

The Association Between Reading Motivation and Reading Achievement in Chinese Students: Exploring the Role of Personality

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ABSTRACT

It is documented that individualistic (Western) versus collective (Eastern) societies may have different expectations of students. For example, compared to their Western counterparts who tend to be more intrinsically motivated to learn, learning in China tends to be characterized by group-level success, being prideful and ensuring positive career outcomes. Further, it is possible that individual differences, such as personality, may be mediating the relationship between reading motivation and achievement. Therefore, the purpose of this study was to explore the associations between reading motivation, personality traits and reading grade in a sample of students from Mainland China ($n = 422$) between the ages of 11 and 19 ($M = 14.61$, $SD = 1.55$). Using path analysis, we examined if reading motivation might be working indirectly through individual personality traits to influence reading grade in this sample. Our results highlight the role of individual differences in the relationship between reading motivation and achievement. Further, results of our study emphasize the importance of fostering Openness, particularly within Chinese students, as it could be associated with higher reading achievement. Taken together, our results suggest that educators working with Chinese students should consider individual differences when fostering reading motivation to increase reading achievement in students.

Keywords: reading, reading motivation, personality, Chinese students

INTRODUCTION

The association between reading motivation and reading achievement has been the subject of an abundance of educational research [1-3]. Much of the research on these topics has been based on Western samples, demonstrating that a lack of motivation is generally associated with poorer reading achievement [1, 4-6]. However, we are less sure about the relationship between these variables in Eastern samples (e.g., Chinese students). Given educational differences

within a Chinese sample versus a Western sample [7], it may be important to examine the association between reading motivation and achievement in non-Western samples. Furthermore, while motivation to read has generally been associated with reading achievement, this relationship may be indirectly influenced by individual personality traits. Research has found associations between reading motivation and personality traits with reading achievement in Western samples [8], but we lack research regarding how these three variables may be working together within a Chinese sample. We are therefore interested in exploring how these three constructs relate to each other within a Chinese sample to better inform our understanding of reading ability amongst Chinese students.

The Relationship between Reading Motivation and Reading Ability

There has been an abundance of research positively linking motivation to read and reading achievement in children and adolescents [2, 3, 9]. While we acknowledge that the motivation to read is multidimensional [1, 10, 11], and the relationship between motivation and reading achievement can be bidirectional [2], there is a growing body of literature to suggest that reading motivation predicts reading achievement [4-6]. Most researchers focus on the motivational dimensions of intrinsic and extrinsic reading motivation [13]. Therefore, for the purposes of the current study, we were influenced by the fundamental framework of Guthrie, Wigfield and colleagues [1, 12, 14, 15] who advocated a focus on the influence of intrinsic and extrinsic motivation with reading achievement. Intrinsic motivation is defined as the act of doing based on inherent satisfaction or motivation originating within oneself, while extrinsic motivation refers to the act of doing for its instrumental value or motivation based on external stimuli [16]. Generally, extrinsic motivation is negatively associated with reading achievement, specifically within Western samples, with the reverse being true for intrinsic motivation [5]. Research that explored the constructs of intrinsic and extrinsic academic motivation suggested that Chinese students' motivation to learn may be different than their Western counterparts [7]. For example, while intrinsic and extrinsic motivation appear to be opposing factors in Western students, these two types of motivation are often linked together in Chinese students [17]. Chinese students also tend to have high academic achievement, that is often attributed to the high value Chinese culture places on education for both individual advancement and group well-being [18]. Learning in China is also characterized by group-level success whereby being good at academics brings pride to yourself, your school and your family [19, 20]. It seems as though the largely individualistic motivations to learn that are prevalent in Western culture may thus not be entirely applicable in other cultures. Specifically, within Chinese culture, academic achievement and motivation to do well is influenced by a collectivist society, where the expectation is that students will consider societal pressures and the opinion of those around them [17, 21, 22]. In general, extrinsic motivation tends to not only be more prevalent in Chinese students, but also tends to be a driving force in motivating them to learn better [23]. Overall, it seems that there are strong cultural differences when it comes to educational beliefs, particularly the relationship between intrinsic and extrinsic motivational factors.

With regards to the relationship between reading motivation and achievement, the cultural emphasis on educational achievement means that extrinsic motivation has been positively associated with reading ability [23-26]. However, cross-cultural research has found intrinsic motivation to significantly predict reading achievement in both a sample of Chinese and American students, whereas extrinsic motivation was found to be negatively associated [14]. Other research found that extrinsic motivation predicted Chinese students' English or Chinese

reading, but intrinsic motivation predicted their Chinese reading [23, 27]. Overall, it seems as though while the literature supports overall differences in education and learning between Western and Eastern (i.e., Chinese) cultures, the limited evidence focusing specifically on the relationship between reading motivation and reading achievement is mixed. Previous researchers have suggested that these discrepancies may be due to differences in academic versus recreational reading and/or the overlap of intrinsic and extrinsic motivation in Chinese students [26]. We propose that one additional important factor that could help resolve these differences is the potential indirect influence of individual differences.

