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The Korean Adaptation of the State-Trait Depression Inventory: STDI-K[1)]

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Recent studies attest that depression may be an important psychological factor in a variety of physical health, including cancer. Further, there is a growing body of research showing that only trait depression may be an important factor in cancer; unfortunately, previous scales have not distinguished state depression from trait depression. Thus, in the present study, a series of attempts were made to adapt the State-Trait Depression Inventory developed by Spielberger (1995), which distinguishes state depression from trait depression. In order to accomplish this purpose, two independent studies were conducted. Participants were 204 high school students and 224 college students (Study 1), and 342 college students and 101 adults, representing major areas in Korea (Study 2). Selection of items was primarily based on internal consistencies and factor analyses, resulting in 30 out of 50 items in Study 1, and 20 out of 30 items in Study 2. In addition, test-retest reliabilities, and concurrent validity with the Korean adaptation of the CES-D for the final 20 items of the STDI-K were examined. The findings suggest that the Korean adaptation of the STDI is a reliable and valid inventory.

A growing body of research suggests that depression may be an important psychological factor in chronic diseases such as cancer or cardiovascular disease. For instance, depression has been closely associated with cancer. In fact, Galen already observed and reported that cancer occurred more frequently in "melancholic" than "sanguine" women in 2 C.

The close relation between depression and cancer has also been observed in a variety of recent studies. For instance, Middelboe, Ovesen, Mortensen, and Bech (1994) reported that, based on Hamilton's depression scale and Melancholia scale, the level of depression in 36 cancer patients were similar to that of clinical depression. More specifically, about 40% of cancer patients showed signs of clinical depression prior to receiving chemotherapy.

Shekelle, Raynor, Ostfeld, Garron, Bieliauskas, Liu, Maliza, and Paul (1981) reported a significant associations between symptoms of depression

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(based on the MMPI) and the risk of death from cancer over a 17-year follow-up period. A follow-up study for a 20 year period at the same Western Electric Company employee again revealed an increased risk of cancer mortality among those who reported depression at baseline (Persky, Kempthorne- Rawson, & Shekelle, 1987). In addition, based on a meta-analytic analysis with seven prospective studies McGee, Williams, and Elwood (1994) concluded that there is "a small, but marginally statistically significant association between depression and the later development of cancer." (p. 187)

Depression may also be associated with the development or prognosis of cancer. For instance, according to Greer, Morris, and Pettingale (1979), hopeless and helpless cancer patients were found to be worse than high spirited patients in five year later. Further, this pattern was also shown in a follow-up study three years later (Greer, Pettingale, Morris, & Haybittle, 1985).

A similar pattern, although less definitive, has been found between depression and cardiovascular diseases (Appels, 1997). In fact, an attempt was even made to develop a more specific depression scale for cardiac patients (Hare & Davis, 1996).

As described above, recent studies attest that there has been a close association between depression and chronic diseases such as cancer and cardiovascular disease. Considering the fact that cancer and cardiovascular disease are the most critical diseases of modern times, there is a dire need to identify the role of depression in chronic diseases such as these.

In order to understand and identify the relations between depression and chronic diseases, a more refined scale for measuring depression is one of the most important tasks at hand. Indeed, a number of depression scales have been developed over the past two decades. However, the majority of depression scales designed thus far measured psychopathology, instead of pathophysiology, in large part due to the lack of knowledge and awareness of the relations between depression and physical health. For example, the following representative scales were designed to measure depression focusing on psychopathology: SADS (Schedule for Affective Disorders and Schizophrenia, Endicott & Spitzer, 1978); HRSD (Hamilton Rating Scale for Depression, Hamilton, 1960); BDI (Beck Depression Inventory, Beck, 1978); SDS (Self-Rating Depression Scale, Zung, 1965); and CES-D (Center for Epidemiologic Studies Depression Scale, Radloff, 1977).

Thus, in order to compensate for the limitations of depression scales such as aforementioned, Spielberger (1995) recently developed the State-Trait Depression Scale (STDI), in large part to facilitate health psychological studies. Briefly, the STDI is a self-report to measure both state and trait aspects of depression via the same instrument. In contrast, the scales mentioned above have focused on either state or trait aspects of depression. For instance, the CES-D is characterized by its focus on depressive affects, while the BDI emphasize the trait nature of depression.

