Content Validity and Reliability of Multiple Intelligences Developmental Assessment Scales (MIDAS) Translated into Persian

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Abstract

This study aimed to translate MIDAS questionnaire from English into Persian and determine its content validity and reliability. MIDAS was translated and validated on a sample (N = 110) of Iranian adult population. The participants were both male and female with the age range of 17-57. They were at different educational levels and from different ethnic groups in Iran. A translating team, consisting of five members, bilingual in English and Persian and familiar with multiple intelligences (MI) theory and practice, were involved in translating and determining content validity, which included the processes of forward translation, back-translation, review, final proof-reading, and testing. The statistical analyses of inter-scale correlation were performed using the Cronbach's alpha coefficient. In an intra-class correlation, the Cronbach's alpha was high for all of the questions. Translation and content validity of MIDAS questionnaire was completed by a proper process leading to high reliability and validity. The results suggest that Persian MIDAS (P-MIDAS) could serve as a valid and reliable instrument for measuring Iranian adults MIs.

***Keywords*:** Content Validity, Multiple Intelligences Developmental Assessment Scales (MIDAS), Multiple Intelligences (MI) Theory

Introduction

Great interest has been shown on the topic of measuring Multiple Intelligence (MI) (Dulewicz& Higgs, 2000). The term 'intelligence' is used to refer to the human ability to solve problems or to make something that is valued in one or more cultures (Gardner, 1991). MI, as one of the influential theories (Morris &Maisto, 1999), is said to explain a higher proportion of variance in learning success than Intelligent Quotient (IQ) (Kim, 2005). As Brown (2000) states, academic achievement of a learner is no longer judged by the degree of Intelligent Quotient (IQ) (Brown, 2000).

MI theory is composed of eight intelligences (Gardner, 1983,1993): Musical Intelligence, to think in sounds, rhythms, melodies and rhymes; bodily-kinesthetic intelligence, to think in movements and to use the body in skilled and complicated ways for expressive and goal-directed activities; logical-mathematical intelligence, to think of cause and effect connections and to understand relationships among actions, objects or ideas; spatial intelligence, to think in pictures and to perceive the visual world accurately; linguistic intelligence, to think in words and to use language to express and understand complex meanings; interpersonal intelligence, the ability to understand and interact effectively with others; intrapersonal intelligence, to think about and understand one's self; naturalist intelligence, to understand the natural world including plants, animals and scientific studies.

One of the instruments used to measure individuals' MI is Multiple Intelligences Developmental Assessment Scales (MIDAS), which was developed by Shearer (1994) to measure Multiple Intelligence in English language. The instrument was a result of a combination of rational and empirical methods of test construction and MI theory as a basis to guide interpretation of empirical results (Shearer, 2004).

The validity of MIDAS has been examined via a series of investigations evaluating its construct, concurrent, and predictive validity (Al-Onizat, 2014). The results of these investigations have included expected correlations between MIDAS scale scores and several matched abilities tests.

As any instrument developed in a particular context needs to be adapted to the local context to be used for different population, many researchers have translated MIDAS from its source language to other languages so that it can

be used in other countries with different languages. For example, MIDAS has been adapted in several countries such as Romania, Spain, Denmark, Germany, and Switzerland (Shearer, 2003). Also it has been translated in Korea, Chile, Egypt, Taiwan, and Malaysia for research purposes (Shearer, 2012).

Translation may affect the content validity of a measurement instrument (Furnham, Callahan, &Akande, 2004).The term content validity refers to the judgments concerning behaviors to be measured by a test and the logical design of items to cover all the important areas of this domain (Furnham et al., 2004). Researchers have recognized that translating verbal items of an assessment or measurement instrument into another language needs to overcome two substantial barriers in order to reflect the original conceptions: a) to make the instrument's semantic contents authentic and b) to keep the instrument readable and appropriate to the levels of the target respondents (Cai, 2004).

