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# Psychometric properties of a revised version of the Assessment Tool for Perceived Agency (ATPA19) for use with older adults in the rehabilitation context

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## Abstract

**Background:** It has been argued that an agency-based approach should be taken to person-centered gerontological rehabilitation. Such an approach requires agency-based assessment tools valid for use with older adults.

**Objective:** To evaluate the psychometric properties of the Assessment Tool for Perceived Agency (ATPA) adapted for older adults in gerontological rehabilitation in Finland.

**Methods:** Participants (n=97) were older adults aged 69 to 90 years. A many faceted Rasch (MFR) analysis was used to investigate the item and person response processes (goodness-of-fit statistics) and the separation reliability (separation index) of the ATPA.

**Results:** The ATPA19 items defined a unidimensional construct with moderate internal consistency and separation ability. More uncertainty than expected was found in within-person responses, mostly among females and participants aged 80 years or older.

**Conclusion:** The ATPA-19 is a promising tool to measure features of older adults' perceived human agency. However, since perceived human agency is seen as a subjective and dynamic phenomenon that is constructed over the life course, research

is needed on how human agency appears in different temporal periods, contexts, and populations.

**Significance:** Evaluating individuals' perceived human agency with ATPA19 can help professionals strengthen the meaningful agency of older adults.

Keywords: construct validity; human agency; older adults; person response validity; Rasch analysis

## Introduction

In rehabilitation practice, the first and most important criterion governing the choice of assessment tools is that the tools used assess the target phenomena (Bond & Fox, 2007). In addition, the assessment should generally promote awareness in both clients and rehabilitation professionals of the overall aim of the rehabilitation and the prioritised outcomes. Understanding and organising rehabilitation as a person-centred agency-based practice entails adapting and validating tools for the assessment and goal-setting phases that focus on human agency. This study contributes to the validation process of an agency-based assessment tool, the Assessment Tool for Perceived Agency (ATPA) (Lautamo et al. 2021), for use in rehabilitation interventions with older adults.

### Person-centred agency-based practice

According to Wressle & Samuelsson (2004), the promotion of client participation has implications for clinical practice and thus requires' person-centred rehabilitation professionals. Pikkarainen et al. (2015) add that to better suit the real-life context of older adults, a person-centred gerontological rehabilitation process should follow not only an agency-based but also life-course approach.

Sharp (2014) reported that there is little consistency or coherence in the definition of agency. Moreover, the concept of agency differs according to the epistemological roots and goals of the researchers who employ it (Hitlin & Elder Jr., 2007). Eteläpelto et al. (2013) have pointed out that in different disciplines agency has usually been described as the relationship between a person and their contextual structure, with its diverse emphases and concepts. In this study, the concept of agency refers to personal or human agency and is defined as the intentions, choices, decisions, and actions through which a person constructs their own everyday life. Agency-based measures, in turn, are based on the possibilities and demands of contextual, temporal, cultural or institutional factors, as well as earlier personal experiences and meanings (Bandura, 2001; Eteläpelto et al., 2013; Hitlin & Elder Jr., 2007). Thus, the agency-based approach

seeks to measures that support a person's ability to become aware of and achieve their potential for agency, i.e., for control over the nature and quality of their life (Bandura, 2001), and thus focuses on individuals' ways of constructing their life courses through their choices and actions (Eteläpelto et al., 2013) and on strengthening their occupational identity (Phelan & Kinsella, 2009; Yamada et al., 2017, p. 14).