Reading Motivation, Personality and Reading Achievement

Western research has positively linked general academic motivation and achievement to personality traits. Specifically, positive correlations have been found with Extraversion, Agreeableness and Conscientiousness in the Big 5 Model (a five factor model of personality used to measure individual differences [28] and academic motivation [29-32]. As well, overall academic achievement has been positively linked to Agreeableness, Conscientiousness and Openness [33, 34]. While these studies have examined general academic motivation and achievement with personality traits, there has been limited research specifically exploring the association between reading motivation and achievement with personality traits. One such study [8] found that personality significantly accounted for the variance in intrinsic reading motivation, even after accounting for reading skill and self-concept. This study found that higher Openness and Agreeableness were significantly associated with higher overall reading motivation, as well as the subscales of higher reading curiosity and reading challenge. Given these significant associations between personality traits and reading motivation, further examination of these links, particularly within culturally diverse samples is needed.

It is possible that one's motivation to read is working partially through individual personality traits to determine one's reading achievement. To date, the link between personality and reading achievement has been understudied. Ritchie et al. (2013) found that Openness is positively associated with reading achievement [35]. Further, Beaujean and colleagues (2011) found reading achievement to be associated with higher levels of Agreeableness, Conscientiousness, and Openness to Experience [36]. Overall, it appears as though being more open to learning and having higher levels of patience (an important component of higher Agreeableness) is associated with both higher levels of reading motivation and reading achievement. With regards to reading ability, Medford and McGeown (2012) did not find significant bivariate correlations between reading skill and any of the personality factors [8], which the researchers noted was not consistent with previous research on personality and overall academic achievement [33, 34]. The researchers suggested that perhaps the effects of personality traits are shown mostly when combined with a student's motivation [8, 33]. Research examining reading and personality has found that students who score higher on traits to do with working hard, being persistent, and being open to new experiences tend to be better readers [36]. Therefore, it is important to consider the potential role of individual personality in the relationship between reading motivation and reading ability.

Current Study

Given the lack of research on reading motivation and achievement with personality in general, particularly in a Mainland Chinese sample, the goal of this study was to investigate the relationships between these variables. Personality has been shown to be a useful predictor of

academic achievement [37, 38]. Whereas the limited research with reading motivation and personality has been correlational in nature, literature from other research areas has supported personality as a mediator of adolescent behaviour [39]. Therefore, we were specifically, interested in exploring how reading motivation may be working indirectly through the HEXACO personality traits. Whereas previous research has demonstrated associations between both reading motivation and personality with reading achievement, there has yet to be research exploring all three variables together in a sample of Chinese students. Our study was exploratory in nature, and we acknowledge that our analyses are based on concurrent data, therefore the directionality of associations cannot be determined. However, to examine if personality may be one mechanism that reading motivation is working through indirectly, we tested a path model from four subscales of reading motivation (from the MRQ) [1] to the HEXACO personality traits, to reading grade (while controlling for age and sex) to test for both direct effects and indirect effects.

To date, research exploring the link between personality with academic and reading motivation, and reading ability has relied on five-factor measures of personality. More recent evidence suggests that the HEXACO Model of Personality consistently replicates a more valid six-factor model across cultures (i.e., a common set of six factors of personality have emerged in over twelve different languages) [40, 41]. To our knowledge, there has not yet been a study using the HEXACO personality model to explore reading achievement within a Chinese sample. The six factors of this model include: Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience [40]. High levels of Honesty-Humility is characterized by individuals who are honest and sincere, while at the low pole is characterized by a willingness to exploit others [40]. Individuals high in Emotionality are more likely to have higher levels of empathy and be more fearful, versus those who are lower on Emotionality, who are likely to display limited stress regarding physical harm and feel detached from those around them [40]. Next, Extraversion is characterized by individuals who are energetic, confident and enthusiastic, whereas those with low levels of this trait are less optimistic and tend to feel awkward in social settings. At the high pole, Agreeableness is characterized by individuals who are patient, forgiving of others and are rarely angry, while individuals low in Agreeableness are more likely to hold grudges, as well as be critical and stubborn [40]. Individuals who are high in Conscientiousness are organized and goal-oriented, while low Conscientiousness is characterized by inattention to detail and making impulsive decisions. Lastly, Openness to Experience is characterized by enjoying a range of activities, particularly works of art, or at the low pole, by individuals who are not interested in art and are not intellectually curious [42]. The high and low poles of these traits may help explore both an individual's motivation to learn as well as learning ability. Recent research examining HEXACO personality traits in Canadian and Chinese samples found that while there were a range of mean differences across all six personality traits; the largest difference was that Chinese students scored higher on Openness to Experience than Canadian students [43].

