Examining the Structure of a Modified Version of the Acceptance of Disability Scale-Revised for Thai Disable Individuals

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Abstract
This study examined the psychometric properties of the modified version of *Acceptance of Disability Scale-Revised (ADS-R)* for Thai individuals with disabilities**.** The scale contains 26 items. Participants were 204 individuals with physical disabilities who attended physical rehabilitation centers or vocational rehabilitation centers for people with disabilities across the country and were on rehabilitation phase. Principal components analysis was performed to examine underlying factorial structure of the Thai version of ADS. Cronbach' s alpha coefficients were computed to examine the scale' s reliability. The findings revealed that the modified version, 26-item *ADS-R* yielded four components (Transformation, Enlargement, Containment, and Subordination), accounting for 59.17% of the total variance. All items loaded significantly onto their respective factors (loading factors ranged from.40 to.90). The modified version, 26-item *ADS-R* demonstrated good reliability with Cronbach's alpha of.92 for the total scale and.84, 81,.91 and.83 for its four components, respectively.
Keywords: Acceptance of Disability, Scale Validation, Thai Individuals with Disabilities

Introduction
Disabilities caused by disease or accident bring radical changes in lives of patients and people around them. The patients affected by such disabling conditions can feel significant loss in terms of bodily/organ functions, self-identity, social responsibilities, and roles. Moreover, if they are employed, they may lose income as a result of losing functional abilities to work. This might lead to dependence on their families, which, in turn, affects their emotional and mental health. Moreover, disease and disability might cause the people with disabilities and their families to feel inferior due to the limitations in their lives, further obstructing their adaptability in daily life and careers. The ongoing and cumulative effect of coping with disability might result in increasing risk of depression (Dunn, Uswatte, & Elliott, 2009; Hoffman, Bombardier, Graves, Kalpakjian, & Krause, 2011; Üzümcüoğlu et al, 2017; Wiseman, Curtis, Lam & Foster, 2015).
In order to rehabilitate and help people with disabilities adapt to the loss, suffering, and impairment of body functions, it requires the integration of a multi-disciplinary team including a counseling psychologist, as the patients need not only physical treatment but also psychological treatments at the same time in order to function (Johnstone, Walsh, Carton & Fish, 2008). Successful long term adjustment to disability (Schulz & Decker, 1985) requires proper psychological support in order to help people with disability realize their self-worth,

achieve positive perspectives in this circumstance, and maintain a meaningful life, instead of focusing on the limitations due to the disability (Martz & Livneh, 2016).

Becoming disabled requires adjustment to life-changing circumstances based on the assumption that becoming disabled is a critical transformation that inevitably affects the life of the person with the disability. Disability acceptance is the primary step to the balanced adjustment of the life that has recently changed. Acceptance places the disabled person in a position to confront reality and adapt to the transitions after becoming disabled. Therefore, adjustment to disability is related to hope, resilience, meaning of life, and sense of coherence (Dorsett, 2010; Kennedy, Lude, Elfström, & Smithson, 2010; Lustig, Rosenthal, Strauser, & Haynes, 2000; Tallman & Hoffman, 2017).

Previous studies on acceptance among people with disabilities defines " acceptance to disability" as the outcomes of the effort made by people with disabilities to build a new balance, which reflects their response to crises. The acceptance phase involves the appraisal of new situations, the past, and the future, which will redefine the acknowledgement of new situations. These will affect the way they adjust to the new functions, roles, values, and believes. Successful adaptation to disability often requires a change in a person' s views toward their environment and the world, as well as the ability to utilize both internal and external resources, for instance, social support, in the adjustment process (Linkowski, 1971).

