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Implicit Theory of Intelligence Scale: Testing for factorial invariance and mean structure

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As conceived by Carol Dweck, implicit theory of intelligence concerns the extent to which intelligence is perceived as a malleable trait. This paper presents a new 14-item measure; the Implicit Theory of Intelligence Scale (ITIS). The ITIS was trialled on two samples of 162 and 940 first year university students in Australia and Egypt, respectively. An exploratory factor analysis for each sample retained two factors: entity and incremental. Entity refers to one's perception that his/her intelligence is a fixed, uncontrollable trait that cannot be changed through effort. Incremental refers to one's perception that his/her intelligence is a malleable, controllable quality that can be increased and improved through effort and investment. Entity and incremental factors each incorporated 7 items and the correlation coefficient between the two factors was found to be around -0.33 in each sample. A multi-group confirmatory factor analysis revealed that the ITIS is factorial invariant across nationalities (i.e., Egypt and Australia) and across gender within each nationality. The ITIS mean structure was invariant across Egyptian and Australian samples. Implications of these findings are discussed within the Australian and Egyptian contexts.

Introduction

Suppose you are asked to agree or disagree with the following: "*You have a certain amount of intelligence and you really cannot do much to change it*", "*Your intelligence is something about you that you cannot change very much*", and "*You can learn new things, but you cannot really change your basic intelligence.*"

If you consistently agree with these statements, you are affirming entity theory. This is the notion that human intelligence is limited and closely tied to immediate feedback information. On the other hand, should you reject these propositions, you are displaying an incremental theory approach to human intelligence. Incremental theory implies that one is prepared to question the role of fixed ability in immediate task performance and believe that people can learn new skills which may increase their intelligence.

The entity versus incremental distinction taps into an essential human dilemma: I.e., a basic conceptual problem concerning interpersonal perception. When we observe someone's behavioural activity, are we entitled to use this thin slice to be judgemental? That is, can we arrive at decisions describing this individual's dispositions, capacities, and limitations? Or do we defer such judgements, believing that the thin slice is hardly a valid indicator of eventual outcomes? Is the target person simply in an early stage of learning or development? If so, then the current performance level is not diagnostic of future performances. This issue, one of fixedness versus malleability, is a basic distinction that people are forced to apply, often unwittingly, in many social judgement contexts, including the classroom.

However, entity theorists only are social ratings affected by one's position on this dimension. One's self-reactions and motivational dispositions appear to be closely attuned to one's dominant theory. People whose dominant self-theory favours an entity orientation are motivated by the need to be successful. But they need to demonstrate success through socially defined goals. Such people's efforts are closely tied to their level of confidence and to the extent that reductions in confidence presage reductions in effort exertion (Hong, Chiu, & Dweck, 1995).

On the other hand, people whose self-reactions hinge around incremental theory appear to be more able to motivate themselves even in the face of low initial confidence or apparent success. That is, harbouring an incremental orientation allows the individual greater leniency in judging personal achievement, whilst recognising the mediating and empowering effects of factors such as effort, practice, strategic learning, and time.

Advantages accrue to learners able to adhere to incremental theory. For example, Hong, Dweck, Chiu, Lin, and Wan (1999) found that college students with an incremental orientation were more willing than others to attribute negative feedback to low effort, and were more ready to accept remedial help in a learning situation. Heyman and Dweck (1998) reported that 7- and 8- year old children who believed in flexible human traits were far less judgemental than others in blaming poor learning outcomes upon low ability, and they did not believe that poor situational performance represented an enduring state. On the other hand, Molden and Dweck (2006) described an unpublished study by Blackwell and others in which students who endorsed entity theory were found to be relatively vulnerable at entry into middle school, through exhibiting a belief pattern congruent with helplessness (i.e., endorsing ego-relevant goals, blaming performance upon ability, and viewing effort as a threat).

