference between the two provided a measure of participants' relative prioritization of one system over the other. Higher scores mean *I* was favored. Results from Study 1 indicated that the correlation between the *I–B* score and PIS was not significant but the *I–B* score was significantly correlated with MNS ($r = -.26$) and PCS ($r = .27$), meaning the more participants prioritized the *I* foundations over the *B* foundations, the higher the level of postconventional reasoning.

Study 2 utilized DIT-2 (Rest et al., 1999). Again, Baril and Wright (2012) found no significant correlations with the Harm foundation and any DIT schema score, but data analyses did yield a significant correlation between Fairness and PCS ($r = .27$). Analyses using the *B* foundations yielded significant correlations between MNS and Ingroup ($r = .25$), Authority ($r = .33$) and Purity ($r = .28$), and between PCS and Ingroup ($r = -.26$). Finally, correlation analysis using the *I–B* score again indicated a significant negative relationship between the *I–B* score and MNS, but a significant positive relationship between the *I–B* score and PCS. Overall, Baril and Wright (2012) concluded there was support for relationships between PIS and the moral foundation of Ingroup, and also between MNS and Authority.

In their analyses, however, Baril and Wright (2012) did not utilize the N2 score generated by the DIT-2, which provides a measure of the degree to which one's moral reasoning indicates preference for postconventional reasoning as well as rejection of the less sophisticated schema focused on personal interests. Furthermore, Baril and Wright (2012) limited their analyses to a correlational design and did not explore predictive relationships between the moral foundations and indices of moral decision-making assessed by the DIT. Consequently, to better explore these relationships, this study investigated the ability of the MFQ (Haidt & Kesebir, 2010) to predict moral judgment scores generated by the DIT-2 using structural equation modeling.

Two competing hypotheses were tested here. Haidt (Graham et al., 2011) claims cognitive-developmental measures are focused only on the individualizing foundations (Harm and Fairness). If this is the case, then only Harm and Fairness should be related to DIT scores and the binding foundations should not be related to DIT scores at all. On the other hand, from a cognitive developmental perspective, the binding foundations may represent aspects of social conformity not prioritized in the highest levels of reasoning studied in cognitive developmental research

(i.e., postconventional thinking). In this case, the binding foundations should be negatively related to DIT postconventional score but positively related to personal interest and maintaining norms, schemas representative of less sophisticated reasoning.

Method

Participants

Students (n = 301) enrolled in an undergraduate core course at a large metropolitan university located in the southwestern United States (US) completed Haidt's MFQ) (www.YourMorals.org; Graham et al., 2011) and the DIT-2 (Rest et al., 1999) for course credit and provided voluntary consent for their responses to be used for research purposes. Of this number, 43 (14%) were eliminated by validity checks embedded within scoring procedures in either the MFQ or DIT-2, leaving 258 participants ranging in age from 18 to 51 years. Of these, 222 were between 18 and 24 years of age. Consequently, in that so few participants who had passed the validity checks were over the age of 24, these individuals were removed from analyses, leaving 43 males and 179 females (M age = 20.34, SD = 1.45), 65.8% of whom self-identified as non-Latino White. Of this sample, 27% self-reported as first-year college students, an additional 23.9% as sophomores, 32% as juniors and 16.7% as seniors. While data related to socioeconomic status was collected, it was ultimately not included in analyses as participants' questions during data collection indicated confusion related to interpreting questions regarding household income.

Procedures and measures

In addition to a demographic questionnaire, students completed Haidt's MFQ (Graham et al., 2011, p. 385) and the DIT-2 (Rest et al., 1999). The three measures were provided to the participants in one packet, and each participant completed the measures in the order of his/her preference in a classroom environment. The MFQ contains both moral relevance and moral judgment items. For the items categorized as moral relevance, respondents are asked, 'When you decide whether something is right or wrong, to what extent are the following considerations relevant to your thinking?' Respondents then rate the relevance of each item provided using a 6-point scale. For the items categorized as moral judgment, respondents are asked to use a different 6-point scale to rate their level of agreement/disagreement with each. One item from each category is used as a consistency check and is not included in the scoring process. Responses to the three relevance and three judgment items designated as measuring each of the five moral foundations are then combined to create an overall continuous score for each; higher scores indicate greater support for each foundation. Internal consistency for each foundation using these continuous scores has been reported as follows: Harm: Cronbach's α = .69; Fairness: α = .65; Ingroup: α = .71; Authority: α = .74; and Purity:

α = .84 (Graham et al., 2011). Alphas based on the sample for this study were Harm: α = .52; Fairness: α = .60; Ingroup: α = .59; Authority: α = .62; and Purity: α = .69.