To measure acceptance of disability, Linkowski (1971) developed the Acceptance of Disability Scale, which consisted of 50 questions. Later, Groomes and Linkowski (2007) further modified the original version and renamed it "Adaptation to Disability Scale-Revised (ADS-R)," comprising 32 items. This measurement scale was derived from the concept of loss proposed by Wright (1983), and is used to appraise the feelings, attitudes, values, and emotions of a person who has become disabled and lost normal functions. There are four components in the recent version of the measurement scale, namely (1) transformation: self-acceptance and self-adjustment to disability, (2) enlargement: the expansion of how to live a life based on limitations of illness and disability, (3) containment: the view of how to perceive their own capability in the light of the limitations, and (4) subordination: how to control negative perspectives toward the disability. Reliability of the scale is attested by an overall Cronbach's alpha of.93, with alphas of each separate component ranging from.71-.90. This scale has been widely applied to various groups of patients including those with multiple sclerosis, muscular dystrophy, general mental illness, and stroke (Chai, Yuan, Jin & Zhang, 2016; Chen & Crewe, 2009; Sánchez et al., 2016). The scale was translated and revised into Chinese and used with the sample of 270 Taiwanese people with disabilities, yielding an overall Cronbach's alpha of.91 (Chiang, Lai, Livneh, Yeh & Tsai, 2013). Later, this Chinese version was used with 111 Chinese cancer patients who had undergone colostomy; the overall Cronbach' s alpha in this study was reported at.955 with the separate components' reliability ranging from.693-. 908 (Zhang et al., 2014). Moreover, a back-translated short version of the Chinese instrument was also developed, comprising 12 items from the original four components, by collecting data from 154 Taiwanese samples with spinal cord injuries (SCI): the reported separate Cronbach's alphas ranged from.65-.82 (Lin et al., 2013).

Recently, in Thailand, Chen, Kotbungkair, and Brown (2015) conducted a comparative study on acceptance of disability between Thai Buddhists with disability and their American Christian counterparts. The back-translated *Adaptation to Disability Scale-Revised (ADS-R)*, reported an overall Cronbach's of.894, as used with 98 Thai patients with disability caused by neuromuscular diseases. Surprisingly, this research has been the only study that has applied *ADS-R* to people with disabilities in Thailand. This scale has been used with people with congenital disabilities; however, it has not been used with people who became disabled by the disease or accident.

Therefore, the current study aimed to modify *the 32-item ADS-R* into a Thai version designed to fit into the context of Thai people with disabilities and their adaptation processes in order to provide the groundwork for relevant studies in the future. Furthermore, the scale can be useful to psychologists in health settings as an essential tool to assess clients with low adjustment ability and help them improve their adjustment and acceptance of their disabilities.

Methods

The study has been approved by the Ethical Review Committee for Research Involving Human Research Subjects, Health Science Group, Chulalongkorn University (COA No. 087.2/60). Details of research method are as below.

Participants and Procedures

Data were collected from 204 individuals with physical disabilities during the rehabilitation phase, who were attending physical rehabilitation centers or vocational rehabilitation centers for people with disabilities across the country. All met the selection criteria. The inclusion criteria were: (1) being clinically diagnosed as having malfunction of the body or an organ acquired from physical injuries or accidents, and affecting normal functions of that organ or bodily part; hence, this included individuals in the rehabilitation phase; (2) attending the physical rehabilitation centers or vocational rehabilitation centers anywhere in Thailand; (3) devoid of cognitive and mental disorders; and (4) consenting to provide information. However, clients with reports of high self-harm and suicidal inclination were excluded in this study.

After approval from the Research Ethics Review Committee for Research Involving Human Research Participants, Health Sciences Group (IRB) at Chulalongkorn University (COA No. 087.2/60), convenience sampling by the first author was used to collect questionnaires. All questionnaires with information about the project and the consent form to comply with research ethical standards were administered to individuals with physical disabilities during the rehabilitation phase, who were attending physical rehabilitation centers or vocational rehabilitation centers for people with disabilities across the country. During the data collection process, the participants filled out the questionnaires by themselves, with the researcher present to answer questions as needed for clarification. The participants were workers who had accidents while at work; 87% were male, 13% were women, and they were 18 to 60 years old. All of them met the selection criteria of being people with disabilities in the rehabilitation phase, and were diagnosed as physical disability; 94% were Buddhist, 4% were Muslim, and 2% were Christian.