Over the past 20 years, an impressive body of literature describing meaningful differences between entity theorists and incremental theorists has been published, and reviews can be found in Dweck (1999), Dweck and Sorich (1999), and Molden and Dweck (2006). The available research has focussed upon two distinct domains: Intelligence, and social cognition. Within each domain, researchers have employed slightly different scales. For example, in research into social stereotyping, one item used to describe entity theorists was; "*Everyone is a certain kind of person, and there is not much that they can do to really change that.*" (Levy, Stroessner, & Dweck, 1998) In this specific project, college students who endorsed entity theory appeared more ready than others to adopt rigid stereotypical thinking, and to project stereotypical traits onto group members. This project used a 3-item scale to separate entity from incremental theorists, although later studies in the same domain used an expanded 8-item version (Plaks, Stroessner, Dweck & Sherman, 2001).

In relation to the implicit theory of intelligence, however, most studies appear to have used the 3-item scale, as defined by the items in our initial paragraph, using a 6-point Likert scale for responding. In her studies, Dweck used only 3 items for several reasons. First, items were intended to have the same meaning, and continued repetition of the same idea becomes somewhat tedious to the respondents. Second, she reported that there was a strong tendency for people to endorse items depicting incremental theory. Put bluntly, the items describing the incremental theory were highly compelling and socially desirable. Thirdly, the 3-item format enabled Dweck and her colleagues to split samples into two groups. Molden and Dweck stated explicitly, "Most individuals generally endorse either an entity theory or an incremental theory, and each theory occurs with equal frequency." (2006, p. 194)

Hong, Chiu, Dweck, Lin, and Wan (1999) referred to an unpublished study in which Levy and Dweck constructed an 8-item measure using both entity and incremental items. They reported that the two sets of items correlated around - 0.8 using a sample of college students, and concluded that the incremental items were measuring essentially the same characteristic as the entity items. Hence, one interpretation stemming from Dweck's research is that incremental theorists are described in terms of their willingness to reject entity-type statements. This interpretation is consistent with the findings from a German study, Spinath and Stiensmeier-Pelster (2001), in which 3 incremental items were used in addition to the 3 entity items. The correlation between the two sets of items was - 0.72 in a sample of 97 college students.

A slightly different picture is suggested in a recent study by Cury, Elliott, Da Fonseca, and Moller (2006) using data from four hundred 13-years olds in France. For purposes of the study, they created a 6-item scale based upon maths-specific statements; "*One has a certain level of ability in math, and there is not much one can do to change it*." Factor analysis indicated that the 3 entity items and 3 incremental items loaded strongly upon separate factors. The entity measure correlated with the incremental measure at - 0.36.

Using Dweck's theory as a model, Faria and Fontaine (1997) published the Personal Conception of Intelligence Scale (PCIS), based upon data from 1500 high school students in Portugal. From a pool of 26 items, an exploratory factor analysis identified 12 'static' items, and 9 'dynamic' items. The 'static' items reflected entity conceptualizations, whereas the dynamic items reflected notions highly consistent with incremental theory. The correlation between the two identified factors was not reported. However, the use of varimax rotation in identifying 2 factors indicated that the factors were not correlated strongly within this study.

Aims and Context of the Study

In the present study, our first goal was to develop a new scale which would further articulate the implicit theory of intelligence. Specifically, we sought to construct a scale that will be of use to future researchers. Using Faria and Fontaine's PCIS as a starting point, we developed items which reflected entity and incremental constructs differentially. Hence, the scale was based upon previous questions as used within the literature, as well as incorporating several new items. Accordingly, we developed the Implicit Theory of Intelligence Scale (ITIS), and sought to test its psychometric properties using data collected from Egyptian and Australian samples. Our second goal was, therefore, to test for the invariance of factorial structure across the two samples and across the gender within each sample. The third goal was to explore the reliability of the ITIS via both tau-equivalent and congeneric models.

Method

Participants

Subjects of the present study included 940 (495 males and 445 females) and 162 (65 males and 97 females) undergraduates enrolled in public universities in El-Minia (Egypt) and Adelaide (Australia) respectively. The median age in both samples was 18 years with age ranging from 17 to 23 years, and 17 to 28 years, for the Egyptian and Australian samples respectively. Students were recruited to participate during their normal classes at their universities. Participation was voluntary and 34 students from the approached Egyptian sample declined to participate in data collection.

