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Title: Psychometric properties of the Assessment Tool for Perceived Agency (ATPA-22) : utility for the rehabilitation of young adults not in education, employment or training (NEETs).

Psychometric properties of the Assessment Tool for Perceived Agency (ATPA-22) - Utility for the rehabilitation of young adults not in education, employment or training (NEETs)

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Abstract

Background: Promoting and supporting agency have been at the heart of the debate multidisciplinary. To promote self-awareness of young people' agency and identify persons in need of support the Assessment Tool for Perceived Agency (ATPA-22) was developed.

Aim: This study aims to evaluate the psychometric properties of the ATPA-22. Participants were young adults not in education, employment or training (NEETs) and students in higher education (HEI).

Materials and methods: The main data analysis was implemented by Many Faceted Rasch (MFR) analysis.

Results: The ATPA-22 items defined a unidimensional construct with reasonable internal consistency and separation ability. The ATPA-22 was capable of detecting differences between HEI students and young adult NEETs. Nine differential functioning items emerged between the groups.

Conclusions: ATPA-22 shows promise as a tool to assess young adults' perceived agency. Anyhow, as the individual life situation affects strongly to perceived agency, research on the stability of the ATPA-22 among different populations is needed.

Significance: The purpose of the ATPA-22 is to measure perceived agency of individuals, and to identify aspects of agency in need for support. ATPA-22 can be used as a tool for promoting self-awareness of occupational challenges.

Keywords: participation; agency; perceived agency; young adults; Rasch measurement

Introduction

Promoting and supporting agency and participation have been at the heart of the debate on multidisciplinary rehabilitation during the past two decades. The international debate strongly affects understanding of how we should measure an individual's functioning and participation [1]. This study takes part to the discussion while aiming to develop a tool to assess individuals' experienced features of agency which is seen here as important facilitator of participation. The concept of perceived agency was chosen to describe this latent trait of self-experienced features of agency. While developing an assessment tool the first important step was theoretically construct the phenomena which are meant to be measured, in this case the perceived agency. In addition, the measurements used in rehabilitation context should be in concurrence with expected outcome.

In multidisciplinary rehabilitation also the quality of life (QOL) is often seen important outcome and measured routinely. Correspondingly, the World Health Organization's International Classification of Functioning, Disability and Health (ICF) emphases participation (defined as involvement in life situations) as the main health outcome [1]. The QOL has been defined as an "perception of individuals' position in life within the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" [2]. In ICF the term 'involvement' incorporates here taking part, being included, engaged in daily activities or being accepted. In turn, involvement refers to an individual experience related to environmental and personal factors. However, although some attempts to determine the personal factors have been made [3], no international consensus on this issue has yet been reached. Consequently, participation in the ICF reveals weaknesses regarding the subjective experience of meaning and in capturing participation features in a single life [4]. In this study, the term participation refers to occupational engagement. The definition of participation as occupational engagement was

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taken from Fisher and Marterella [5], who argue that value of doing is connected to participation and that the value of participation cannot solely be positive, but neutral or negative aspects also need to be considered. Participation should be understood as a transaction between an individual's personal and environmental domains [5, 6]. The transactional perspective emphases complexity and the strength of the connection between persons and contexts [5].

Furthermore, based on a systematic review, Sharp [7] concluded that the agency-related literature manifests little consistency and coherence in the definitions and components of agency, particularly those pertaining to young people. In general, agency has been seen as a dynamic process that, in its transactions with social and cultural contexts, alters throughout the lifespan [8, 9]. In social science, agency is defined as "the capacity of individuals to act independently and to make their own free choices" [10]. It is seen as a pre-reflective experience or a sense of control over one's own performance and possibilities to make individual choices. Agency has also been considered as a narrative identity, that is, as the internalized, evolving story of the self that a person creates to provide a sense of personal occupational purpose and harmony [11]. Agency should be understood as an experienced phenomenon that manifests when individuals are attending and engaging in activities in their everyday environments [6]. Participation in activities contributes to a person's construction of identity [12]. Perceived agency can appear as part of occupational identity or vice versa [10]. Occupational identity highlights society's influence on individual identity formation. Society is important in framing what occupations are deemed acceptable. Therefore, we also need to emphasize the way identities are formed through social approval.

While the ATPA-22 is meant to be used in multidisciplinary rehabilitation context, we wanted to emphasis the multidisciplinary theoretical understanding of the perceived agency in connection with statistical analysis. We believe that while measuring perceived agency

rehabilitation professionals can facilitate client's self-awareness over occupational meanings and harmony [11], enable participation (attending and engaging in activities in their everyday environments) [6], and promote quality of life [2].

Agency of young adults who are not in education, employment, or training

In this study, perceived agency was examined in two participant groups: Young adults not in education, employment or training (NEETs) and students in higher education (HEI) [13-16]. Because young adult NEETs are not in employment, education or training, they are at risk for becoming economically and socially marginalized [13-16]. Several reports highlight the global prevalence of this phenomenon and growing concern about these young people [13-16]. The Nordic countries have been characterized by relatively low NEET rates, the highest rates occurring in the southern regions of Europe [13-16]. In several studies, NEETs have been identified as at high risk for adverse economic, health, and psychosocial outcomes [17-19]. The mean proportion of young persons classified as NEETs was in OECD 14.3% for persons aged 18- to 24 [16]. Estimates are based on the administrative status of young persons. However, numbers alone are not informative about more subjective matters in this group, such as self-reported agency, wellbeing or quality of life (QoL) [20].