Given that previous research has largely (but not entirely) supported the importance of extrinsic motivation and academic achievement within Eastern samples, we tentatively hypothesized that the subscales of reading challenge and competition would be the facets directly and indirectly associated with reading achievement. Further, we hypothesized that there would be a positive association between the HEXACO traits of eXtraversion, Conscientiousness, Openness to Experience, and Agreeableness to reading ability in Chinese

students, as well as potential indirect effects of these traits between reading motivation and reading grade. We did not expect traits of Honesty-Humility (exploitativeness) or Emotionality (empathy) to have significant associations with reading motivation or reading ability.

METHODS

Participants

The sample for the present study ($N = 422$) were recruited from two schools in the North of China: a middle school (an academic school, $n = 272$) and a technical school ($n = 149$; one participant's school was unknown). The total sample included 277 boys and 143 girls (2 unknown), between the ages of 11 and 19 ($M = 14.61$, $SD = 1.55$). With regards to socioeconomic status, 72.7% of the overall sample reported that they're family was "about the same" in richness as the average Chinese family.

Materials

All questionnaires provided, unless otherwise specified, were translated to Mandarin by native Chinese scholars from a Canadian University (one undergraduate, two-postdoctoral, and one professor). All materials were reviewed for content validity and appropriateness by the two Chinese school principles.

Demographics

Participants were asked their age, sex and grade. Further, they were asked about their family, financial situation and their academic achievement.

Personality

Participants were asked to complete the 60-item HEXACO Personality Inventory – Revised self-report form (HEXACO-PR-I) [44]. Mandarin versions of the HEXACO-PR-I were obtained from www.hexaco.org. This questionnaire prompts participants to rate themselves based on a five-point Likert scale ($1 = strongly disagree$, $5 = strongly agree$) for each item. The six subscales with sample items include: Honesty-Humility (e.g. "I wouldn't cheat a person, even if they were easy to trick or fool"; $\alpha = .66$), Emotionality (e.g. "I sometimes can't help worrying about the little things"; $\alpha = .60$), Extraversion (e.g. "In social situations, I am usually the one who makes the first move"; $\alpha = .74$), Agreeableness (e.g., "I tend to be forgiving of other people"; $\alpha = .66$), Conscientiousness (e.g., "I plan ahead and organize things, to avoid scrambling at the last minute"; $\alpha = .68$) and Openness to Experience (e.g., "I am interested in learning about how things work"; $\alpha = .68$) [45].

Reading Motivation

For the current study, we used an adapted version of The Motivation for Reading Questionnaire (MRQ) [1] to capture 2 intrinsic and 2 extrinsic aspects of reading motivation. We employed 20 items (4 subscales comprised of 5 items each) that specifically related to the four intrinsic versus extrinsic motivation measures. These included: Reading Challenge and Reading Curiosity (associated with intrinsic motivation), and Reading Competition and Reading Recognition (associated with extrinsic motivation). Individuals who score high on reading challenge are those who like learning new things regardless of how difficult it is to read, whereas reading curiosity is characterized by being motivated to read more to learn about interesting things [1]. Individuals who score high on reading competition are motivated by wanting to be better than other students at reading, and individuals who score high on reading

recognition are students who like to get compliments about their reading from other students, the teacher and their parents [1]. Participants were asked to rate his/her feelings about reading by choosing how much each statement is like them on a scale from 1 = *very different from me* to 4 = *a lot like me*. Sample derived reliabilities and sample items for each of the subscales were: Reading Challenge ("If the project is interesting, I can read difficult material"; $\alpha = .80$), Reading Competition ("I try to get more answers right than my friends"; $\alpha = .72$), Reading Recognition ("I like having the teacher say I read well"; $\alpha = .86$), and Reading Curiosity ("I have favorite subjects that I like to read about"; $\alpha = .75$).

Reading Achievement

School-issued final exam of Chinese achievement from two schools were used to measure students' reading achievement, which could range from 0 to 120. Although different tests were used in different schools, the contents of the tests were similar across the schools. Each test consisted of sentence compositions (20%), reading comprehension of passages (40%), and writing (40%). The final exam was considered valid as it was designed by the subject teachers who were familiar with the levels of students and covered the contents learned by the students in the semester. Therefore, the final exam typically represents students' reading achievement.

