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6 (688)

19

0.40 0.68 0.35

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. 0.84 0.62

0.082 0.123 0.058

. 0.112

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0.79 0.61

. 0.92

. 0.94 ( )

(0.05 = α)

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.(Elliot, 1987)

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(16) (100)

.(Anastasi, 1988) . *

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.2005/6/2 2004/11/2

(Sternberg, 1985)

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.   (Schmidt and Clano, 1974)

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.(Sternberg, 1985)

.(Schmidt and Clano, 1974)

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.(Morgan, 1996)

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.   (180)   (150)

(6 x   5 x   6)

.(2002   )

(Eells, 1951; Lorge,   .1974   WISC – R

.1966; Reynold and Brown, 1984; Roca, 1955)

(15)   (6)

(1995   )

.(Anastasi, 1988)

(Leiter-International Performance

Scale)

:

.   Bodily – Kinesthetics

(Gardner, 1983)

(   )   .

Right column:

(   ) .

IPAT Culture   .

Free Intelligence Test.

.Raven Progressive Matrices (Anastasi, 1988)

(McCallum, 2000)

(   )   .

1-

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(Wolman,   )

1999)

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Bender – Gestalt Test for Young   1-
Children (Koppitz, 1975).

Detroit Test of   2-
Learning Aptitude (Hamill, 1991).

Matrix Analogies   3-
.(Naglieri, 1985)

Snijders-   –   4-
Oemen Nonverbal Intelligence (Snijders, Tellegen,
and Laros, 1989).

(   )   5-
.(Wechsler, 1991)

(Anastasi, 1988)   (Aiken, 1994)

:

Left column:

Leiter International Performance   -1
.(Arthur, 1950) Scale

Hiskey –   –   -2
Nebraska Test of Learning Aptitude (Hiskey, 1966).

Test of Nonverbal   -3
Intelligence (Brown, Sherbenold and Johnsen,
1996).

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-4
(12-9)   (1984)

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-12)   -5
(1986)   (15

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-15)   -6
(18

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(Kaufman   -7
(El-Mneizel,   and Kaufman, 1983)
1987)

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10- (Aslin and Smith,

.1998; Hamill, Pearson and Voeress, 1993) (1995)

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CTONI

Nonverbal (Comprehensive Test of CTONI)

CTONI .(High-order thinking) Intelligence

(Hamill, Pearson and Weiderholt, 1997)

(Cattell, 1963; Horn and Cattell, 1966;

: Horn, 1985)

1-

. 19 6

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CTONI

2-

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CTONI (Salvia and Ysseldyke,

. 1995)

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-3   (Das, 1972; Das, Kirby and Jarman, 1975; Das and
Molloy, 1975)

(CTONI)   -4   (Simultaneous Processing)
(Successive

-5   Processing)

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CTONI

.   (Jensen,

-2   1980)

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(Hamill et al., 1997)   .(   )

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(Hamill et al., 1997)

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.**2**   (CTONI)

-2

(CTONI)

19   6

(1)

414	206	208	
205	101	104	
69	34	35	
688	341	347	

(2)

Context		
Geometric Designs	**Pictorial Objects**	**(Ability)**
Geometric Analogies	Pictorial Analogies	Analogical Reasoning
Geometric Categories	Pictorial Categories	Categorical Classification
Geometric Sequences	Pictorial Sequences	Sequential Reasoning

