**Psychometric properties of the Norwegian *Self-Efficacy for Therapeutic Mode Use***

**(N-SETMU)**

Authors:

Tore Bonsaksen1,2 & Tove Carstensen3

1Department of Occupational Therapy, Prosthetics and Orthotics, Faculty of Health Sciences, Oslo and Akershus University College of Applied Sciences, Oslo, Norway

2Faculty of Health Studies, VID Specialized University, Sandnes, Norway

3 Department of Health Science, Faculty of Health and Social Science, Norwegian University of Science and Technology, Trondheim, Norway

Author correspondence:

Tore Bonsaksen, Department of Occupational Therapy, Prosthetics and Orthotics, Faculty of Health Sciences, Oslo and Akershus University College of Applied Sciences, PO Box 4 St. Olavs Plass, 0130 Oslo, Norway. E-mail tore.bonsaksen@hioa.no Tel. +47 67 23 66 11

Abstract

Background: According to the Intentional Relationship Model (IRM), the intentional use of relational approaches in therapy (therapeutic modes) is essential for obtaining successful relationships to clients. There have been no attempts to combine the IRM with self-efficacy theory, and instruments for measuring self-efficacy for therapeutic mode use are lacking.

Aim: This study aimed to examine the component structure and internal consistency of the Norwegian version of the *Self-Efficacy for Therapeutic Mode Use* (N-SETMU).

Methods: Occupational therapy students (*n* = 111) from two education programs completed the N-SETMU along with sociodemographic information. Principal Components Analysis (PCA) was performed and component extraction was controlled using Parallel Analysis. Internal consistency was assessed with Cronbach’s α and inter-item correlations.

Results: All items on the N-SETMU loaded on the same latent dimension, tentatively called *Self-Efficacy for Therapeutic Mode Use*. Cronbach’s α for all scales ranged 0.73-0.82.

Conclusions: The N-SETMU is a unidimensional measure of self-efficacy for therapeutic mode use in general. The N-SETMU may be a useful tool for occupational therapy research and audits focusing on occupational therapists’ use of therapeutic modes in client interactions.

*Keywords*: higher education, principal components analysis, psychometrics, reliability, students, validity

**Introduction**

Self-efficacy denotes a person’s belief that he or she is able to produce the behaviors needed to achieve a desired outcome (1). Thus, self-efficacy is concerned with a person’s belief that he is able to control and execute his own actions, in spite of potential obstacles. Self-control of action is considered an important aspect of the person’s occupational motivation: The concept contributes to explain what people decide to do, the amount of effort they invest in what they do, and the persistence they show when doing it, even in the face of difficulties. As a result, persons with higher self-efficacy for doing a specific task may have better chances of actually succeeding with it (1).

As self-efficacy is believed to influence a person’s motivation for performing occupations, and thus potentially influence health-related outcomes, the concept has gradually been incorporated into occupational therapy research with diverse clinical groups. For example, Pinxsterhuis and coworkers’ development of a group-based self-management program for persons with chronic fatigue was explicitly linked to self-efficacy theory and research (2). In a study of persons with arthritis, Reinseth and coworkers found that higher self-efficacy for managing the illness was associated with higher levels of leisure-time physical activity (3), demonstrating a link between self-efficacy and participation in this group. Closely related concepts, like perceived self-mastery and self-management, have been investigated in studies of persons with mental illness (4) and persons with human immunodeficiency virus (5). Taken together, the literature indicates that self-efficacy and similar concepts related to personal mastery are important to target in occupational therapy interventions for a range of conditions and occupational problem areas.

Self-efficacy is needed not only among clients with defined characteristics, but also among health professionals providing the services required by their clients. Occupational therapists need self-efficacy for a range of different behaviors and skills to be able to perform their work. To our knowledge, only one study has empirically investigated occupational therapists’ self-efficacy related to their work. Vax and coworkers (6), in a study of 64 Israeli occupational therapists working in mental health practice, examined both general self-efficacy and work-related self-efficacy among therapists working in hospital settings and therapists working in community health settings. On both of the self-efficacy measures the two groups showed similar scores. However, the multivariate analysis revealed that having more education, more work experience, a leadership role, and higher levels of general self-efficacy were independently and significantly associated with higher work-related self-efficacy among the participants (6). As occupational therapists’ competence and feelings of professional identity seems to be linked with their sense of professional confidence (7), such investigations targeting their work-related self-efficacy are important.