However, the concept NEET has been criticized for, e.g., not capturing the heterogeneity of the population, stigmatizing certain groups of young people, and classifying young people by 'what they are not' [e.g. 15,21,22]. According to Eurofound [15], the NEET population includes a long list of subgroups, each of which has their own characteristics and needs, and for this reason, using the NEET label as an automatic signifier for the most vulnerable is no longer justified. Further, Robertson [23] points out that NEET status is often transitory, and that the situations of young NEETs are dynamic, as transitions from youth to adulthood in post-industrial society are also no longer linear or circular.

Interventions and policies to prevent and restrict youth unemployment and inactivity require an understanding of the obstacles that keep NEETs out of employment or education [24]. Only then can these be effectively designed and tailored to individuals' needs, since as a group NEETs are diverse, as also are the challenges they face [24]. Long-term unemployment is known to be associated with relatively low levels of both objective and subjective wellbeing. [24]. For this study, it was assumed that comparing young adult NEETs with HEI students would provide a broader continuum of perceived agency among individuals in this age group. A further aim was to gain a more nuanced understanding of the perceived agency of young adult NEETs in comparison with same-age peers in HEI.

Development of a tool to assess perceived agency

In this study, we developed a new tool for multidisciplinary use in assessing young adults' perceived agency (ATPA-22) in rehabilitation facilities. The purpose of this tool was not only to promote young adults' awareness of their agency in setting meaningful goals for rehabilitation but also to identify individuals in need of support in perceiving their agency. The first, theoretical, step was to construct the complex transactional framework of perceived agency in more detail, and the second step was to operationalize and pilot a set of potential items.

Theoretical construction of the ATPA

First, the theoretical framework (Fig. 1) was constructed through the three transactional elements of perceived agency: (1) competence, (2) resilience, and (3) balance.

insert Figure 1 here

Competence refers to individuals' personal experience of the fit between their abilities and resources and the tasks they need or want to accomplish. This entails that individuals are also able to experience control over their personal activity choices and a sense of causation based on their personal interests and values [e.g. 12, 25, 26]. Successful daily accomplishment adds to the sense of competence and thereby also promotes the development of occupational identity [12]. A person's interests reflect their perceived competence and are dependent on and enhance their occupational identity. Furthermore, the realization of skilled performance across the lifespan involves changes in individuals' skills to meet their needs over time. The changes that occur in people's environments and lives require that they adapt to new certainties. Individuals' ability to flexibly adapt their own performance and vary their routines and environment are fundamental when seeking balance in daily life [12, 27]. Resilience, in turn, which empowers a person to recover from a setback, is related to adaptive skills and perceived competence, although it is often more narrowly defined. In fact, to develop resilience requires the experience of emotional distress. Resilience is considered to depend on an individual's strengths and is highly influenced by supportive elements in the environment [28]. In the present framework, resilience is viewed not only as the result of successful adaptation to difficulties during the life course but also as the ability to adapt one's performance and routines and have an active impact one's environmental features.

Occupational science researchers have employed the concept of occupational balance [12, 22, 29] when pondering the relationship between sociocultural and occupational demands. Although, our present focus is on perceived agency, the concept of occupational balance (OB) is also important. In their literature review, Eklund et al. [7] describe three main indicators of a subjective experience of OB; these are a person's abilities and resources, the congruence of the activities with values and meaning, and a harmonious mix of daily activities. Each individual's optimal and harmonious variety of activities is unique [30]. The

focus of our reflection in this study is on the personal use of time and achieving a feeling of balance between demands and possibilities. We use the term harmonious mix to describe this fit between values and meanings on the one hand and demands and potential on the other [7].

Operationalizing and piloting the preliminary version of the ATPA

The next step was careful operationalization of the theoretical elements of perceived agency into measurable items. The first version of the ATPA contained 25 items meant to represent the latent trait of the of perceived agency. Items were constructed to represent each of the dynamically interwoven aspects of perceived agency: competence, resilience, and balance. The aim was to describe the self-rating items in everyday language to be comprehensible for young adults.

In the first phase, ATPA with 25 items were piloted by collecting data from occupational therapy students (n=43) together with open written feedback on the comprehensibility of items. Each item on the ATPA scale was rated from 1 (never) to 6 (always) based on individuals experience how well the statement stems to own perception of daily life while focusing the latest two months of own perception. Based on statistical analysis of ratings and the written feedback, some items were re-worded. In the second phase, more heterogeneous data were collected from first-degree students (n=72) in health, social and rehabilitation studies. At the same time, the students were also asked for give their consent to participate in this study. The HEI student data were collected using web-based self-rating forms with re-worded 25 items of ATPA. They were invited to volunteer for the study via individual university emails. In addition, the same 25 items of ATPA were used in the further data collection of the young adult NEET group. In third phase, the pilot data analysis simultaneously with theoretical considerations was conducted with the data obtained from both young adult groups (HEI and NEET). In this phase, three misfit and theoretically

inappropriate items were removed. The ATPA-22 version was finalized before the study proper, with the age-matched data on all the young adults, was started. Therefore, in this study, the psychometric properties of the ATPA-22 and details of its separation ability are reported by comparing the two groups of young adults (HEI students and young adult NEETs). The ATPA-22 items are introduced in table 1.