The other aspect of the STDI, in addition to measuring both state and trait components of depression, is achieving a balance between the positive items and negative items in the scale. Stated differently, one half of the scale is tapping into the dysthymia, and the other half into euthymia. The equal number of dsthymia and euthymia items may provide an interesting implication for cross-cultural study. For example, Iwata, Mishima, Simizu, Mizoue, Fukuhara, Hidano, and Spielberger (1998) reported that the Japanese were shown to score lower than Americans in anxiety scores. When a series of attempts were

made to understand the major reasons why the Japanese scored lower in anxiety than Americans, it was found that the Japanese scored lower on positive items. While there were no differences in the scores on negative items, the lower scores on positive items resulting in lower scores over all (Iwata et al., 1998). Stated differently, the Japanese may repress or suppress their positive feelings compared to their counterparts. Thus, the STDI, with its equal number of positive and negative items, provides easier and more efficient cross-cultural comparison for depression.

In summary, a growing body of literature suggests that there is a significant association between depression and cancer, and, to a lesser extent, cardiovascular disease. Nonetheless, the majority of depression scales thus far were not designed to explore the relations between depression and physical health. Thus, in the present study, an attempt was made to adapt the State-Trait Depression Inventory (Spielberger, 1995), which is characterized by measuring both state and trait aspects of depression with its balance of positive and negative items. The development of the State-Trait Depression Inventory, with a more refined measurement, may shed greater light on the relations between depression and physical health. For example, although controversial, there has been empirical evidence that trait and chronic depression may be a more viable risk factor for cancer than state and episodic depression (Croyle, 1998; McGee, Williams, & Elwood, 1984). Thus, the primary aim of the present study was to adapt the State-Trait Depression Inventory in Korea.

STUDY 1

METHOD

Participants and procedure

Participants were 204 high school students (Male, 47%; Female, 53%) and 224 college students (Male, 33%; Female, 67%). The surveys were done in group during class.

Scale construction

Initially, in order to adapt the State-Trait Depression Inventory for Korea, translations for each item were done by five bilinguals. More specifically, one American English professor at the department of English and four Korean psychologists, who earned their doctoral degrees in the US, participated in the initial stage of translation. After the first round of translations, at the expert evaluation stage, the translations were sent to five health/clinical psychologists to ascertain whether the translations were correct. Experts were asked to provide their own translations in case of differing opinions on any items. As a result, the final items in the pilot scale were developed primarily by five bilinguals, together with five additional experts.

The selection of items through the above process resulted in 50 items (25 items for state depression and 25 items for trait depression), although the original scale consisted of 20 items (10 for state and 10 for trait) in total. Note, in passing, that, with the exception of two items ('sad,' 'depressed'), all items were translated into more than two alternatives. For example, 'I feel strong' for state depression was translated into four alternatives such as 'Hwallyŏgi nŏmch'inda,' 'Hwalgiga nŏmch'inda,' 'Kanghadago nŭkkinda,' 'Kanghada'. In a similar fashion, two items indicative of trait depression were translated into four alternatives: 'I feel whole' for 'Ch'ungmanhada,' 'Chohwasŭrŏpda,' 'Onjŏnhada,' and 'Kŏnganghada'; 'I feel low' for 'Kibuni chŏjohada,' 'Mugiryŏkhada,' 'Kiuni ŏpda,' and

'Ŭigisoch'imhada'.

Once the final 50 translations were selected, care was taken to avoid response set; the order of items was counterbalanced by mixing the negative items with positive items.

Experimental scale for the State-Trait Depression Inventory

As described above, the present study was an attempt to adapt the State-Trait Depression Inventory in Korea. The STDI is a self-report for evaluating the intensity of depression. In addition, the STDI is also designed to measure both state and trait aspects of depression, together with both negative and positive aspects of depression in one scale. More specifically, the inventory is composed of 10 state items and 10 trait items; in addition, half of them is positive and the other half is negative. Each item was designed to be rated on a four-point rating scale. State depression was assessed by 1--'not at all,' 2--'somewhat,' 3--'moderately so,' 4--'very much so.' while trait depression was rated by 1--'almost never,' 2--'sometimes,' 3--'often,' and 4--'almost always.'