## Agency of older adults

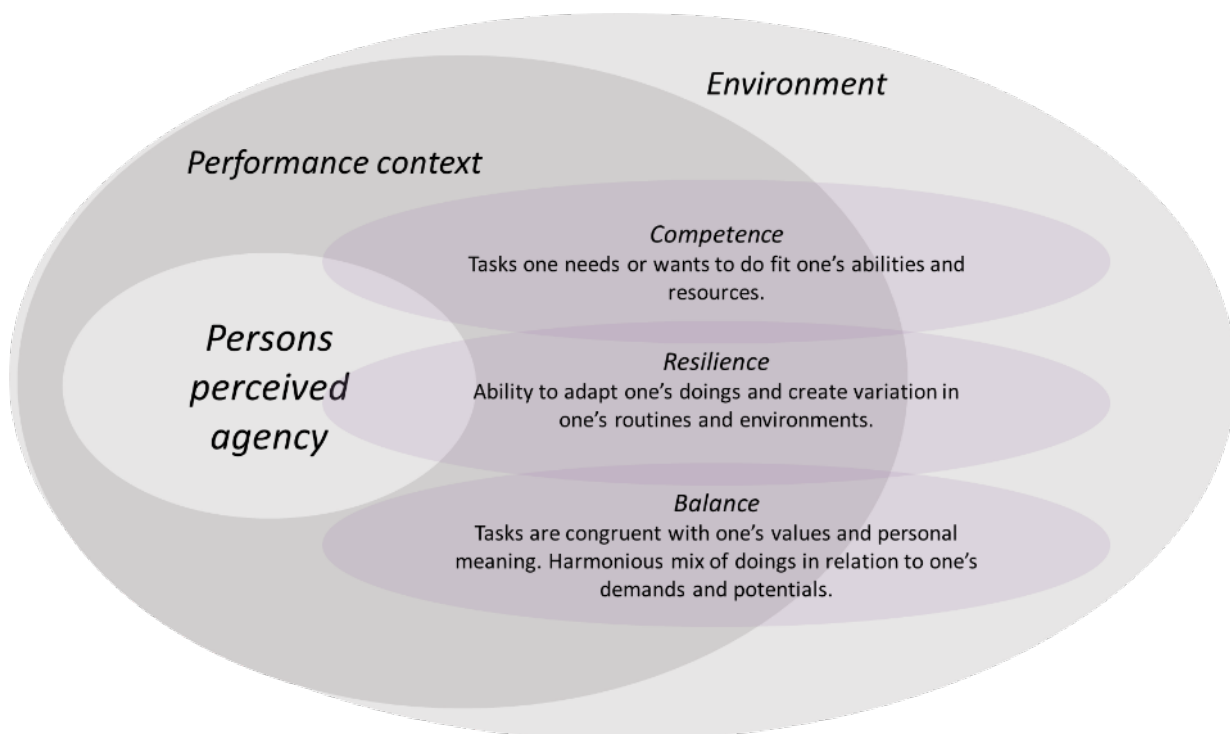
Only a few studies have focused on the agency of older adults (Pikkarainen et al. 2019; Vik et al. 2008; Wray, 2004) and no studies have measured agency in older adults. However, evidence supporting the use of the agency-based approach in gerontological rehabilitation has been reported. In their case-oriented study, Vik et al. (2008) confirmed that being an agent was a strong feature in older adults' experience of participation in daily life. Participation was not only a matter of performance per se but was also contingent on the ability to continue being an active agent in daily life. Active intentional human agency has been found to be associated with successful ageing (Wray, 2004). Agency has also been seen as contributing to processes of personal growth and resilience (Dmytro et al.2014; Masten & Wright, 2009). Resilient ageing in the face of challenges has also been found to be achievable with environmental support, a positive attitude, and appropriate coping strategies (Tourunen et al., 2021). For most persons, adjustment, and adaptation to the challenges of ageing take place gradually. Overall, active human agency, resilient ageing, and having social relationships have all been proposed as factors that promote healthy ageing (Masten & Wright, 2009). We suggest, therefore, that the rehabilitation of older adults should be based on not only person-centred but also agency-based principles.

Gerontological rehabilitation designed for older adults should place greater emphasis on challenges to personal agency, while rehabilitation professionals should find new ways of enabling clients to become active agents (Pikkarainen et al., 2015; Pikkarainen et al., 2019; Vik et al., 2008). From the standpoint of occupational therapy, tools and frames of reference that support human participation and agency have shown potential in designing rehabilitation services that match older adults' unique life contexts (Pikkarainen et al., 2015), even in rehabilitation periods implemented in rehabilitation centres. Unfortunately, the assessment tools currently used with older adults in the Finnish multidisciplinary rehabilitation context do not focus on agency or the life course per se. Instead, assessment mainly focuses on health conditions, body functions and structures or solitary activities in the current life situation.