Measurements

Implicit Theory of Intelligence Scale (ITIS). The ITIS was developed for use within the current project. It consists of 14 items (see Table 1). Three of the items are taken from Faria and Fontaine's (1997) instrument known as PCIS. In general, we felt that the other items from the PCIS did not translate easily, and new items were generated, based upon our understanding of entity and incremental notions. It was intended that 7 items reflected entity theory, and 7 items reflected incremental theory. Respondents rated their agreement or disagreement per item on a 4-point Likert type scale that ranged from 1 (Strongly Disagree) to 4 (Strongly Agree).

Procedure

The initial version of the ITIS was prepared in English and was administered to the Australian sample in October 2005. The first author translated the ITIS from English to Arabic. Applying a blind-back-translation strategy, two qualified translators, working without referencing to the English version of the ITIS, independently translated the Arabic version back to English. All the translators were accredited with the British-Egyptian Centre in El-Minia. Other three qualified translators independently compared the original English version of the ITIS to the new English version that was translated back from Arabic, and rated the match between the two versions on a scale from 1 to 10. A score of 1 represented poor match, whereas a score of 10 represented perfect match. The average percentage of match between the two versions of the ITIS was 94 per cent which could be considered acceptable (see, Brislin, Lonner, & Thorndike, 1973). The Arabic version of the ITIS was administered to the Egyptian sample in February 2006, and is available from the first author. For both samples, all questionnaires were administered by the first author in person, although in the case of the Egyptian sample, some assistance in this was given by collegial staff.

Results

Exploratory Factor Analysis

An exploratory factor analysis with oblique rotation, presented in Table 1, was used to analyse the Egyptian and Australian data. For the Egyptian data, the analysis identified two factors each consisting of 7 items. The two factors correlated, $r = -.35$, $p < .001$. The entity factor (Cronbach $\alpha = .83$) explained 35.5 per cent of the total variance extracted. The incremental factor (Cronbach $\alpha = .75$) explained 15.3 per cent of the total variance extracted.

For the Australian data, the analysis identified two factors ($r = -.33$, $p < .001$) each consisting of 7 items. The entity (Cronbach $\alpha = .78$) and incremental factors (Cronbach $\alpha = .76$) accounted for 26.5 and 18 per cent of the total variance extracted respectively.

Table 1

Exploratory factor analysis with oblique rotation of the ITIS for the Egyptian (*N* = 940) and Australian (*N* = 162) data

Item	Statement	Loadings for Egyptian	Loadings for Australian
Entity			
14	You are born with a fixed amount of intelligence.	.86	.86
7	Good performance in a task is a way of showing others that you are intelligent.	.86	.79
1	You have a certain amount of intelligence and you cannot do much to change it.	.79	.77
4	If you fail in a task, you question your intelligence.	.77	.71
8	When you exert a lot of effort, you show that you are not intelligent.	.72	.58
2	Difficulties and challenges prevent you from developing your intelligence.	.51	.56
12	Your abilities are determined by how intelligent you are.	.44	.52
Eigenvalue		3.7	3.4
Incremental			
13	Good preparation before performing a task is a way to develop your intelligence.	.70	.71
11	Performing a task successfully can help develop your intelligence.	.68	.67
6	You can develop your intelligence if your really try.	.65	.61
9	When you learn news things, your basic intelligence improves.	.62	.61
3	The effort you exert improves your intelligence.	.60	.59
10	If you fail in a task, you still trust your intelligence.	.59	.57
5	Criticism from others can help develop your intelligence.	.51	.56
Eigenvalue		2.7	2.7

Confirmatory Factor Analysis

A confirmatory factor analysis using the LISREL 8.5 program (Joreskog & Sorbom, 2001) showed that two hypothesized models, presented in Figures 1 and 2, fitted the Egyptian (χ^2 (75, N =940) = 86.3, p = .18) and Australian data (χ^2 (75, N =162) = 83.7, p = .23) satisfactorily. Other fit indices of the two models, presented in Table 2, were also examined.

There was a correlation between the error terms associated with two observed variables (i.e., T1 and T14) for the Egyptian (r = .25, p < .01) and Australian (r = .22, p < .01) samples. Generally, the specification of correlated error terms for the purpose of achieving a better fitting model is not an acceptable practice; as with other parameters, such specifications must be supported by a substantive or empirical rationale (Jorskog & Sorbom, 1985). Specifically, the correlated error terms often indicate some type of redundancy between the measured variables (Abd-El-Fattah, in press). Put bluntly, the measured variables with correlated error terms may express similar meaning. On this basis, the correlated error terms between the specified items in the models of the present study are considered to be justifiable.