Study aims

The aims of this study were (1) to examine whether the items of the ATPA-22 work together to define a single construct that can be used to measure perceived agency, and (2) to ascertain in more detail whether the ATPA-22 can be used to identify persons in need of support, in this case young adult NEETs. We examined the content and construct validity of the ATPA-22 and its capacity to separate persons who need support in strengthening their perceived agency and the convergent validity and internal consistency of the ATPA-22 in young adult NEETs.

The following research questions were addressed:

(1) Do the ATPA-22 items, which are representative of the theoretical features of perceived agency, define a single unidimensional construct, such that the items demonstrate acceptable goodness-of-fit when tested with the simple Rasch model?

(2) Do the ATPA-22 items target young adults (n=79) levels of perceived agency and do the items separate participants into different levels of perceived agency?

(3) Do the items of ATPA-22 function differently (DIF) in the two groups same-aged young adults, i.e., HEI students (n=48) and young adult NEETs (n=31)?

(4) If differentiating items are found, do they decrease the ability of the ATPA-22 to statistically differentiate the young adult NEETs and same-aged HEI students in perceived agency?

(5) Does the level of perceived agency and ATPA-22 (index) of the young adult NEETs correlate with level of quality of life, assessed with the EuroHIS-8 index?

(6) How well does the set of ATPA-22 items measure a single, unidimensional latent construct in young adult NEETs?

Materials and method

Procedures and measures

Ethical approval for the study was obtained from the Social Insurance Institution of Finland and permission to collect the HEI student data via e-mail invitation was obtained from the JAMK University of Applied Sciences administration. The HEI students gave their consent via the computer-based self-rating form and the young adult NEETs gave their written consent.

This study consists two separate data collection procedures: (1) HEI students' data and (2) young adults' NEET data. Firstly, to obtain an age-matched population for the young adult NEETs, the HEI student data was restricted to the students aged 19-34 years (collected from the total 72 students pilot data). In the HEI student data, age was only asked on a continuum, hence the groups, although not perfectly matched, were nevertheless close enough in age to be compared.

Secondly, the young adult NEETs were recruited to the study from participants in the intervention project "Low-threshold group intervention for young adult NEETs" (MATKA project). There was a total of six intervention groups which were implemented during autumn 2018 and spring 2019. Each group intervention (3 to 8 participants) lasted from three to four

months continuously with weekly group sessions (15 to 18 in total, each lasting four hours). Data were collected during the first or second group meeting with a web-based self-rating form including a short introduction to the form. Overall, 49 young adult NEETs enrolled in the group program in three large or medium-sized towns in Finland. Of the 49 young adult NEETs, 31 signed the informed consent, giving permission for the use of their data in the present study.

The perceived agency of the young adult NEETs was assessed with the ATPA-25 (1-6) version. In addition, the Quality of Life (QoL) was assessed simultaneously with the EuroHIS-8 QoL measure. The EuroHIS-8 data was used for comparison when examining the convergent validity between the ATPA and EuroHIS-8, as we expected QoL to be correlated to some extent with perceived agency. The EuroHIS-8-item questionnaire is an adaptation of the WHOQOL-100 and the WHOQOL-BREF. The psychological, physical, social and environmental domains are represented in this short form by two items each [31]. The EuroHIS-8-item index (1-5) has shown good cross-cultural performance in field studies and satisfactory convergent and discriminant validity [32] and can therefore be recommended for use in public health research [32].

Participants

The participants in young adult NEETs group (n=31) were 18 to 29 years old with a mean (sd) age of 23.2 (3.4) years, 65 % were women and 52 % were living alone. All had attained a school-leaving certificate from comprehensive school and 58 % had also completed upper secondary education. Half of them had started higher education but had dropped out before graduation. The participants were not in employment or education at the time of the study. One in four of them were aiming at studying or working and one in four were on sick leave. The most frequently mentioned reasons for enrolling in the group

program was having something to do in everyday life and achieving control over daily life routines.

The HEI participants (n=48) group were 19 to 34 years old. The median age group was 25 to 34, 88 % were women, 27 % were living alone or with a fellow student and 73 % with their family or spouse. All had completed their bachelor's degree.

Data analysis

The main data analysis was implemented by Many Faceted Rasch (MFR) analysis. Since self-ratings can only be evaluated and scored using ordinal rating scales and cannot be treated as quantitative measurements [34,35]. MFR offers an alternative approach for instrument development that generates unidimensional linear measures based on additive numbers. Two facets were considered in the data analyses of the ATPA-22: (a) competence in perceived agency, and (b) the difficulty of the items. It was expected that the Rasch model for the ATPA-22 would confirm the following assertions: (a) a person is more likely to obtain higher scores on the easier than more difficult agency items, and (b) the easier agency items are more likely to be easier for all persons. The MFR models have been described more detail elsewhere [e.g. 35].

The ordinal raw scores of the ATPA-22 were analyzed using FASETS and WINSTEPS [32], two different MFR computer software packages. The ATPA-22 statements were originally each rated on 6-point scale indicating level of agency (1= is not at all true, 6= is perfectly true). Owing to a slight unbalance between the numbers of ratings used, the rating scale was recorded, by combining scores 1 and 2 and scores 3 and 4, to form a 4-point scale. This adjustment did not affect the item-fit statistics or separation reliability of the ATPA-22. Therefore, the analysis was continued with the transformed 4-point scale data.

To ascertain whether the ATPA-22 items define a single unidimensional construct, such that the items demonstrate acceptable goodness-of-fit with the MFR model, the data of

all 79 young adults were analyzed. The FASETS program, which summarizes all unexpected responses into goodness-of fit statistics (MnSq and z scores), was used. The criteria for acceptable goodness-of-fit (both infit and outfit) of the ATPA-22 items were set at MnSq 1.3 and $z < 2$ for items [36]. It is generally expected that 95% of items will meet this criterion.