If human agency is considered an important factor in promoting older adults' participation in unique life contexts (Vik et al., 2008), then to meet this objective in gerontological rehabilitation calls for the development of new tools. Hence, the suitability for use of the ATPA in gerontological rehabilitation was investigated in this study.

## Assessment of perceived agency, ATPA

The ATPA was designed as a generic self-rating tool for multidisciplinary use in community-based practice (Lautamo et al. 2021). Its purpose is to promote self-awareness of one's own agency for the goal-setting process in rehabilitation. The aim is to identify persons needing support in realising their potential to achieve agency in their everyday lives. The original ATPA scale (with 22 items) was previously standardised among young adults (Lautamo et al., 2021). According to the authors, it functions as a unidimensional scale to measure the transactional elements of perceived agency, i.e., competence, resilience, and occupational balance (Fig.1).



**Figure 1.** The theoretical features of perceived agency.

In the ATPA, competence refers to personal experience of the fit between one's abilities and resources when engaged in daily life tasks. More specifically, level of competence is based on individuals' experience of control, personal choices, and an awareness of causation in relation to their personal interests and values (Christiansen,

1999; Taylor & Kielhofner, 2017; Velde & Fidler, 2002). Resilience refers to the ability to flexibly adapt one's performance and vary one's routines as the need arises, such as in recovering from a setback, and thus is related to the one's adaptive skills and perceived competence (Luthar & Brown, 2007; Rutten et al., 2013). In the ATPA, resilience is viewed theoretically '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 environment (Lautamo et al., 2021), both of which are fundamental when seeking balance in daily life (Christiansen, 1999; Wagman et al., 2012). Occupational balance, in turn, reflects the relationship between sociocultural and occupational demands (Christiansen, 1999; Wagman et al., 2017). This includes the personal use of time and achieving a sense of balance between demands and possibilities in everyday contexts (Eklund et al., 2017; Håkansson et al. 2006).

## Previous studies of the ATPA

A recent study confirmed the structural validity and separation reliability of the ATPA22 in a young adult population (Lautamo et al., 2021). The authors found a slight hesitation in the person response process and nine differentially functioning items (DIF) between the two groups studied, one comprising young adults not in education, employment, or training and the other students in higher education. Most of those who exhibited misfitting response patterns were found in the group of young adults not in education, employment, or training. This raised the question of whether this would also be the case in other, comparable populations (Lautamo et al., 2021), such as older adults. Failure to understand of some items may be one reason for misfitting responses and DIF items in a certain population. Therefore, the starting point in this study was to modify any such ATPA22 items in a piloting process.

## Piloting and adapting the ATPA

To ensure that older adults understand and can cope with all the ATPA items (Messick, 1995; Padilla & Benítez, 2014), the scale was modified for use in the gerontological rehabilitation context based on feedback from a group of older adult volunteers (n=47). These individuals filled in the original ATPA22 self-assessment forms and were subsequently interviewed on the comprehensibility of the items by students studying for a bachelor's degree in healthcare, guided by one of the present authors.

Based on the feedback, three items were re-worded, one item was split into two different items, and one new item was added. The three reworded items were: "I feel

that my skills and capacities enable me to cope in daily life”; “I have the ability to manage the challenges of daily life”; and “I take care of my wellbeing in reasonable way”. The item “I do tasks that I feel to be important and meaningful for myself” was divided to two separate items: “I do tasks that I feel are meaningful to me” and “I do tasks I get enthusiastic about”. The new item was: “I dare to ask other people for help from when I need it”. We wanted to retain as many items as possible for data collection purposes, even if our ultimate aim was to construct a shorter version of the ATPA. Thus, the version of the ATPA used in this study comprised 24 items (table 1).