Amongst the many skills required by occupational therapists are skills for establishing and maintaining productive, helping relationships with their clients. Taylor (8), introducing the Intentional Relationship Model (IRM), suggested that occupational therapists can develop and nurture these skills by increasing their awareness of and competence in using a variety of therapeutic modes. According to the IRM, therapeutic modes are defined as specific ways of relating to clients, and these ways are labelled the advocating, collaborating, empathizing, encouraging, instructing, and problem-solving modes (8, 9). It is not suggested that some modes are preferable to others; rather, therapeutic modes should be used flexibly and with good timing, according to the client’s current needs. The *advocating* mode describes the occupational therapist as helping the client in providing adequate resources. The *collaborative* mode is when the occupational therapist includes the client in all aspects of the therapeutic process. The *empathizing* mode describes the occupational therapist making substantial efforts to understand the client’s inner experience, including his or her sometimes painful feelings. In the *encouraging* mode, the occupational therapist cheers and applauds the client’s performance. Employing the *instructing* mode, the therapist assumes a teacher-like way of communicating with the client. Lastly, the *problem-solving* mode describes addressing the client’s concerns employing logical reasoning and analysis.

To date, studies have investigated the therapeutic modes most often preferred by undergraduate occupational therapy students (10, 11) and have compared occupational therapists and occupational therapy students with a view to their preferences for using therapeutic modes (12). However, being inclined to use some therapeutic modes more frequently than others does not inform about the person’s self-efficacy for using these modes. Moreover, to be able to inform about a person’s self-efficacy for using therapeutic modes, appropriately designed assessments with known measurement properties need to be developed. This study is the first to report on the measurement properties of a Norwegian language instrument designed to assess occupational therapists’ self-efficacy for therapeutic mode use.

**Study aim**

The aim of the study was to examine the component structure of the *Norwegian Self-Efficacy for Therapeutic Mode Use* (N-SETMU) in a sample of occupational therapy students in Norway. In addition, the aim was to establish measures of reliability (internal consistency and inter-item correlations) related to each of the resulting factors, and to assess the response format of the questionnaire items.

**Methods**

**Design and settings of the study**

The study had a cross-sectional design. The occupational therapy education programs in Oslo and Trondheim, where the study was conducted, are both undergraduate three years full time programs.

**IRM workshops**

Workshops on the IRM were conducted in the classroom with the students from each of the universities, both of which consisting of students in their second year of study. Due to differences between the study programs, the IRM workshop with the students in Oslo had three hours’ duration, while the workshop with the students in Trondheim had six hours’ duration. The two workshops had similar aims, but had some differences with a view to their instructional methodology.

Both workshops included a theoretical introduction to the IRM model and its main concepts, teacher demonstrations, student role-plays using the therapeutic modes, and a concluding plenary discussion. The main concepts were the six therapeutic modes, interpersonal reasoning, and therapist adaptation. The teacher demonstrations were role-plays conducted by the two seminar instructors (authors) based on a pre-developed clinical case-story, followed by discussions with the students. The students’ role-plays were also based on clinical case-stories, followed by group discussion. The discussions were about identifying the therapeutic modes employed, identifying the possible reasons for their use, experiences from using them, and exploring alternative courses of action.

**Participant recruitment**

The students were included as participants in the study based on their i) enrolment in one of the involved occupational therapy education programs; and their ii) provided informed consent to participate in the study. The questionnaires were distributed to the students during breaks in classrooms approximately two weeks after the IRM workshops in the autumn of 2016. At the time of the workshop and data collection, the participants were undergoing an “Occupational therapy in mental health” study module.

