SEX DIFFERENCES IN MORAL REASONING: THE ROLE OF INTELLIGENCE AND LIFE HISTORY STRATEGY

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ABSTRACT

The manner in which sex interacts with intelligence and life history strategy to predict moral reasoning was examined using a sample of early adolescents. Hierarchal regression revealed that for males, intelligence was positively and significantly associated with the level of moral reasoning. However, for females intelligence was not predictive of the level of moral reasoning. Alternatively, for females slow life history strategy was positively associated with the level of moral reasoning, while for males it was not. The results add to the growing understanding of individual differences in moral decision making. However, some caution is warranted when drawing conclusions given the size of the sample

Key words: *Sex differences, moral reasoning, life history strategy, intelligence*

INTRODUCTION

The adoption of evolution as the guiding framework for psychological functions (Buss, 1995) has led to the renovation of many of Psychology's most important and influential theories (e.g., Badcock, 1998; Dunkel & Sefcek, 2009; Kenrick, Griskevicius, Neuberg, & Schaller, 2010). Especially useful in breathing new life into established, but possibly stagnant, approaches has been the mid-level evolutionary model called Life History (LH) theory. LH theory is based on the premise that organisms necessarily and consistently face trade-offs in how to allocate their limited resources throughout their development. According to LH theory, the outcome of these trade-offs is that natural selection shapes the timing of key developmental events (e.g., age of puberty/rate of maturation, gestation time,

interbirth intervals) of an individual's life. These developmental trade-offs have been identified as involving the allocation of resources toward somatic effort (i.e., maintenance and growth) or reproductive effort. Within reproductive effort, further allocations are needed toward mating effort or parental and kin investment. Another trade-off is between present and future reproduction. Organisms are said to have a fast LH strategy to the extent that they allocate resources toward reproduction (over somatic effort) and specifically toward mating effort and present reproduction (over parenting effort and future reproduction). Alternatively, organisms that allocate more resources toward somatic effort (growth and maintenance) and with reproductive resources focused on parental and kin investment are said to have a slow LH strategy. Theoretically, selection should favor an adaptive clustering of various psychosocial traits as a result (e.g., Figueredo, Vasquez, Brumbach, Kisner, & Jacobs, 2005). Differences in LH strategies between individuals can be seen in indicators such as the rate of maturation, age at sexual debut, sociosexuality, and parenting effort. Individuals who have a fast LH strategy tend to reach puberty earlier, have an earlier sexual debut, a greater number of sexual partners, and decreased parental investment. Individuals with a slow LH strategy tend to delay puberty and sexual debut, have a fewer number of sexual partners, and greater parental investment (e.g., Belsky, Steinberg, & Draper, 1991). Following previous efforts at reexamining older psychological theories through the application of LH theory, we look at the role that individual differences in LH strategies may have in explaining differences in moral reasoning. To this end, we review Kohlberg's theory of the stages of moral reasoning and research on LH theory and morality prior to positing and testing hypotheses on how the two approaches may be allied.

Kohlberg's Stages of Moral Reasoning

Kohlberg (1981) used Piaget's (1948) understanding of cognitive development and moral reasoning as the foundation for creating a grand and detailed theory of the development of moral reasoning. In Kohlberg's theory, development is qualitative in nature, defined by six developmental stages with each stage involving a greater level of cognitive sophistication. In the first two stages, both of which comprise the Preconventional level, moral judgments are based on consequences. If the outcome of an action is satisfying (e.g., receiving praise) then the action itself is by default judged as morally correct or admissible. In the next two stages, or Conventional level, there is an internalization of values and morals from outside the individual (e.g., authority figures). The development of internal moral structure allows judgments of right or wrong to be determined with a degree of independence of the outcome of the action. For example, individuals can break the law and not get caught and punished, but are still seen as doing something wrong because they broke the law. The last two stages make up the Postconventional level of moral reasoning. In defining this level, Kohlberg (1981, p. 18) writes, "At this level, there is a clear effort to define moral values and principles that have validity and application apart from the authority of the groups or people holding these principles and apart from the individual's own identification with these groups." Thus, in contrast to the Conventional level, the individual may feel compelled

under some circumstances to work to change or even break a law considered unjust. While rightly seen as a developmental theory in which age is the predominant predictor of interindividual variability in reasoning stage, other predictors that may account for individual differences in moral reasoning have also received focus. Chief among these predictors have been intelligence and gender.