There has recently been an increased interest in the role of MI in relation to learning and achievement (Kornhaber, 2004). Similarly, Tahriri and Yamini (2010) states that Gardner's MI theory has recently been embraced by numerous theorists and applied by countless language instructors. There have been various studies on the relationship between MI and EFL teachers' teaching style and EFL learners' language learning from different perspectives. For example, the relationship between Iranian EFL learners' multiple intelligences and their writing performance (Alizadeh, Saeidi, Hadidi, 2015); the relationship between Iranian junior high-school EFL teachers' multiple intelligences and their teaching style (Aliakbari, 2014); Iranian EFL bilinguals' and monolinguals' multiple intelligences and learning strategies (Assadnasab, 2014); the relationship between EFL learners' multiple intelligences and their performance on information gap writing task (Saeidi&Karvandi, 2014); the relationship among Iranian EFL learners' multiple intelligences, use of reading strategies, and their proficiency level across different genders (Ezzati, 2013); a comparative study on bilingual and monolingual EFL learners' linguistic and interpersonal intelligences across gender (Mazoochi, 2013); EFL teachers' emotional intelligence and multiple intelligences across gender and their relationship with students' language achievement (ReimaniNikou, 2013); multiple

intelligence-based focus on form and Iranian EFL learners' accurate use of grammar (Saeidi, 2009). Nonetheless, the development of reliable and valid translation of MIDAS, as a valid tool to assess individuals' MI, into Persian is lagging behind its widespread use in our context. Obviously, there is a necessity for a reliable and valid instrument to assess individuals' MI for research, teaching, and consultation purposes. Hence, the lack of valid translation of MIDAS in the Iranian context provided the researchers with the impetus to carry out this study to facilitate the use of MIDAS for the concerned parties in Iran (researchers, teachers, and counselors). Accordingly, this study aimed at translating and determining the content validity and reliability of MIDAS instrument used to measure individuals' MI in the Iranian context.

Method

Participants

One hundred and ten participants from different educational levels (graduate and under-graduated, bachelor, master, and PhD) and from different fields of study including Humanities, Sciences, and Mathematics participated in this study. They comprised 45 males and 65 females. The participants' demographic characteristics such as gender, age, marital status, ethnic background and education are displayed in Table 1.

Table 1
The socio-demographic distribution of the participants.

Variables	**Number**	%
Gender		
Male	45	40.9
Female	65	59.1
Age		
17-24	41	37.2
25-40	39	35.4
40-57	28	25.4
Marital status		
Married	32	29.0
Single	78	70.9
Ethnic Groups		

Persian	35	31.8
Turkish	20	18.1
Kurdish	17	15.4
Lurish	22	20.2
Arabian	16	14.5
Education		
High school	47	42.7
Graduate from college and above	63	57.3

Instrumentation

There were two stages in the development of the original English MIDAS: the first stage was completed over a period of 6 years; it involved a series of activities including content reviews, field-testing, pilot validation studies, item analysis, subscale development, instrument revision, and secondary validation studies. MIDAS, which includes 119 items, was developed via in-depth interviews, whereby feedback on question wording and content clarity of the test was provided by the interviewers. A series of quantitative studies were conducted to examine inter-informant and test-retest reliability, item response patterns, and inter-item correlations (Shearer, 1994). The second stage of validation development was a pilot implementation project conducted during one academic year in collaboration with several public school teachers. The teachers completed the MI assessment and also had their students contribute to it (Shearer & Jones, 1994).

Procedure

The MIDAS questionnaires were distributed among the participants and had to be completed within 30-35 minutes. The Respondents were informed that participation was voluntary and that they could leave the questionnaires anonymous.

Validation of MIDAS

Validation process involved several steps including selection of experts, translation (forward- translation and back-translation (Squires et al., 2013), experts' agreement on item relevance, and face validity. Documentation showing all the steps taken for translation and content validity was sent to the author of the original questionnaire to ensure the adequacy of the

translation. This study was preceded by a formal authorization of the authors of the original version of the MIDAS for translation into Persian and validation.

Selection of the Experts

The present study included a balancednumber of experts (N = 5), with master's and Ph.D. degrees in Translation, English Language Teaching, Psychometrics and Educational Evaluation. They had experiences in MI research and practice in educational and clinical settings. This purposeful selection of team members (i.e., experts) were used to incorporate maximum variation and to ensure thepanel members' theoretical and practical understanding of andexperience in MI.