Procedure

Loco procedure parentis consent was provided by Chinese principles for all participants. For each participating class, no matter the number of final participants, \$5 Canadian was donated to the school library to reward participation without potential teacher- or school- driven participant coercion. All questionnaires were completed during class time, under the supervision of classroom teachers. Questionnaires were then placed in sealed envelopes by teachers and handed to the principal, who then mailed them back to the researchers in Canada. Data collected from questionnaires were inputted into IBM SPSS 25 for analysis. Ethical clearance was received from the University Ethics Board.

RESULTS

Data Analysis

Data was scanned for outliers and checked for appropriate data assumptions. Any outliers were Winsorized and all variables met the all relevant assumptions. It is worth noting, however, that the larger correlation values (i.e., above .70) are between reading motivation subscales. While they are below the .80 cutoff for issues of multicollinearity [46], this indicates that there may be potential overlap in these constructs within this sample [26]. Table 1 displays all means, standard deviations and correlations between the variables.

Descriptive Statistics and Bivariate Correlations

As noted above and in previous research [22, 26], our data showed a significant overlap between the extrinsic and intrinsic motivation scales. We found large to very large positive correlations between all the reading motivation factors other than the medium to large correlation between reading challenge and reading recognition. Next, having a higher reading grade was significantly correlated with all four subscales of the MRQ scale and the personality traits of Extraversion, Agreeableness, Conscientiousness and Openness. Further, all four of the subscales of reading motivation were correlated with Extraversion, Conscientiousness, and Openness to Experience. Additionally, reading challenge was positively associated with

Agreeableness, reading competition was negatively associated with Honesty-Humility, while reading recognition was significantly correlated with both Honesty-Humility and Emotionality.

Path Model

Path analysis (controlling for age and sex) was conducted using MPlus version 7.2 [47]. Since all paths were tested, the model was fully saturated and therefore model fit indices were not informative. To test for indirect effects, we used bootstrapped confidence intervals (95% bias corrected) using 10 000 samples and Maximum Likelihood estimation (ML). Confidence intervals that did not cross over zero were used to determine significant indirect effects [48]. The analysis showed the following significant direct effects (Table 2; Figures 1 and 2). First, being younger and being a boy was associated with higher Honesty-Humility, eXtraversion and Agreeableness. Higher reading challenge was significantly associated with lower Emotionality, higher eXtraversion, Conscientiousness and Openness. Next, there were significant direct effects from higher reading competition to lower Honesty-Humility and Agreeableness. There were also positive direct effects from reading recognition to Honesty-Humility and Emotionality. Higher reading curiosity was significantly, directly associated with higher Agreeableness and Openness. Lastly, with regards to direct effects to reading grade, being a boy, and having higher levels of eXtraversion and Openness was significantly, directly associated with having a higher reading grade.

There were significant indirect effects from reading challenge to reading grade through both Extraversion ($\beta = .03$; 95% CIs [.01, .07]) and Openness to Experience ($\beta = .04$; 95% CIs [.00, .09]). Further, there were significant indirect effects from reading competition ($\beta = -.01$, 95% CIs [-.05, .00]), reading recognition ($\beta = .08$; 95% CIs [.00, .04]) and reading curiosity ($\beta = .03$; 95% CIs [.01, .07]) to reading grade through Openness (See Figure 3).

DISCUSSION

The purpose of our study was to explore the links between reading motivation, personality, and reading achievement within a sample of Chinese adolescent students. This was the first study to our knowledge that examined these constructs together within a Chinese sample, specifically using the HEXACO model of personality. Overall, our results support the idea that while reading motivation plays an important role in reading achievement, the influence of reading motivation on achievement may be indirectly influenced by personality traits. They also highlight the important direct effects that personality traits may have on reading achievement as well as offer a potential explanation for the ambiguous effects of intrinsic versus extrinsic motivation on Chinese adolescents' reading achievement.

To begin with, our results confirm that the factors of intrinsic versus extrinsic motivation appear to be strongly correlated amongst Chinese adolescents (see Table 1). This data fits with previous research [22, 26] and suggest that some of the ambiguity in the literature on Chinese adolescents reading achievement may be due to the strong overlap of these concepts. We suggest that the collectivist culture of China [18, 19] may result in extrinsic factors linked to group identity (e.g., classroom or family belonging/pride) fusing with internalized factors (e.g., curiosity, self-identity, and self-pride) in a manner that makes separating their influence much more complex than in Western samples [22].