To investigate if the ATPA-22 items are targeted to an individual's level of perceived agency, the acceptability of goodness-of-fit of the individual's measures with the MFR model for ATPA-22 was analyzed. The criteria for acceptable goodness-of-fit for individuals (outfit) were set at MnSq 1.5 and $z < 2$, since we used leaner but more productive MnSq criteria for the effects of the personal factors on the measured phenomena than for the items [36]. It is generally expected that 95% of items will meet this criterion. Standard error estimates (SE) for the separation of items and individuals were investigated. The size of SE is influenced by how well the data fit the model assertions and how well targeted the challenges of the items are at the individual level. [36]. The criterion representing an acceptable standard for individuals was set at $SE \leq 0.30$. Furthermore, to confirm the utility of the separation index, its reliability for individuals was investigated. A separation index of > 2 and reliability coefficient of > 0.80 were expected [34].

When analyzing whether the ATPA-22 items function differently between two groups of persons (here, the HEI students and young adult NEETs), we used the WINSTEPS program for DIF analysis to generate group-specific MFR analyses. The item calibrations were plotted with 95% confidence intervals (CI) and the probability (Mantel-Haenszel) for meaningful differences between groups was set at < 0.05. Our basic assumptions were that the ATPA-22 item calibration hierarchy would remain largely stable across different groups of persons and that 95% of the items would meet the criteria [35].

Last, to ascertain whether the differentially functioning items affected the statistical ability of the ATPA-22 to separate the young adult NEETs and HEI students in perceived

agency, two different independent samples were conducted: first, using the perceived agency values (index in logits) of individuals, conducted with all 22 ATPA-22 items, and second, with the perceived agency values (index in logits), conducted with a limited set (n= 15) of uniform ATPA-22 items.

In addition, as a part of the construct validity study we assessed the convergent validity within the young adult NEET group by using Pearson correlations with the ATPA-22 and EuroHIS-8. The internal consistency of the ATPA-22 in the young adult NEET group was also assessed.

Results

Item fit and internal scale validity of the ATPA-22

Analysis with all 22 items and the data of all 79 young adults revealed that 1 (4,5%) item of the ATPA-22 failed to meet the criterion for acceptable goodness-of-fit. This meets our 5% criteria. The misfitting item was "I feel that my loved ones support my choices".

The ATPA-22 items targeted to the challenges to perceived agency reported by the participants (n=79) were linearly distributed (Fig. 2). In addition, no floor or ceiling effects were found. This reveals that, combined, the items represented an individual's perceived agency. The ATPA-22 item calibration and goodness-of-fit statistics are detailed in table 1.

Insert Figure 2 here

Insert table 1 here

Response validity

The Rasch model for ATPA-22 showed that the results for 84.5% of the participants demonstrated acceptable goodness-of-fit. This was less than the expected 95 %. The SE of the ATPA-22 challenge items was 0.38, which was higher than the expected < 0.30. Since the proportion of misfitting individuals was higher than expected, a further analysis was performed to find out whether the misfitting individuals showed any systematic patterns. Eight (61 %) of the 13 misfitting individuals were young adult NEETs. No other systematic patterns were found. Since the proportion of misfitting young adult NEETs was higher than expected, we further investigated the DIF items to see if they affected the separation ability of the ATPA-22.

Differentially functioning items

Analysis of the DIF showed that 15 (68%) of the 22 items seemed to be stable across both participant groups. However, seven (32%) of the items measuring challenge differentiated between the young NEETs and HEI students. This was more than expected. However, despite the relative stability of the item hierarchy of the 22 ATPA-22, group-specific items were observed (Fig. 3).

Insert Figure 3 here

Separation ability

The separation index of the ATPA-22 using all 22 items with data on all 79 young adults was 3.59 (separation reliability = 0.93), showing that the ATPA-22 items separated individuals into at least four different challenge levels in perceived agency. The ATPA-22 clearly differentiated the young adult NEETs from the HEI students. The 9 differentially functioning items found were then studied to see whether they affected the ability of the

ATPA-22 to differentiate individuals who reported challenges in perceived agency. Two different independent samples t-tests were run. The Levene's tests confirmed the equality of variances in both analyses and the t-tests showed significant differences between the two groups of participants. In the first analysis, with 22 stable items, the t-test confirmed that while the means differed significantly ((77), $t = 5.22$, $p < 0.01$), the effect size was relatively small (*Hedges' g* = 0.12). In the second analysis, with 15 uniform items, the t-test also confirmed that the means differed significantly ((77), $t = 5.06$, $p < 0.01$), while the effect size remained at the same level (Hedges' g = 0.11). Small effect sizes indicate overlap in the standard deviations between groups.

Insert table 2 here

Internal consistency and convergent validity when used with young adult NEETs.

Examination of the convergent validity between the ATPA-22 and quality of life (EuroHIS-8) scales in the young adult NEETs (n=31) showed a significant correlation between the ATPA-22 (logits) and the EUROHIS-8 index ($r = .894$, p < 0.01) and between the APTA-22 and EuroHIS-8 index ($r = .896$, $p < 0.01$) (Fig. 4). The alpha coefficient for the ATPA-22 was .949, suggesting that the items have relatively high internal consistency in the young adult NEET group.