Instruments

This study utilized a self-administered questionnaire comprising the following three sections:

1.The first part of the questionnaire was designed by the researcher to tap basic demographic information, including gender, age, marital status, religion, career, monthly income, highest education, the duration of disabilities or chronic illness, and co-inhabitants.

2. The modified *version of ADS-R* for Thai Disabled Individuals was translated and adjusted from the 32-item *ADS-R* (Groomes & Linkowski, 2007). The original version consists of 32 items evaluating feelings, attitudes, values, and emotions related to losing physical functions or becoming disabled. The content of the items grouped into four components: Transformation, Enlargement, Containment, and Subordination. Overall Cronbach' s alpha of.93 and separate components' alphas between.71 and.90 support the instruments reliability. This questionnaire is a self-reported, 4-point rating scale, ranging from 1 (*totally disagree*) to 4 (*totally agree*). The original English version, which was translated into Thai and supplemented with additional items designed to fit into the context of Thai people with disabilities and their acceptance process. The first version of the modified *version of ADS-R consisted of* 47 items.

All items were checked and approved by an expert, a university lecturer in psychology, before testing linguistic/ literal equivalence and construct validity. Only 40 items were approved by four experts routinely working with people with disabilities.

3. The 21-item Depression Anxiety Stress Scale was developed by Lovibond & Lovibond (1995). The Thai version of this scale was translated by Oei, Sawang, Wah Goh, & Mukhtar (2013). This short version contains seven items specifically designed to assess depression using a 4-point rating scale ranging from 0 ("*not at all true to me*") to 3 ("*absolutely true to me*" or "*occurs the most to me*"). The Cronbach's alphas range from.69-.82.

Data Analysis

All the measures in this study contained less than 5% missing values. The data was analyzed by Statistical Package for the Social Sciences (SPSS 23.0), which also was used to estimate the missing data. Exploratory factor analysis (EFA) was conducted to examine the underlying factorial structure of modify *version of ADS-R***.** Cronbach's alpha coefficients were computed to test the reliabilities of each component of the modify *version of ADS-R***.**

Results

Exploratory factor analysis

The 26 x 26 correlation matrix of modify *version of ADS-R* was subjected to a principal components analysis. The Kaiser-Meyer-Olkin (KMO) analysis resulted in a sampling adequacy of.887, and the Bartlett's Test of Sphericity pointed to statistical significance at the level of.05 (Chi-Square = 2767.886, df = 325, p <.001)

The solution was rotated using varimax rotation to simplify the structure and enhance interpretation of the four factors. Items with component loading equal to or greater than.40 were retained. The final solution accounted for 59.165% of the total variance. All items loaded significantly onto their respective factors (loading ranged from.403 to.755 for the Transformation factor,.414 to.901 for the Enlargement factor,.525 to.792 for the Containment factor, and.627 to.812 for the Subordination factor). As a result, the modify *version of ADS-R* contained 26 items. After examining the items of each factor, the factors were found to be identical to the original English version of Acceptance of Disability Scale-Revised (ADS-R).

Factor 1-Transformation: This factor consists of eight items representing negative items. Seven of the items are from the original instrument and include the following: (2) Having my disability, I am unable to do things like people without disabilities do. (4) Because of my disability, I have little to offer other people. (7) No matter how hard I try or what I accomplish, I could never be as good as the person who does not have my disability. (10) Because of my disability, other people's lives have more meaning than my own. (13)The kind of person I am and my accomplishments in life are less important than those of persons without disabilities. (19) Almost every area of life is closed to me. (26) If I didn't have my disability, I think I would be a much better person. And there is one additional item, which is (9) Disability prevents me from being a better person.

Factor 2-Enlargement: This factor consists of five items representing positive items. Four of the items are from the original instrument and include the following: (11) A person with a disability is restricted in certain ways, but there is still much s/he is able to do. (12) Though I have a disability, my life is full. (13) There are many things a person with my disability is able to do. (15) There are many more important things in life than physical ability and appearance. And there is one additional item, which is, (14) Although people with disabilities have constraints in their lives, they are still able to do lots of things.