Spielberger (1995) reported that, consistent with its construct, state depression and trait depression were divided into dysthymia (negative) and euthymia (positive). In addition, each scale showed a satisfactory level of internal consistencies: state depression (male, .93, female, .87), trait depression (male, .94, female, .91), dysthymia in the state depression (male, .92, female, .81), euthymia in the state depression (male, .92, female, .87), dysthymia in the trait depression (male, .94, female, .85), and ,euthymia in the trait depression (male, .86, female, .89), suggesting that the STDI is a reliable measurement.

Table 1
Item-remainder Correlations for State Depression Items in the First Experimental Scale

Item No.	M	SD	Total	High school students	College students	Male	Female
Item 1-1 (11)	2.59	.85	.70	.75	.65	.74	.67
Item 1-2 (23)	2.57	.85	.72	.70	.74	.81	.65
Item 1-3 (1)	2.79	.80	.51	.49	.51	.60	.42
Item 1-4 (21)	2.63	.84	.56	.55	.56	.58	.54
Item 2-1 (12)	1.79	.85	.65	.66	.65	.66	.67
Item 2-2 (2)	2.08	.81	.60	.59	.62	.60	.61
Item 3-1 (19)	2.36	.87	.57	.56	.59	.71	.47
Item 3-2 (3)	2.38	.85	.46	.47	.48	.59	.36
Item 3-3 (13)	2.33	.86	.52	.53	.53	.67	.43
Item 4-1 (14)	1.66	.81	.68	.68	.67	.76	.64
Item 4-2 (4)	1.78	.80	.63	.55	.69	.60	.63
Item 4-3 (22)	1.64	.81	.59	.55	.62	.49	.65
Item 5-1 (5)	2.67	.86	.64	.60	.67	.63	.64
Item 5-2 (15)	2.55	.86	.66	.58	.72	.67	.63
Item 6 (6)	1.77	.89	.59	.57	.61	.53	.62
Item 7-1 (24)	2.64	.83	.62	.59	.63	.63	.62
Item 7-2 (7)	2.29	.88	.59	.56	.61	.56	.62
Item 7-3 (16)	2.34	.88	.63	.61	.64	.71	.58
Item 8-1 (8)	1.73	.87	.68	.66	.69	.62	.71
Item 8-2 (17)	1.55	.79	.62	.65	.60	.71	.57
Item 9-1 (18)	1.40	.75	.65	.66	.64	.65	.66
Item 9-2 (9)	1.50	.82	.63	.63	.63	.56	.69
Item 10-1(10)	2.28	.89	.66	.62	.69	.65	.65
Item 10-2(20)	2.24	.89	.65	.59	.69	.68	.63
Item 10-3(25)	2.29	.95	.62	.59	.63	.67	.58

Note. The first number stands for the item number in the original English STDI. The number in parentheses refers to the item number in the experimental scale.

Table 2
Item-remainder Correlations for Trait Depression Items in the First Stage of the Experimental Scale

Item No.	M	SD	Total	High school students	College students	Male	Female
Item 1-1(11)	2.31	.71	.69	.67	.71	.70	.69
Item 1-2(1)	2.29	.72	.67	.63	.70	.71	.66
Item 2-1(2)	2.01	.65	.65	.62	.67	.67	.62
Item 2-2(12)	2.02	.66	.63	.62	.65	.63	.64
Item 2-3(16)	1.68	.76	.63	.59	.67	.61	.64
Item 3-1(21)	2.39	.82	.62	.59	.65	.64	.61
Item 3-2(3)	2.47	.75	.50	.49	.51	.60	.42
Item 3-3(13)	2.19	.78	.55	.51	.59	.51	.58
Item 3-4(18)	2.09	.88	.50	.49	.53	.59	.45
Item 4(4)	1.98	.65	.61	.62	.61	.65	.58
Item 5-1(5)	2.29	.74	.66	.67	.66	.69	.64
Item 5-2(14)	2.28	.76	.64	.57	.70	.59	.68
Item 5-3(22)	2.33	.76	.71	.67	.74	.69	.73
Item 6-1(6)	2.05	.64	.66	.61	.72	.68	.64
Item 6-2(15)	1.90	.81	.59	.57	.61	.56	.60
Item 6-3(23)	1.97	.70	.72	.55	.61	.55	.59
Item 6-4(24)	1.92	.72	.58	.51	.64	.57	.58
Item 7(7)	2.06	.71	.62	.62	.62	.69	.56
Item 8-1(8)	2.14	.88	.59	.56	.61	.63	.56
Item 8-2(17)	2.37	.78	.59	.58	.59	.61	.57
Item 9-1(19)	1.42	.70	.58	.52	.64	.54	.60
Item 9-2(9)	1.52	.74	.57	.61	.53	.60	.55
Item 10-1(25)	2.13	.82	.72	.71	.73	.72	.72
Item 10-2(10)	2.22	.78	.68	.67	.69	.75	.62
Item 10-3(20)	2.22	.83	.71	.70	.72	.68	.73