The DIT-2 (Rest et al., 1999) serves as a paper-and-pencil alternative to Kohlberg's Moral Judgment Interview (Colby et al., 1987). The measure is a recognition task which presents the respondent with five hypothetical dilemmas, each accompanied by 12 items reflecting Kohlberg's Stages 2–6. After reading a dilemma, the respondent is asked to rate and rank each of its accompanying items in the order of its importance. Validity of the original DIT has been established using a variety of criteria, and reliability has been considered adequate, with Cronbach alphas reported in the upper .70s to low .80s. Compared with the original version, DIT-2 has demonstrated improved validity, and the correlation between the two has been established as .79 (Bebeau & Thoma, 2003). The DIT-2 generates an overall measure of moral reasoning (N2) as well as the three schema scores of PIS, MNS and PCS. The PIS score measures the individual's use of Stage 2 and 3 reasoning, with higher scores indicative of a focus on personal concerns, advantages to the self, and approval from authority figures. The MNS score measures use of Stage 4 reasoning, with higher scores indicating the individual's consideration of societal norms (law and order) in moral decision-making. Finally, the individual's use of Stage 5 and 6 reasoning is assessed in the PCS score, with higher scores indicating a consideration of equity and reciprocity across all groups, reflecting a greater sense of macro morality (Narvaez & Bock, 2002; Thoma, 2006).

The latent variable models presented in Graham et al. (2009) were utilized as the basis for the models tested in this study. Similar to Graham et al. (2009), two sets of models were created, each of which included demographic variables of age, sex, education and political liberalism (as assessed by the DIT-2, with higher scores indicating higher levels of conservatism). The first set of models also included the moral relevance items from Haidt's MFQ, while the second included the MFQ moral judgment items (see Graham et al., 2011, p. 385). In order to test the ability of the five moral foundations to predict moral decision-making, the DIT-2 scores for N2, PIS, MNS and PCS were included as dependent variables in separate structural models. For each model it was hypothesized that the demographic variables would predict use of the five moral foundations, and use of these latent constructs would, in turn, predict DIT-2 scores. Descriptive statistics for the sample are reported in Table 2 as well as population norms for the DIT-2 (http://ethicaldevelopment.ua.edu/files/2014/03/Norms-for-DIT2.pdf) using college undergraduates and the MFQ (Graham et al., 2011).

In that the response variables were ordinal in nature and the univariate normality assumption was not met, analyses were based on polychoric correlation and asymptotic covariance matrices (Jöreskog, 1994), as well as robust unweighted least squares estimation (McDonald, 1982). Using fixed thresholds for the underlying continuous response variables, polychoric correlations were computed.

Hu, Bentler, and Kano (1992) have recommended use of Satorra and Bentler's (1988) scaled χ^2 statistic when data may violate the multivariate normality

Table 2. Descriptive statistics (n = 222)

	Sample				Norms	
	Minimum	Maximum	Mean	SD	Mean	SD
N2	−1.90	69.13	27.93	12.99	34.76	15.45
Personal Interest	4	58	32.48	11.45	25.04	12.36
Maintaining Norms	6	68	32.97	12.73	35.06	13.89
Postconventional	4	70	29.88	12.65	35.09	15.21
Harm	1	5	3.58	.64	3.42	.84
Fairness	1.83	4.83	3.46	.60	3.55	.73
Ingroup	1.17	4.50	2.92	.70	2.26	.87
Authority	1	4.67	3.30	.64	2.27	.90
Purity	0.5	4.5	2.84	.83	1.54	1.08
Individualizing	1.92	4.67	3.52	.51		
Binding	1.06	4.11	3.02	.57		

assumption. This statistic is reported here, even though it was not used to assess model fit due to its sensitivity to sample size (Bollen, 1989; Chen, 2007; Cheung & Lau, 2012; Tucker & Lewis, 1973). Instead, model fit was assessed using the following: (1) the comparative fit index (CFI); (2) the root-mean-square-error of approximation (RMSEA), its 90% confidence interval, and test of close fit; and (3) the standardized root-mean-square-residual (SRMR). Values of CFI ≥ 0.95, RMSEA ≤ 0.05, and SRMR ≤ 0.08 were considered indicators of good model fit, with values of RMSEA between 0.05 and 0.08 indicating adequate model fit (Browne & Cudeck, 1993; Hu & Bentler, 1999; MacCallum, Browne, & Sugawara, 1996). A parameter estimate t value greater than ± 1.96 was considered the indicator of statistical significance for model paths (Kline, 2011).

Results

Means and standard deviations are presented in Table 2. Examination of mean scores indicates that participants in this study appear to utilize less sophisticated forms of justice reasoning than is typical for university undergraduates. The low N2 and PCS scores reported for this sample, in addition to the somewhat higher PIS score, would indicate that this sample is more focused on issues of personal concern and approval from authority than is typical for their comparable group. While norms reported for the MFQ foundations are not specific to university students, the higher Authority and Purity scores for this sample might also indicate a higher need for order and control of personal desires compared with the larger population.