Having explored the links between motivation factors, we next turn our attention to the links between personality and reading achievement in Chinese adolescents. We find significant links between personality and both extrinsic and intrinsic reading motivations, with several personality traits showing opposing links with both kinds of motivation. These links may be representative of the dual-nature of Chinese education that emphasizes group identity and success at the same time as it encourages individual competition and achievement [50]. Contrary to expectations, we report significant direct effects from higher reading competition to lower levels of Honesty-Humility, and from higher reading recognition to higher Honesty-Humility (Table 2; Figures 1 & 2). While a theoretical explanation of the admittedly small effect from Honesty-humility and reading recognition is unclear, it may be that more honest/prosocial Chinese adolescents may be more motivated to cooperate with their class and teacher by ensuring that others are aware of their reading skills. This is further supported by the positive link between Emotionality and recognition, whereby adolescents who are more emotionally dependent appear to desire greater reading recognition. Our data fit with Chinese cultural values [21, 50] as more prosocial, empathic individuals appear to be motivated by pleasing others in their social group.

On the other hand, the effect from reading competition to Honesty-humility is quite large. This finding makes theoretical sense as individuals who are low on this trait tend to view the world as more competitive in general and therefore it is not surprising that they may be motivated to read by competing with others [40]. Similarly, individuals low on Agreeableness appear to be more strongly motivated by reading competition. Thus, reading competition may reflect a different aspect of Chinese culture- the desire to individually be better than others as well as the tendency to react to others' competitive efforts [50].

There is a positive direct effect from reading curiosity to Agreeableness and Conscientiousness, and a negative effect from Emotionality, in our data. These suggest that Chinese adolescents who are more patient and less anxious may be more willing to take on challenging reading assignments. Furthermore, more Extraverted and Open adolescents are more motivated by reading challenge, perhaps as a way of demonstrating their desire to please a broader group or of expanding their social and intellectual horizons.

Finally, Openness to Experience and Agreeableness are significantly positively associated with the reading curiosity, emphasizing that a patient willingness to explore and be intellectually curious may be an important aspect of Chinese adolescents' intrinsic reading motivation [40]. Previous research examining personality traits and reading motivation in a sample of children from the U.K. found similar positive associations with Openness to Experience and these two subscales of reading motivation [8].

With regards to direct effects with reading grade, our results show that having higher levels of both Extraversion and Openness are associated with having higher reading grades. This suggests that Chinese adolescents who are outgoing and intellectually curious have higher reading achievement, which is in line with previous research that also found positive associations between Openness and reading ability within samples of Western students [35, 36]. Our results also support the collective and individual emphases on reading achievement in China [51]. Our data contrast Western data that offer a more individualistic view of achievement that emphasizes Agreeableness and Conscientiousness [36].

Interestingly, we need not find any direct effects between the reading motivation subscales and reading achievement in the present study. This lack of direct effects contrasts with much of the literature cited in our introduction [23, 24, 26, 27]. It appears that when explored in a simultaneous model, personality takes away the variance that may have been accounted for by motivation. This may help account for the mixed findings in the literature as previous research did not take into account individual differences in personality. This would be particularly important if our data demonstrate that personality may mediate the links between reading motivation and achievement.

We found significant indirect effects from each of the four motivation subscales through Openness to reading achievement, particularly highlighting the importance of this trait especially with Chinese adolescents. It appears that reading challenge, reading curiosity and reading recognition may be working indirectly through being more open and inquisitive to be positively associated with reading achievement. Further, the small, negative indirect effect from reading competition to reading grade through Openness shows that individuals who are motivated by competition and have higher levels of Openness may have lower reading grades. Lastly, we found a significant indirect effect from reading challenge to reading achievement through higher Extraversion. This demonstrates that Chinese adolescents who pursue more challenging reading materials are more likely to develop their reading skills, particularly when they are not only more open to experiences [8], but also more focused on the broader social group. Once again, these indirect findings support a dual-view of reading motivation in Chinese adolescents whereby collectivist/extrinsic and individualist/intrinsic factors play a combined role in predicting reading achievement.

LIMITATIONS AND FUTURE DIRECTION

Our results should be interpreted in light of some potential limitations. First, we acknowledge there may be limitations with our study measures. The MRQ scale was translated to Mandarin for the purposes of the present study, and it is possible that translation of an English-based questionnaire may result in validity and reliability concerns due to differences in languages or improper translations. However, the researchers took precautions to ensure the translations were accurate, as validity was ensured across multiple University scholars and both principals of the Chinese schools and reliability coefficients were acceptable. Our measure of reading achievement was a single measure of academic reading (i.e., the reading grade of the student). While this grade was itself a composite of many different evaluations and observations, it remains possible that a more comprehensive measure of reading achievement (e.g., including recreational reading) would have resulted in different pathways from the reading motivation subscales to reading achievement. While this use of a school-issued measure of achievement is consistent with other research within a Chinese sample [52, 53], future research should continue to explore this construct within this sample more comprehensively. Future research should also utilize other scales of reading motivation with personality within this population, as it is possible that other scales or subscales would be differentially associated with reading achievement.