Translation of MIDAS

A panel of five Farsi-speaking experts was selected; all experts had expertise in MI. Three of them were involved in translating and thoroughly reviewing the translation. They compared the initial Persian translation with the original English version of the MIDAS and were guided by such questions as: Has this question been translated in a proper way? If no, please suggest a better translation (Cha, Kim, &Erlen, 2007). The various comments and wording suggestions were then discussed by them until a consensus was reached.

After this, the Persian version was back-translated into the original language for comparison with the translation by two other team members, who had not seen the English MIDAS. The new version of the translation underwent a new process of achieving consensus among all panel members. Figure 1 displays the translation process.

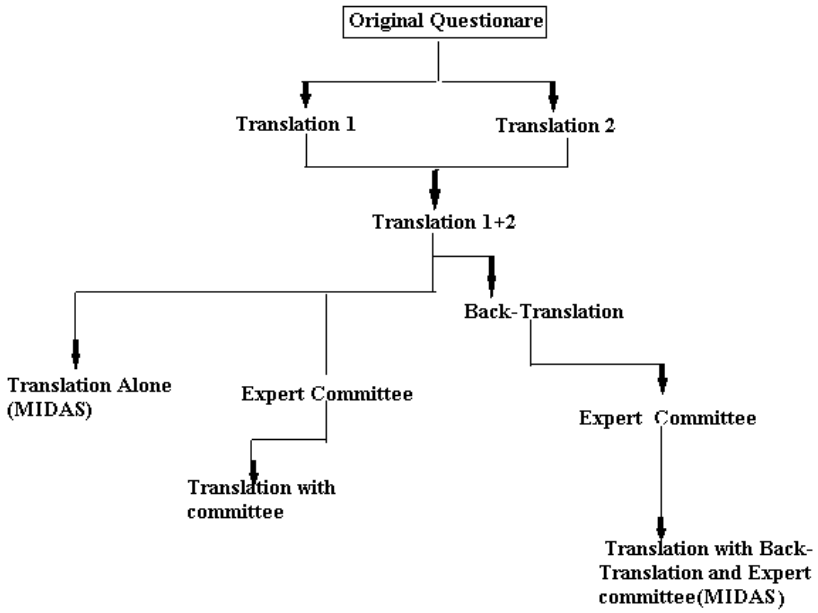

Figure 1
The Translation Process of MIDAS

Experts' Agreement on Item Relevance (Item Content Validity Index)

Item content validity index (I-CVI) was calculated for each item. For the total instrument and each scale, a scale content validity index (S-CVI) was specified. I-CVI is the proportion of experts who rate an item's content as valid (Armstrong, Cohen, Eriksen, &Cleeland, 2005; Polit, & Beck, 2007). To calculate an S-CVI, different methods were used. The first requirement was achieving 'universal agreement' among experts and defining the S-CVI as the proportion of items on an instrument that achieved a rating of 3 or 4 by all the experts (S-CVI/UA). The second requirement was to calculate the average of all the I-CVIs of the individual items (S-CVI/Ave) (Figure 2).