Insert figure 4 here

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Discussion

Instrument validation is a fundamental and continuing process that is required to support relevant interpretations of test scores in relation to the theoretical structure being assessed [35]. The main aim of the present study was to investigate the psychometric properties of the ATPA. In doing so, we obtained information on the perceived agency of young adult NEETs in comparison with same-age HEI students. Our assumption was that the young adult NEETs would differ at the group level from same-age HEI students, and therefore that these two groups had the potential to yield data heterogeneous enough for a validity study using Rasch analysis. This article focuses on the psychometric properties of the ATPA-22 using empirical data collected from two groups of same-age young adults, HEI students and young adult NEETs.

Validity evidence based on internal structure of the ATPA-22

To provide evidence on the validity of the ATPA-22, we used MFR analysis, in which we analyzed fit statistics to detect discrepancies between the Rasch model predictions and the data we had collected [35]. Overall, the results, showing good item fit, supported the internal scale validity of the ATPA-22. This means that the ATPA-22 items worked together and measured the same latent trait of perceived agency of all participated young adults. In addition, the statistical analysis supported the theoretical content of perceived agency and the construction of ATPA-22 items. Up to this point, we can argue that the ATPA-22 can be used to measure young adults perceived agency no matter which the client group is. Despite the fact, that ATPA-22 clearly separates the young adults by group (NEET or HEI), there were individual participants whose level of perceived agency was lower or higher than expected based on client group (see Figure 2). This supports the critique that the concept of NEET is not capturing the individual differences between young adults [e.g. 15,21,22].

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Further investigation is needed to drive better understanding of the perceived agency in large population of young adults.

The misfit items are threat to the uniformity of the measurement. Anyhow, the Rach analysis gave us the opportunity to detailed investigation of the possible reasons of misfit items [35]. Only one item, "I feel that my loved ones support my choices", which assesses the supportiveness of the individual's social environment in relation to agency, showed a slight misfit to the present data. The detailed analyses revealed that 4/31 of the young NEET adults gave higher scores and 3/48 of the HEI students gave lower scores than expected in relation of their total level (logits) of perceived agency. The agency is highly context depended phenomena which has seen as a dynamic process in transactions with social environment [e.g. 9, 10]. This item might depend not only on the supportiveness of significant others but also on whether they even exist. At the same time, perceived agency is more representative of agency defined as a pre-reflective experience or sense that a person develops to demonstrate personal purpose [11].

Validity evidence based on responses

While the 22 items were well distributed linearly and targeted to the level of perceived agency of the two heterogenous groups of young adults, more misfits than expected in the participants' responses were observed. Furthermore, 61% of these misfits were found in the young adult NEET group. As this was the only systematic pattern we found, we assumed the existence of some group-specific items which could threaten the unidimensional structure of the ATPA-22. Therefore, we further evaluated the differential item functioning (DIF) between two groups of young adults (HEI and NEET), despite the fact, that the groups were relatively small. We found 9 items that differed between the groups. To understand the possible sources of the DIF, we further considered the content of these items by comparing the problems reported by the two participant groups.

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We found four items which were relatively harder for the young adult NEETs: "I am able to solve daily challenges in reasonable way"; "I can handle problems and pressure (by discussing them or taking actions)"; I feel that I have the ability to manage the challenges of work or studies"; and "I can take care of my everyday tasks independently". These items, which were relatively harder for the young adult NEETs, are related to a low resilience [e.g. 38]. In addition, three items were relatively harder for the HEI students: "I have time and/or energy to take care for my wellbeing,"; "I do enough daily for others (not too much/not too little)"; and "I feel that I have enough time to do tasks that I want to do". These items reflect the pressure of time management which has been found to be one cause of stress for HEI students in Finland [e.g. 39]. Agency is a complex and subjective phenomenon that is strongly affected by life situation and circumstances. It might, therefore, be impossible to construct perfect and stable measurement.

Power to separate young adults in level of perceived agency

Assessment tools which can identify individuals who require support in coping with challenges in their daily lives are needed both for research purposes and in evidence-based practice. The power of the ATPA-22 to separate young adults into different levels of perceived agency was calculated with a separation index. The index reveals the number of statistically different strata present in the data sample. The separation index of the ATPA-22 was 3.59, which indicates that its items separated the young adults into at least four different levels of challenge in perceived agency. Our assumption was that the young adult NEETs would be at risk for a lower level of perceived agency than the HEI students. Accordingly, we found that the young adult NEETs had lower total scores (logits) in perceived agency measured with the ATPA-22 than the same-age HEI students. We also found the effect sizes of the significant difference in perceived agency between the HEI students and young NEETs were relatively small. This indicates the presence of internal variation within both groups,

and hence no group-specific generalizations (e.g., on the life situation of NEETs) can be made; instead more individual assessment is needed [e.g. 15, 23].

Because a slight lack of uniformity in measurements can lead to incorrect estimates of effects [40], we investigated whether omitting the DIF items affected the mean differences between the HEI and NEET groups. The t-test results of the two different analyses, one with all 22 items and the other with only 15 items showed no notable differences. We can therefore conclude that despite the 9 differentially functioning items, the ATPA-22 succeeded in differentiating the young adult NEETs from the same-age HEI students. Thus, the ATPA-22 can be used to separate persons in need of support in perceived agency. Moreover, as the ATPA-22 is a self-evaluation tool, it can be used to promote self-awareness of challenges to one's own agency.