Note. The first number stands for the item number in the original English STDI. The number in parentheses refers to the item number in the experimental scale.

RESULTS AND DISCUSSION

Internal consistencies

In order to find out internal consistencies for the scale, Cronbach's αs were calculated, and presented in Table 1 and Table 2. As can be seen in Table 1 and Table 2, means and standard deviations were also provided. Moreover, since the primary purpose of Study 1 was to select the best items among item pool, analyses were made with high school students, college students, those in the males as well as females, in addition to the total group. As can be seen in Table 1 and Table 2, the level of α revealed a highly satisfactory level. For example, the total sample revealed .94 for state depression and .95 for trait depression.

Factor analyses

In order to explore the construct validity of the scale, factor analyses were administered, and presented in Table 3 and Table 4. The principal component analyses and Varimax rotations were employed, unless special care was needed for other analyses. Again, since the primary purpose of the study was to select the best items among the 25 each for state depression and trait depression, separate analyses were made for each scale.

The present findings revealed that, consistent with the construct, there were two factors, dysthymia and euthymia, for state and trait depression. These two factors explained the 56% of the total variance of state depression, and 54.2% of the total variance of trait depression.

Based on item-remainders and factor loadings, 15 out of 25 items were selected for the present study. More specifically, the following 15 items were selected for each scale in the present study:

State depression items: (strong, 2 items) Hwallyŏgi nŏmch'inda, Kanghada; (blue, 2 items) Kibuni ŏdupda, Uljŏkhada; (healthy) Kŏnganghamŭl nŭkkinda; (downhearted, 2 items) P'uri chugŏitda, Ŭigisoch'imhae itda; (alive, 2 items) Saengdonggamŭl nŭkkinda, Saenggiga itda; (sad) Sŭlp'ŭda; (safe, 2 items) Andogamŭl nŭkkinda, Anjŏnhada; (gloomy) Ch'imulhada; (miserable) Chŏch'amhada; (hopeful) Hŭimangŭl nŭkkinda

Trait depression items: (happy, 2 items) Kibbŭda, Haengbokhada; (gloomy, 2 items) Ch'imulahda, Uljŏkhada; (whole, 2 items) Ch'ungmanhada, Onjŏnhada; (sad) Sŭlpŭda; (peaceful, 2 items) Pyŏnghwaropta, Pyŏngonhada; (low) Kibuni chŏjohada; (depressed) Uulhada; (safe, 2 items) Anjŏnhada, Andogamŭl nŭkkinda; (hopeless) Hŭimangi; (enjoying life) Saenghwari chŭlgŏpta.

STUDY 2

The purpose of Study 2 was to select the best 10 out of 15 items, as a continuation of the development of the STDI in Korea.

Table 3
Summary of Factor Analyses for the State Depression Scale in the First Stage

Item	Factor I	Factor II
Item (9)	.82	
Item (8)	.82	
Item (18)	.78	
Item (17)	.77	
Item (6)	.76	
Item (12)	.76	
Item (22)	.76	
Item (2)	.74	
Item (14)	.72	
Item (4)	.70	
Item (20)		.79
Item (13)		.77
Item (23)		.76
Item (11)		.72
Item (3)		.70
Item (15)		.69
Item (10)		.67
Item (20)		.66
Item (21)		.66
Item (25)		.63
Item (1)		.61
Item (24)		.59
Item (5)	.38	.58
Item (16)	.39	.54
Item (7)	.43	.46
Explained variance (56%)	43.2%	12.8%

Note. Loadings <.30 not reported. Number in parentheses is the number in the experimental scale.