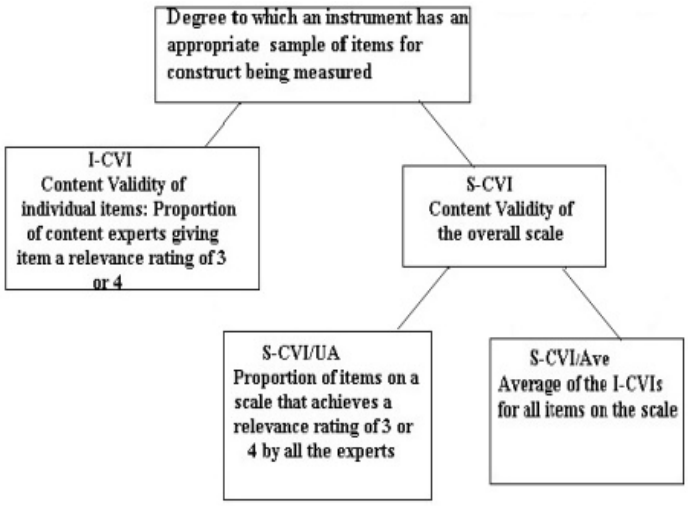

Figure 2
Content Validity Index/Polit and Beck:Item-level content validity index (I-CVI); scale-level content validity index (S-CVI); scale-level content validity index, universal agreement calculation method (S-CVI/UA); scale-level content validity index, averaging calculation method S-CVI/Ave

Content validity indexes were rated as good when I-CVI, S-CVI/Ave and S-CVI/UA were at least 0.78, 0.90, and 0.80, respectively (Polit et al., 2007).

To counter the limitations of the CVI, an I-CVI was computed to correct the chance agreement by calculating the modified kappa statistic (k*), which is an index of agreement among experts that the item is relevant (Polit et al., 2007). To compute the modified kappa, the probability of chance agreement was computed using the following formula:

$Pc = [N!/A!\,(N - A)!] \times 0.5N$

where N is the number of experts and A is the number agreeing on good relevance (rating 3 and 4). k* was calculated by using $k^* = [\text{I-CVI} - Pc]/[1 - Pc]$ (Polit et al., 2007). Finally, the standards described in Fleis (1981) were applied to find out whether the value for each k* was

acceptable (between 0.4 and 0.59), good (between 0.60 and 0.74), or excellent (more than 0.74).

Content validity was examined by the members of the expert panel. Each of the experts was asked to rate each MIDAS item on its relevance using a 4-point Likert scale, ranging from "highly relevant" (score 4), "quite relevant" (score 3), "somewhat relevant" (score 2), to "not relevant" (score 1) (Polit et al., 2007). In addition, the experts were asked to indicate whether the wording of a specific item should be revised. If the expert recommended a revision, he/she was encouraged to revise the item.

Face Validity

Before using the instrument, the face validity was examined by three of the experts randomly selected from the panel (Table 2). They studied the Persian version and were guided by questions such as: *Are these questions understandable? If no, please reveal the item and feel free to propose a better* formulation. The comments were then discussed by other three members of the panel until the final translated MIDAS Persian version was established, a process recommended by Polit and Beck (2006).

Table 2
Validity Content Index (CVI) and Kappa Concordance Coefficient

	CVI (%)	**Kappa (95% CI)**
Clarity	71.2	---[b]
Judge 1* judge 2 * judge 3	96.4	.82 (.70–.94)
Judge 1* judge 2	85.8	.91 (.85-.97)
Judge 1* judge 3	98.6	.93 (.84–1.0)
Judge 2* judge 3		
Pertinence	94.9	.87 (.78-.96)
Judge 1* judge 2 * judge 3	98.2	
Judge 1* judge 2	97.6	.82 (.71–.95)
Judge 1* judge 3	100	.94 (.90-.98)
Judge 2* judge 3		

Content Validity

All the appointed experts completed the validation process. Of 119 items, 116 items received adequate content validity (CVI > 0.70 and kappa > 0.4). Based on Lynn (1986), Tilden, Nelson and May (1990), and Polit et al. (2007), the items with an I-CVI of 0.7 or greater were retained; 0.5–0.7

were clarified; less than 0.5 were discarded unless they were theoretically supported (see Appendix for Table 3).

As shown in Table 3, some items were considered content invalid and consequently modified in the P-MIDAS. These items scored satisfactorily in CVI but failed to reach the kappa standard (CVI > 0.70 and kappa < 0.4). The minimum kappa for achieving content validity was 0.40(Fleiss, 1971). Accordingly, some items needed revision based on Iranian culture.

Reliability

The coefficient alpha was used to examine the internal consistency reliability. The mean item response values for the 119 items ranged from 2.2 to 2.49 with a median of 2.61. The standard deviation for item responses ranged from 1.0 to 1.8. The response patterns for each item were carefully reviewed for each scale. These values indicated that respondents used a full range of options when responding to the items. Some items were responded more highly than others while other items had an evenly distributed pattern of responding. Overall, there was a fairly good mix of high, low and moderate response patterns.