Convergent validity and utility of the ATPA with NEET young adults

Only the young adult NEET group data (n=31) was used in assessing the internal consistency of the ATPA-22 and convergent validity between the ATPA-22 and EuroHIS-8. We found a strong correlation between these two instruments. Whereas the EuroHIS-8 is a quality of life screening tool, the ATPA-22 yields more information about perceived agency. Previous studies have found a high correlation between the EuroHIS-8 and both the SF-36 Mental Health Index (r=0.49) and Oslo Social Support Scale (r=0.36) [41] and statistically significant (p<0.001) correlations between the EuroHIS-8 and both the Symptom Checklist 90 (r=-0.42), SF-36 (r = 0.58) and WHOQOL-BREF domains (r=0.61–0.77) [32]. It can be assumed that the high correlations between the ATPA-22 and EuroHIS-8 found in our study may be due to similarities in the psychological, physical, social and environmental domains included in both measures.

We did not study the correlation between the APTA-22 items and EuroHIS-8 items because of the relatively small number of young adult NEETs in our study group. Future

research with a larger group of participants is thus needed. Age is an important factor in assessing functioning and QoL. Whether our results can be generalized to other groups, e.g. older adults, could also be studied.

The goal in designing a reliable instrument is not only to ensure that scores on similar items are related (internally consistent) but also that each item contributes unique information. High reliabilities (Cronbach's alpha of 0.95 or higher) are not necessarily desirable, as they indicate that the items may be redundant. Our result was just below that threshold, indicating good internal consistency of the ATPA-22 with the young adult NEET group.

Practical implications

Through self-assessment of their perceived agency, individuals can reflect on the meaning of what they do. Evaluating individual thoughts and actions are an important component of enhancing young people's perceptions of themselves as agents. Using the ATPA-22 for self-evaluation endorses the importance of critical reflection on young people's perceptions of their agency. Perceived agentic identity can motivate agentic activity choices over time [8]. We assume that agency, and thus empowerment, is a key thread linking many areas in young people's lives. A focus on agency may lead to a paradigm shift in how young persons view themselves and are viewed by others. We should pay more attention to individuals' power to influence in their own life courses [42].

Limitations of the study

The sample size in this study was relatively small. The sample for the MFR analysis for validity based on internal structure comprised 79 young adults' analysis. According to Linacre [43], a sample size of 64 to 144 is needed to ensure 95% and a sample size of 108 to 243 to ensure 99% confidence for stable item difficulty estimates based on a criterion of

±0.50 logits. Moreover, the sample sizes (NEET n=31, HEI n=48) for studying DIF were below the recommended size of 100 [44] to 200 [45] participants per group. In fact, DIF analyses depend on standard error estimates, which are lower in large samples [44].

There were persons in NEET young adults' rehabilitation group (18/49) that declined to participate in this study. We assumed that they were the most vulnerable persons and might have lower perceived agency level than those who participated. Even though, the total available data was heterogeneous enough and separation ability of ATPA-22 was good.

The respondents had difficulties using the original 6-point response scale. We therefore recorded the scale after data collection to a more user-friendly 4-point scale. This solution slightly decreased separation ability but increased the individual fit statistics. If the data had originally been collected with the 4-point scale, the scores might have shown less variation.

Conclusion

The main conclusion of this study is that the ATPA-22 shows promise as a clinical tool for the self-evaluation of perceived agency for the purposes of awareness-raising and identifying personal need for change. Overall, the results supported the internal scale validity (content, construct and convergent) of the ATPA-22 and showed that it also has potential for use with different groups of individuals. Owing to the slight instability some of the ATPA-22 items, the validity of the ATPA-22 should be further studied in different populations. In addition, when using the ATPA-22 for research purposes, we recommend controlling for DIF when comparing perceived agency between different groups of people.

Acknowledgement

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Compliance with Ethical Standards

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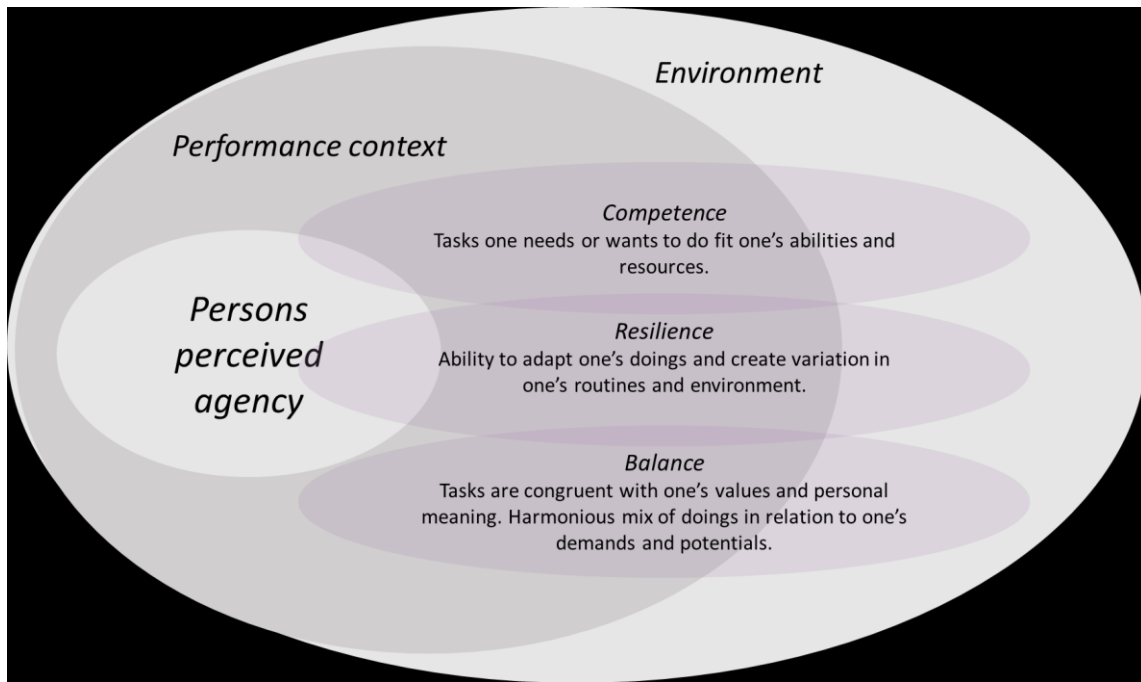
Figure 1 The theoretical features of perceived agency.