Table 4
Summary of Factor Analyses for the Trait Depression Scale in the First Stage

Items	Factor I	Factor II
Item (22)	.76	
Item 21)	.73	
Item (11)	.73	
Item (25)	.72	
Item (14)	.72	
Item (10)	.71	
Item (5)	.71	
Item (1)	.70	
Item (17)	.69	
Item (20)	.68	
Item (8)	.61	
Item (18)	.56	
Item (3)	.56	
Item (12)		.77
Item (7)		.77
Item (4)		.75
Item (2)		.74
Item (6)		.74
Item (15)		.70
Item (6)		.70
Item (6)		.70
Item (23)		.67
Item (9)		.65
Item (19)		.59
Variance explained (54.2%)	43.7%	10.5%

Note. Loading <.30 not reported. Number in parentheses is the number in the experimental scale.

To his end, while Study 1 was conducted with a sample of high school and college students, the present study utilized both college students and adult populations. Further, a more geographically representative sample than that of Study 1 was employed for the present study.

METHODS

Participants and procedure

As described earlier, the present study utilized a more representative sample in Korea. More specifically, participants included 342 college students (Male, 51%, Female, 49%), representing the major geographic areas in Korea: Seoul, Inchon, Chunchon, Taejeon, Chungjoo, Chonjoo, Kwangjoo, Taegu, Changwon, and Cheju. Additionally, 101 adults (Male, 51%, Female, 49%) also represented the major areas of th country: Seoul (north), Chonjoo (southwest), and Taegu (southeast). The scale was administered in groups during class for the college students; adults, however, responded individually for adults; they responded individually at home and returned it in a week.

Instruments

State-Trait depression scale: As described earlier, the present version of the STDI was composed of 30 items in total; half of them were state items, and the other half were trait items.

Korean adaptation of the CES-D: In order to examine the concurrent validity of the State-Trait Depression Inventory, the Korean adaptation of the CES-D (Chon & Lee, 1992) was also employed in the present study. The CES-D is a self-report for measuring depressive symptoms, especially identifying the emotional aspects of depression. The scale was designed to measure depression by four-point ratings. Since its inception, CES-D has been used in epidemiological studies. It has also been used in health psychological studies such as those of patients with cancer (Thomson & Pitts, 1993), and caregivers of cancer patients (Nelson, Miles, Reed, Davis, & Cooper, 1994), among others.

According to Chon and Lee (1992), the Korean adaptation of the the CES-D revealed a satisfactory level of internal consistency. It also revealed a similar factor structure to the original English scale, suggesting a valid instrument for use in Korea.

RESULTS AND DISCUSSION

Internal consistencies and factor analyses

In order to calculate its internal consistencies, Cronbach's αs were calculated, and presented in Table 5 and Table 6. As was done in Study 1, means and standard deviations were also provided. and a variety of analyses was done with college students, adults, males, and females as well as the total sample. It was found that the total sample revealed satisfactory levels of internal consistencies for state depression (α = .93) and trait depression (α = .95), respectively.

Factor analyses were conducted with the principal component analyses and Varimax rotations, revealing two factors, dysthymia and euthymia. These two factors explained 59.7% of the total variance of the state depression and 62.5% of the total variance of the trait depression. Parenthetically, the present findings suggest that the explained variance by two factors was increased little when compared to Study 1.

Table 5
Item-remainder Correlations for the State Depression Items in the Second Stage

