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האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

Development and Longitudinal Measurement Invariance

of the

Study Choice Task Inventory – Secondary Education Form

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Identity Formation in Adolescence

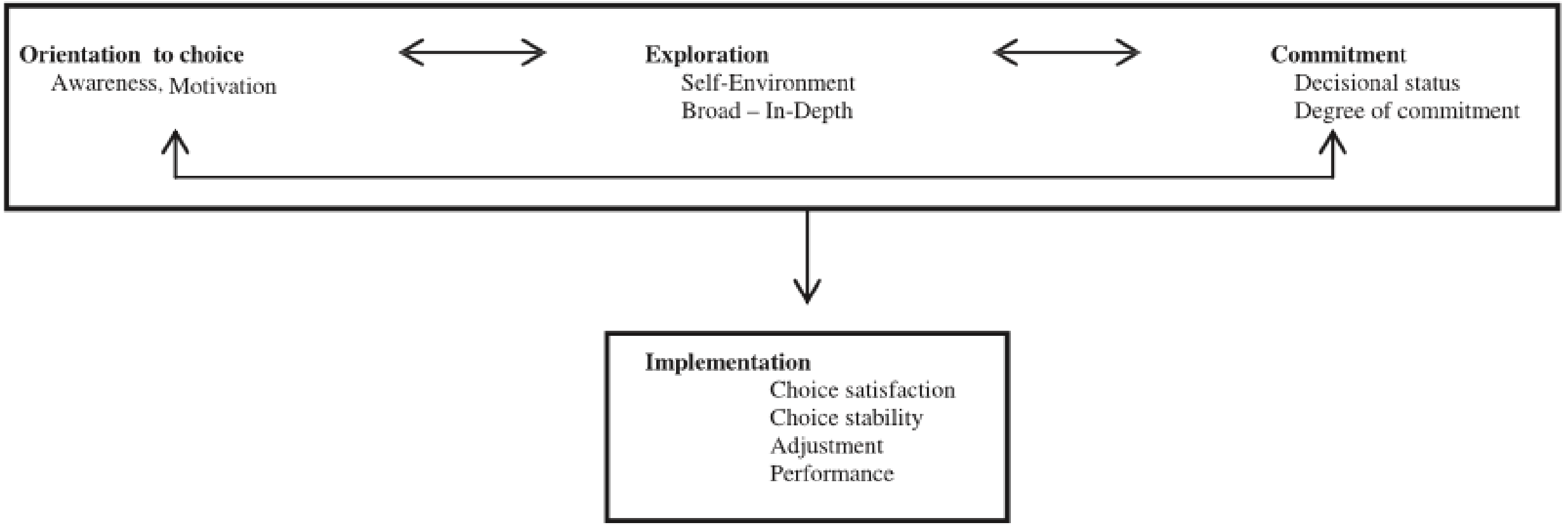
- Since Erikson, adolescence is conceptualized as a stage of identity development and formation.
- Neo-Eriksonian models of identity formation emphasize engagement in exploration and commitment processes (e.g., Marcia’s identity statuses model).

Study Choice Task Inventory (SCTI)

- Aimed for the assessment of engagement in five educational decisional tasks.
- Originally developed and tested in the context of preparation for transition to post-secondary education.

Germeijs & Verschueren 2006, *J Career Assess*. **14**

Educational/Occupational Identity Formation



Germeijs & Verschueren 2006, *J Career Assess*. **14**

Goals of the Present Study

- Develop and validate a version of the Study Choice Task Inventory appropriate for use in early/middle adolescence (SCTI-SE).
- Test the longitudinal measurement invariance of the SCTI-SE.

Study Choice Task Inventory (SCTI)

- For the purposes of our study, **34 items** (of the original 55) were selected and reformulated for use among secondary education students facing **general education track choice** (Grade 8) and **high school major choice** (Grade 10).

Orientation to Choice

The **orientation to choice** subscale probes students' *awareness* of the need and *motivation* to engage in decision-making (**6 items**).

"I often think about which courses I will choose next year."

"I often daydream about how it will be in the 9th grade."

Self Exploratory Behavior

The **self exploratory behavior** subscale taps students' exploration of their abilities, preferences, and study approach (**12 items**).

"I considered what my capabilities and flaws are."

"I considered what I like and don't like to do."

Broad Exploratory Behavior

The **broad exploratory behavior** subscale relates to students' engagement in superficial environmental exploration (**4 items**).

"I collected information about study alternatives in 9th grade."

"I looked at a summary about the structure of high school."

In-Depth Exploratory Behavior

The **in-depth exploratory behavior** subscale addresses students' exploration of alternatives in a more detailed way (**7 items**).