Once the model achieves an overall satisfactory fit, the second step in the model testing process is to examine the statistical significance of each of the hypothesized path coefficients. The test statistics is the critical ratio (CR), which represents the parameter estimate divided by its standard error. As such, it operates as a z-statistic in testing whether the estimate is statistically different from zero. Based on a significance level of .05, the test statistic needs to be >±1.96 before the hypothesis that the estimate equals 0.0 can be rejected. Table 3 shows that all the hypothesized path coefficients of the Egyptian and Australian models are statistically significant.

Table 2

Summary of Chi-square (χ^2), degrees of freedom (df), and fit indices for models of Egyptian (N =940) and Australian (N =162) data

	Model/ Fit Statistics	$\chi^{2\,(a)}$	df	RMSEA[(b)]	SRMR	AGFI	PGFI	CFI
Model 1	Egypt	86.3	75	.04	.04	.96	.35	.99
Model 2	Australia	83.7	75	.05	.05	.95	.38	.98
Model 3	Baseline (Egyptian &Australian)	170	150	.05	.04	.97	.33	.98
Model 4	Constrained (Egyptian & Australian)	192	166	.05	.04	.95	.34	.97
Model 5	Baseline for Gender (Egyptian)	165	150	.03	.05	.98	.30	.98
Model 6	Constrained for Gender (Egyptian)	188	166	.04	.04	.96	.34	.98
Model 7	Baseline for Gender (Australian)	160	150	.02	.03	.97	.30	.99
Model 8	Constrained for Gender (Australian)	181	166	.03	.04	.96	.35	.98
Model 9	Latent Mean (Egyptian & Australian)	194.4	178	.04	—(c)	—	—	.99

Note. (a) p > .05 for all reported χ^2.

(b) All values of the reported modification indices fall within the recently suggested guidelines (see, Hu & Bentler, 1999).

(c) The AMOS 5.0 program does not produce the SRMR, AGFI, and PGFI modification indices in case of latent mean structures (James Arbuckle(1), personal communication, 31st May, 2006).