Individuals * HEI # NEET	Items	Rating scale
*		
#		
*		4
**		
*		
***		
**		
*	1, 5	
**		
**	3	
**	2	
#********	4, 11, 12	
#******	14	
*****	6, 8	
**	7, 9, 10, 13	
#	15	3
***		
##***		
#**	16	
#		
	17, 18, 19	
#*	20	
#**		
*		
#		
*	21	
#*	22	
*		
##		
*		2
##		
#		
#		
*		
		1

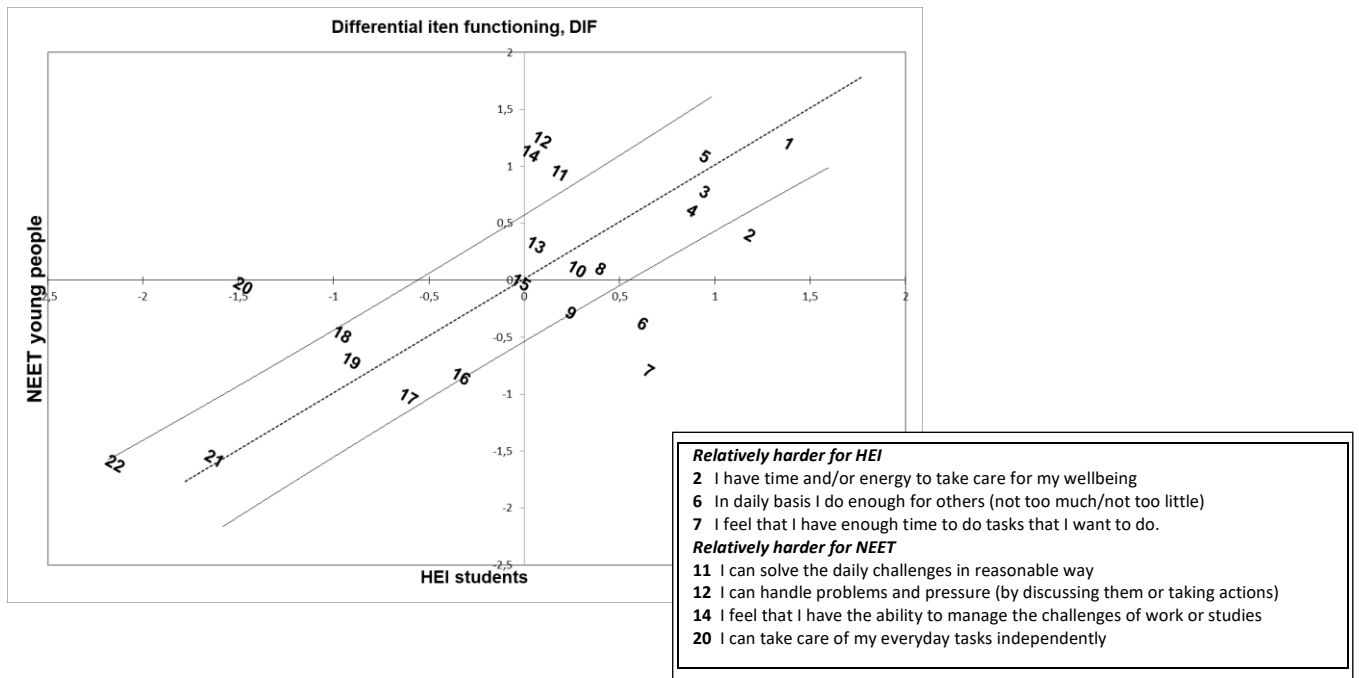Figure 2 Individuals' data targeted by the ATPA-22 items.

Figure 3 Differential item functioning plots of the challenge items (logit, group mean = 0) for young adult NEETs and HEI students. Items outside the control lines (95% CI) indicate differential item functioning between the two groups.