**Table 1** The modified version of the ATPA used with older adults in the data collection.

ATPA24 items
1 I can take care of my everyday tasks independently
2 I take care of my wellbeing in a reasonable way
3 I feel safe in my surroundings
4 If necessary, I can flexibly and fluently adapt my performance and routines
5 I can easily express my thoughts and opinions to other people
6 I am satisfied with the amount of daily activities I manage to do
7 I can solve daily challenges in a reasonable way
8 I am happy with the amount of time I have for rest and sleep
9 I feel that I have enough time to do tasks that I want to do
10 I do tasks I get excited about
11 I do enough daily for others (not too much/not too little)
12 I make choices about what to do daily
13 I do tasks that gives me a feeling of competence or satisfaction
14 I can cope with stressful daily life situations
15 I feel that I have enough skills to manage the challenges of daily life
16 I do tasks that I feel are meaningful for me
17 I dare ask other people for help when I need it
18 I feel accepted in my community
19 I feel that different areas of my daily life are balanced
20 I manage to perform in my environment*
21 I can influence my living situation in satisfying ways*
22 I feel that my loved ones support my choices*
23 My life situation is satisfactory, and I don't want a change*
24 I have people to share my worries with, if necessary*

\*Deleted in first phase of analysis

This study aimed to investigate if the ATPA with the re-worded items (Table 1) can be treated as a unidimensional scale in older adult populations. Therefore, we analysed two types of structural validity (validity based on internal structure and validity based on person response processes) of the ATPA intended for use with older adults.

The specific research questions addressed in this study were:

1. Do the ATPA items representative of the theoretical features of perceived agency define a single unidimensional construct such that they demonstrate acceptable goodness-of-fit to the Rasch model for the ATPA?
2. Do the person response processes of older adults in rehabilitation demonstrate acceptable goodness-of-fit to the Rasch model for the ATPA?
3. Do the ATPA items separate the older adults in rehabilitation into different levels of perceived agency?
4. If systematic misfit patterns are found, are differentially functioning items (DIF) also found between different sub-groups of the older adults in rehabilitation?

## Materials and methods

### Procedures

Older adults participating in group-based gerontological rehabilitation were recruited to the study from five different rehabilitation centres across Finland. The rehabilitation process comprised a total of three one-week periods in a rehabilitation centre over a one-year period alongside home-based individual tasks, including physical exercises. The eligibility criteria were a) 68 years or older, b) no memory impairment (Minimental State Examination, MMSE >24), and c) the ability to move independently, at least indoors.

Participants received a short oral introduction to the study from the rehabilitation professionals working with them and were administered the modified ATPA24 (1-6) with a self-rating form in their rehabilitation centre during the first one-week rehabilitation period. The written form of the ATPA was self-rated independently during group sessions or completed during the individual interview with the support of a rehabilitation professional.

### Participants

Overall, 100 older adults signed an informed consent permitting use of their data for the present study. The final analysis was conducted for the ATPA ratings of 97 participants. The remaining 3 participants' ratings were excluded owing to the ceiling



effect. Participants (n=97; 66 females, 31 males) were aged 69 to 90 years (mean 79 years, SD 5.1). Detailed demographic data are presented in detail in table 2.

**Table 2** Descriptive characteristics of participants (n=97)

Characteristics	Participants (n=97)
Age (in years)	
Min-max	69-90
Mean (SD)	79 (5.4)
Gender	
Female n (%)	66 (68)
Male n (%)	31 (32)
Marital status	
Single n (%)	10 (10.4)
Married n (%)	38 (39.1)
Widow n (%)	49 (50.5)

## Data analysis

To gain a deeper understanding of the structural validity of the ATPA when used with older adults, the item response theory approach (Rasch analysis) was used (Bond & Fox, 2007; Dima, 2018). As DIF was found between the two groups of young adults in the earlier study (Lautamo et al., 2021) and we felt less confident about the unidimensionality of the ATPA when used with older adults, we decided to study dimensionality (item fit) along with differential item functioning (DIF). The Rasch analysis was the most appropriate choice because with Rasch model we provided detailed information of item and person location on the continuum and facilitated further the development of a construct theory (Wright, 1996). The ordinal raw scores were entered into the computer and then we conducted the Many Faceted Rasch (MFR) analysis using two different MFR computer programs, FACETS and WINSTEPS.