Item No.	M	SD	Total	College students	Adults	Male	Female
Item 1 (1)	2.78	.82	.61	.64	.47	.54	.66
Item 1-2(11)	2.18	.84	.59	.61	.50	.55	.62
Item 2-1(2)	1.71	.74	.60	.61	.47	.59	.61
Item 2-2(12)	1.53	.70	.69	.71	.44	.67	.70
Item 3 (3)	2.56	.81	.55	.56	.49	.52	.55
Item 4-1(4)	1.47	.70	.64	.66	.45	.68	.60
Item 4-2(13)	1.48	.73	.69	.71	.45	.70	.68
Item 5-1(5)	2.65	.85	.74	.76	.64	.69	.77
Item 5-2(14)	2.45	.85	.74	.77	.59	.70	.76
Item 6 (6)	1.53	.80	.62	.63	.44	.60	.62
Item 7-1(7)	2.73	.86	.50	.49	.49	.45	.54
Item 7-2(15)	2.12	.81	.56	.59	.36	.47	.63
Item 8 (8)	1.46	.72	.71	.73	.54	.68	.72
Item 9 (9)	1.22	.64	.58	.58	.56	.58	.58
Item 10 (10)	2.15	.87	.62	.61	.64	.60	.62

Note. The first number stands for the item number in the original English STDI. The number in parentheses refers to the item number in the experimental scale.

Table 6
Item-remainder Correlations for the Trait Depression Scale in the Second Stage

Items	M	SD	Total	College students	Adults	Male	Female
Item 1-1(1)	2.21	.63	.59	.59	.62	.54	.67
Item 1-2(11)	2.09	.73	.74	.74	.72	.71	.79
Item 1-1(2)	1.84	.60	.65	.67	.45	.60	.67
Item 2-2(12)	1.81	.66	.62	.64	.46	.62	.62
Item 3-1(3)	2.34	.73	.63	.69	.33	.55	.71
Item 3-2(15)	2.30	.77	.72	.74	.62	.71	.73
Item 4-1(4)	1.82	.64	.58	.58	.48	.54	.61
Item 5-1(5)	2.14	.73	.70	.70	.66	.66	.74
Item 5-2(14)	2.12	.71	.75	.75	.66	.74	.76
Item 6 (6)	1.89	.65	.68	.69	.53	.63	.72
Item 7 (7)	1.83	.65	.63	.63	.49	.61	.63
Item 8-1(8)	2.00	.84	.59	.61	.54	.54	.63
Item 8-2(13)	2.22	.73	.71	.72	.62	.67	.73
Item 9 (9)	1.36	.62	.54	.53	.55	.49	.57
Item 10(10)	2.07	.74	.74	.75	.67	.69	.79

Note. The first number stands for the item number in the original English STDI. The number in parentheses refers to the item number in the experimental scale.

Construction of the scale

The best 20 items were selected based on item-remainder correlations and factor analyses. Once selected by means of the above procedures, internal consistencies and factor analyses with these final 20 items were again performed, and presented in Table 7.

As can be seen in Table 7, when factor analyses with 20 items were performed, there were four factors, consistent with the presumed construct. Stated differently, although some items revealed significant factor loadings (>. 30) for more than two factors, most items revealed a clear-cut factor structure: state dysthymia, state euthymia, trait dysthymia and trait euthymia.

One of the advantages of the STDI is to produce various scores with 20 items. More specifically, the STDI can produce the following scores: total, state, trait, state dysthymia, state euthymia, trait dysthymia and trait euthymia. The utilization of subscores would be meaningful only if subscales were reliable and valid. Thus, in order

Table 7

Means, Standard Deviations, Internal Consistencies, and Summary of Factor Analyses for STDI-K

Items	M	SD	Factor I	Factor II	Factor III	Factor IV	Item-remainder correlation
State dysthymia (α = .89)							
Item 6	1.53	.80	.80				.61(.74)
Item 12	1.53	.70	.79				.64(.77)
Item 8	1.46	.72	.76				.66(.76)
Item 9	1.22	.64	.74				.58(.67)
Item 13	1.48	.73	.70			.30	.64(.71)
Trait dysthymia (α = .85)							
Item 2	1.84	.60		.75			.66(.73)
Item 6	1.89	.65	.33	.72			.69(.74)
Item 4	1.82	.64		.71			.57(.67)
Item 7	1.83	.65	.38	.65			.65(.69)
Item 9	1.36	.62		.63			.56(.52)
Trait euthymia (α = .89)							
Item 14	2.12	.71			.85		.64(.78)
Item 13	2.22	.73			.82		.62(.73)
Item 15	2.30	.77			.72		.65(.73)
Item 11	2.09	.73		.43	.67		.65(.74)
Item 10	2.07	.74		.48	.59		.66(.71)
State euthymia (α = .81)							
Item 1	2.78	.82				.82	.52(.66)
Item 5	2.65	.85				.78	.65(.56)
Item 3	2.56	.81				.70	.51(.75)
Item 10	2.15	.87		.42		.50	.64(.56)
Item 7	2.73	.86			.43	.49	.51(.50)
Eigen value			8.82	1.88	1.50	1.11	
Variance explained		(66.5%)	44.1%	9.4%	7.5%	5.6%	(α = .93)