Because Piaget's cognitive developmental model forms the basis for Kohlberg's theory, Kohlberg's theory is truly a cognitive-developmental theory and one would expect that not only increasing levels of cognitive sophistication corresponding with age, but also individual differences in cognitive ability would be predictive of the level of moral reasoning. Indeed this was predicted by Kohlberg and has consistently garnered empirical support (e.g., Kohlberg, 1984; Rest, 1979). More intelligent individuals exhibit higher levels of moral reasoning. In a review of the findings, Kohlberg (1984) estimated a correlation between the level of moral reasoning and intelligence at $r = .30-.50$. Rest (1979) made a similar estimate, and research consistently shows that intelligence is also predictive of moral action (Kohlberg & Candee, 1984; Ruffle & Tobol, 2015). Kohlberg predicted that the relationship between the level of moral reasoning and general cognitive ability would be moderate in strength, such that there is significant overlap but a greater degree of independence between the two constructs; although results have also indicated a stronger relationship leading to questions of discriminant validity (e.g., Sanders, Lubinski, Benbow, 1995; but also see e.g., Derryberry, Jones, Grieve, & Barger, 2007; Thoma, Derryberry, & Narvaez, 2009).

In part because Kohlberg's original work used a male only sample, a well-recognized criticism is that the theory has an inherent gender bias (Gilligan, 1993); a criticism which presumes a difference in moral reasoning between the sexes. Following the ideas of Erik Erikson (1968) that the development of male identity precedes the capacity for intimacy while the development of female identity often occurs with the inverted sequence of the two psychosocial stages, Gilligan (1993) proposed that the effect of possible decisions on interpersonal relationships is weighed heavily in female's moral judgments. To make this point, Gilligan (1993) contrasts the responses of two 11 year-old children judged to be of equal intelligence, one male and one female, to the Heinz dilemma in which Heinz is faced with the death of his wife if he doesn't steal medicine from a druggist. "Both children thus recognize the need for agreement but see it mediated in different ways- he impersonally through systems of logic and law, she personally through communication in relationships" (Gilligan, 1993, p. 29). However, the preponderance of evidence indicates no mean differences in the level of moral reasoning between the sexes (e.g., Al-ansari, 2002; Derryberry et al., 2007; Kohlberg, Levine, & Hewer, 1983) or even that females score slightly higher (Rest, Thoma, Moon, & Getz, 1986). On the other hand, Kohlberg (Kohlberg et al., 1984) does concede that his original scoring system may have discounted Gilligan's (1993) relationship-based morality and that both an ethic of care and an ethic of justice are important and used by individuals when making moral judgments, but he also states that there are not systematic sex differences in balance between the two ethics.

Another criticism of Kohlberg's approach is that he incorrectly places moral decision making under the jurisdiction of reason (Haidt, 2001). According to Moral Foundations Theory (Haidt & Graham, 2009) while reason can be applied to moral dilemmas, most often it is not (note that this does not imply that decisions are never reasoned). Moral decisions tend to be laden with emotion, and gut reactions drive the responses to moral dilemmas. Controlled thinking most often follows these reactions to moral dilemmas forming a justification to the decision that is actually based upon emotion. These affective responses emanate from the five moral domains or intuitions of harm/care, fairness, purity/divinity, in-group loyalty, and respect for authority.

Slow LH strategy in adulthood has been implicated in increased strength of moral judgment across all of the five ethical domains of harm/care, fairness, purity/divinity, in-group loyalty, and respect for authority (Gladden, Welch, Figueredo, & Jacobs, 2009; Gladden, 2011). Gladden et al. (2009) found that the five ethical domains exhibited strong intercorrelations forming a single moral intuitions factor and that measures of slow LH strategy were positively associated with this moral intuitions factor. Van Leeuwen, Koenig, Graham, and Park (2014) analyzed the relationship between the five moral foundations and numerous individual-level (e.g., education level) and state-level (e.g., teenage birth rates) variables. While results varied across indices, Van Leeuwen et al. (2014) concluded that state-level environmental factors associated with LH strategy were important factors in predicting the five moral foundations while cognitive differences between individuals, as measured by education, only had a small effect.

To summarize research indicates the importance of both emotion and reason in moral decision making. Unsurprisingly, reasoned moral decisions show at least a moderate association with intelligence. More recently, it has also been found that LH strategy plays a role in emotion based moral decisions. It follows that if one is more likely to apply reason to moral dilemmas then level of intelligence should be more predictive of decision making. Alternatively, if one is more likely to incorporate emotion into moral decision making then LH strategy should be more predictive of decision making.