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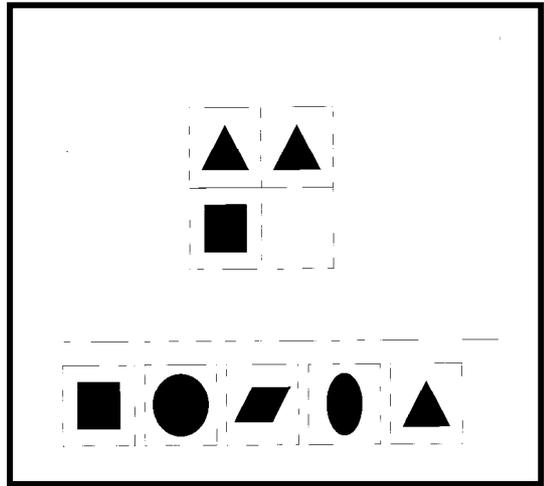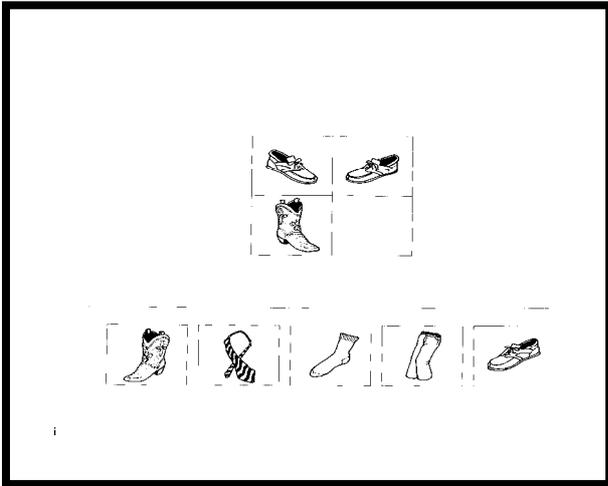(11   19)   (6)
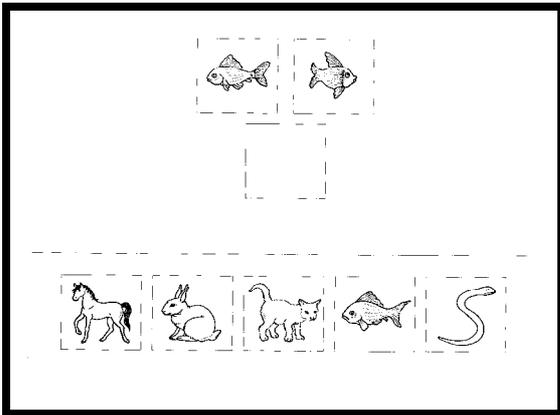
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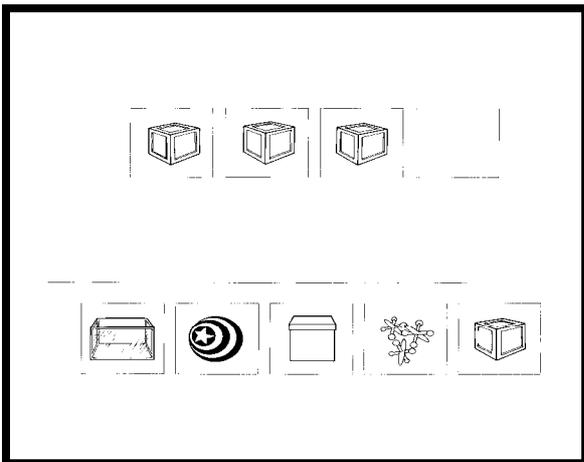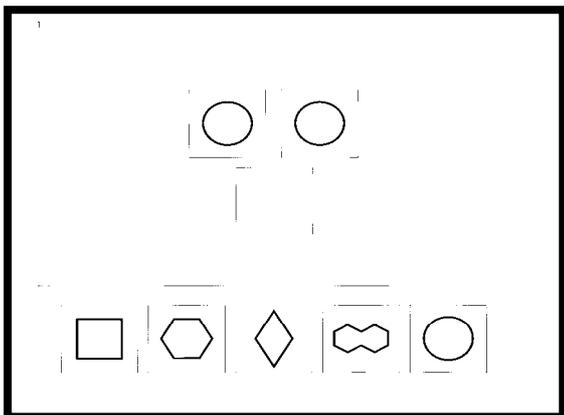
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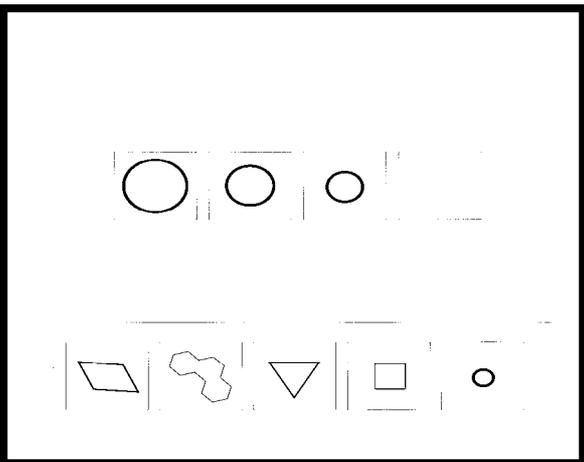
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(2x3)

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Nonverbal Intelligence: –

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2 x2
Pictorial Nonverbal – .Analogical Reasoning
Intelligence: ( ) -
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Geometric Nonverbal –
Intelligence:

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(3)

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( )   (2)

22   21

(18)   25   24   23

( )   .