The reliability of the MIDAS fell in the high-moderate to high range with alpha coefficients ranging from .82 to .90 and a median of .86. Total scales score correlations were also obtained to provide additional information for evaluating the adequacy of each scale (Table 4).

Table 4
The Reliability of the MIDAS Scales

Scales	Cronbach's Alpha	N of Items
Interpersonal	.85	19
Intrapersonal	.88	25
Spatial	.83	16
Linguistic	.82	14
Math-logical	.87	20
Kinesthetic	.90	12
Music	.89	19
Naturalist	.86	16

The results of the reliability coefficients of this study were similar to alpha coefficients obtained for all scales in several international studies of

MIDAS translations (English, Wiswell, Hardy and Reio, 2001; Malaysian, Yoong, 2001; Spanish, Pizarro, 2003; Korean, Kim, 1999). The mean scale scores are presented in Table 5. Most mean scores cluster around 50% except for the highest spatial scale (55%) and the lowest Linguistic at 42%.

Table 5
Mean and S.D Scale Scores

Scale	Mean	S.D
Interpersonal	48.02	16
Intrapersonal	51.91	15
Spatial	55.83	16
Linguistic	42.13	17
Math-logical	50.82	17
Kinesthetic	52.31	18
Musical	54.48	21
Naturalist	43.90	18

Design

A cross-sectional design was used to translate and determine the content validity and reliability of the MIDA questionnaire. SPSS 22 was used for conducting descriptive and statistical analyses of Cronbach's alpha and correlation.A content validity index (CVI) was used to establish the CVI of the items, scales and subscales. The multi-rater kappa coefficient was also conducted.

Discussion

The translated MIDAS (P-MIDAS) had an acceptable content validity and reliability as the results of the study indicate. The translation and validation process in this study are in line with Guillemin, Bombardier and Beaton(1993) according to whom there are certain conditions to meet for establishing equivalence in cross-cultural validation, which include semantic (considering meaning components), idiomatic (attending to certain idioms and colloquialism which are not translatable), experiential (adapting the original instrument in terms of cultural context), and conceptual (validating the conceptual aspects culturally using the target population). In addition, the translation process employed in this study focused on functional equivalence, which is ‘the extent to which an instrument does

what it is supposed to do equally well in two or more cultures (Herdman, Fox-Rushby&Badia, 1998). Finally, the translation process in this study falls into a category which is called moderately resource intensive translation. As the related literature shows, using both 'resource intensive' and 'resource-saving' strategies can lead to satisfactory results. Thus, the translation process in this study ensured at least minimal criteria according to published requirements for a successful validation process.

The Persian version of MIDAS (P-MIDAS) was found to be a valid and reliable instrument with psychometric properties similar to the original English MIDAS. As confirmed by the high reliability of the Corenbach's alpha (82) and significant consistency illustrated by correlation between individual test items and total score, the results of the present study showed that the translation and linguistic validation process had been properly done and that the Persian version of the MIDAS had undergone a culturally appropriate validation process. Thus, it could be claimed that P-MIDAS is a quick, easy to use, highly reliable and valid test which can be used to evaluate MI of Iranian adults.

In every culture, including Iranian culture, there is a need for validation of the instruments used in different cultures for assessing multiple intelligences so that researchers, teachers and counselors could develop better appreciation of individuals. Particularly, teachers should have enough knowledge about MI theory and its assessment in order to use it effectively for helping individuals to improve learning and success. As Minton (1998) asserts, multiple intelligence theory explains a higher proportion of variance in learning success rather than the other theories.

As the results of this study indicate, because of the specialty of Persian culture, including some aspects of Islamic culture, some of the MIDAS items were modified. For example, item number 17 was modified as it was related to dancing activity at schools, which does not exist in the curriculum of Iranian schools because of the Islamic regulations. Also, among the modified items was the item 12, which belonged to musical intelligence. In the Persian culture, as a part of Muslim culture, music is not treated in the same way as seen in the western culture. As these modifications culturally reflect the social and cultural elements in Iran, they

are more likely to render the MI measurement more relevant and meaningful.