**Scale analysis.** The original 6-point rating scale (1= is not at all true, 6= is perfectly true) was recoded to a 4-point scale due to a slight imbalance of the categories. Different iterations were obtained to identify which categorisation performed best without overlapping. Finally, the scores 1 and 2 were transformed as one, scores 3 and 4 were transformed as two, and the score 5 as three and score 6 as four. The analysis was then continued using the transformed 4-point scale. The transformation process

was identical as in an earlier study when implementing ATPA with young adults (Lautamo et al., 2021).

***Attaining more accurate assessment tool.*** The theoretically unproductive items were removed in a step-by-step analysis (MFR). We simultaneously checked that the deletion of these items did not reduce the internal consistency of the scale (MFR). In addition, it was assumed that the MFR separation index and reliability would remain stable or increase (Bond & Fox, 2007). Finally, five items were removed (see table 1). This removal process was performed in co-operation with the developers of the ATPA (Lautamo et al., 2021). The analysis then continued with the new 19-item ATPA and the results are reported in this article.

***Unidimensionality.*** To answer the first research question on whether the ATPA items would define a single unidimensional construct, MFR -analysis was used. MFR analysis enables instrument validation while generating unidimensional linear measures based on additive numbers. MFR analysis provides indicators of how well the responses to each item, or the responses of an individual fit the underlying construct (Bond & Fox, 2007). To investigate whether the ATPA items demonstrated acceptable goodness-of-fit with the MFR model and thus define a single unidimensional construct, the criteria set for acceptable goodness-of-fit were *MnSq* (infit and outfit) values of 0.71 to 1.40 and *Z* values of -2.0 to 2.0 (Fisher Jr., 2007). It is generally expected that 95% of the items will meet these criteria (Goekoop & Zwinderman, 1994).

***Person response processes.*** To answer the second research question on whether the person response processes of the older adults in rehabilitation would demonstrate acceptable goodness-of-fit to the Rasch model for the ATPA, the *MnSq* statistics of the person measures (total logarithmic scores and *MnSq*) were analysed. The criteria set for acceptable goodness-of-fit for persons were *MnSq* values of 0.5 to 2.0 and *Z* values of -2.0 to 2.0. These leaner, but still productive *MnSq* criteria, were used since the characteristics of the measured phenomena (Fisher Jr., 2007). It was expected that 95% of persons would meet these criteria. In general, items can be expected to show better fit than person responses. Consequently, stricter fit criteria were set for items than persons (American Educational Research Association, 2014; Fisher Jr., 2007; Linacre, 2003). Standard error (*SE*) estimates of the MFR measures (logits) for items and persons were investigated. The size of *SE* is influenced by how well the data fit the model assertions and how well targeted the challenges presented by the items are at the person level (Bond & Fox, 2007). For persons,  $SE \leq 0.30$  was considered an acceptable criterion.

**Separation.** To answer the third question on whether the ATPA items would separate the older adults in rehabilitation into different levels of perceived agency, the separation index and its reliability for persons was investigated. In order to separate persons a good assessment tool should have a separation index (strata separated) of  $> 3$  with a reliability coefficient of  $> 0.90$  (Fisher Jr., 2007).

**Differentially functioning items.** In answer to the fourth research question on possible systematic misfit between different sub-groups of the older adults in rehabilitation, two systematic misfit patterns of (for gender and age) person responses were found. Therefore, a DIF analysis was performed with the WINSTEPS program. The item calibrations were plotted with 95% confidence intervals (CI) and the probability (Mantel-Haenszel) for meaningful differences between groups was set at  $< 0.05$ . The basic assumption was that the item calibration hierarchy would for the most part remain stable (Bond & Fox, 2007).