A recent meta-analysis on gender differences in response to moral dilemmas adds additional insight. Friesdorf, Conway, and Gawronski (2015) tested the gender differences in moral reasoning using a dual-process model which distinguishes between affectively based and cognitively based processes. Consistent with hypotheses, Friesdorf et al. (2015) found a moderately sized gender difference in affect based judgments with women scoring higher. Conversely, men exhibited a slightly greater (small effect size) tendency to make utilitarian decisions. Thus if LH strategy plays a great role in judgments where the influence of emotions is greater, the meta-analytic findings suggest that LH strategy will be a significant predictor of moral decision making for females. On the other hand, if cognitive ability is more influential when the utility of the judgment is more important, the meta-analytic findings suggest that cognitive ability will be a significant predictor of moral decision making for males. These are the predictions we set out to test using archival data from the Block and Block (2006a, 2006b) data set.

METHOD

Participants

The Block and Block (2006a) longitudinal study was utilized. The Block and Block study spanned thirty years (Block & Block, 2006a) beginning when participants were in preschool; a variety of psychosocial measures were administered to participants at each wave of data collection. The complete sample for the wave of data collection when participants were age 14 (the wave of data used in the current analyses) included 52 males and 54 females. Seventy-one of the participants were White, 27 were Black, five were Asian, and three were categorized as "other". The sample is described as heterogeneous with regards to socioeconomic status (Block & Block, 2006a), but with slight overrepresentation of the middle class (Funder & Block, 1989).

Intelligence. Intelligence was measured using the total score of the Wechsler Intelligence Test for Child (WISC). The WISC was administered to participants when they were 11 years of age. However, test scores reflecting individual differences have been found to remain stable over this three year period of time from age 11 to age 14 when the other measures were administered (e.g., Deary, Pattie, & Starr, 2013).

LH Strategy. LH strategy was measured using the Q-sorted California Q-set items (CAQ; Block 1978) measure of LH strategy (Sherman, Figueredo, & Funder, 2013). The California Q-set (Block, 1978) is a variety of 100 short statements describing aspects of an individual's disposition (e.g., is moralistic, is self-defeating, physically attractive). The Q-set items are designed to be Q-sorted, that is, arranged in piles based on the degree to which the statements describe a concept or an individual. Often these sorts are arranged in a normal distribution with items that are extremely non-descriptive or extremely descriptive of the target placed in the far left or right columns.

A common method for scoring Q-sorts is the template or prototype approach (Block, 1978). In this approach, experts arrange the Q-set to describe a prototype and then individual's sorts are correlated with the resulting template. Sherman, Figueredo, and Funder (2013) developed a CAQ measure of LH strategy using the prototype approach, which Dunkel, Summerville, Mathes, and Kesserling (2015) subsequently validated and slightly refined using the Block and Block (2006) data file.

At age 14 four trained raters used the CAQ to rate each participant's personality. The sorts for each participant were aggregated across raters. Each participant's aggregated sort was transposed and correlated with the LH prototype. The resulting correlational coefficient was the participant LH score.

Moral Reasoning. Moral reasoning was measured using the Defining Issues Test (DIT; Rest, 1979; 1986). The DIT is based on a slightly different theoretical approach than Kohlberg's original conceptualization of his stage theory, primarily in that it conceptualizes moral

reasoning in terms of schema over stages (Rest, Narvaez, Bebeau, & Thoma, 1999a; 2000) and uses a multiple choice instead of interview format. Thus the DIT (Rest, 1979) is an objective measure of moral reasoning that consists of six moral dilemmas. For each dilemma participants are given issues that parallel Kohlberg's six stages of moral development, two exploratory substages, and one or more nonsense distractors. For each dilemma they are instructed to pick the four issues that they find most important in solving the dilemma. They are then instructed to rank the four issues in importance. The rankings provide weights for the choices, i.e., the first choice would be scored four; second choice, three; etc. Scoring involves categorizing weighted choices by stage and summing. The principled morality score (P score reported by Block and Block) involves summing the weighted stage 5 and 6 choices over the six moral dilemmas.

RESULTS

Because sex differences were posited, the sample was split by sex. Next, correlations among study variables were calculated. The results of these correlations can be seen in Table 1. As can be seen in Table 1, for males there was a statistically significant positive correlation for intelligence and moral reasoning, and intelligence and LH strategy. Moral reasoning and LH strategy were not significantly correlated. For females only the positive correlation between moral reasoning and LH strategy approached significance

Table 1: Correlations among Study Variables by Participant Sex

	P-Score	Intelligence	LH Strategy
P-Score		.56***	.08
Intelligence	.11		.46***
LH Strategy	.26†	.11	

Note: †p < .10; **p < .01; ***p < .001. Males above the diagonal and females below the diagonal.