Correlations among the five MFQ foundations are presented in Table 3. As expected, the two individualizing foundations (i.e., Harm and Fairness) were moderately correlated with each other. Similarly, the three binding foundations of

Table 3. Correlation matrix of latent variables

	Harm	Fairness	Ingroup	Authority
Fairness	.60			
Ingroup	.17	.27		
Authority	.10	.15	.74	
Purity	.19	.02	.63	.72

Ingroup, Authority and Purity also correlated well with each other. Table 4 presents the correlations between the DIT scores, the five foundations, and for the higher order constructs—Individualizing Foundations and Binding Foundations. Interestingly, while both N2 and PCS were negatively correlated with all MFQ scores, correlations between PIS and MNS and the MFQ scores were all positive. These are discussed further below.

Next, factor analyses were conducted. The measurement model with the MFQ moral relevance items was fitted to confirm the factor structure presented by Graham et al. (2009). Neither this model nor any alternate reasonable CFA models using the moral relevance items fit the data (CFI < 0.6, RMSEA > 0.1). Consequently, the moral relevance items were removed and replaced with the moral judgment items from the MFQ (see Graham et al., 2011, p. 385). A measurement model using the MFQ moral judgment items was then created that fit the data well and confirmed the factor structure presented by Graham et al. (2009).

Next, four structural models were then fitted to test the ability of the demographic variables to predict the MFQ factors; the factors were then used to predict overall moral judgment (i.e., N2) and each DIT-2 schema (i.e., PIS, MNS and PCS). All models were rejected, however, when the demographic variables were included as predictors of the latent factors (CFI < 0.8). Consequently, the demographic variables were removed, and the models were fitted again using only the latent factors representing the five moral foundations to predict N2, PIS, MNS and PCS. Although the fit indices were acceptable to retain each model, none of the separate factors in any model proved to be a statistically significant predictor (Table 5).

Table 4. Correlations between Defining Issues Test scores and Moral Foundations Questionnaire variables

	Defining Issues Test (DIT) N2	Personal Interest Schema (PIS)	Maintaining Norms Schema (MNS)	Postconventional Schema (PCS)
Harm	−.15	.06	.05	−.09
Fairness	−.18	.08	.04	−.10
Ingroup	−.21	.10	.23	−.27
Authority	−.22	.10	.24	−.27
Purity	−.19	.09	.24	−.25
Individualizing Foundations	−.21	.09	.06	−.12
Binding Foundations	−.25	.11	.28	−.31

Table 5. Model fit of Moral Foundations Questionnaire factors with Defining Issues Test -2 indices

	X^2_{SB}	*df*	*p*	CFI	RMSEA	SRMR
N2	132.96	90	0.002	95	0.05	0.071
Personal Interest	125.44	90	0.008	96	0.04	0.07
Maintain Norms	117.71	90	0.03	97	0.04	0.07
Postconventional	130.69	90	0.003	95	0.05	0.071

X^2_{SB}=Satorra–Bentler scaled χ^2

In that Graham et al. (2009) have previously identified Harm and Fairness collectively as the Individualizing foundations and Ingroup, Authority and Purity collectively as the Binding foundations, a second order confirmatory factor analysis was then used to confirm these two higher order constructs. The model fit the data well [χ^2 (84) = 135.58, CFI > .95, $p < 0.001$; RMSEA = 0.053]; Harm and Fairness loaded significantly on Individualizing foundations (.79 and .76 respectively) and Ingroup, Authority and Purity loaded significantly on Binding Foundations (.83, .89, and .78, respectively). Based on the findings of the CFA, the four structural models using the DIT-2 scores were then modified to incorporate use of these higher order scores.

Each structural model was again fitted to the data (Figures 1, 2, 3 and 4); Table 4 presents the polychoric correlations. The factor pattern coefficients of most items were medium–high, with the exception of KIL ('It can never be wrong to kill a human being'). This affects the convergent validity of the instrument for this sample. Some of the structure coefficients were large (> 0.4), indicating possible lack of discriminant validity. Structure coefficients in these models can be computed by multiplying the factor coefficients of the paths involved. For instance, for the model shown in Figure 1 the structure coefficient of ANI on Individualizing Behaviors can be computed as the product of the factor coefficient of ANI on Harm (0.5) and Harm on Individualizing Behaviors (0.72), that is 0.36.

Again, a parameter estimate *t* value greater than ± 1.96 was considered the indicator of statistical significance for model paths (Kline, 2011). Fit indices showed that the model for N2 fit the data well (see Figure 1; [$\chi^2(97) = 205.44$, $p = 0.00$; Satorra–Bentler scaled $\chi^2(97) = 138.18$, $p = 0.004$; RMSEA = 0.044; SRMR = 0.073; CFI = .95]. The model explained 9% of the variance in N2; Binding foundations served as the only statistically significant predictor.