## Results

### Internal construct of the ATPA19

Person's perceived agency	Items	Scale
<b>Stronger agency</b>	<b>Harder to reach</b>	
*		
***		
*		4
**		
***		
*		
**		
*		
*****		
****		
*****		
****		
*****		
*****		
*****		
*****		
*****		
*****	15	3
*****	6	
*****		
***	8, 11, 14	
***	10	
***	2, 7	
*****	13, 16, 19	
****	1, 17	
*****	4, 9	
*	12	2
*	5	
****	18	
	3	
**		
*		
*		
		1
<b>Weaker agency</b>	<b>Easier to reach</b>	

\*separation index 3.04, reliability 0.90

**Figure 2.** ATPA-19 item calibrations (logits) targeting older adults' (n=97) perceived agency.

The MFR analysis showed that all the ATPA19 items showed good fit to the expectations of the Rasch model for the ATPA19. All the items targeted the continuum of the perceived agency reported by the older adults (n=97) and were linearly

distributed (Fig. 2). The mean SE of the ATPA19 items was 0.16, and thus low, supporting the reliability the items represent of older adults' perceived agency. The item calibration and goodness-of-fit statistics for the ATPA19 are presented in detail in table 3.

**Table 3.** Calibrations (logits, average = 0.00) for the perceived agency items of the ATPA-19 and their goodness-of-fit to the Rasch model for older adults.

ATPA-19 items	Measure	SE	Infit		Outfit	
			MnSq	ZStd	MnSq	ZStd
<b><i>Harder to reach</i></b>						
15 I feel that I have enough skills to manage challenges of daily life	1,00	0,16	1,08	0,60	1,08	0,60
6 I am satisfied with the amount of daily activities I manage to do	0,88	0,15	0,77	-1,70	0,77	-1,70
11 I do enough daily for others (not too much/not too little)	0,54	0,16	1,09	0,60	1,09	-0,60
14 I can cope with stressfull daily life situations	0,54	0,15	0,93	-0,40	0,90	-0,60
8 I am happy with the amount of time I have for rest and sleep	0,49	0,16	1,15	1,00	1,12	0,80
10 I do tasks I get excited about	0,26	0,15	0,96	-0,20	0,95	-0,20
7 I can solve daily challenges in a reasonable way	0,22	0,15	0,77	-1,80	0,75	-1,80
2 I take care of my wellbeing in reasonable way	0,19	0,15	0,96	-0,20	0,96	-0,20
19 I feel that different areas of my daily life are balanced	0,07	0,15	0,89	-0,70	0,88	-0,80
16 I do tasks that I feel are meaningful for me	0,02	0,15	0,77	-1,80	0,77	-1,70
13 I do tasks that gives me a feeling of competence or satisfaction	-0,04	0,15	0,78	-1,70	0,75	-1,80
17 I dare to ask other people for help when I need it	-0,10	0,17	1,27	1,90	1,23	1,40
1 I can take care of my everyday tasks independently	-0,19	0,15	0,94	-0,30	0,92	-0,50
4 If necessary, I can flexibly and fluently adapt my performance and routines	-0,28	0,16	1,14	1,00	1,27	1,60
9 I feel that I have enough time to do tasks that I want to do	-0,28	0,15	0,95	-0,30	0,90	-0,60
12 I make choices about what to do daily	-0,54	0,16	1,02	0,10	1,11	0,70
5 I can easily express my thoughts and opinions to other people	-0,74	0,17	1,10	0,70	1,05	0,30
18 I feel accepted in my community	-0,85	0,16	0,85	-1,10	0,87	-0,70
3 I feel safe in my surroundings	-1,21	0,18	1,21	1,30	1,38	1,70
<b><i>Easier to reach</i></b>						
* acceptable goodness-of-fit (infit and outfit) $MnSq \leq 1.40$ or $\geq 0.71$ and $z < 2$						

## Validity based on the person response processes of older adults

The Rasch model for the ATPA19 showed that the results for 87,6 % of the older adults demonstrated acceptable goodness-of-fit. This was less than the expected 95 %. Three persons' ratings exhibited a ceiling effect (3%) and were removed from the data before further analysis. The SE of the ATPA19 challenge measures for persons was 0.39,

which was higher than the expected  $< 0.30$ . This also indicated a threat to person measure reliability. Since both the proportion of uncertainty in person response processes and the variation in individual ratings were higher than expected, a further analysis was performed to find out whether the misfit ratings showed any systematic patterns. Misfit ratings were found for 11 females (91,7%) and for 7 persons aged 80 or older within the 12 misfitting participants. Whereas, in the total data the proportion of females was 69% and the proportion of participants aged 80 years or older was 48,5%. No other systematic patterns were found.