**Measures**

The Norwegian *Self-efficacy for therapeutic mode use* (N-SETMU) represents Part I of the original instrument *Self-efficacy for therapeutic use of self* as developed by Yazdani (13) in the United Kingdom. It asks respondents to rate their level of confidence that they possess the required skills to use each of the therapeutic modes in therapeutic encounters. Each of the modes, described in the IRM as the advocating, collaborating, empathizing, encouraging, problem-solving, and instructing modes (8), are listed as items on this scale. Respondents are required to have a basic conceptual understanding of the practical content of each mode in order to provide valid responses. For all items, respondents are asked to rate their level of confidence on a 1-10 scale, 1 indicating the lowest possible level of confidence and 10 indicating the highest possible level.

Measures were taken to ensure cross-cultural equivalence of the Norwegian version of the instrument with the original English language version. The instrument was translated into Norwegian by the first author and back-translated into English by a person proficient in Norwegian and in English. Subsequently, the instrument developer checked the content of the back-translated version for correctness and conceptual clarity by comparing it with the original version (13). No further amendments were required after the instrument developer had checked the back-translation. In addition to the N-SETMU, information regarding the participants’ age and gender was collected.

**Data analysis**

Latent components in the N-SETMU was analyzed with Principal Component Analysis (PCA). Component extraction was determined by visual inspection of the scree-plot, assessment of Eigenvalue (λ) estimates, and assessment of the variance explained by the components. According to statistical convention, components with λ > 1 and/or explaining more than 10 % the items’ variance proportions were retained. In addition, Parallel Analysis (14) was used in order to obtain a clearer view of the component structure. The Parallel Analysis is known to be more restrictive with a view to the number of components to extract from the analysis (15). It suggests that one should retain components with an actual λ exceeding the randomly generated λ of the corresponding component in a random dataset with the same number of items and respondents. Expecting the items to be interrelated, the Direct Oblimin rotation method was used in order to obtain a clearer pattern matrix.

An exploratory approach to the PCA was used, followed by confirmatory analyses using a fixed set of components in cases where different solutions might be applied. In addition to the λ estimates, the statistical measures reported from the analysis include communalities (the variance proportion of each item explained by the components together) and component loadings (estimates of the impact from a given item on each component). Component loadings > 0.40 were considered high.

The reliability (internal consistency) of the resulting scales was examined with Cronbach’s coefficient α and with inter-item correlations. Estimates of internal consistency are known to vary according to the number of items belonging to a scale and with the sample size contributing the data (16, 17). Cronbach’s α coefficient > 0.70 is usually considered good for scales consisting of fewer than seven items and when derived from a sample of fewer than 100 participants, whereas very short scales may be unable to produce α estimates at a satisfactory level. In such cases, assessing the inter-item correlations is the method of choice, and mean inter-item correlations of 0.20 are usually considered satisfactory (18). The data were analyzed the computer program IBM SPSS (19), and statistical significance for all analyses was set at *p* < 0.05.

**Ethics**

Approval for conducting the study was obtained from the Norwegian Data Protection Official for Research (project number 49433). The students were informed that completion of the questionnaires was voluntary, that their responses would be kept anonymous, and that there would be no negative consequences from opting not to participate in the study. Written informed consent was provided from all participants.

**Results**

**Participants**

The participants in this study were 111 occupational therapy students from the second study year in the Oslo (*n* = 47) and Trondheim (*n* = 64) education programs, respectively. The mean age of the students was 24.5 years (*SD* = 6.0 years). There was a predominance of female students within the subsamples from both universities (Oslo *n* = 37, 78.7 %, Trondheim *n* = 51, 79.7 %). At the time of the data collection, there were 142 students enrolled in the relevant cohorts of the two education programs, yielding a response rate of 78.2 %. Among the non-responders (*n* = 31), the mean age was 23.9 years (*SD* = 5.2 years) and they were 29 (93.5 %) women and 2 (6.5 %) men.

**Scores distribution**

The mean scores, standard deviations, and score range for the items encompassed by the N-SETMU is shown in Table 1. Mean scores ranged from 5.50 (advocate) to 7.45 (encourage) for the six items, and the mean score range across all items was 7.0. The actual score range for the sum score of these six items (possible score range: 6-60) was 21-53.