(6)   ( )

.(9)   .   (3)

(3)

1	1	0	1	1	1
1	1	0	1	1	2
1	1	0	0	1	3
1	1	1	1	1	4
0	1	1	1	1	5
0	1	-	1	1	6
1	1	-	0	1	7
1	0	-	1	0	8
0	1	-	1	0	9
-	1	-	0	0	10
-	1	-	1	-	11
-	0	-	0	-	12
-	0	-	1	-	13
-	1	-	0	-	14
-	1	-	-	-	15
-	1	-	-	-	16
-	0	-	-	-	17
-	1	-	-	-	18
-	1	-	-	-	19
-	1	-	-	-	20
-	0	-	-	-	21
-	0	-	-	-	22
-	1	-	-	-	23
-	1	-	-	-	24
-	0	-	-	-	25
6	18	2	9	7	

(4) ． :**Testing Time**

． 40

． 10-5 60

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(5) ．

．

: .3

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: ．

: .1 /(Wechsler, 1991)

(Dunn (Brown et al., 1998) (Salvia and

.and Dunn, 1981) Ysseldyke)

(Cattell and Horn)

0.50 .(Wechsler) (Jensen) (Das)

.0.90 0.80 : .2

(4)

00	24	49	29	32	21	6
39	33	48	32	39	35	7
35	35	43	30	44	40	8
50	45	50	36	44	40	9
59	48	53	38	45	45	10
56	49	51	41	53	58	11
56	49	53	39	63	48	12
61	50	50	45	60	50	13
58	47	51	37	57	48	14
64	55	54	42	61	47	15
61	49	56	41	64	45	16
58	56	51	42	64	43	17
67	63	62	47	66	48	18
59	35	49	40	52	43	29‐19

(5)

00	01	13	06	01	02	6
02	04	22	10	05	04	7
03	15	32	19	08	12	8
13	25	49	23	15	17	9
21	37	55	31	23	30	10
21	42	56	33	21	37	11
32	48	60	39	33	47	12
34	53	64	46	44	50	13
39	62	67	56	43	58	14
42	58	62	49	44	50	15
47	67	71	55	54	51	16
46	65	71	52	54	55	17
39	53	60	55	50	56	18
63	86	80	74	76	72	29-19

(6)

46	44	32	43	54	-	
55	49	37	39	-	-	
38	38	34	-	-	-	
32	41	-	-	-	-	
57	-	-	-	-	-	
-	-	-	-	-	-	

(7)

( )

0.57	
0.66	
0.50	
0.54	
0.68	
0.71	

.4 :

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.0.66 0.45   .0.80

.

(0.92-0.86)
.(0.97-0.93)

.

(6)   .(4.0-2.6)

.

(7)   (0.87-0.80)
.   -0.87)
.(0.92

(8)

7	6	5	4	3	2	1	
0.733	0.498	0.512	0.353	0.407	0.566	-	.1
0.832	0.661	0.592	0.374	0.423	-	-	.2
0.632	0.402	0.367	0.372	-	-	-	.3
0.623	0.377	0.364	-	-	-	-	.4
0.797	0.683	-	-	-	-	-	.5
0.829	-	-	-	-	-	-	.6
-	-	-	-	-	-	-	.7

(9)

652	0.007	0.105	.1
652	0.127	0.060	.2
652	0.054	0.075	.3
652	0.136	0.058	.4
652	0.002	0.123	.5
652	0.025	0.088	.6
652	0.004	0.112	.7

0.623   : -

                                    0.832   :

                                                                                              1.

                                                                            (   )

                        (6).   .

" :   2.

"   13-12   11-9   8-6

.   (9)   19-18   17-16   15-14.

              (9)   (t-test)

                                                                        .

    0.123   0.058   3.

                        0.082

              0.112   .

                                                                                    : -

(1997)

                                                              :

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                                                              .

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    .(   )   .

    " :

                                                                                          3.

                                                    "

            (10).

        (10)   :   .   19   6

                                                (α = 0.05)   "

        .

                                                      .   (8)

.   (8)

                                        0.683   0.353

                                                                      0.402

            (11).

الجـــدول رقم (10)

المتوسطات الحسابية والانحرافات المعيارية للأداء على الاختبارات الفرعية والاختبار الكلي لكل فئة عمرية

الفئة العمرية / الاختبار	6-7		8-9		10-11		12-13		14-15		16-17		18-19		الكلي	
	المتوسط الحسابي	الانحراف المعياري	المتوسط الحسابي	الانحراف المعياري	المتوسط الحسابي	الانحراف المعياري	المتوسط الحسابي	الانحراف المعياري	المتوسط الحسابي	الانحراف المعياري	المتوسط الحسابي	الانحراف المعياري	المتوسط الحسابي	الانحراف المعياري	المتوسط الحسابي	الانحراف المعياري
1. الأبنية الصادرة	0.18	0.39	0.27	0.45	0.27	0.45	0.37	0.49	0.59	0.50	0.51	0.50	0.33	0.58	0.38	0.49
2. التصاميم الهندسية	0.32	0.47	0.47	0.50	0.47	0.50	0.53	0.50	0.62	0.49	0.53	0.50	1.00	0.00	0.50	0.50
3. التصنيفات الصادرة	0.34	0.48	0.29	0.46	0.40	0.49	0.42	0.50	0.69	0.47	0.58	0.50	0.67	0.58	0.47	0.50
4. التناظرات الهندسية	0.41	0.50	0.45	0.50	0.68	0.47	0.81	0.39	0.87	0.34	0.80	0.41	0.67	0.58	0.69	0.46
5. المتتابعات الصادرة	0.30	0.46	0.25	0.44	0.37	0.49	0.44	0.50	0.59	0.50	0.53	0.50	0.33	0.58	0.42	0.49
6. المتتابعات الهندسية	0.20	0.41	0.14	0.35	0.17	0.38	0.14	0.35	0.25	0.44	0.29	0.46	0.33	0.58	0.20	0.40
7. الاختبار ككل	0.55	0.50	0.45	0.50	0.42	0.50	0.44	0.50	0.51	0.50	0.51	0.50	0.33	0.58	0.48	0.50