The use of P-MIDAS can provide a lot of information about the individuals' MI. This instrument can be helpful for individuals to understand themselves and their specific strengths and weaknesses. In particular, it can provide teachers and researchers with additional information about their students' thinking and behavior. As Dababneh (1998) states, the information obtained from teachers' rating of their students' MI may be useful to categorize students based on theirstrengths and interests. If educators do not use instruments for measuring their students' intelligences, they will have no clear ideas about which intelligence(s) a student (or a group of students) is more likely to benefit from and how their capabilities can be improved by reinforcing these intelligence(s). In theIranian educational setting, insights derived from MI theory should be incorporated into the curriculum in order to engagestudents with various activities that may improve their MI skills. Furthermore, P-MIDAS can be used by counselors during counseling sessions for educational purposes. Thus, the results of the present study may positively affect the daily practice of educators and therapists as well as researchers.

To conclude, translation remains the most crucial step in validating a well-developed instrument; thus, communicating this translation experience and content validity and reliability procedure may assist other researchers with their validation procedure for MIDAS. The content validity and reliability of the P-MIDAS are now being subjected to rigorous testing for future studies, especially with larger sample size. This study was a stepping-stone to further studies on MIDAS in Iran).

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Appendix

Table 3
Results of the content validity of the Persian version of the MIDAS

Scales	Item numbers in the original MIDAS	I-CVI	Kappa	Nmk Action	P
Music	1	1.00	1.00	Retain	<0.001
	2	0.90	0.90	Retain	<0.001
	3	1.00	1.00	Retain	<0.001
	4	1.00	1.00	Retain	<0.001
	5	0.90	0.90	Retain	<0.001
	6	1.00	1.00	Retain	<0.001
	7	1.00	1.00	Retain	<0.001
	8	1.00	1.00	Retain	<0.001
	9	0.90	0.90	Retain	<0.001
	10	1.00	1.00	Retain	<0.001
	11	0.90	0.90	Retain	<0.001
	12	0.70	0.36	Modification	<0.001
	13	1.00	1.00	Retain	<0.001
	14	1.00	1.00	Retain	<0.001
S-CVI (subscale 1) = 0.95					
Kinestetic	15	0.90	0.90	Retain	<0.001
	16	1.00	1.00	Retain	<0.001
	17	0.70	0.38	Modification	<0.001
	18	0.90	0.90	Retain	<0.001
	19	0.70	0.38	Modification	<0.001
	20	0.90	0.90	Retain	<0.001
	21	0.90	0.90	Retain	<0.001
	22	0.90	0.90	Retain	<0.001
	23	1.00	1.00	Retain	<0.001
	24	0.90	0.90	Retain	<0.001
	25	1.00	1.00	Retain	<0.001