The present study only used two Chinese schools that were from the same city, which may limit the generalizability of the results to all Chinese adolescents. However, this was the first study to our knowledge that examined these constructs simultaneously within a Chinese sample, and the schools used were diverse to try to expand the range of students surveyed. Future research

should continue to explore these constructs in a wider range of geographically located Chinese students. Further, we acknowledge that our discussion of Western (individualistic) vs. Eastern (collectivist) culture is only one of the many potential influences on student learning, and therefore future research should continue to examine these relationships while considering other factors (e.g., power, class, family background). Lastly, our data was cross-sectional and therefore future research should longitudinally examine these associations to establish directionality.

IMPLICATIONS

The results of our study highlight the importance of motivation and personality on reading achievement. For educators of Chinese students, our data advocate a potential emphasis on fostering Openness within these students, as it could be associated with greater learning abilities. Research discusses Chinese students as generally passive learners who do not actively engage in their learning [18, 19]. In general, educators working with Chinese students should consider individual differences as a factor in learning, particularly when considering the relationship between reading motivation and achievement.

Theoretically, our study adds to the literature on reading within a Chinese sample, by including personality as a potential factor in students' willingness to learn. Overall, our study emphasizes the importance of taking multiple factors into account when discussing individual learning (e.g., examining motivation and personality traits together) and offers a potential explanation for the mixed findings in the literature. Our data suggest that Chinese adolescents' reading motivation is influenced by a culturally-informed mix of intrinsic (individualist) and extrinsic (collectivist) factors that present a different pattern in comparison to Western adolescents. This highlights the need for culturally-informed research hypotheses in the discussion of reading achievement and motivation amongst adolescents across the world as Western-based evidence may not apply to other cultures.

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Table 1: Descriptive Statistics and Bivariate Correlations Among Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Age	-												
2. Sex	-.04	-											
3. H	.01	-.13**	-										
4. E	.00	-.16**	.03	-									
5. X	-.05	.07	.14**	-.03	-								
6. A	-.06	-.00	.35**	-.12*	.24**	-							
7. C	.04	.04	.15**	-.09	.30**	.20**	-						
8. O	.00	-.20**	.19**	.03	.25**	.16**	.26**	-					
9. Chall.	-.00	-.01	.16	-.06	.29**	.16**	.34**	.53**	-				
10. Comp.	.05	-.03	-.26**	.06	.18**	-.01	.13**	.27**	.50**	-			
11. Rec.	-.02	-.14**	-.12*	.16**	.19**	.05	.08	.30**	.38**	.71**	-		
12. Curios.	-.00	-.17**	.10	.06	.23**	.22**	.18**	.52**	.73**	.52**	.50**	-	
13. Grade	-.41**	-.21**	.07	-.03	.23**	.16**	.20**	.28**	.33**	.20**	.20**	.31**	-
Mean	14.61	.66	3.87	3.15	3.47	3.48	3.22	3.51	2.92	2.67	2.82	3.23	85.23
SD	1.55	.47	.58	.58	.65	.58	.58	.62	.73	.71	.80	.65	12.46

Note. *p < .05, **p < .01. Sex was coded 0 = girl, 1 = boy. H = Honesty-Humility. E = Emotionality. X = Extraversion. A = Agreeableness. C = Conscientiousness. O = Openness to Experience. Chall. = Reading Challenge, Comp. = Reading Competition, Rec. = Reading Recognition, Curios. = Reading Curiosity, Grade = Reading Grade.

Table 2: Standardized Direct Effects

Variable	Age		Sex ^a		Reading Challenge		Reading Competition		Reading Recognition		Reading Curiosity	
	β	95% CI	β	95% CI	β	95% CI	β	95% CI	β	95% CI	β	95% CI
H	-.72*	[-1.33, -.11]	.74*	[.10, 1.38]	.12	[-.03, .25]	-.50*	[-.63, -.37]	-.09*	[.05, .23]	.15	[-.00, .30]
E	.16	[-.26, .57]	-.18	[-.65, .29]	-.18*	[-.35, -.02]	-.08	[-.24, .08]	.22*	[.06, .38]	.14	[-.03, .31]
X	-.65*	[-1.20, -.09]	.65*	[.08, 1.2]	.22*	[.06, .38]	-.02	[-.17, .13]	.12	[-.03, .26]	-.04	[-.20, .11]
A	-.64*	[-1.22, -.05]	.65*	[.05, 1.25]	.03	[-.13, .18]	-.21*	[-.36, -.07]	.06	[-.08, .20]	.21*	[.06, .36]
C	.09	[-.30, .48]	-.16	[-.55, .24]	.45*	[.29, .61]	.03	[-.12, .18]	-.05	[-.20, .09]	-.13	[-.30, .04]
O	-.09	[-.45, .27]	.04	[-.32, .39]	.35*	[.23, .46]	-.11	[-.23, .01]	.10	[-.01, .22]	.26*	[.13, .38]
Reading Grade	-.60	[-1.22, .01]	.65*	[.01, 1.30]	.00	[-.16, .17]	-.09	[-.25, .08]	.08	[-.07, .23]	.00	[-.18, .18]
Variable	H		E		X		A		C		O	
Reading Grade	-.06	[-.18, .06]	.07	[-.02, .16]	.13*	[.03, .23]	.02	[-.10, .13]	.09	[-.01, .19]	.12*	[.01, .22]