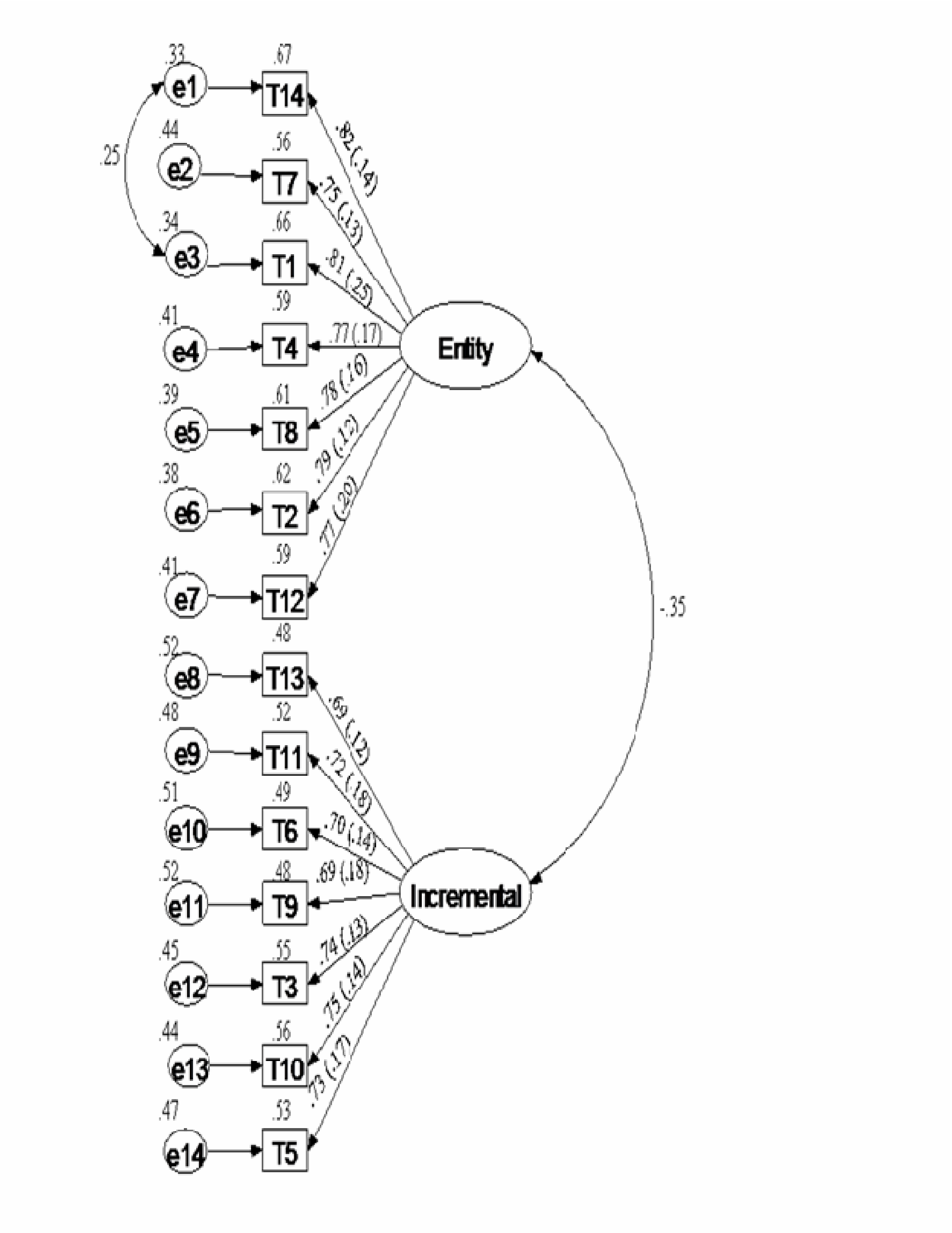

Figure 1. Two-factor model of the ITIS for the Egyptian data

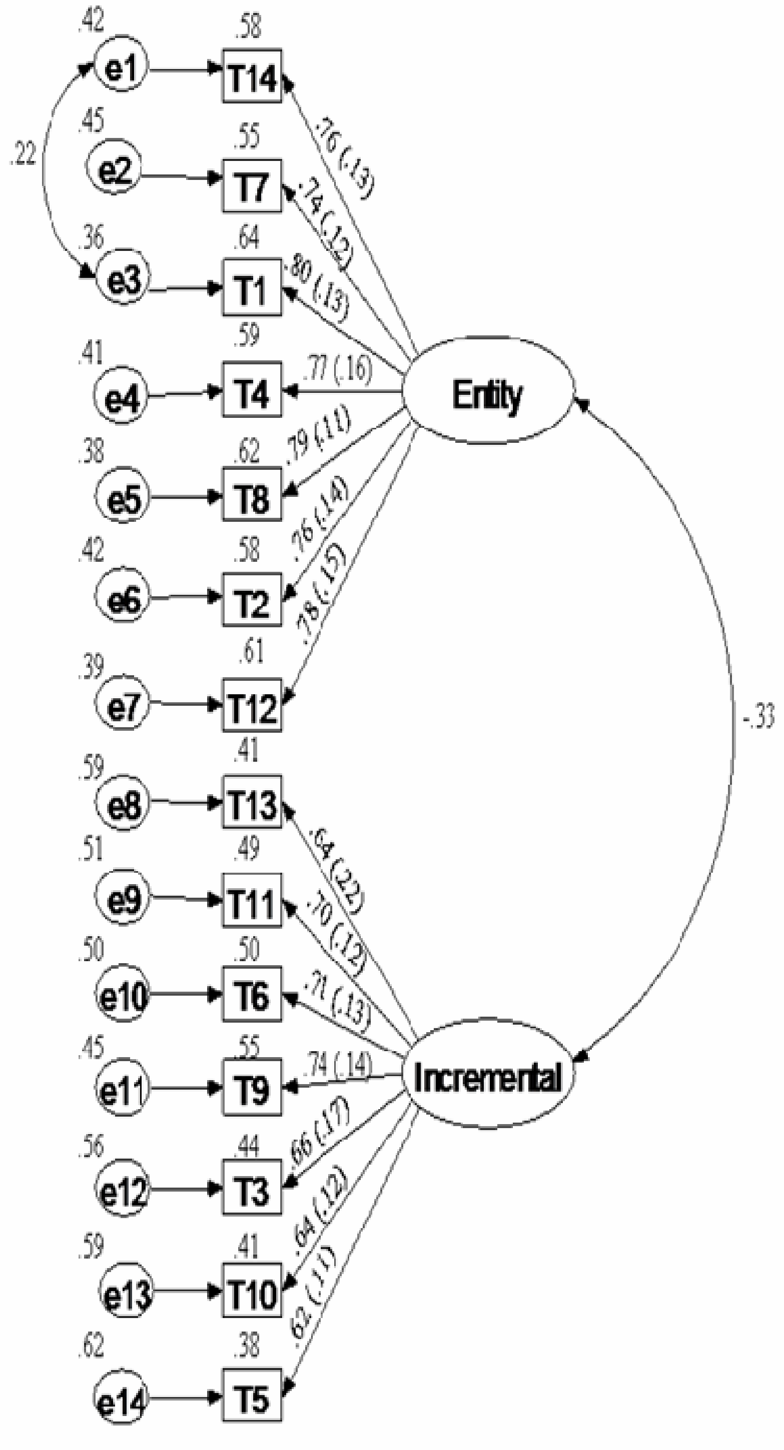

Figure 2. Two-factor model of the ITIS for the Australian data

Table 3
Standardized path coefficients, standard error, critical ratio, and R^2 of a two-factor model of the ITIS for the Egyptian ($N = 940$) and Australian ($N = 162$) data

	Egyptian Data					Australian Data				
Paths	Path coefficient	Standard error	Critical ratio	Error variance	R^2	Path coefficient	Standard error	Critical ratio	Error variance	R^2
Entity										
T14	.82	.14	5.9	.33	.67	.76	.13	5.9	.42	.58
T7	.75	.13	5.8	.44	.56	.74	.12	6.2	.45	.55
T1	.81	.25	3.2	.34	.66	.80	.13	6.2	.36	.64
T4	.77	.17	4.5	.41	.59	.77	.16	4.8	.41	.59
T8	.78	.16	4.9	.39	.61	.79	.11	7.2	.38	.62
T2	.79	.12	6.6	.38	.62	.76	.14	5.4	.42	58
T12	.77	.20	3.9	.41	.59	.78	.15	5.2	.39	.61
Incremental										
T13	.69	.12	5.8	.52	.48	.64	.22	2.9	.59	.41
T11	.72	.18	4.0	.48	.52	.70	.12	5.8	.51	.49
T6	.70	.14	5.0	.51	.49	.71	.13	5.5	.50	.50
T9	.69	.18	3.8	.52	.48	.74	.14	5.3	.45	.55
T3	.74	.13	5.7	.45	.55	.66	.17	3.9	.56	.44
T10	.75	.14	5.4	.44	.56	.64	.12	5.3	.59	.41
T5	.73	.17	4.3	.47	.53	.62	.11	5.6	.62	.38

Tests of Factorial Invariance

Joreskog (1971a) and Bollen (1989) argued that tests of invariance work on the null hypothesis (H_0) that $\sum_1 = \sum_2 = ... = \sum_G$, where $\sum$ represents the population variance covariance matrix and *G* is the number of groups. Failing to reject H_0 implies that the groups are equivalent and thus tests for invariance are unjustified. Put bluntly, data should be pooled and all subsequent analyses should be based on a single group. Rejection of $H_{0,}$ however, argues for the nonequivalence of the groups and thus for the subsequent testing of increasingly restrictive hypotheses in order to identify the source of noninvariance.

For the purpose of testing for the invariant factorial structure of the ITIS across Egyptian and Australian data, the AMOS 6.0 program (Arbuckle, 2005) was used to test a baseline model (Joreskog & Sorbom, 1996; Yung & Bentler, 1996) of the ITIS. Results, presented in Table 2, showed that the baseline model fitted the data satisfactory (χ^2 (150, N =940) = 170, p = .13).