Note. Loadings <.30 not reported.
The item number stands for the item in the second stage of the development of the STDI-K. Item-remainder correlation refers to the results from the total number of 20. Item-remainder in parentheses refers to the results from the subscale, consisting five items.

to examine its reliabilities for each scales, Cronbach's αs were calculated for each scale, resulting in satisfactory levels for every scale: total (α = .93), state (α = .88), trait (α = .91), state dysthymia, (α = .89), state euthymia (α = .81), trait dysthymia, (α = .85), and trait euthymia (α = .89), respectively. Thus, the present findings suggest that, based on its reliability and validity, the Korean adaptation of the STDI (STDI-K) is a reliable and valid scale, consisting of a variety of scales based on only 20 items.

Additional evaluation

As a way of examining the reliability and validity of the STDI-K, two additional evaluations were made: test-retest reliability and concurrent validity.

Test-retest reliability

The STDI-K was administered to a subsample

of Taegu college students. In the second administration of the scale, special care was taken to avoid the examination period. In other words, timing was prearranged to avoid the possible influence of examinations on scores.

As can be seen in Table 8, when test-retest reliabilities were calculated over four weeks, the trait depression was .45, although the state depression was .07. These findings revealed that, consistent with the state-trait construct, state depression was unstable, while trait depression was stable across situations and time.

Concurrent validity

In order to examine its concurrent validity, the STDI-K was correlated with the Korean adaptation of the CES-D (Chon & Lee, 1992). As can be seen in Table 9, there were significant correlations between the Korean adaptation of the CES-D and the Korean adaptation of the STDI with the range of .41 for state euthymia and .66 for trait dysthymia, suggesting that the STDI-K is a valid depression scale.

In summary, the present findings indicate that the Korean adaptation of the STDI is a reliable and valid scale. More specifically, internal consistencies revealed satisfactory levels for all scales. and factor analyses identify four factor structures, consistent with its construct. In addition, test-retest reliabilities showed that, consistent with its construct, state depression was unstable, while trait depression was stable across situations and time. Finally, concurrent validity with the Korean adaptation of the CES-D revealed a satisfactory level, suggesting that the Korean adaptation of the State-Trait Development Inventory is a reliable and valid measurement.

GENERAL DISCUSSION

The present study represents a series of attempts to adapt the State-Trait Depression Inventory (STDI, Spielberger, 1995), designed to measure both the state and trait nature of depression in the same scale. In pursuing this aim, two separate studies were conducted. In Study 1,

Table 8
Test-retest Reliabilities over Four Weeks

No. of weeks	State depression	Trait depression
4	.07	.45*

Note. n = 32, * $p < .01$

Table 9
Correlation Matrix between the State-Trait Depression Inventory and the Korean Adaptation of the CES-D

Scales	1	2	3	4	5
1. State dysthymia		-.58**	.58**	-.46**	.56**
2. State euthymia			-.54**	.70**	-.41**
3. Trait dysthymia				-.67**	.66**
4. Trait euthymia					-.45**
5. CES-D					

** $p < .001$

30 items were selected out of 50 items; in Study 2, 20 items were finally selected out of these 30 items in study 2, based on item-remainder analysis and factor analyses. The participants were 204 high school students and 224 college students in Study 1, and 342 college students and 101 adults in Study 2. After passing through two stages of the development of the STDI-K, the final 20 items revealed satisfactory levels of reliability and validity based on internal consistencies and factor analyses. In addition, test-retest reliabilities over four weeks and the concurrent validity with the Korean adaptation of the CES-D also revealed satisfactory levels of reliability and validity.