"I thoroughly looked at a brochure or website about 9th grade."

"I looked at a textbook from 9th grade."

Commitment

The **commitment** subscale was adopted from the Groningen Identity Development Scale (GIDS; **5 items**).

“I am uncertain about my study choice.”

“I have doubts about my study choice.”

Bosma 1985

Participants (CFA)

- Part of a large four-wave longitudinal study.

- **598 individuals** completed the SCTI at **Grade 8** (wave 1)

M_{age} **= 14.05**, 323 (**55.4%**) **girls**.

Confirmatory Factor Analysis

The model – five correlated factors	**(34 items)**	**(N = 598)**
(a) Orientation	(6 items)	
(b) Self exploration	(12 items)	
(c) Broad exploration	(4 items)	
(d) In depth exploration	(7 items)	
(e) Commitment	(5 items)	

χ^2 (517) = 3,112.17, *p* < .001, CFI = .69, RMSEA = .092, SRMR = .086.

Confirmatory Factor Analysis

- **Inspection of modification indices and item content – substantial covariances among 13 items referring to parents, teachers, or friends.**

  “I talk to my parents about my capabilities and flaws” (self exploration)

  “I asked my family members which courses they took” (broad exploration)

  “I talked to my parents to find out more about 9th grade” (in depth exploration)

- **Four additional items substantially cross-loaded on other subscales.**

  “I’m willing to do my best to bring this choice to fruition” (commitment)

Confirmatory Factor Analysis

The model – five correlated factors	**(17 items)**	**(N = 598)**
(a) Orientation	(5 of 6 items)	
(b) Self exploration	(3 of 12 items)	
(c) Broad exploration	(2 of 4 items)	
(d) In depth exploration	(4 of 7 items)	
(e) Commitment	(3 of 5 items)	

χ^2 (109) = 326.96, p < .001, CFI = .94, RMSEA = .058, SRMR = .056.

Participants (Longitudinal Measurement Invariance)

- **276 individuals** completed the SCTI twice, at **Grade 8** (wave 1) and two years later again at **Grade 10** (wave 3).
- At Grade 8 – M_{age} **= 13.98**, 165 (**59.87%**) **girls**.
- **No notable differences** between individuals who participated at Grade 10 and those who did not (*N* = 322) in age, gender distribution, or in the SCTI subscales.

Step 1: Configural Invariance

- Do the samples have the same **factor structure**?
- **Is the number of factors** equal across time?
- **Is the pattern of factor-indicator relationships** also identical across time?

Step 1a: Configural Invariance

Testing factor structure within each sample separately:

Grade 8 –

χ^2 (109) = 326.96, p < .001, CFI = .94, RMSEA = .058, SRMR = .056.

Grade 10 –

χ^2 (109) = 231.22, p < .001, CFI = .93, RMSEA = .064, SRMR = .067

Step 1b: Configural Invariance

Estimating a combined model in which all model parameters are allowed to differ across groups:

χ^2 (218) = 468.49, p < .001, CFI = .93, RMSEA = .065, SRMR = .065

Step 2: Metric Invariance

Testing whether factor loadings are equivalent across time; If metric variant, measurement bias depends on subscales scores (nonuniform bias).

Fit indices -
χ^2 (235) = 488.77, *p* < .001, CFI = .93, RMSEA = .063, SRMR = .075

- Compare fit of metric invariance to configural invariance –

Δχ2 (Δ*df*) = 20.28 (17), *ns*, ΔCFI = .00, ΔRMSEA = -0.002, ΔSRMR = 0.010

Metric invariance is needed for correlational-based analyses.

Step 3: Scalar Invariance

- When the observed scores are regressed on each factor, are the **intercepts** equivalent across samples?
- If established, item mean differences could exist but are the result of factor mean differences.
- Fit indices -

χ^2 (252) = 566.15, $p < .001$, CFI = .91, RMSEA = .067, SRMR = .094

- Compare fit of scalar invariance to metric invariance –

Δχ2 (Δ*df*) = 20.28 (17), $p < .001$, ΔCFI = .02, ΔRMSEA = -0.004, ΔSRMR = 0.019

Step 3*: Partial Scalar Invariance

- **Inspection of modification indices and intercepts of individual items indicated two non-invariant items (different between samples):**

  “I often think about which courses I will choose next school year”

  “I went to an information day organized by a school”

Partial Scalar Invariance

- Fit indices -

χ^2 (250) = 536.53, p < .001, CFI = .918, RMSEA = .064, SRMR = .089

- Compare fit of scalar invariance to metric invariance –

Δχ2 (Δ*df*) = 20.28 (17), p < .001, ΔCFI = .01, ΔRMSEA = 0.001, ΔSRMR = 0.011

- Partial invariance is informative only in the case of at least one invariant item per factor (no real consensus).