A baseline model with equality constraints specified for factor loadings, variances, and covariances across Egyptian and Australian data was constructed. While it is possible to test for equality of error variances and covariances across groups, “the testing of equality constraints bearing on error variances and covariances is now considered to be excessively stringent...” (Byrne, 2001, p. 186). In the present study, however, the testing for error covariance could be justified on the bases of the substantial values of these covariances in Egyptian (r = .25) and Australian (r = .22) data.

Results, presented in Table 2, showed that the overall fit of the constrained baseline model was satisfactory (χ^2 (166, N =162) = 192, p = .08). The chi-square difference ($\Delta\chi^2$) between the baseline model and the constrained model was statistically nonsignificant ($\Delta\chi^2$ = 22, Δdf = 16, p = .14) which indicated that the factorial structure of the ITIS was invariant across the Egyptian and Australian samples.

For the purpose of testing for the invariant factorial structure of the ITIS across gender in Egyptian and Australian samples, a baseline model and a constrained model (i.e., factor loadings, variances, and covariances) of the ITIS were tested for males and females in each sample separately. For the Egyptian sample, results showed that the baseline model (χ^2 (150, N = 940) = 165, p = .19) and the constrained model (χ^2 (166, N = 940) = 188, p = .12) fitted the data satisfactorily. The chi-square difference ($\Delta\chi^2$) between the two models was statistically nonsignificant ($\Delta\chi^2$ = 23, Δdf = 16, p = .11) which indicated the factorial structure of the ITIS was invariant across Egyptian males and females.

For the Australian sample, results showed that the baseline model (χ^2 (150, N = 162) = 160, p = .27) and the constrained model (χ^2 (166, N = 162) = 181, p = .2) fitted the data satisfactorily. The chi-square difference ($\Delta\chi^2$) between the two models was statistically nonsignificant ($\Delta\chi^2$ = 21, Δdf = 16, p = .2) which indicated the factorial structure of the ITIS was invariant across Australian males and females.

Reliability of the ITIS

Cronbach alpha assumes that the items of a scale are tau-equivalent (Cohen & Swerdlik, 2001; Hopkins, Stanley, 1981). The tau-equivalent measures have the same true scores, but may have unequal error variances (Novick & Lewis, 1967). This means that each item is measuring the same construct to the same degree; a restrictive assumption that is unlikely to be met in practice. If the items of a scale are not tau-equivalent, Cronbach alpha will be a conservative estimate of reliability (Novick & Lewis, 1967).

Joreskog (1971b) argued that the congeneric model is the least restrictive model based on the classical testing theory. The assumption underlying the congeneric model is that different items do not reflect the same true score.

$$X_j = T_j + E_j \qquad (1)$$

Each observed test score consists of the true score for that test plus error. The congeneric model further assumes that the true scores for different items correlate perfectly with each other. This assumption led to a respecification of

$$X_j = M_j + \beta_j T + E_j \qquad (2)$$

where βj refers to the loading of an item on a generic true score and Mj represents the mean. Put bluntly, each observed score reflects the same generic true score (Alwin & Jackson, 1980) but to different degrees, as reflected in different βj for different items.

If the congeneric model applies, the degree to which each item reflects the generic true score (as shown in the β_j coefficients) must be considered. If items are summed to form a scale, the formula (Fleishman & Benson, 1987) to estimate reliability is,

$$p_{xx} = \frac{(\sum Bj)^2}{(\sum Bj)^2 + \sum \theta j^2} \qquad (3)$$

where θ^2 represents error variance for each item.

Applying the congeneric model approach, the reliability estimates of the entity and incremental factors were .87 and .88 respectively. It is noted, however, that the reliability values for the entity and incremental factors using the congeneric model were higher than the estimates obtained when applying the tau-equivalent model (i.e., Cronbach α). These findings seems to be consistent with the suggestion that Cronbach alpha works as a lower bound estimate of reliability when the assumption of the tau-equivalence model is not met (Lord & Novick, 1968; Novick & Lewis, 1967; Shevlin, Miles, Davies, & Walker, 2000).