Factor 3-Containment: This factor consists of nine items representing negative items. All of the items were from the original instrument: (20) With my disability, all areas of my life are affected in some major way. (21) It makes me feel very bad to see all the things that people

without disabilities can do that I cannot. (22) Because of my disability, I feel miserable much of the time. (23) Since my disability interferes with just about everything I try to do, it is foremost in my mind practically all of the time. (24) My disability in itself affects me more than any other characteristic about me. (25) My disability prevents me from doing just about everything I really want to do and from becoming the kind of person I want to be. (26) My disability affects those aspects of life that I care most about. (27) When I think of my disability, it makes me so sad and upset that I am unable to do anything else. (28) In just about everything, my disability is annoying to me so that I can't enjoy anything.

Factor 4-Subordination: This factor consists of four items representing negative items. Two of the items are from the original instrument and include the following: (29) You need a good and whole body to have a good mind. (31) Physical wholeness and appearance make a person who s/he is. And there are two additional items, which are, (30) You need to have a whole, complete body to be kind hearted. (32) The thing that defines our identity is the complete, physical wholeness and appearance.

Table 1 Means and standard deviation for each of modify *version of ADS-R* factors, as well as factors' communality (h^2), eigenvalues, percentage of variance explained, and reliability coefficients.

Items		**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**	**Communalities h^2**
6	Almost every area of life is closed to me. (additional item)	.403				.441
3	No matter how hard I try or what I accomplish, I could never be as good as the person who does not have my disability.	.755				.588
2	Because of my disability, I have little to offer other people.	.679				.549
5	The kind of person I am and my accomplishments in life are less important than those of persons without disabilities	.579				.434
4	Because of my disability, other people' s lives have more meaning than my own.	.545				.435
1	Having my disability, I am unable to do things like people without disabilities do.	.531				.408
9	Disability prevents me from being a better person. (additional item)	.448				.352

Table 1 (Con.)

Items		Factor 1	Factor 2	Factor 3	Factor 4	Communalities h^2
8	If I didn't have my disability, I think I would be a much better person. (additional item)	.433				.311
14	Although people with disabilities have constraints in their lives, they are still able to do lots of things.		.901			.846
13	There are many things a person with my disability is able to do.		.784			.626
12	Though I have a disability, my life is full.		.717			.559
11	A person with a disability is restricted in certain ways, but there is still much s/he is able to do.		.513			.391
15	There are many more important things in life than physical ability and appearance. (additional item)		.414			.257
22	Because of my disability, I feel miserable much of the time.			.792		.698
26	My disability affects those aspects of life that I care most about.			.765		.636
27	When I think of my disability, it makes me so sad and upset that I am unable to do anything else.			.758		.627
23	Since my disability interferes with just about everything I try to do, it is foremost in my mind practically all of the time.			.718		.564
28	In just about everything, my disability is annoying to me so that I can' t enjoy anything.			.684		.617
25	My disability prevents me from doing just about everything I really want to do and from becoming the kind of person I want to be.			.684		.569

Table 1 (Con.)

Items		Factor 1	Factor 2	Factor 3	Factor 4	Communalities h^2
24	My disability in itself affects me more than any other characteristic about me.			.679		.533
21	It makes me feel very bad to see all the things that people without disabilities can do that I cannot.			.612		.510
20	With my disability, all areas of my life are affected in some major way.			.525		.353
30	You need to have a whole, complete body to be kind hearted.				.812	.724
29	You need a good and whole body to have a good mind.				.745	.654
32	The thing that defines our identity is the complete, physical wholeness and appearance.				.628	.510
31	Physical wholeness and appearance make a person who s/he is.				.627	.422
Eigenvalue		8.686	2.934	2.017	1.746	
Cumulative % Variance		33.406	44.691	52.450	59.165	
Reliability (Cronbach's alpha)		.840	.813	.914	.834	
Mean (SD)		21. 583 (4.952)	16. 642 (2.564)	22. 966 (5.867)	11. 907 (3.059)	

Note: Only factor loadings greater than.40 were retained

Reliability

Internal consistency reliability coefficients (Cronbach's alpha) of the modified *version of 26 item ADS-R* demonstrated good reliability with the overall Cronbach's alpha at.916 and with Cronbach' s alpha of each component at. 840 (Transformation) ,.813 (Enlargement) ,.914 (Containment), and.834 (Subordination).