To further examine these patterns a hierarchical regression was conducted in which dummy coded sex (males = 0 and females = 1), intelligence score (standardized), and LH strategy (standardized) were entered in Step 1. Next three interaction terms (intelligence × sex, LH strategy × sex, and intelligence × LH strategy) were created by multiplying the variables. The three products were entered in Step 2. An initial model with a three-way interaction representing the intelligence × LH strategy × sex product entered in Step 3 was tested, but because the three-way interaction was not significant the model was rerun sans the three-way interaction.

The results of the hierarchal regression can be seen in Table 2. As seen in Table 2, with regard to the overall models, the amount of variance accounted for in Step 1 was significant and Step 2 explained a significant amount of additional variance. While intelligence was the only variable in Step 1 that accounted for a significant amount of variance, it was superseded

by a significant intelligence × sex interaction in Step 2. Additionally, in Step 2 the LH strategy × sex interaction was significant. To assist in interpreting these interactions, the interactions were plotted in line graphs. As seen in Figure 1, for men as intelligence increases so does the P score, while for women there is a slight decrease in P score as intelligence increases. As seen in Figure 2, for both men and women, slower LH strategy (i.e., "higher" in figure) is associated with increasing P scores, but the trend is stronger for women.

Table 2: Regression Analysis Predicting P Score by Sex, Intelligence, and Life History Strategy

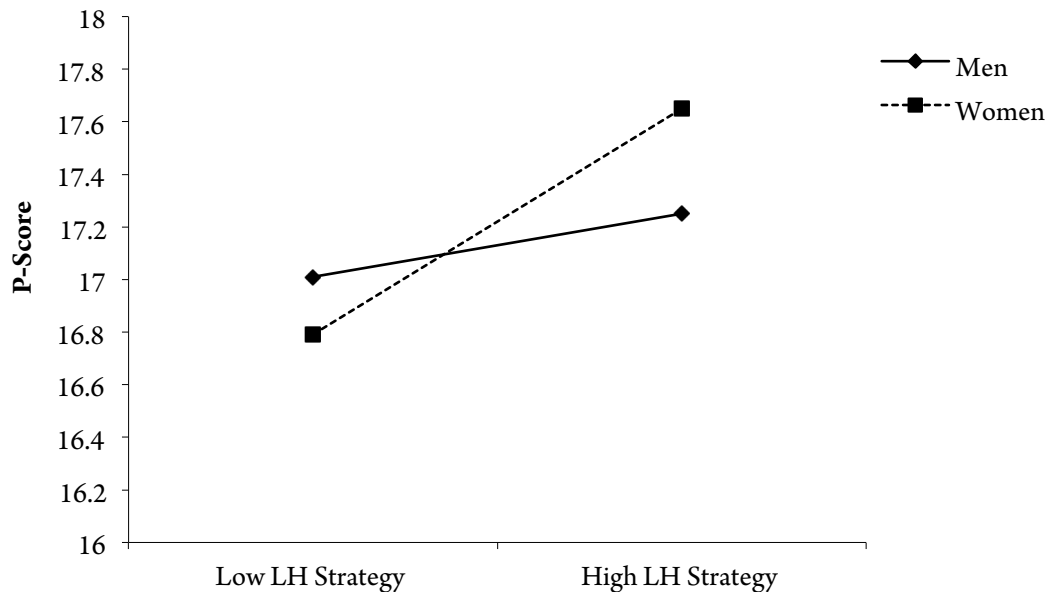|	Step 1	Step 2
Sex	.09	.14
Intelligence	32**	.64**
LH Strategy	.12	-.15
Sex * Intelligence		-.40**
Sex * LH Strategy		.31*
Intelligence * LH Strategy		-.00
ΔR^2	.13**	.10*