Fit indices showed that the model for PIS also fit the data well (see Figure 2; [$\chi^2(97) = 212.70$, $p = 0.00$; Satorra–Bentler scaled $\chi^2(90) = 142.35$, $p = 0.002$; RMSEA = 0.046; SRMR = 0.075; CFI = .94]; however, neither higher order construct served as a statistically significant predictor. The model explained only 2% of the variance in PIS.

Fit indices showed that the model for MNS fit the data well (see Figure 3 [$\chi^2(97) = 200.91$, $p = 0.00$; Satorra–Bentler scaled $\chi^2(97) = 124.60$, $p = 0.03$; RMSEA = 0.04; SRMR = 0.073; CFI = .97]. The model explained 8% of the

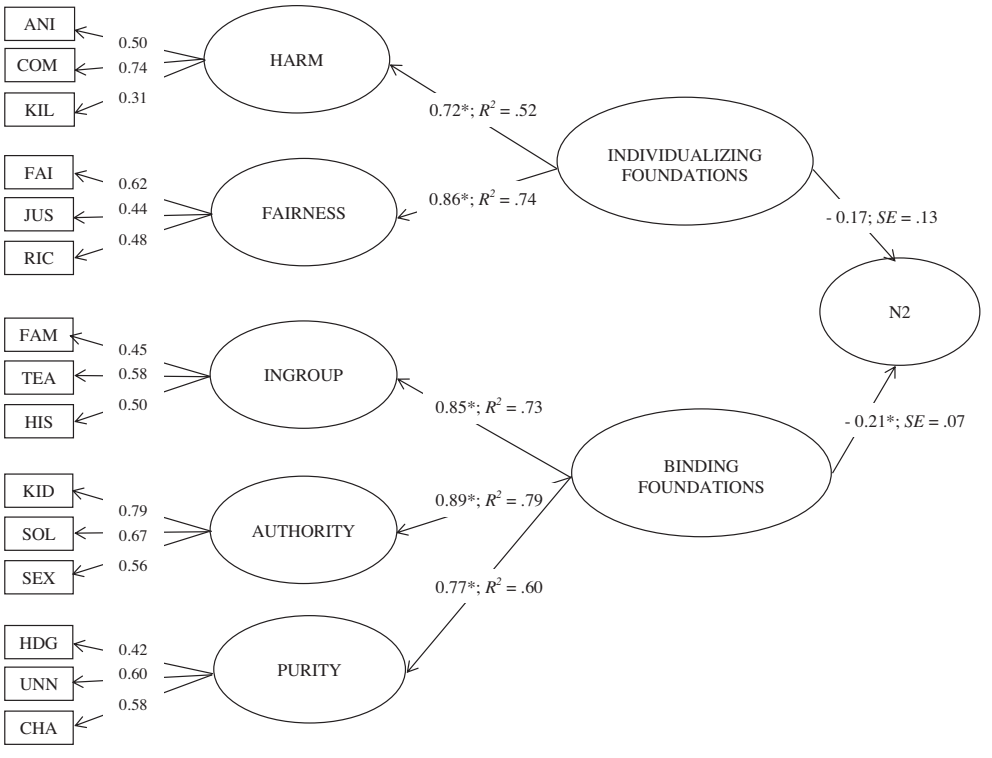

Figure 1. Structural equation model for N2; R^2 = .09; *t > ± 1.96

variance in MNS. As with N2, Binding foundations was the only statistically significant predictor.

Finally, fit indices also showed that the model for PCS fit the data well (see Figure 4; [$\chi^2(97)$ = 204.66, p = 0.00; Satorra–Bentler scaled $\chi^2(97)$ = 137.13, p = 0.005; RMSEA = 0.043; SRMR = 0.072; CFI = .95]. Here, the model explained 10% of the variance in PCS; again, Binding foundations was the only statistically significant predictor.

Discussion

Traditional perspectives of moral functioning have focused on measuring cognitive reasoning about justice, with an emphasis on the development of postconventional thinking (Kohlberg, 1984; Rest, 1986). Haidt (2008), on the other hand, has argued for the dominance of automatic judgment processes which rely on moral intuition. While some agreement exists that both perspectives contribute to a broader understanding of moral functioning (Narvaez, 2010), the manner in which the two are related has not been thoroughly investigated via empirical analysis. This study investigated the ability of Haidt's moral foundations to predict justice reasoning as assessed by the DIT. Specifically, the study explored relationships between the five foundations, as well as Individualizing and Binding foundations,