Testing for Latent Mean Structure

Latent mean structure is intended to test for latent mean differences across groups. In the analysis of covariance structures, it is implicitly assumed that all observed variables are measured as deviations from their mean (i.e., means are equal to zero). Hence, the intercept terms generally associated with regression equations are irrelevant to the analysis. However, when the observed means take on nonzero values, as is the case in testing for differences in latent mean structures, the intercept must be taken into account (Bentler, 1995). Furthermore, because the observed variable means are functions of the other parameters in the model, the intercept term must be estimated jointly with all other parameters in the model (Byrne, 2001). Chi-square and fit statistics will then refer to fit of covariance and mean structure.

The latent mean structure analysis requires that the factor intercepts for one group be fixed to zero for the purpose of achieving overidentification of the factors. The factor intercepts are the estimated means of the latent variables. The group whose means are constrained to a value of zero serves as the reference group when interpreting the path coefficients. That is, the estimated mean of one group will be compared to zero, representing the other group.

In the present study, the model for the Australian data was considered to be the reference group, as such, its factor means were constrained to zero. Results, presented in Table 2, showed that the overall fit of the model was satisfactory (χ^2 (178, N =940) = 194.4. In addition, there are nonsignificant differences in endorsing entity (Mean = .54, standard error = .46, Critical Ratio = 1.2) and incremental theory (Mean = .59, standard error = .43, Critical ratio = 1.4) between the Egyptian and Australian students.

Discussion

Our data suggest that the ITIS has merit as an index of people's implicit theories. The scale displayed remarkable properties in separating entity and incremental subscales in a manner that was both meaningful and highly similar across both samples. The Australian sample was drawn from students from a predominantly Caucasian background in Adelaide, who responded to an English language instrument. Although of similar age, the Egyptian sample stemmed from a provincial Egyptian city, and they responded to an Arabic translation version of the instrument. Despite such variations in samples, the psychometric data yielded remarkably consistent patterns across samples.

Since the scale is of 14-items, and can be completed within 5 minutes, we believe that the ITIS is an instrument that will prove useful in further studies into implicit theory. The original intention was for the scale to be serviceable, brief, and easy to administer and score. At the outset, we were unsure if the two intended factors could be defined cleanly, as earlier studies did not suggest clearly that this would be the case. However, the current data do suggest that it is meaningful to describe scores on the incremental dimension as distinct from scores on the entity dimension. We suggest that people do not neatly fit into two distinct types of individuals (i.e., entity theorists and incremental theorists) as some of the findings reported from earlier studies might have implied.

Instead, it appears more appropriate to employ the ITIS to describe scores along traditional psychometric dimensions. Within the current data sets, responses to both entity and incremental items conform to standard distributional assumptions, and coherent and normal properties appear to be evident.

Were there any meaningful differences in the way Australian and Egyptian students responded to the ITIS? We constructed entity and incremental tallies for the two samples independently. Results from mean testing showed that levels of incremental theory were similar across both samples and across gender within each sample. However, the Australian students were apparently lower than their Egyptian counterparts in endorsing the entity theory (shown in Table 4). The factorial invariance clearly supported the view that the scale was functioning in a remarkably similar manner across both samples.

Coda

We conclude by acknowledging the scientific contribution of Dr Carol Dweck. At one stage, she was invited by Robert Sternberg to contribute to a book keenly entitled "Why smart people can be so stupid" (Sternberg, 2002). The resulting essay we feel ought to be seen as a classic paper, a statement of the remarkable findings in this area, and essential reading for humanistic educators. She identified the following as 'Beliefs that make smart people dumb": (a) the belief that intelligence is a fixed trait, (b) the belief that intelligence measures performance and self-worth, (c) the belief that learning is risky, and (d) the belief that effort is for the incompetent. Such beliefs, allied to entity conceptualizations, are potentially maladaptive since they automatically define limiting conditions upon one's self-development even at the very point when these conditions remain unknowable to the individual. As Dr Dweck expressed it, her research has sought to explain "why people who have all the ability one could wish for, often do not use it when they need it most, and can even lose it" (2002, p.24).

Table 4

Means differences across Egyptian (*N = 940*) and Australian (*N = 162*) samples

Scale		Egyptian	Australian
Incremental		Mean	
	Males	18.69	19.12
	Female	18.89	19.42
	Total	18.78	19.30
Entity			
	Males	14.82	13.40
	Female	14.92	12.77
	Total	14.87	13.02

Note. (1) Professor James Arbuckle (Temple University, Philadelphia, USA).

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