Note: H = Honesty-Humility, E = Emotionality, X = Extraversion, A = Agreeableness, C = Conscientiousness, O = Openness, ^aSex was coded as 0 = girl, 1 = boy

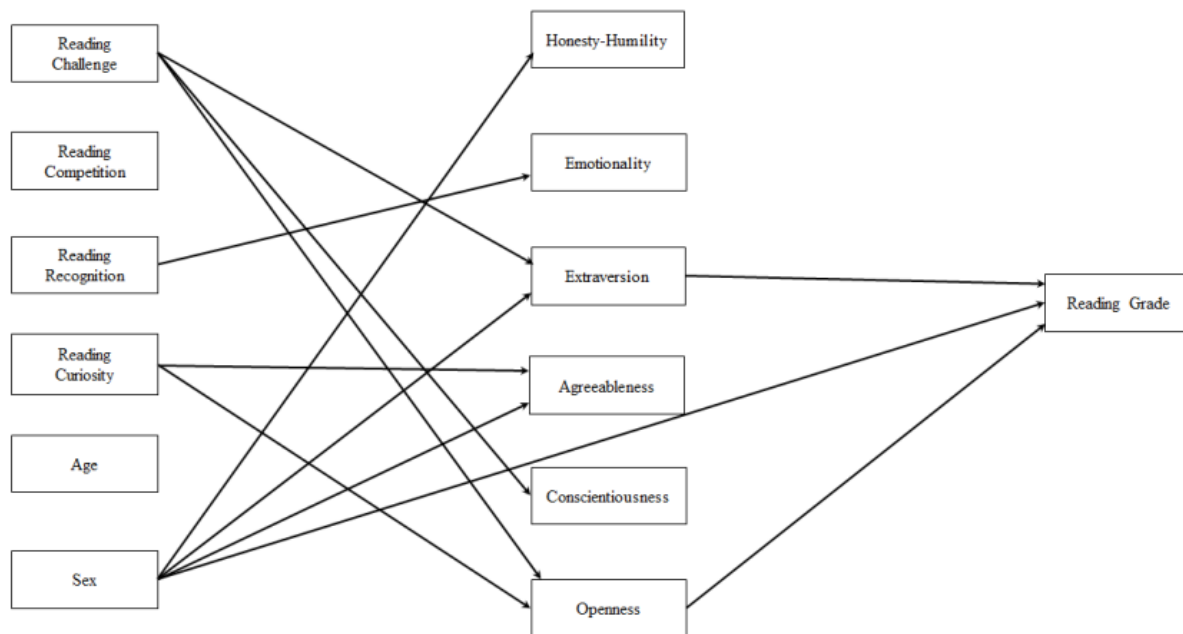


Figure 1: Final Path Model showing Significant, Positive Direct Paths

***Notes.** All paths, disturbances and covariances were tested in the model however only significant, positive paths are indicated in diagram. Disturbances and covariances are not shown in the diagram for ease of presentation. Sex was coded as 0 = girl, 1 = boy. Positive associations are indicated by black lines. Standardized and unstandardized values for significant and non-significant paths are presented in Table 2.

