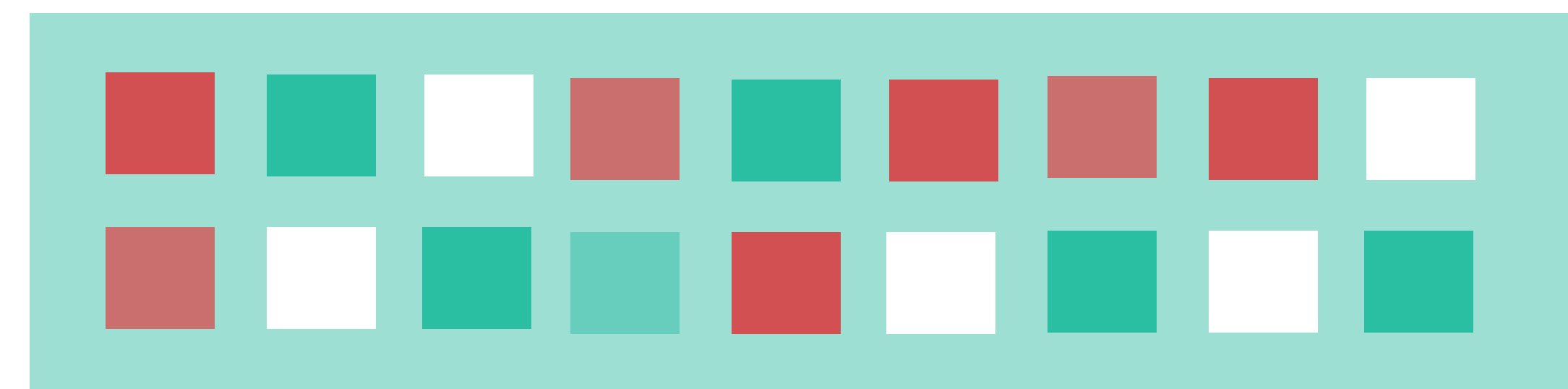


PSYCHOMETRIC PROPERTIES OF A QUESTIONNAIRE MEASURING THE IMPLICIT THEORIES OF INTELLIGENCE AND WILLPOWER OF CHILDREN AGED 11 TO 13

SIMON LISAINGO, LAURIE FORD, & NANCY PERRY
University of British Columbia



IMPLICIT THEORIES OF INTELLIGENCE¹

ABOUT. Dweck and her colleagues posit that students’ beliefs about their capabilities influence their school performance (Blackwell, Trzesniewski, & Dweck, 2007). Implicit theories are beliefs people develop about the stability of their abilities and characteristics (Ross, 1989). Dweck (2000) describes individuals’ implicit theories of intelligence as either entity (fixed) or incremental (growth). Her research indicates that students with a “fixed mindset” tend to avoid difficult or challenging tasks, yet students with a “growth mindset” seek challenges as learning opportunities (Dweck & Leggett, 1988).

SCALE. A self-report scale for children aged 10 and older for examining implicit theories of intelligence was adapted for use in the present study (*Self-theories of Intelligence Scale for Children-Self-Form* [Dweck, 2000]). The original questionnaire is comprised of six questions rated on a 6-point Likert scale ranging from strongly agree to strongly disagree. For instance, participants who agree with the statement, “Everyone has a certain amount of intelligence and we can’t really do much to change it,” would fall in the fixed mindset group, whereas, students who disagree with the above statement, would fall in the growth mindset group.

PSYCHOMETRICS. According to Dweck, Chiu, and Hong (1995), using a three-item *Self-Theories of Intelligence Scale* is recommended in order to reduce confusion and repetitiveness; consequently, this was the format used in the current study. Psychometric properties from six validation studies using this method described high internal reliability and test-retest reliability (α ranging from .94 to .96; test-retest reliability of .80); in addition, multiple regression analyses indicated that the scale is independent of participants’ age and sex (Dweck, Chiu, & Hong, 1995). No specific details were available for children aged 11 to 13.

¹In the current poster, psychometric properties are provided for the *Self-theories of Intelligence Scale for Children-Self-Form*, adapted version with three-items.

IMPLICIT THEORIES OF WILLPOWER²

ABOUT. In an extension of implicit theories of intelligence, Job, Dweck, and Walton (2010) proposed that individuals’ also have implicit theories about willpower: limited or non-limited. In other words, they proposed that depletion of self-control is mediated by students’ beliefs about willpower.