Note: *p < .05; **p < .01

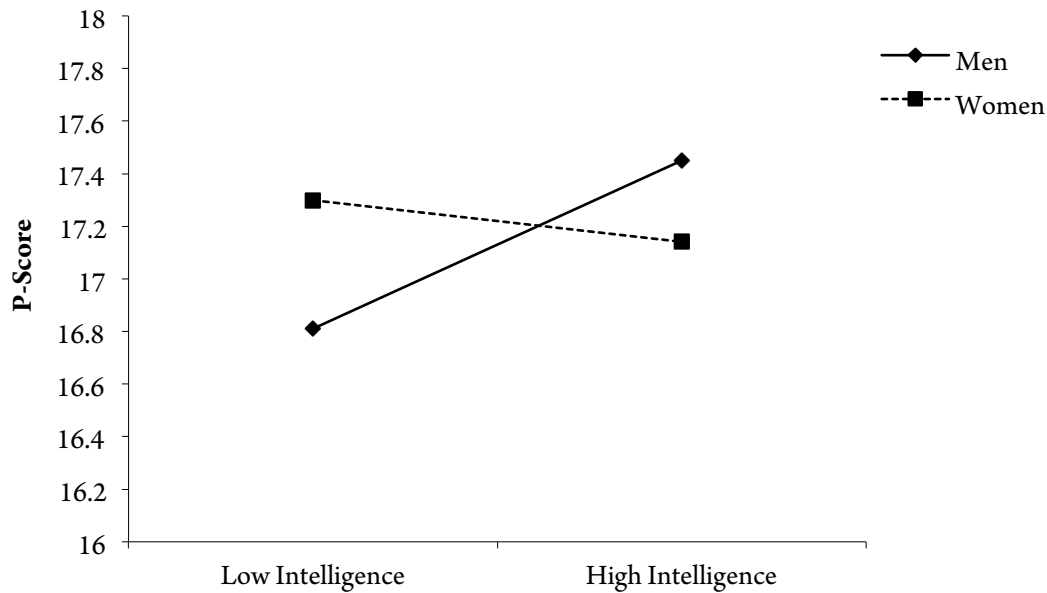**Figure 1:** P-score by Sex and LH Strategy

Figure 2: P-score by Sex and IQ

DISCUSSION

This study was based on the wider premise that viewing psychological theories that were established prior to the availability of the meta-theoretical framework offered by Evolutionary Psychology (Buss, 1995) could produce fresh insights when said framework is applied. And LH theory appears to be especially applicable (e.g., Kenrick et al., 2010). In this instance LH strategy was used to better understand Kohlberg's theory of the development of moral reasoning.

While it has long been recognized that cognitive ability is predictive of moral reasoning (Kohlberg, 1984), the possibility of sex differences in moral reasoning has been more contentious (Kohlberg, 1984; Gilligan, 1993). However, a recent meta-analysis on sex differences in moral decision making lends support to the assertion that men and women approach moral dilemmas differently. Men may be more reliant on cognitive processes when making moral decisions. Thus given that men may be more apt to use cognitive processes when making moral decisions and cognitive ability is predictive of the level of moral reasoning, we ventured that intelligence would be especially predictive of level of moral reasoning for men. The significant correlation between moral reasoning and intelligence for males was supportive of this hypothesis.

Because LH strategy is predictive of the use of intuitive moral judgments emanating from emotional responses (Gladden et al., 2009), and women are more likely to utilize affective

processes when making such judgments (Friesdorf et al, 2015), it was predicted that LH strategy would be predictive of moral reasoning for women. While not significant, the association between LH strategy and moral reasoning, for women, trended in the predicted direction. However, the results of the hierarchical regressions were consistent with each of the hypothesized interactions.

There is an additional finding that needs mentioning. For men, there was a significant association between LH strategy and intelligence. The relationship between intelligence and LH strategy has been the focus of a great deal of theoretical and empirical attention (Sefcek & Figueredo, 2010; Rushton, 1985). In a review of the research Woodley (2011) found that the two variables, LH and intelligence, were only slightly positively correlated. Woodley's (2011) finding fits well with the independent interactive effects of intelligence and LH strategy that were found in the current analyses, but are contrary to the positive association that was found. The association between LH strategy and intelligence could be a function of the CAQ measure of LH strategy. The CAQ measure of LH strategy was not included in Woodley's (2011) analysis, and CAQ based measures of aspects of personality that are associated with LH strategy have been found to be strongly correlated with intelligence (Dunkel, 2013). As to why such an effect may only appear in men we cannot venture. It is hoped that future research is directed at answering some of these questions.

Of course, there are additional limitations to the study. First and foremost, the sample is small. However, while sample size is a methodological issue, the theoretical question as to the evolution of the sex difference in which cognitive ability in males predicts moral reasoning whereas LH strategy predicts moral reasoning in females also remains. Here we would like to conjecture hypotheses that could be examined in future research. LH strategy may be especially predictive of women's moral reasoning because women have played the primary role of caretaker. Women who exhibit a slower LH strategy may be more likely to form and rely upon extended interpersonal relations to assist in childcare, and prosocial post conventional schema may help in the formation and maintenance of these networks. Lesser parental investment, as seen in a fast LH strategy, may free women from the need to from reciprocal interpersonal arrangements. Alternatively, it could be that while LH strategy assists women in intimate interpersonal networks, the larger networks preferred by men rely more upon cognitive ability for their formation and maintenance (Baumeister, 2010). Obviously, these explanations are speculative; however, they supply ample direction for future research.

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independent assessments based on personality and cognitive Life, Observational, Test, and Self-report (LOTS) measures.

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