	26	1.00	1.00	Retain	<0.001
	27	1.00	1.00	Retain	<0.001
		S-CVI (subscale 2) = 0.90			
Mathematics	28	0.90	0.90	Retain	<0.001
	29	1.00	1.00	Retain	<0.001
	30	1.00	1.00	Retain	<0.001
	31	1.00	1.00	Retain	<0.001
	32	0.70	0.34	Modification	<0.001
	33	0.90	0.90	Retain	<0.001
	34	0.70	0.38	Modification	<0.001
	35	0.70	0.35	Modification	<0.001
	36	1.00	1.00	Retain	<0.001
	37	1.00	1.00	Retain	<0.001
	38	0.70	0.33	Modification	<0.001
	39	1.00	1.00	Retain	<0.001
	40	0.90	0.90	Retain	<0.001
	41	0.70	0.36	Modification	<0.001
	42	1.00	1.00	Retain	<0.001
	43	0.70	0.34	Modification	<0.001
	44	0.90	0.90	Retain	<0.001
		S-CVI (subscale 3) = 0.87			
Spatial	45	0.80	0.39	Modification	<0.001
	46	0.70	0.38	Modification	<0.001
	47	1.00	1.00	Retain	<0.001
	48	0.90	0.90	Retain	<0.001
	49	1.00	1.00	Retain	<0.001
	50	0.90	0.90	Retain	<0.001
	51	1.00	1.00	Retain	<0.001
	52	1.00	1.00	Retain	<0.001
	53	1.00	1.00	Retain	<0.001
	54	0.90	0.90	Retain	<0.001
	55	0.90	0.90	Retain	<0.001
	56	1.00	1.00	Retain	<0.001
	57	0.70	0.38	Modification	<0.001
	58	0.90	0.90	Retain	<0.001
	59	1.00	1.00	Retain	<0.001
		S-CVI (subscale 4) = 0.91			
Linguistics	60	1.00	1.00	Retain	<0.001
	61	0.90	0.90	Retain	<0.001
	62	0.90	0.90	Retain	<0.001
	63	1.00	1.00	Retain	<0.001
	64	0.90	0.90	Retain	<0.001
	65	1.00	1.00	Retain	<0.001
	66	1.00	1.00	Retain	<0.001
	67	0.90	0.90	Retain	<0.001
	68	1.00	1.00	Retain	<0.001
	69	1.00	1.00	Retain	<0.001
	70	0.90	0.90	Retain	<0.001
	71	1.00	1.00	Retain	<0.001
	72	0.90	0.90	Retain	<0.001
	73	1.00	1.00	Retain	<0.001
	74	0.90	0.90	Retain	<0.001
	75	1.00	1.00	Retain	<0.001
	76	1.00	1.00	Retain	<0.001
	77	0.90	0.90	Retain	<0.001

	78	1.00	1.00	Retain	<0.001
	79	1.00	1.00	Retain	<0.001
			S-CVI (subscale 5) = 0.96		
Interlanguage	80	0.90	0.90	Retain	<0.001
	81	1.00	1.00	Retain	<0.001
	82	1.00	1.00	Retain	<0.001
	83	0.90	0.90	Retain	<0.001
	84	0.90	0.90	Retain	<0.001
	85	1.00	1.00	Retain	<0.001
	86	0.90	0.90	Retain	<0.001
	87	1.00	1.00	Retain	<0.001
	88	1.00	1.00	Retain	<0.001
	89	0.90	1.00	Retain	<0.001
	90	0.90	0.90	Retain	<0.001
	91	1.00	0.34	Modification	<0.001
	92	1.00	1.00	Retain	<0.001
	93	0.80	1.00	Retain	<0.001
	94	1.00	1.00	Retain	<0.001
	95	1.00	1.00	Retain	<0.001
	96	0.90	1.00	Retain	<0.001
	97	1.00	1.00	Retain	<0.001
			S-CVI (subscale 6) = 0.95		
Intrlanguage	98	1.00	1.00	Retain	<0.001
	99	0.90	0.90	Retain	<0.001
	100	1.00	1.00	Retain	<0.001
	101	1.00	1.00	Retain	<0.001
	102	0.80	0.78	Retain	<0.001
	103	1.00	1.00	Retain	<0.001
	104	0.90	0.90	Retain	<0.001
	105	1.00	1.00	Retain	<0.001
	106	1.00	1.00	Retain	<0.001
			S-CVI (subscale 7) = 0.95		
Naturalistics	107	1.00	1.00	Retain	<0.001
	108	0.90	0.90	Retain	<0.001
	109	1.00	1.00	Retain	<0.001
	110	1.00	1.00	Retain	<0.001
	111	0.90	0.90	Retain	<0.001
	112	1.00	1.00	Retain	<0.001
	113	1.00	1.00	Retain	<0.001
	114	0.90	1.00	Retain	<0.001
	115	1.00	1.00	Retain	<0.001
	116	1.00	1.00	Retain	<0.001
	117	0.90	0.90	Retain	<0.001
	118	1.00	1.00	Retain	<0.001
	119	0.90	1.00	Retain	<0.001
			S-CVI (subscale 8) = 0.96		

Biodata

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