SCALE. Job (personal communication, September 11, 2014) adapted a scale for children in German. Job’s scale was translated into English and used for the first time in Canada. The items in this questionnaire assess students’ theories about the effects of mental exertion. The questionnaire is comprised of four questions rated on a 5-point Likert scale ranging from not at all agree to strongly agree. Participants who agree with the statement, “Because I have already completed a few difficult assignments, it’s now easier for me to continue with my other assignments”, hold a non-limited resource theory of willpower, whereas, participants who disagree with the above statement, hold a limited resource theory of willpower.

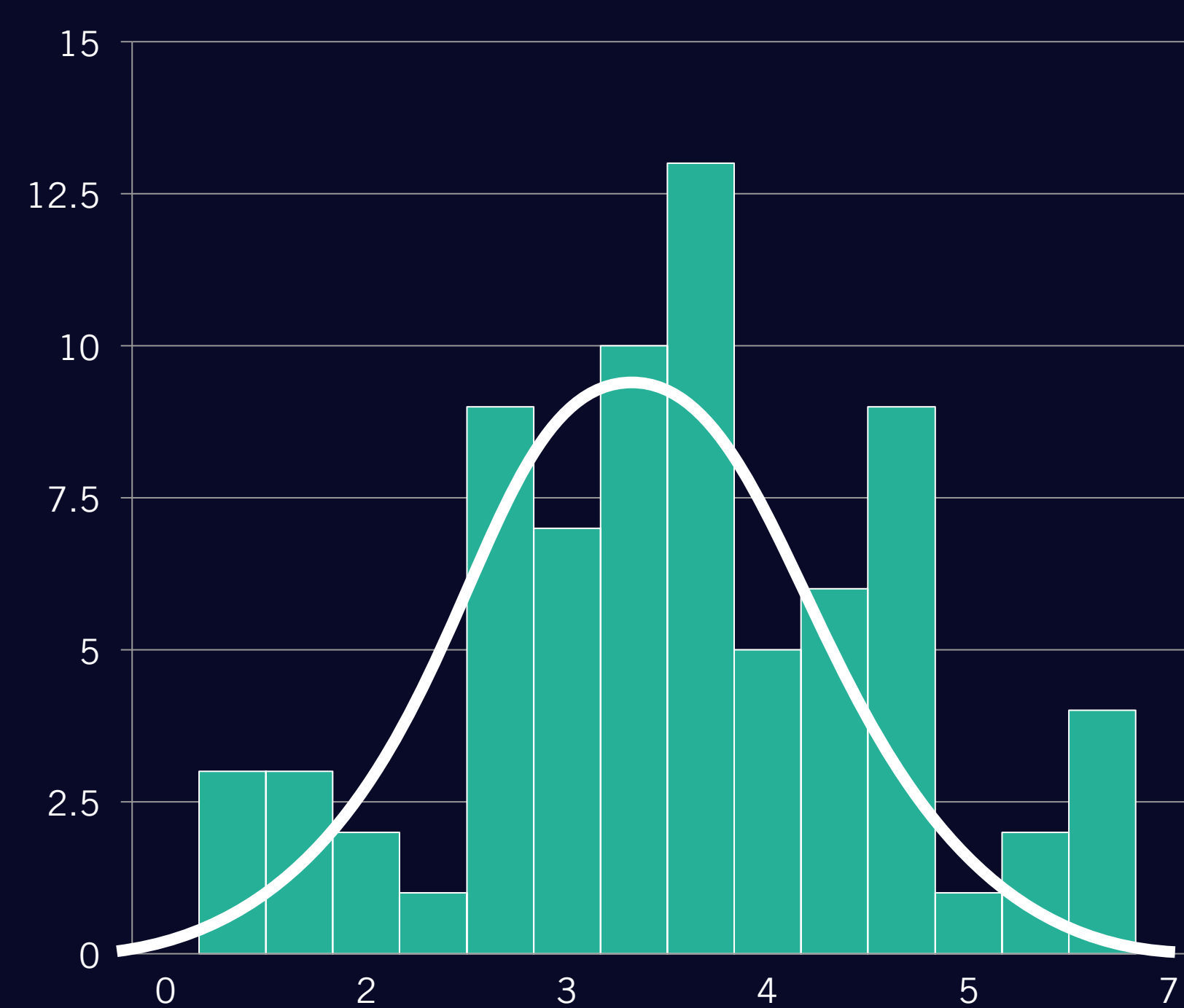
PSYCHOMETRICS. The adult questionnaire is comprised of 12 questions rated on a 6-point Likert scale ranging from strongly agree to strongly disagree. Psychometric properties of the implicit theories of willpower were found to be acceptable for a sample of sixty undergraduate students (α = .89, with test-retest reliability greater than .77) (Job et al., 2010). No statistical properties of the scale were available for children for the German child version.