TABLE 1 ABOUT HERE

**Component structure and internal consistency**

In the present study, the correlations between the six items included in the N-SETMU varied between 0.27 and 0.62. The KMO value was 0.82 and Bartlett’s test of sphericity was statistically significant (*p* < 0.001), all of which indicating a dataset appropriate for component extraction. One component had Eigenvalue > 1: Component 1 λ = 3.20, explaining 53.4 % of the variance. The Eigenvalue estimate of a potential Component 2 was below the threshold value (λ = 0.99), but explaining an additional 16.6 % of the variance in the data (cumulative 70.0 % variance explained by the two components). The Parallel Analysis, however, suggested a one-component solution, as only the Eigenvalue estimate of Component 1 was higher than the corresponding random estimate derived from the Parallel Analysis (λ = 1.32). The communalities of the items were between 0.46 (advocating and instructing) and 0.66 (encouraging). Table 2 shows the component solution resulting from the PCA after the forced extraction of one component, and with component loadings sorted by size. All items loaded strongly on the component (0.68-0.81), and the internal consistency of the items was Cronbach’s α = 0.82 (mean inter-item correlation 0.44).

[TABLE 2 ABOUT HERE]

**Discussion**

**Scores distribution**

The scores distribution reported for the N-SETMU (see Table 1) showed that all the higher level response options were used for most items, excepting self-efficacy for instructing, whereas the lowest response option was not in use for any items excepting self-efficacy for advocating. For two items (self-efficacy for encouraging and for collaborating), the three lowest response options were not used by any of the participants. The scores distribution where the lower level response options were mostly avoided mirror the distribution sometimes seen for scales assessing positive, socially desirable assets, like quality of life (20). Self-efficacy for therapeutic mode use may also be one such positive asset that most occupational therapy students would be inclined to rate highly. Taking the educational context of this study into account, it may also be that the participants would feel uncomfortable with themselves as students if they were to score these items at a lower level.

 Reducing the number of scale steps (i.e., into fewer response alternatives) carries the risk of reducing data precision. This would be the case if the number of response options is less than the person’s ability to discriminate. However, it has been suggested that the human ability to discriminate is generally independent of the situation in question (16), and that this ability often stops at seven scale steps. Considering the actual score range for the items in this study, this may indicate that the 1-10 scale of the N-SETMU should be subjected to further scrutiny in terms of its response format. Pending on future studies, reducing the response format to a 1-7 scale, for example, may be an alternative.

**Factor structure and internal consistency**

The N-SETMU items can be seen as expressions of a unidimensional construct: self-efficacy for therapeutic mode use (in general). A conservative assessment of Eigenvalue estimates (21), the results from the Parallel Analysis (14), the substantial proportion of variance explained, as well as the consistent high loadings on one component, were all in favor of the one-component solution. Internal consistency between the items was also high when all items were treated as expressions of one underlying dimension (see Table 2). Using the N-SETMU as a unidimensional scale allows for calculating a sum of all six items, and for using the resulting sum score as an indicator of the person’s self-efficacy for therapeutic mode use in general. This overall measure may be useful in educational as well as in practice settings. Occupational therapy students or practitioners receiving training in using IRM and the therapeutic modes in client-therapist interactions may rate their self-efficacy in using the modes before and/or after the training. Subsequently, they may interpret a sum score in the lower range as indicating that more training and/or supervision would be required if they want to develop more confidence in using therapeutic modes. Conversely, they may interpret a sum score in the higher range as generally indicating that they are self-confident with regard to their using therapeutic modes during interactions with clients. Researchers may use the sum score of all six items for various purposes, for example when exploring factors being associated with higher or lower scores. Moreover, in the case of future educational studies with longitudinal data collection designs, we may suggest using the overall sum score as the outcome measure of interest.