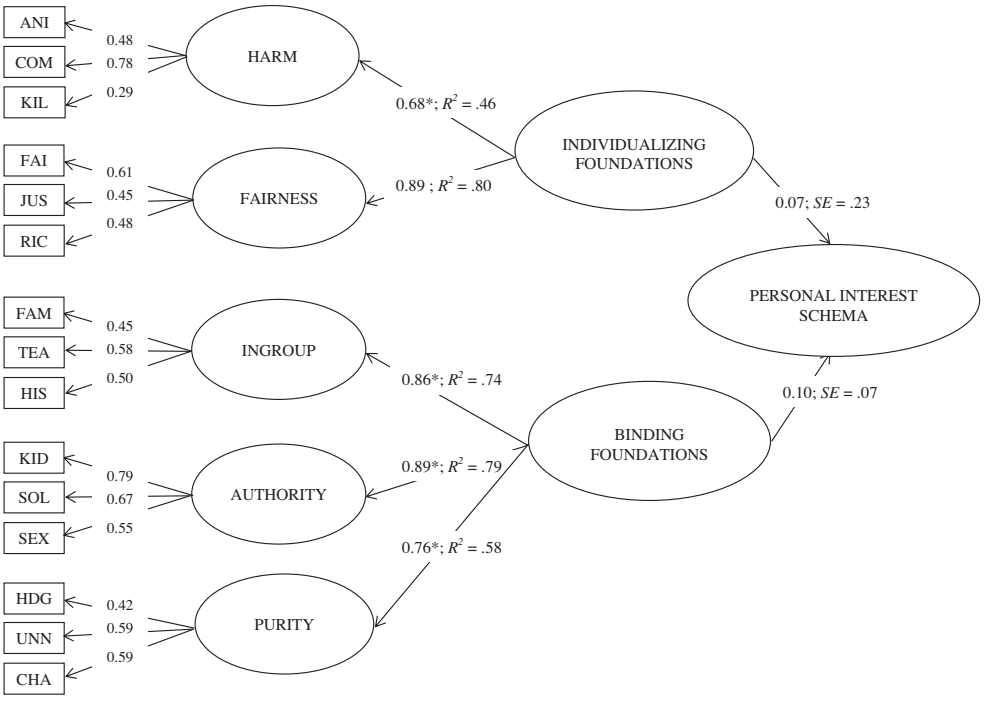

Figure 2. Structural equation model for Personal Interest Schema; R^2 = .02

and DIT-2 scores for N2, PIS, MNS and PCS using separate structural equation models (SEMs) for each.

While the models tested in this study did not confirm direct relationships between Haidt's separate moral foundations and aspects of moral decision-making as assessed by the DIT-2, analyses did confirm relationships using Individualizing and Binding foundations. The hypotheses are discussed.

Given Haidt's (Graham et al., 2011) argument that Harm and Fairness are the primary concerns of the rationalist perspective with its focus on justice reasoning, and given that the DIT-2 has long functioned as a reliable measure of such judgment, the first hypothesis anticipated that both Harm and Fairness (the Individualizing foundations) would be strong predictors of the DIT-2 schema, particularly with regard to N2 and PCS. This hypothesis was not supported. Furthermore, while both higher order factors made some contribution to variance explained in the models for N2, PIS and PCS, the Individualizing foundations contributed almost nothing to variance explained in the model for MNS, and failed to serve as a significant predictor of any of the DIT-2 schemas. While it may be concluded that the predictive relationship between Haidt's individualizing foundations and justice reasoning are limited at best, it could be equally likely that the moral judgments assessed by the hypothetical dilemmas utilized in the DIT-2 (Rest et al., 1999) are simply not evoking the foundations assessed by the MFQ. And perhaps the results would differ if the Liberty/Oppression foundation was

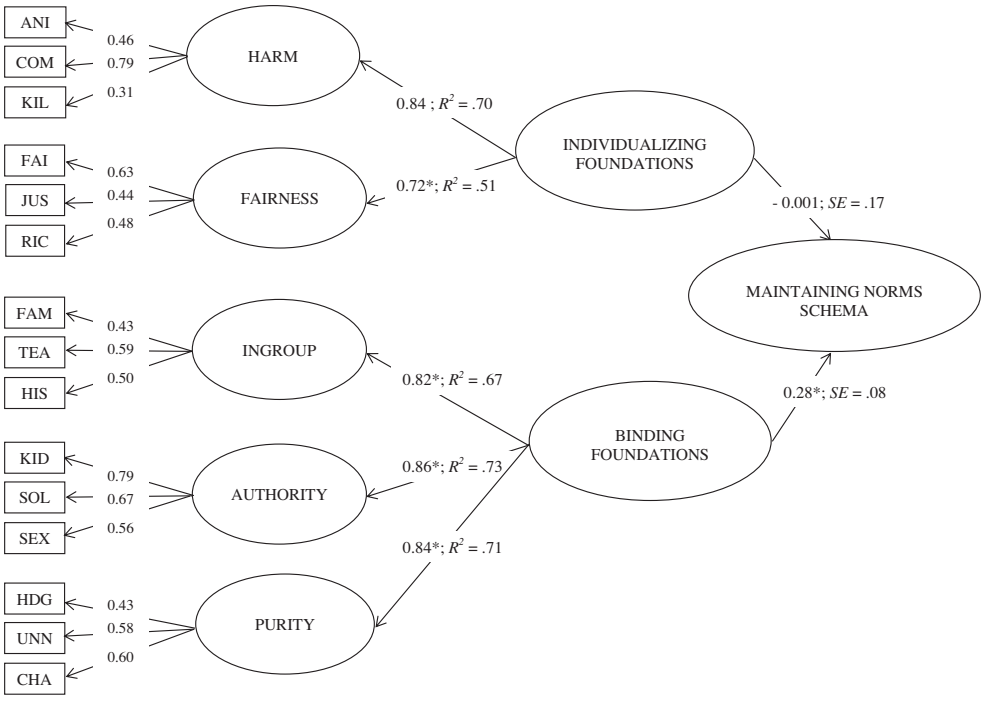

Figure 3. Structural equation model for Maintaining Norms Schema; R^2 = .08; $^{\star}t > \pm 1.96$