²In the current poster, psychometric properties are provided for a translated child version of the *Implicit Theories of Willpower Scale*.

DEMOGRAPHIC CHARACTERISTICS (N =75)

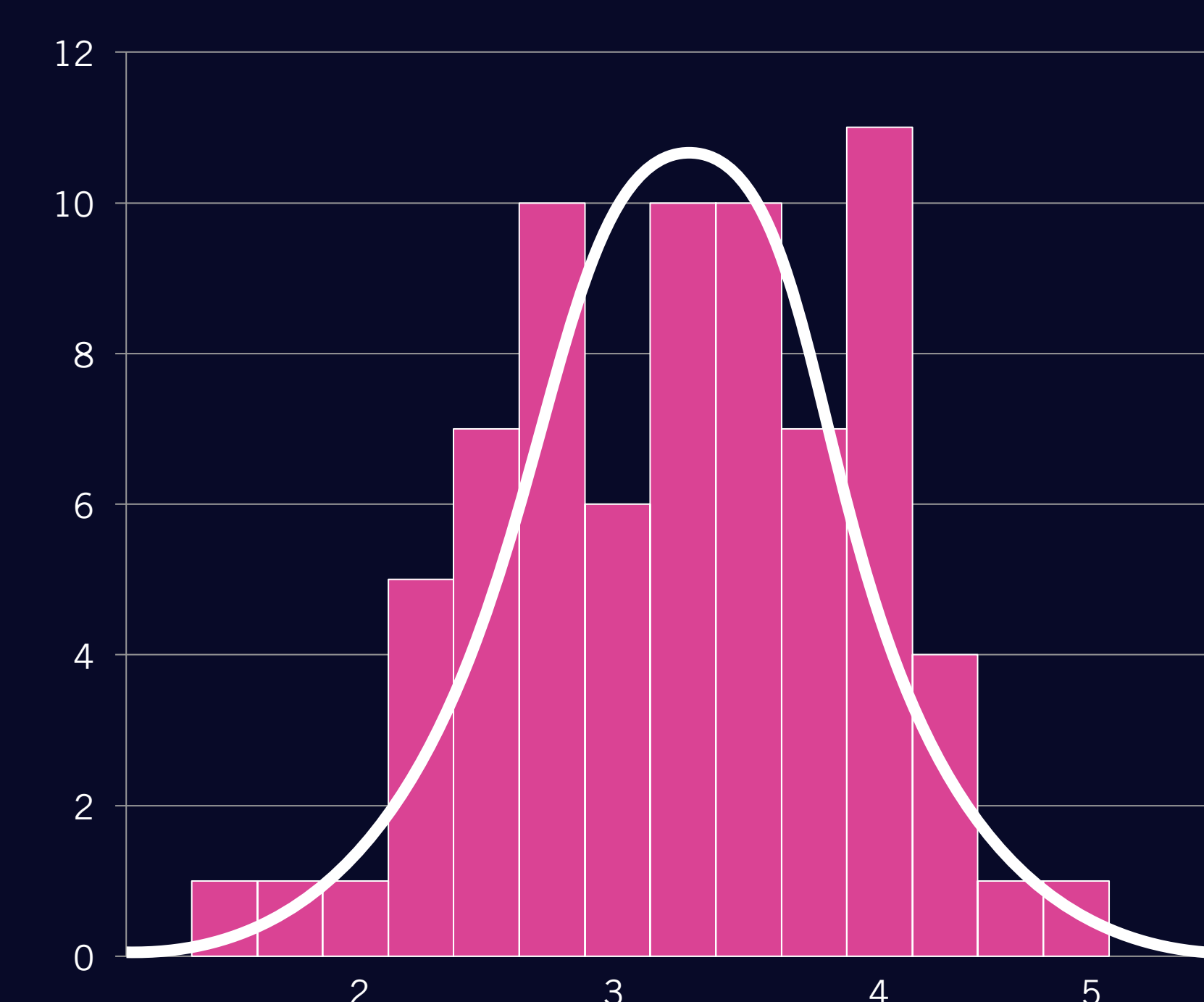
Location	North Vancouver, British Columbia, Canada	Parent Education	Mother	Father
Response rate	57% (132 distributed, 75 returned)	No response	7%	11%
Participant Gender	32 Male, 43 Female	Less than Grade 12	0%	0%
Participant Age	11-13 years (Mean Age = 12.41)	High School Diploma	1%	5%
Spoken Language at school	63% French Immersion; 37% English	Some College/Trades	19%	19%
Ethnicity	78% Canadian/European; 13% Other; 8% No response	Apprenticeship/Trades Certificate	3%	11%
Primary Language spoken at home	93% English; 5% Other; 1% No response	Bachelors Degree	29%	27%
		More than Bachelors	40%	25%