Criterion Validity

Previous studies, such as the work of Psarra and Kleftaras (2013) , have shown that the acceptance of disability correlates negatively with depression. That is, the lower the acceptance of disability, the higher the tendency for the disabled person to experience depression. To determine whether a reduced number of items in this measurement could yield a valid result, the researcher selected a subscale from the original version—the depression scale—out of the entire DASS-21 in Thai. The depression subscale consists of seven items. When the complete scale and the subscale were used to measure depression among Thai individuals with disabilities and analyzed with Pearson's Correlation Coefficient (PCC), both scales showed a statistically significant negative relationship of.01 (r = -. 287, p <.01) . Therefore, the direction of the relationship in this study is consistent with the findings from

the study of Psarra and Kleftaras. Furthermore, the analysis supports the use of the depression subscale scale in further studies.

Discussion

The modified *version ADS-R* for Disabled Individuals consists of 26 items covering four components: Transformation, Enlargement, Containment, and Subordination and is based on the original version of the Adaptation to Disability Scale-Revised (ADS-R) developed by Groomes and Linkowski (2007). In this study, this newly modified version has passed the expert approval. The fundamental quality of all the items was in a good level, with the overall Cronbach's alpha at.916 and the Cronbach's alpha of each component ranging between.813 and.914. This can be considered a good level of reliability. The analysis of Cronbach's alpha of the whole version derived from the data of 204 subjects in the rehabilitation stage yielded reliability results close to the score reported by Chen et al. (2015) , who studied the acceptance of disability among the Thai disabled observing Buddhism and the American disabled observing Christianity. This study applied the back-translated version of the ADS-R with 98 Thai subjects with disabilities caused by neuromuscular diseases, a version with an overall reported Cronbach's alpha of.894.

The principal components analysis suggested that the modified *version of ADS-R* is a multidimensional measure and supports the four-component measurement structure among Thai individuals with physical disability during rehabilitation phase. The four components: Transformation, Enlargement, Containment, and Subordination were in accordance with the original Adaptation to Disability Scale-Revised (ADS-R; Groomes & Linkowski, 2007) . Although the results of this study indicate that the subscales of the Thai version of ADS-R-26 help explaining the variation in the data, still, there is room for improvement in developing the modified *version of 26-item ADS-R* for a Thai population of individuals with disabilities. One possible concern in the modified *version of 26-item ADS-R* is that only a few items load on the component Subordination. Moreover, all of the items in this component are negatively-stated: *(30) You need to have a whole, complete body to be kind hearted; (29) You need a good and whole body to have a good mind; (32) The thing that defines our identity is the complete, physical wholeness and appearance.* Thai participants might find difficulty in responding to such negatively stated items. Thus, inconsistent responses might lead to a difficult to control form of bias.

Conclusion and Limitations

The modified *version of ADS-R* for Thai individuals with disabilities developed in this study consists of 26 items with a good level of reliability. However, this study has some specific limitations, for instance, the fact that the data were collected in holistic rehabilitation centers that provide physical, psychological, and vocational recovery for individuals with disabilities. Most of the service recipients were permanent residents, not living with their families, and without income. This condition is in accordance with the study of Douangkamol (1998) at the "Vocational Rehabilitation Center for Disabled and Handicapped Persons" in Phra Pradaeng District, Samut Prakarn Province. Douangkamol compared the self-concept of individuals with disabilities during the rehabilitation process among three groups: those who had not yet completed a rehabilitation program or vocational training, those who had just completed the programs, and those who had completed the rehabilitation phase and already had their own career. This study found that the rehabilitation process could improve self-concept according to progression through the process: the group who had their own career had the most positive self-concept, followed by those who had just completed vocational training, while those who had not attended the vocational program showed a high negative self-concept. Therefore, further investigations are recommended in order to study the quality of the modified *version*

of ADS-R when applied to individuals with disabilities who have not experienced vocational and physical rehabilitation.

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