included (Haidt, 2012). Currently, the MFQ (www.YourMorals.org) assesses only the original five foundations. Future research using the revised foundations (and/or others not currently identified) and/or a measure of moral judgment other than the DIT-2 might yield findings different from those reported here.

Hypothesis two predicted that the binding foundations would be negatively related to postconventional reasoning, yet positively related to both the personal interest and maintaining norms schemas. The analyses supported the cognitive development hypothesis, that Binding foundations would be related to less sophisticated reasoning. Specifically, increased concern for the group-binding combination of loyalty, duty and purity (Binding foundations) was predictive of lower overall moral judgment (N2) as well as lower levels of postconventional thinking, the moral schema focused on consideration of shared ideals and full reciprocity. Moreover, Binding foundations was also predictive of a moral schema focused on the maintenance of an established social order (MNS). Across the models tested here, Binding foundations significantly negatively predicted N2 and PCS and positively predicted MNS. In that the focus of Binding foundations rests on loyalty and duty to one's group, their ability to predict higher support for societal norms is not surprising, nor is their ability to predict a lesser support for equity and reciprocity across all groups.

The results here conform to Maxwell and Beaulac's (2013) contention that Haidt's (2012) foundations are more representative of preconventional and

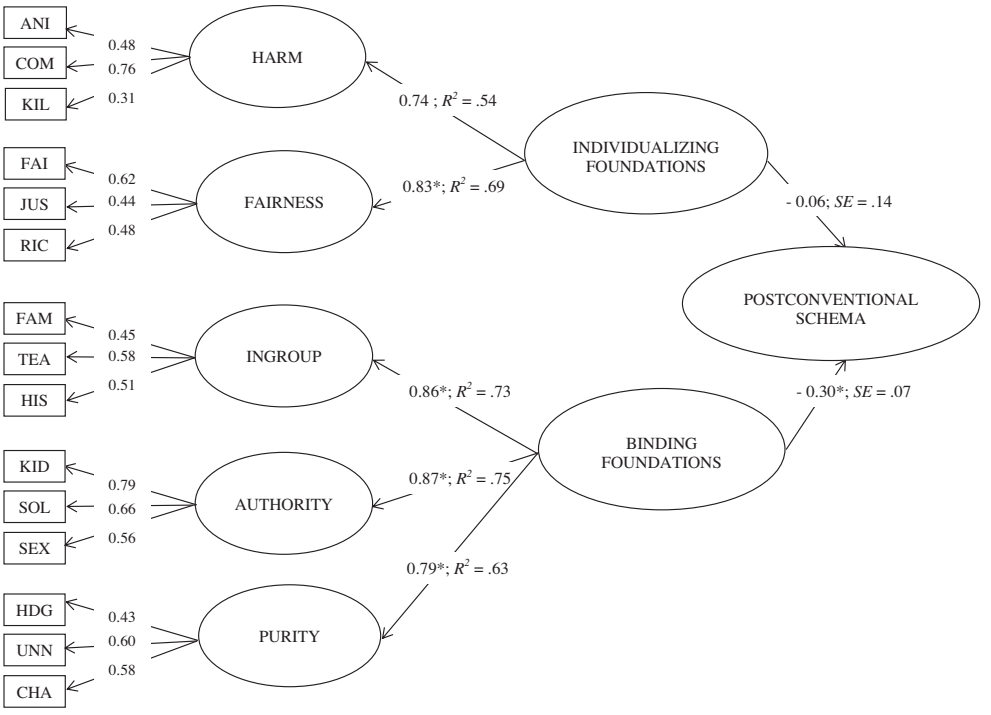

Figure 4. Structural equation model for Postconventional Schema; R^2 = .10; $^{\star}t > \pm 1.96$

conventional reasoning (i.e., PIS and MNS) than of postconventional reasoning (i.e., PCS). Postconventional thinking involves considering that 'moral obligations are to be based on shared ideals, are fully reciprocal, and are open to scrutiny (i.e., subject to tests of logical consistency, experience of the community and coherence with accepted practice)' (Rest et al., 2000, p. 388). Even though neither higher order score significantly predicted PIS, the models do demonstrate negative relationships between the Individualizing and Binding foundations and both N2 and PCS, while the same relationships with PIS and MNS were positive. Whereas the present study might suggest that the MFQ is not suitable for capturing the more advanced moral functioning reflected in the PCS, future research using a larger sample might work to confirm a more complete model as well as explore the contradictory findings and perspectives.