The scatter plot shows the correlation between MATKA-22 (1-6) on the x-axis and EUROHIS-8 (1-5) on the y-axis, with the regression line y=0,42+0,71*x and R² Linear = 0,803.
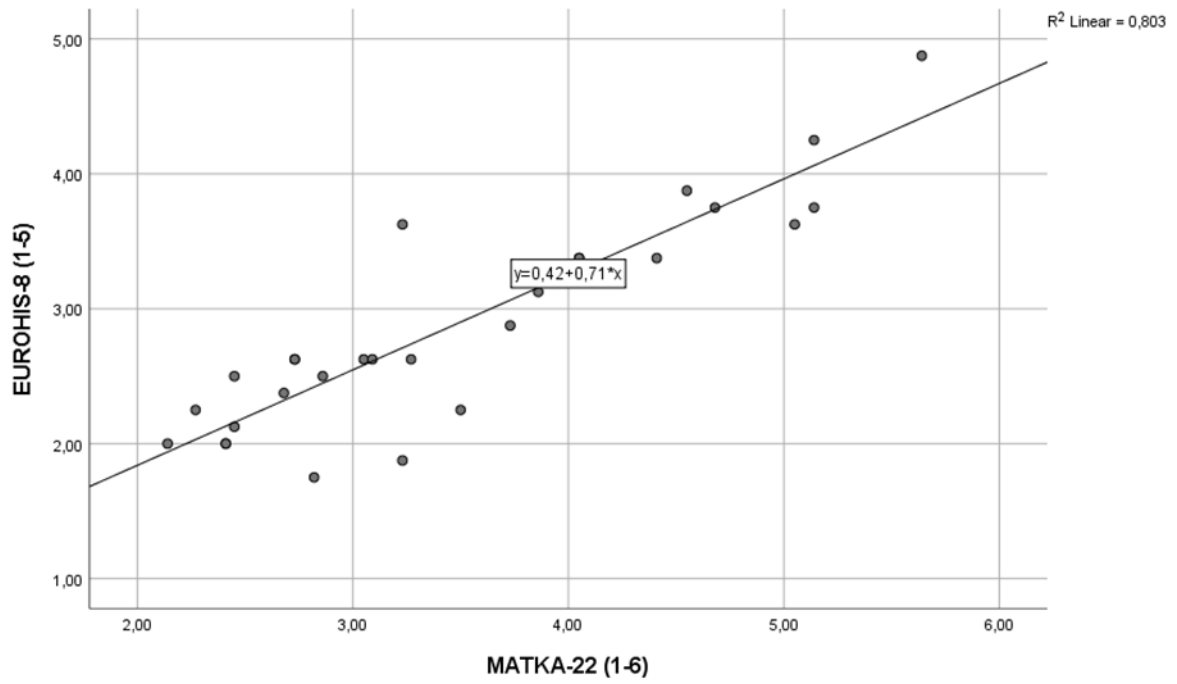
Figure 4 Correlation (*r* = .896, *p* < 0.01) between APTA-22 (logits) and EUROHIS-8 (index) in young adult NEETs.

Table 1 Calibrations (logits) for to perceived agency items of the ATPA-22 and their goodness-of-fit to the Rasch model.

		Measure		Infit		Outfit	
		(logit)	SE	MnSq	ZStd	MnSq	ZStd
	Harder to reach						
1	I feel that different areas of my daily life are balanced	1,25	0,19	0,76	-1,50	0,79	-1,30
5	I am satisfied with the amount of daily activities I manage to do	1,22	0,19	0,98	0,00	0,91	-0,40
3	I feel that I have a suitable amount to do on a daily basis	0,95	0,19	1,07	0,50	1,04	0,20
2	I have time and/or energy to take care of my wellbeing	0,92	0,18	0,82	-1,10	0,80	-1,20
4	I am happy with the amount of time I have for rest and sleep	0,64	0,20	1,25	1,50	1,25	1,50
12	I can handle problems and pressure (by discussing them or taking actions)	0,64	0,18	0,83	-1,00	0,88	-0,70
11	I can solve daily challenges in a reasonable way	0,52	0,17	0,63	-2,60	0,65	-2,50
14	I feel that I have the ability to manage the challenges of work or studies	0,43	0,19	1,16	1,00	1,16	1,00
8	I do tasks that I feel challenge me appropriately	0,25	0,17	0,80	-1,30	0,83	-1,10
6	I do enough daily for others (not too much/not too little)	0,23	0,18	1,16	1,00	1,24	1,50
9	I do tasks that I feel are important and meaningful to me	0,17	0,17	0,95	-0,20	0,96	-0,10
10	I do tasks that gives me a feeling of competence or satisfaction	0,17	0,17	0,68	-2,20	0,66	-2,40
13	I make active choices about what to do daily	0,09	0,17	0,92	-0,50	0,87	-0,80
7	I feel that I have enough time to do tasks that I want to do	0,08	0,17	0,92	-0,40	1,06	0,40
15	If necessary, I can flexibly and fluently adapt my performance and routines	0,06	0,17	0,98	0,00	0,97	-0,10
16	I can easily express my thoughts and opinions to other people	-0,49	0,17	1,09	0,60	1,13	0,80
17	I feel that my loved ones support my choices	-0,81	0,20	1,45*	2,80	1,52*	2,90
19	I can influence my living situation in satisfying ways	-0,81	0,17	1,02	0,10	1,24	1,40
18	I feel I am accepted in my community	-0,92	0,17	1,11	0,80	1,19	1,20
20	I can take care of my everyday tasks independently	-0,95	0,17	0,98	-0,10	0,93	-0,40
21	I feel safe in my surroundings	-1,70	0,18	0,92	-0,50	1,05	0,30
22	I manage to perform in my environment	-1,92	0,19	1,13	0,80	0,93	-0,20
	Easier to reach						

misfitting items, infit and outfit criteria MnSq 1.3

Table 2 *Mean difference (logit mean set at 0.0) in perceived agency of young adult NEETs (n=31) and HEI students (n=48) measured with the ATPA with 22 items and with 15 items.*

Participants	ATPA with 22 items t = 5.22, P < 0.01		ATPA with 15 items t = 5.06, P < 0.01	
	M	SD	M	SD
NEET	0.47	1.00	0.61	1.04
HEI	-0.95	1.45	-0.83	1.51