Residual Invariance

- Are the **residual variances** of the observed scores not accounted for by the factors equivalent across time?
- Fit indices -

χ^2 (265) = 565.90, *p* < .001, CFI = .91, RMSEA = .064, SRMR <~ .100

- Compare fit of residual invariance to scalar invariance –

Δχ2 (Δ*df*) = 29.37 (15), *p* < .001, ΔCFI = .00, ΔRMSEA = 0.000, ΔSRMR = 0.011

Summary of Results

The Construct Validity of the Study Choice Inventory

- The five educational decision-making behaviors are differentiated already in early adolescence.
- These differentiation is less pronounced than that of social sources of information (e.g., family, friends, teacher) in early/middle adolescence.
- For this reason, items relating to social sources of information were excluded from the SCTI-SE.

Summary of Results

The Longitudinal Measurement Invariance of the SCTI-SE

- Equivalent structure across time
- Equivalent factor loadings justify correlational-based analyses.
- Equivalent item intercepts justify factor mean level comparisons.

The Importance of the Present Study

- In general, only limited empirical attention to identity formation processes in early adolescence.
- In the educational domain – even fewer. No previous testing of the SCTI model in early adolescence.
- Psychological instability in adolescence emphasizes the importance to demonstrate longitudinal measurement invariance.

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Thank you

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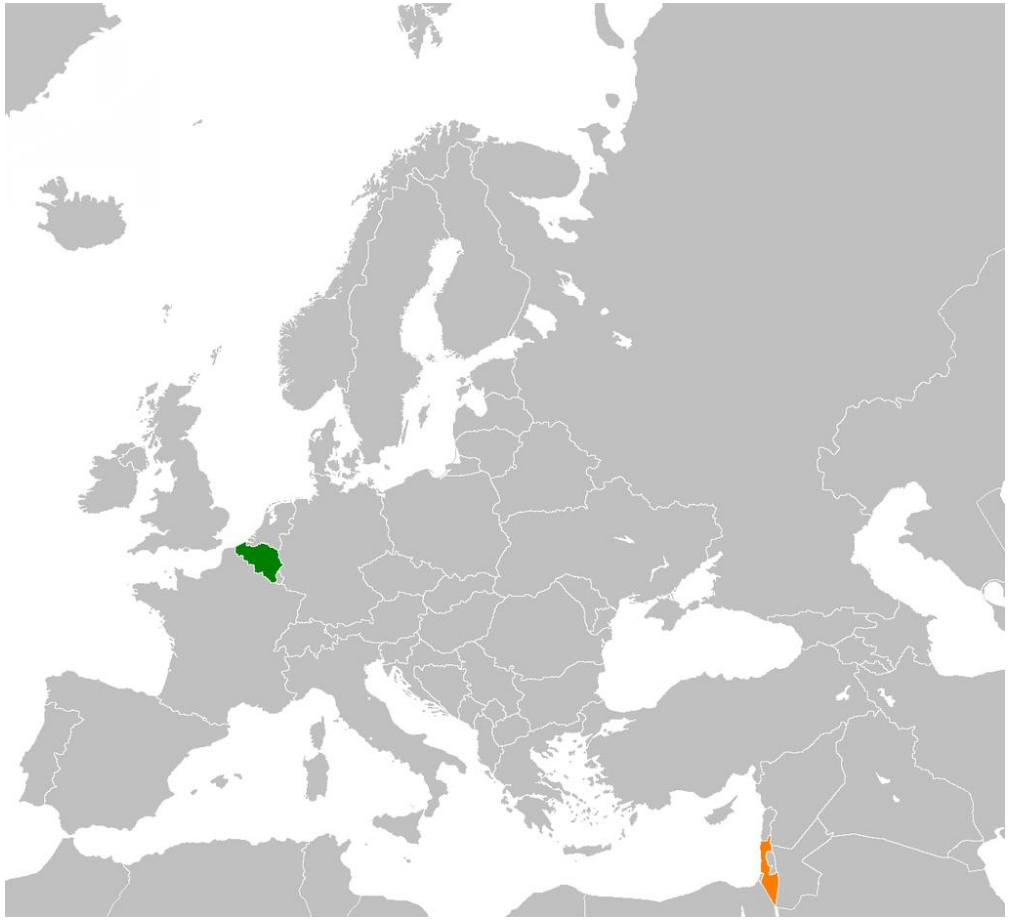

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