The present findings showed similar levels of internal consistencies to the original scale. For example, Cronbach's αs for state depression were .93 for male and .87 for female in the original scale. In STDI-K, Cronbach's αs for state depression were .86 for male and .89 for female. In a similar fashion, Cronbach's αs for trait depression in the original scale were .93 for male and .91 for female, while Cronbach's αs for state depression in the STDI-K were .89 for male and .92 for female. Thus, although both STDI and the STDI-K revealed similar levels of internal consistencies and factor structures, the STDI-K showed slightly higher internal consistencies in the case of males, while it showed slightly lower internal consistencies in the case of females when compared to the original scale.

As described earlier, the factor structure of the STDI-K was the same as the original scale, composed of dysthymia and euthymia items for the state and trait scale, respectively. Further, when the 20 items for the state and trait scales together were analyzed simultaneously, four separate factors emerged; state dysthymia, state euthymia, trait dysthymia and trait euthymia, consistent with the construct presumed in the scale.

Unfortunately, since there is no test-retest reliability of the original English scale or even the German adaptation of the STDI (Krone & Spielberger, 1998), it is impossible to compare the present scale with other scales developed in the West. On the other hand, with respect to concurrent validity, the English scale reported that the STDI was associated with the CES-D in the following manner: state dysthymia (.34), state euthymia (.58), trait dysthymia (.72) and trait euthymia (.67). Thus, the STDI-K revealed lower associations with the Korean adaptation of the CES-D, compared to the original English scales. It is not clear at this point, however, if the lower associations were due to the STDI-K itself or the Korean adaptation of the CES-D. Parenthetically, Chon and his colleagues (Chon, Kwon, & Kim, 1999) have recently refined the Korean adaptation of the CES-D, in part due to the fact that there have been three Korean versions of the CES-D in Korea. Thus, there needs to be a further attempt to examine the associations between the STDI-K and the CES-D-K in future studies.

Although the STDI-K revealed itself to be a reliable and valid scale, there is a continuing need to examine its validity in future studies. For example, the primary purpose of the development of the STDI-K was to explore the relations between depression and physical health as seen in individuals suffering from cancer and cardiovascular disease. Thus, there is a dire need to apply the STDI-K to either cancer patients or cardiovascular disease patients. In fact, according to Chon, Chung, and Tae (1999), when the STDI-K, the Korean adaptation of CES-D, and the Korean adaptation of Zung were employed, the STDI-K was shown to be the best depression

measurement in reliability and validity for cancer patients. For example, Cronbach's α for the STDI-K was .92, while the CES-D and the Zung were .85 and .88 respectively. In addition, group differences among three stages of cancer were shown to be significant only with the STDI-K, but not with the CES-D or the Zung.

As yet another step in the validation process, however, further efforts may be advised to apply the scale to clinical depression patients to examine its clinical validation. In addition, it also needs to be applied to a more expanded sample in order to supply normative data for future studies.

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최근 연구에 의하면 우울이 암을 비롯한 다양한 질병의 중요한 심리적 영향 요인으로 나타나고 있다. 또한 상태 우울에 비하여 특성 우울이 암에 더욱 중요한 영향을 미치는 심리적 요인으로 밝혀지고 있다. 그러나 지금까지 개발된 대부분의 우울 척도는 상태적 측면과 특성적 측면의 구분이 없이 개발되었다. 본 연구에서는 상태적 우울과 특성적 우울을 구분할 수 있는 Spielberger의 상태-특성 우울 척도의 한국판 개발을 시도하였다. 이 목적을 위하여 두 개의 독립된 연구를 수행하였는데, 연구 1에서는 고등학생 204명과 대학생 224명이 연구에 참가하였으며, 연구 2에서는 대학생 342명과 성인 101명이 연구에 참가하였다. 연구 1에서는 내적일치도와 요인분석에 기초하여 50개의 예비 문항으로부터 30문항을 선발했으며, 연구 2에서는 30문항으로부터 다시 20문항을 선발했다. 이런 과정을 거쳐 최종적으로 만들어진 20문항(상태 우울 10문항, 특성 우울 10문항)으로 구성된 척도에 대한 내적 일치도, 요인 분석, 검사-재검사, 한국판 CES-D와의 준거 타당도 검증을 시도한 결과, 본 연구에서 개발된 상태-특성 우울 척도가 매우 신뢰롭고 타당한 척도임이 드러났다.