Despite some uncertainty in the person ratings, no gender- or age group-related DIF were found. The separation of the ATPA19 in the older group was good (separation index 3.47, reliability 0.90), showing that the ATPA19 clearly differentiated participants on at least four different levels of self-perceived challenge in agency in the present rather homogeneous group of older adults. Consequently, the ATPA can be used to identify persons who have lower sense from those who have stronger sense of agency, but, keeping in mind that agency is a varying phenomena in persons' lives.

## Discussion

It has been proposed that an agency-based approach should be applied to person-centred multidisciplinary rehabilitation (Pikkarainen et al., 2015; Pikkarainen et al., 2019). This requires agency-based assessment tools suitable for use with older adults participating in rehabilitation interventions (Lautamo et al., 2021). In this study, we examined the psychometric properties (American Educational Research Association, 2014; Messick, 1995) of the ATPA19 assessment tool when used in group-based gerontological rehabilitation. Structural validity was established for older adults' response processes when scoring the ATPA items. We also studied the issue of the comprehensibility of the ATPA items.

The results of the MFR analysis supported the unidimensionality of the ATPA19. Moreover, using relatively strict fit criteria, the MFR infit and outfit values of the items strongly supported the internal scale validity and uniformity of the ATPA19 when used in a sample of older adults. This indicates that all the ATPA19 items measured the same latent trait of older adults' perceived agency. The MFR analysis provided indicators that confirmed the meaningfulness of the items as reflecting the theoretical construct of the instrument (Bond & Fox, 2007). Only one item, item 3 ("I feel safe in my surroundings") showed slight misfit with the strict criteria in this target group. While the 19 items of the ATPA were well distributed linearly and targeted the level of perceived agency of older adults, more misfitting items were found in participants'

responses than were acceptable. Both the proportion of misfits (infit and outfit) and the SE (mean) in the person measures were higher than expected. This could present a slight threat to the unidimensionality (Dekker et al. 2005) of the ATPA19 when used as general measure of perceived agency. It is, therefore, recommended, especially in research settings, to control for possible causes of uniformity in individuals' ratings (Bond & Fox, 2007).

Probing the systematic patterns of misfits further, we found that participants aged 80 years or older and females were overrepresented in the data. Therefore, we investigated whether any DIF items were present in the age or gender groups. No such items were found and thus the item hierarchy seemed to be stable. However, the variety in person responses suggests that DIF should be controlled for when comparing groups, especially in research settings. At the same time, we are aware that agency is a complicated and latent phenomenon which a person constructs and transforms in relation to contextual factors and institutional settings throughout the life course, and which is always manifested in the current life situation (Eteläpelto et al., 2013; Masten & Wright, 2009; Messick, 1995; Pikkarainen et al., 2015; Pikkarainen et al., 2019; Vik et al., 2008). Thus, it can never be precisely conceptualised or expressed as an index or test score. However, it seems that the ATPA19 contains items that can reasonably be considered to detect the main features of perceived agency. One of the benefits of using MFR analysis (Bond & Fox, 2007) was that we also obtained information not only on the level of older adults' perceived agency but also on the aspects of agency they perceived as more or as less challenging to achieve.

In addition to structural validity, comprehensibility is an important property of a measurement tool. In the present instance, a pilot phase was implemented (Bond & Fox, 2007; Linacre, 2002), in which some of the original ATPA items were modified and pretested in order to ensure their comprehensibility for older adults in rehabilitation. It is important, especially in the goal setting process (e.g., Lautamo et al., 2021), that the instrument is comprehensible to the target group and thereby also promotes the self-awareness and readiness required for participation in rehabilitation. The purpose of the ATPA is not only to identify persons in need of support and but also to assist individuals in realising their potential to be an active agent in their daily lives. In this study, three participants' self-ratings of the ATPA items showed a ceiling effect. This may have been caused by misinterpretation of the items or purpose of the assessment procedure. However, the slight modifications made to some items seemed to function appropriately in the older adults' ratings. For the scoring of any instrument to be reliable requires the avoidance of all sources of potential misunderstanding or confusion (Padilla & Benítez, 2014). Therefore, in clinical practice, professionals need to ensure that older adults receive the support they need in self-rating the ATPA19.