These findings also conflict with Baril and Wright (2012) who successfully utilized both the moral relevance and moral judgment MFQ items and demonstrated that higher prioritization of Individualizing foundations was related to PCS (and conversely, higher prioritization of Binding foundations was related to MNS). Here, models containing the MFQ moral relevance items did not fit this data well, and all models which did fit the data contained only the MFQ moral judgment items. Graham et al. (2011, p. 371) note that the moral relevance items are more abstract, self-theories about how individuals make a moral judgment and, as such,

may be 'inaccurate with regard to actual moral judgments', while the MFQ moral judgment items are more contextualized and might serve to more directly assess moral judgment. This might explain why only those models incorporating the moral judgments items fit the data; however, additional research is warranted to see if this is an issue unique to this study or if this pattern is consistent across multiple analyses.

Limitations and future directions

Characteristics of the sample created limitations for this study and might have mattered for the findings here. Unlike Haidt's (Graham et al., 2009) previous work, all models which included the demographic variables (i.e., age, sex, education, political liberalism) as predictors of the latent factors were rejected (CFI < 0.8) and, consequently, removed from further analysis. Demographics of this sample might work to explain this as, in addition to being predominately female (80.6%), it was younger in age (M = 20.34) than the sample utilized by Graham et al. (2009) (median age = 29) and likely represented a narrower range in terms of years of education.

Furthermore, at the time of data collection all participants were attending one large metropolitan university in the Southwest of the US.

Haidt (Graham et al., 2009) has argued that political conservatives tend to rely more on the Binding foundations, while political liberals tend to rely more on the individualizing foundations. Political liberalism for the sample in this study was assessed by an item on the DIT-2 wherein participants self-reported their political views using a 5-point scale (1 = very liberal; 5 = very conservative). The sample mean was 3.09 (.96), indicating only a slightly more conservative view overall. Graham et al.'s (2009) findings, on the other hand, were based on responses of 1613 individuals, collected via the internet. Using a 7-point scale (1 = strongly liberal; 7 = strongly conservative), 55.9% of the Graham et al. sample rated its political identity as liberal, 22.6% as moderate and 16.4% as conservative. Consequently, differences in political views of the two samples and the limited variance in political liberalism found in this particular sample may have resulted in the lack of a direct relationship between political perspective and the moral foundations. Future analyses using responses from subjects who vary more in their political perspective might yield different findings.

Participants who are more diverse in sex, race, level of education and geographic location would create a more heterogeneous sample and one more diverse in age would include more fully developed adults. Additionally, a larger sample size might allow for group comparisons (e.g., sex, education, political perspective) to explore differences in model fit and overall variance accounted for. Finally, data here is based on self-report measures and includes no behavioral assessments, both of which might create issues related to validity.

Conclusions and implications for moral education

This study sought to examine competing perspectives regarding social conformity and postconventionality using the DIT (Rest et al., 1999) and the MFQ (Graham et al., 2011). Undoubtedly, more work needs to investigate the relations among deliberate, tacit and automatic processes as well as how these forms of functioning are optimally assessed, and the role of moral education in enhancing all three. Haidt and Kesebir's (2010) call to 'Go beyond harm and fairness!' (p. 824) and incorporate discussions of loyalty, duty and self-control is not supported by the data here, and Blum (2013, p. 306) cautions that the Binding foundations are positive only to the extent to which they involve 'loyalty to authority with respect to something good'. He urges moral educators to assist students in recognizing the need to prioritize values, not just to have them. While findings here are limited and additional empirical research is warranted to better understand how these perspectives might collectively interact, the manner in which all three might be integrated into educational approaches designed to achieve more advanced moral functioning and promote cooperative social interactions remains to be investigated.

References

Baril, G. L., & Wright, J. C. (2012). Different types of moral cognition: Moral stages versus moral foundations. *Personality and Individual Differences, 53*, 468–473. doi:10.1016/j.paid.2012.04.018

Bebeau, M., & Thoma, S. J. (2003). *Guide for DIT-2*. Minneapolis: University of Minnesota Center for the Study of Ethical Development.

Blum, L. (2013). Political identity and moral education: A response to Jonathan Haidt's *The Righteous Mind*. *Journal of Moral Education, 42*, 298–315.

Bollen, K. A. (1989). *Structural equations with latent variables*. New York, NY: Wiley.

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136–162). Beverly Hills, CA: Sage.

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling, 14*, 464–504.

Cheung, G. W., & Lau, R. S. (2012). A direct comparison approach for testing measurement invariance. *Organizational Research Methods, 15*, 167–198.