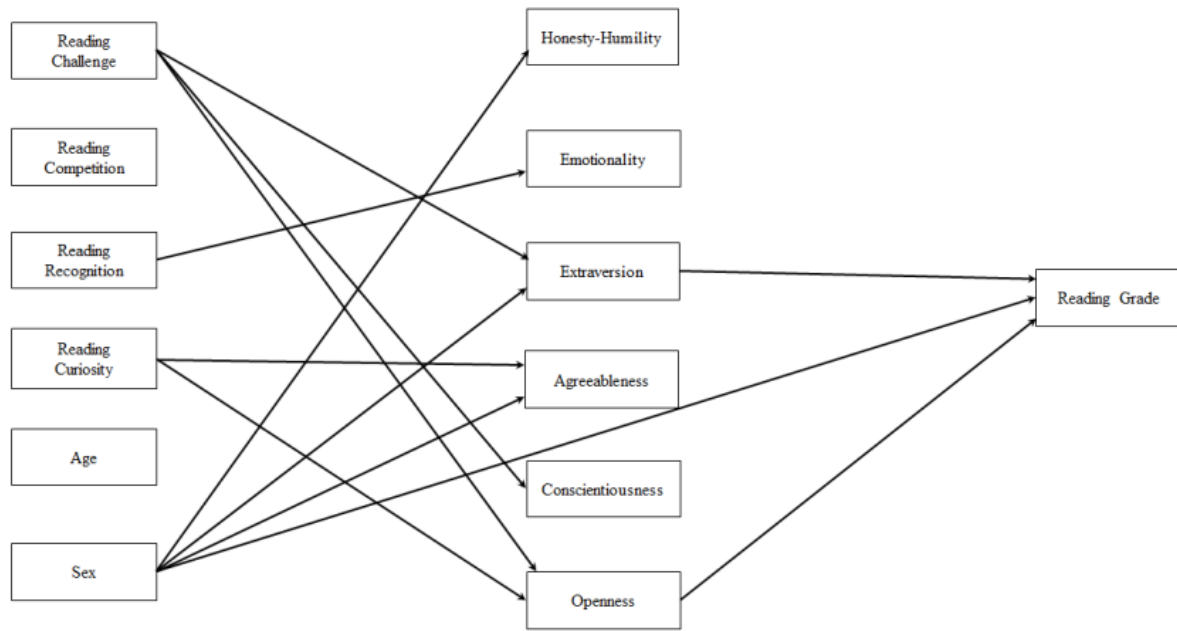


Figure 2: Final Path Model showing Significant, Negative Direct Paths

***Notes.** All paths, disturbances and covariances were tested in the model however only significant, negative paths are indicated in diagram. Disturbances and covariances are not shown in the diagram for ease of presentation. Sex was coded as 0 = girl, 1 = boy. Negative associations are indicated by grey lines. Standardized and unstandardized values for significant and non-significant paths are presented in Table 2.

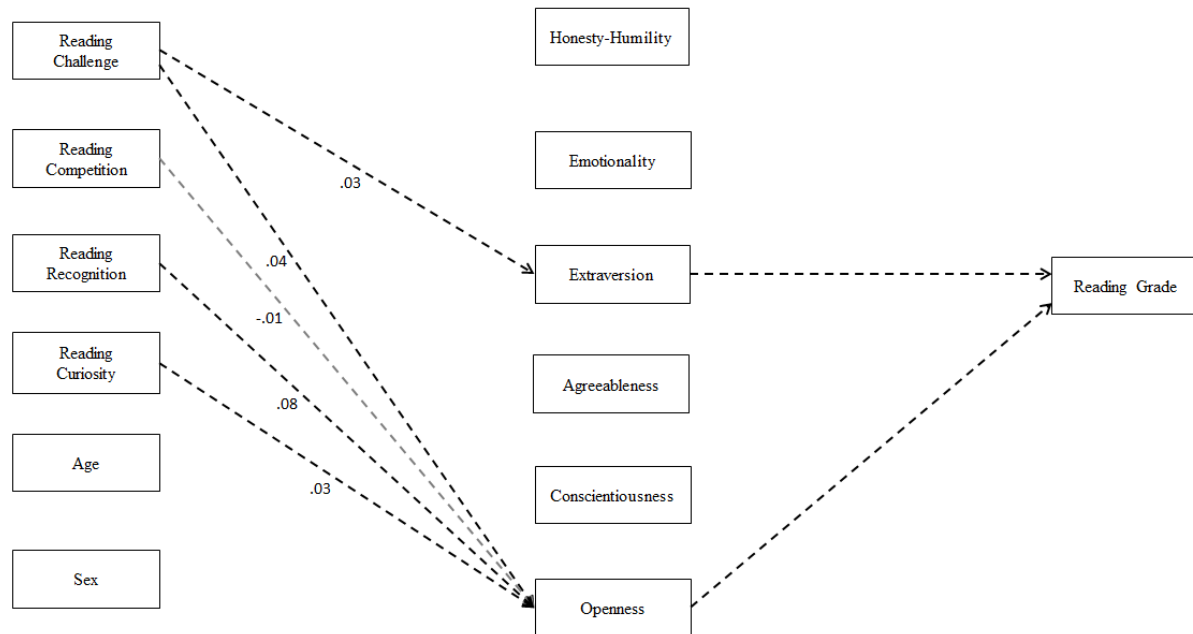


Figure 3: Final Path Model showing Significant Indirect Paths

***Notes.** All paths, disturbances and covariances were tested in the model however only significant indirect paths are indicated in diagram. Disturbances and covariances are not shown in the diagram for ease of presentation. Sex was coded as 0 = girl, 1 = boy. Standardized betas are presented in the diagram.