IMPLICIT THEORIES OF INTELLIGENCE SCALE



Mean (Std. Dev.) | 3.90 (1.06)
Skewness; Kurtosis | -.069; -.244
Cronbach’s alpha | α = .730 (items = 3)

IMPLICIT THEORIES OF WILLPOWER SCALE



Mean (Std. Dev.) | 3.25 (.70)
Skewness; Kurtosis | -.123; -.349
Cronbach’s alpha | α = .654 (items = 4)

CORRELATION MATRIX

	Mindset1	Mindset2	Mindset3	WP1	WP2	WP3	WP4
Mindset1: “amount of intelligence, can’t change”	1						
Mindset2: “intelligence something you can’t change”	0.686**	1					
Mindset3: “can’t change basic intelligence”	0.414**	0.343**	1				
WP1: “after difficult assign., easier to continue”	0.187	0.064	0.249*	1			
WP2: “after difficult assign., more diff. to continue”	0.218*	0.058	0.186	0.228*	1		
WP3: “after difficult assign., too tired to continue”	0.079	0.076	0.311**	0.282**	0.097	1	
WP4: “after difficult assign., strong and energized”	0.112	0.037	0.2*	0.609**	0.199*	0.492**	1

**Correlation matrix significant at the .01 level (1-tailed)

*Correlation matrix significant at the .05 level (1-tailed)

“Intelligence means to me, is that how smart you are.” (Fixed Mindset)

“To me, intelligence it not just the skill of how smart you are at a skill, but also at life in making good choices and being cautious about certain things.” (Growth Mindset)

“The ability to control how much effort you put into something.” (Limited)

“To keep beliving and never give up and that eny obstacles getting you push threw them.” (Non-Limited)

INTERPRETATION

IMPLICIT THEORIES OF INTELLIGENCE SCALE

- Students’ responses about their implicit theories of intelligence indicated that the majority of students are uncertain about their beliefs about intelligence (Mean=3.90).
- Students’ responses were normally distributed with few students responding consistently at the extremes.
- In examining the correlation matrix, the last item of the questionnaire, which asked about students’ “basic intelligence”, were less related to other items. Based on students’ responses to an open ended-questions about “What is intelligence?”, it appeared that many viewed intelligence as much more than “basic intelligence”, e.g., courage, book-smart, street-smart, thinking quickly, etc.
- Consistent with previous research, the *Self-theories of Intelligence Scale for Children-Self-Form* was found to have acceptable reliability, (α =.730); in other words, the items on the measure reliably measure the same construct. Of note, the child scale was found to be slightly less reliable than the adult scale.

IMPLICIT THEORIES OF WILLPOWER SCALE

- Students’ responses about their implicit theories of willpower indicate that the majority of students are uncertain about beliefs about willpower (Mean=3.25).
- Students’ responses were normally distributed, with few responding consistently at the extremes.
- In examining the correlation matrix, it is interesting that the middle items, which were the reverse worded items, related less to first and last items. It is possible that students viewed the reversed items differently than the other items.
- Consistent with previous research, the implicit theories about willpower scale for children was found to have acceptable reliability, (α =.654); in other words, the items on the measure reliably measure the same construct.

PRELIMINARY FACTOR ANALYSIS

- A Principal Component Analysis was conducted and provided some initial support for two distinct factors: implicit theories of intelligence and willpower.
- An approximately normal distribution was evident for the composite score data in the current study, thus the data were well suited for parametric statistical analyses.



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Poster presented at the 2015 Canadian Psychological Association Convention, Ottawa, ON.
For more information, please contact simon.lisaingo@alumni.ubc.ca