Colby, A., & Kohlberg, L. (1987). *The measurement of moral judgment* (Vol. 1). New York, NY: Cambridge University Press.

Colby, A., Kohlberg, L., Speicher, B., Hewer, A., Candee, D., Gibbs, J., & Power, C. (1987). *The measurement of moral judgment: Standard issues scoring manual* (Vol. 2). New York, NY: Cambridge University Press.

Dong, Y. (n.d.). *Norms for DIT2: From 2005-2009*. Retrieved from http://ethicaldevelopment.ua.edu/files/2014/03/Norms-for-DIT2.pdf

Graham, J., Haidt, J., & Nosek, B. (2009). Liberal and conservatives rely on different sets of moral foundations. *Journal of Personality and Social Psychology, 96*, 1029–1046. doi:10.1037/a0015141

Graham, J., Nosek, B. A., Haidt, J., Iyer, R., Koleva, S., & Ditton, P. H. (2011). Mapping the moral domain. *Journal of Personality and Social Psychology, 101*, 366–385. doi:10.1037/a0021847

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

Haidt, J. (2008). Morality. *Perspectives on Psychological Science, 3*, 65–72. doi:10.1111/j.1745-6916.2008.00063.x

Haidt, J. (2012). *The righteous mind: Why good people are divided by politics and religion*. New York, NY: Pantheon Books.

Haidt, J., & Kesebir, S. (2010). Morality. In S. T. Fiske, D. Gilbert, & G. Lindzey (Eds.), *Handbook of social psychology* (5th ed., pp. 797–832). Hoboken, NJ: Wiley.

Hu, L.-T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1–55.

Hu, L.-T., Bentler, P. M., & Kano, Y. (1992). Can test statistics in covariance structures be trusted? *Psychological Bulletin, 112*, 351–362.

Jöreskog, K. G. (1994). On the estimation of polychoric correlations and their asymptotic covariance matrix. *Psychometrika, 59*, 381–389.

Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). New York, NY: Guilford Press.

Kohlberg, L. (1984). *Essays on moral development: The nature and validity of moral stage* (Vol. 2). San Francisco, CA: Harper and Row.

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1*, 130–149.

Maxwell, B., & Beaulac, G. (2013). The concept of moral domain in moral foundations theory and cognitive development theory: Horses for courses? *Journal of Moral Education, 42*, 360–382.

McDonald, R. P. (1982). Linear vs. nonlinear models in item response theory. *Applied Psychological Measurement, 6*, 379–396.

Moral Foundations Questionnaire. Retrieved from http://www.yourmorals.org/

Narvaez, D. (2010). Moral complexity: The fatal attraction of truthiness and the importance of mature moral functioning. *Perspectives on Psychological Science, 5*, 163–181. doi:10.1177/1745691610362351

Narvaez, D., & Bock, T. (2002). Moral schemas and tacit judgments or how the Defining Issues Test is supported by cognitive science. *Journal of Moral Education, 31*, 297–314. doi:10.1080/0305724022000008124

Piaget, J. (1932/1965). *The moral judgment of the child* (M. Gabain, Trans.). New York, NY: Free Press. (Original work published 1932).

Rawls, J. (1971). *A theory of justice*. Cambridge, MA: Harvard University Press.

Rest, J. (1979). *Development in judging moral issues*. Minneapolis: University of Minnesota Press.

Rest, J. (1986). *Moral development: Advances in research and theory*. New York, NY: Praeger.

Rest, J., Narvaez, D., Bebeau, M. J., & Thoma, S. J. (1999). *Post-conventional moral thinking: A neo-Kohlbergian approach*. Mahwah, NJ: Erlbaum.

Rest, J., Narvaez, D., Thoma, S. J., & Bebeau, M. J. (1999). DIT2: Devising and testing a new instrument of moral judgment. *Journal of Educational Psychology, 91*, 644–659.

Rest, J. R., Narvaez, D., Bebeau, M., & Thoma, S. (2000). A neo-Kohlbergian approach to morality research. *Journal of Moral Education, 29*, 381–395.

Satorra, A., & Bentler, P. M. (1988). Scaling correlations for chi-square statistics in covariance structure analysis. *Proceedings of the Business and Economic Statistics Section of the American Statistical Association, USA, 1*, 308–313.

Thoma, S. J. (2006). Research on the Defining Issues Test. In M. Killen & J. G. Smetana (Eds.), *Handbook of moral development* (pp. 67–91). Mahwah, NJ: Erlbaum.

Tucker, L. R., & Lewis, C. (1973). A reliability coefficient for maximum likelihood factor analysis. *Psychmetrika, 38*, 1–10.

Turiel, E. (1983). *The development of social knowledge: Morality and convention*. Cambridge: Cambridge University Press.

Turiel, E. (2010). Thought, emotions, and social interactional processes in moral development. In M. Killen & J. G. Smetana (Eds.), *Handbook of moral development* (pp. 7–35). Mahwah, NJ: Erlbaum.