**Methodological considerations**

At the time of the data collection, the participants in this study had recently undergone a study module where the use of the six therapeutic modes had been introduced and practiced. In addition, both groups of students had portions of Taylor’s textbook (8) on the syllabus. However, their skills training was brief, and the extent to which the participants had gained an adequate understanding of the conceptual content of each mode may be questioned. Undoubtedly, the participants’ degree of understanding of the modes (as asked for in the questionnaire), varied considerably. Future studies, in which mode descriptions at an abstract level (e.g., empathize) are replaced with descriptions of specific behaviors representing each of the modes, may improve the current state of knowledge and may represent an alternative method of measuring self-efficacy for therapeutic mode use.

The study was conducted with a relatively small sample. There is general agreement that large samples are better than small ones (22), but there is no consensus in answering the question: “How large is a large sample?”. Some authors propose that samples consisting of more than 200 subjects is “large” (23). Nunnally (24), on the other hand, suggests a 10:1 ratio (i.e., that there should be at least ten times as many subjects as variables). The present sample consisted of 111 participants, and the PCA was applied on six variables. Thus, according to Nunnally’s criterion (24), the sample size was deemed appropriate for the PCA. Given the homogeneity of the sample (comprised largely by young and female students of Norwegian background), generalizing to the larger population of occupational therapy students across geographical and cultural contexts may not be warranted. With a view to the Norwegian context, however, the age and gender distribution of the sample reflects well the distribution shown in a previous study (25). The sample was one of convenience, and this limits the generalizability of the study results. However, recruiting participants from two higher education institutions adds to the external validity of the results. The substantial variance proportion explained by the component, the high component loadings, and the high measures of internal consistency indicate that scale sum score is relevant to apply in subsequent research and audits. For future studies, statistical procedures guided by Item Response Theory could be used to examine the rating scale structure of the N-SETMU.

**Conclusion**

This study showed that the N-SETMU scale should be used with a one-component structure, indicating that the sum score can be seen as an expression of the individual’s self-efficacy for therapeutic mode use in general. Considering that this study reports about the psychometric properties of a new instrument, future studies should continue to report about its measurement properties when used with a variety of designs and purposes, with different populations, and within different contexts. In addition, future studies may further examine the need for a refinement of the scale’s items and response format.

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**Competing interests**

The authors have no competing interests.

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References

1. Bandura A. Self-efficacy: The exercise of control. New York: W.H. Freeman and Company; 1997.

2. Pinxsterhuis I, Hellum LL, Aannestad HH, Sveen U. Development of a group-based self-management programme for individuals with chronic fatigue syndrome: a pilot study. Scand J Occup Ther. 2015;22(2):117-25.

3. Reinseth L, Uhlig T, Kjeken I, Koksvik HS, Skomsvoll JF, Espnes GA. Performance in leisure-time physical activities and self-efficacy in females with rheumatoid arthritis. Scand J Occup Ther. 2011;18(3):210-8.

4. Eklund M, Bäckström M. The role of perceived control for the perception of health by patients with persistent mental illness. Scand J Occup Ther. 2006;13(4):249-56.

5. Bernardin KN, Toews DN, Restall GJ, Vuongphan L. Self-management interventions for people living with human immunodeficiency virus: A scoping review. Can J Occup Ther. 2013;80(5):314-27.

6. Vax S, Schreuer N, Sachs D. Work-related self-efficacy of occupational therapists in mental health. Scand J Occup Ther. 2012;19(1):42-8.

7. Holland K, Middleton L, Uys L. Professional confidence: A concept analysis. Scand J Occup Ther. 2012;19(2):214-24.

8. Taylor RR. The intentional relationship. Occupational therapy and the use of self. Philadelphia: FA Davis; 2008.

9. Bonsaksen T, Vøllestad K, Taylor RR. The Intentional Relationship Model - Use of the therapeutic relationship in occupational therapy practice. Ergoterapeuten. 2013;56(5):26-31.

10. Bonsaksen T. Self-reported therapeutic style in occupational therapy students. Br J Occup Ther. 2013;76(11):496-502.

11. Yazdani F, Carstensen T, Bonsaksen T. Therapeutic mode preferences and associated factors among Norwegian undergraduate occupational therapy students: A cross-sectional study. Scand J Occup Ther. 2017;24(2):136-42.