It is important that the instrument used in rehabilitation facilities is able to identify persons who need support in achieving the rehabilitation goal, in the present instance increased agency. Good separation reliability and a good person separation index indicate the extent to which the scale differentiates respondents with different levels of the measured latent dimension (Dima, 2018). The ATPA19 differentiated persons into least three different levels of perceived agency in the present sample of older adults in rehabilitation, a group that can be assumed to be relatively homogeneous. The separation reliability remained good despite the recoding of the rating scale from a six-point to four-point scale before the final analysis. The recoding was necessary as the rating scale diagnostics indicated that some categories were infrequently used. If the results of combining adjacent categories statistical analysis in the different phases of developing an instrument yield a more optimal categorisation, it is recommended that this be used in the final version (Bond & Fox, 2007). Therefore, in future studies involving the ATPA and in rehabilitation practice, the present 4-point version of the scale is recommended.

## Practical implications

Readiness for rehabilitation (Farkas et al. 2000, pp. 23-28) is not always evident when older people enter an intervention process. First, it is necessary to focus on promoting self-awareness of the aspects of agency that individuals themselves are concerned about and in which they would like to experience change. Thus, the ATPA19 is recommended not only for use in assessing if individuals need support in strengthening their agency but also in the promotion of individuals' self-awareness of strengths and challenges to their agency. Therefore, the ATPA not only to identify persons in need of support and but also to assist individuals in realising their potential to be an active agent in their daily lives.

A strong sense of agency (Bandura, 2001) or occupational identity can be seen as promotor of volitional decisions and personal causation, despite poor health or functional incapacity (O'Brien & Kielhofner, 2017, pp. 32-33). Active intentional agency has been shown to be directly related to successful aging (MacLeod et al., 2016; Wray, 2004). However, research has also shown that even when older adults have strong sense of agency, they need to be aware of and accept their own functional challenges and able to accept help without feeling that they have lost their sense of autonomy (Hammarström & Torres, 2010; Ottenvall Hammar et.al, 2015). We would argue that individuals can retain their sense of agency despite impairments in their skills and capacities during the late phases of the life course.



## Limitations of the study

The sample size in this study can be considered reasonable. The sample for the MFR analysis for validity based on the internal structure of the ATPA comprised data collected from 97 older adults. According to Linacre (1994), 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  $\pm 0.50$  logits. However, the sample sizes (males  $n=31$ , females  $n=66$ ; aged 69 to 79 years  $n=50$ , and 80 to 90 years  $n=47$ ) for studying DIF were below the recommended size of 100 to 200 participants per group (Tennant & Pallant, 2007; Tristan, 2006).

Despite the pilot phase analysis and re-wording of some of the ATPA items, the possibility of misunderstandings by some participants remains. In addition, some older adults found it difficult to use the original 6-point response scale, as also found among young adults in a previous study on the ATPA-22 (Lautamo et al., 2021). While re-coding the scale from a 6- to a more user-friendly 4-point scale slightly reduced the separation ability of the ATPA19, it increased the person fit statistics. It is important to note that the scores might have shown less variation if the 4-point scale had been used in the original data collection.

## Conclusion

The ATPA19 is a useful tool for the self-evaluation of perceived agency in older adults. It not only offers an opportunity for awareness-raising but has potential for negotiating a new kind of meaningful agency for older persons who find it hard to meet the task demands, roles or expectations presented by their everyday surroundings. Overall, the results supported the internal content and structural validity of the ATPA19 in a group of older adults participating in rehabilitation. It is recommended that in future uses the 4-point rating scale is used instead of the original 6-point scale.

However, since the perceived agency is seen as a subjective and dynamic phenomenon that is constructed over the life course, research is needed on how agency manifests in different temporal periods, contexts, and populations.

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## Compliance with Ethical Standards

Ethics approval: The Social Insurance Institution of Finland approved the study (10/1/500/2018). All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed consent: All the older adults participating in the study gave their informed consent.

Conflict of Interest: The authors declare no conflict of interest.

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