(11)

( )

(50)   (3)   .

            (17-16)   (15-14)   (1997)
                 0.945   .
                 (1997)

                                                                              .
                                                           " :
                                                                      "

      .
          " :
(0.05 = α)   .   (12)
                                                                  (12)
                              "   0.79   0.61
          .   (13)   0.73
                                                                              0.92

(11)

0.000	23.325	0.378 0.016	6 681 687	2.218 11.037 13.305		.1
0.000	36.488	1.170 0.032	6 681 687	7.019 21.832 28.851		.2
0.000	13.489	0.198 0.015	6 681 687	1.191 10.020 11.211		.3
0.000	23.089	0.459 0.02	6 681 687	2.763 13.533 16.286		.4
0.000	23.110	0.506 0.022	6 681 687	3.034 14.902 17.936		.5
0.000	29.058	0.757 0.026	6 681 687	4.543 17.430 21.973		.6
0.000	51.270	0.524 0.010	6 681 687	3.143 6.957 10.100		.7

(12)

0.61	25	688	1.
0.83	25	688	2.
0.61	25	688	3.
0.71	25	688	4.
0.75	25	688	5.
0.79	25	688	6.
0.92	150	688	7.

(13)

341	347	3.37	3.59	9.08	9.26	1.
		5.35	4.89	9.33	9.64	2.
		3.14	3.25	11.91	11.73	3.
		3.94	3.75	14.96	15.28	4.
		4.25	4.10	11.81	11.66	5.
		4.69	4.25	11.00	11.28	6.
		18.37	18.03	68.09	68.84	7.

(14)

( )

0.532	0.625	686	1.
0.432	0.789	686	2.
0.475	0.715	686	3.
0.284	1.073	686	4.
0.835	0.476	686	5.
0.413	0.820	686	6.
0.590	0.539	686	7.

(13)   (14)   .

(14)

$(\alpha = 0.05)$

( )

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1995

1994

1986
(12-9)

1973

2002

1988
11
132-157 (8).

1987
18-15

1973
(9-4)

1981

1986
(15-13)

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Examining the Item Effectiveness, Reliability and Validity of the CTONI for the Jordanian Environment

Ayesh M. Gharaibeh, Mayyada M. Al-Natour and Abdullah F. El-Mneizel*

ABSTRACT

The purpose of this study was to examine the item effectiveness, reliability and validity of the Comprehensive Test of Nonverbal Intelligence (CTONI). The CTONI is an individual intelligence test that contains six subtests designed to measure higher-order nonverbal abilities.

A stratified random selection was utilized to select (688) students from public and private schools, their age ranged from 6-19 years. The sample was representative to the three major areas of Jordan (north, middle and south).

Results of the study indicated that correlation coefficients for the six subtests ranged from 0.35 - 0.68 with a median of 0.40. These results are substationally correlated which can be considered as an evidence of construct validity.

Correlation coefficients between scores on the subtests and the total score of the test ranged from 0.62 to 0.84. This result is an indicator that the CTONI is measuring what it supposes to measure.

Results also indicated that correlation coefficients between the subtest of the CTONI and achievement ranged from 0.058-0.123 with a median of 0.082, while correlation coefficients between achievement and total score was 0.112. These results clearly indicate that the CTONI does not measure achievement, which is another evidence of construct validity. Another evidence of construct validity is the increase of overall performance according to age.

Internal consistency for the CTONI subtests ranged from 0.61-0.79 and for the total score 0.92; Test retest (stability coefficients) was 0.94. The previous result indicates that the CTONI has acceptable reliability.

Finally, results indicated that there are no statistical differences (α =0.05) among male and female students.

Overall, the Comprehensive Test of Nonverbal Intelligence has acceptable psychometric characteristics; therefore, it can be used in Jordan.

Keywords: Intelligence Tests, Nonverbal Intelligence Tests, CTONI, Jordanian Environment.