12. Carstensen T, Bonsaksen T. Differences and similarities in therapeutic mode use between occupational therapists and occupational therapy students in Norway (early online). Scand J Occup Ther. 2016.

13. Yazdani F. Self-efficacy for therapeutic use of self. Unpublished instrument. 2016.

14. Horn JL. A rationale and test for the number of factors in factor analysis. Psychometrika. 1965;30(2):179-85.

15. Zwick WR, Velicer WF. Comparison of five rules for determining the number of components to retain. Psychol Bull. 1986;99(3):432-42.

16. Streiner DL, Norman GR. Health measurement scales - a practical guide to their development and use. 4 ed. Oxford: Oxford University Press; 2008.

17. Ponterotto JG, Ruckdeschel D. An overview of coefficient alpha and a reliability matrix for estimating adequacy of internal consistency coefficients with psychological research measures. Percep Motor Skills. 2007;105(3 Part I):997-1014.

18. Briggs SR, Cheek JM. The role of factor analysis in the development and evaluation of personality scales. J Personality. 1986;54(1):106-48.

19. IBM Corporation. SPSS for Windows, version 24. Armonk, NY: IBM Corp.; 2016.

20. Bowling A. Research methods in health. 3 ed. Buckingham: Open University Press; 2009.

21. Kaiser HF. An index of factorial simplicity. Psychometrika. 1974;39(1):31-6.

22. Pedhazur EJ, Schemelkin LP. Measurement, design, and analysis: An integrated approach. Hillsdale, NJ.: Lawrence Erlbaum Associates; 1991.

23. Comrey AL. Common methodological problems in factor analytic studies. J Consult Clin Psychol. 1978;46(4):648-59.

24. Nunally JO. Psychometric theory. New York, NY: McGraw-Hill; 1978.

25. Bonsaksen T, Kvarsnes H, Dahl M. Who wants to go to occupational therapy school? Characteristics of Norwegian occupational therapy students. Scand J Occup Ther. 2016;23(4):297-303.

Table 1

*The Norwegian version of the Self-Efficacy for Therapeutic Mode Use: items, mean scores (M) and standard deviations (SD), median scores (Md) and minimum and maximum scores, and interquartile range (IQR) (n = 111)*

|  |
| --- |
| SELF-EFFICACY FOR THERAPEUTIC MODE USE |
| *When I work with clients I am confident in my ability to:* | *M (SD)* | *Md (Min-Max)* | *IQR 25-75*  |
| 1) Advocate | * 1. (1.73)
 | 5 (1-10) | 3 |
| 2) Problem-solve | * 1. (1.52)
 | 7 (3-10) | 2 |
| 3) Instruct | * 1. (1.45)
 | 6 (2-9) | 2 |
| 4) Encourage | * 1. (1.49)
 | 8 (4-10) | 3 |
| 5) Empathize | * 1. (1.66)
 | 7 (3-10) | 2 |
| 6) Collaborate | 7.36 (1.48) | 7 (4-10) | 3 |

*Note*. All items are rated 1 (“I cannot do this at all”) to 10 (“I am very confident I can do this”).

Table 2

*One-component solution of the Self-Efficacy for Therapeutic Mode Use: component loadings, communalities, Eigenvalue estimates (*λ)*, reliability estimates, and explained variance (n = 111)*

|  |  |  |
| --- | --- | --- |
| Variables | Component 1 | Communalities  |
| Encourage | **0.81** | 0.66 |
| Collaborate | **0.77** | 0.60 |
| Problem-solve | **0.72** | 0.52 |
| Empathize | **0.71** | 0.50 |
| Advocate | **0.68** | 0.46 |
| Instruct | **0.68** | 0.46 |
| λ | 3.20 |  |
| Mean inter-item correlation | 0.44 |  |
| Cronbach’s α | 0.82 |  |
| Explained variance | **53.4 %** |  |

*Note.* Results derived from the confirmatory Principal Component Analysis, using forced extraction of one component, and from the scale reliability analysis.