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Measuring participation of social-support clients: validity and reliability of IPA-MO

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Abstract

This study evaluates the reliability and validity of the Impact on Autonomy and Participation instrument (IPA) for heterogeneous populations of social support clients. Decentralisation of social support and accompanying budget cuts spurred interest in outcome-related payment systems to foster efficiency of social support. This prompted the need to have insight in outcomes of social support, defined as 'self reliance and participation'. Eight municipalities in different parts of the Netherlands used an adapted version of IPA (IPA-MO) to collect self-reported outcome measures among cohorts of inhabitants receiving social or income support. Participants included people with mild physical, severe physical, cognitive or mental impairments and people depending on income support. Survey data were combined in a single database (N=4.120). Multivariate analysis was used to analyse reliability and validity of IPA-MO.

The original IPA model distinguished five scales ('participation domains'): Autonomy indoors, Family Role, Autonomy outdoors, Social life and Work & education, each scale loading on a separate factor. Due to high non-response on Work & education, our analysis mostly focused on the remaining four scales. These were confirmed, with minor changes, for IPA-MO. Financial autonomy was found as a new participation domain, composed by two new items added to the original single one. Five items of the original IPA were eliminated for duplicity and high correlation with other items. Confirmatory factor analysis confirmed construct validity of the five-scale IPA-MO model (CFI .936, TLI .925, SRMR .051). Internal reliability was confirmed for all scales (Cronbach alpha >.80, item-test correlation >.50 for all items). Exploratory factor analysis revealed a four-factor structure, with two scales (Family role and Autonomy outdoors) located on one factor. Yet, model fit is better when treated as separate scales.

Two approaches to create more homogeneous groups were tested: impairment-based and age-based groups. The IPA-MO model as found for total research population, proved valid for both types of groups.

The Work & education scale was tested for a small number of participants (N=234). One item was eliminated for duplicity. Exploratory factor analysis showed six scales loading onto six factors. Model fit was acceptable (CFI .915, TLI .903, SRMR .067)

We conclude that the IPA-MO model is a valid and reliable instrument for local governments to assess participation of heterogeneous social-support populations. Further research is needed to test if Financial autonomy sufficiently covers clients' perspectives.

Keywords: IPA-MO, participation, social support, validation, exploratory factor analysis, confirmatory factor analysis

JEL classification: I12, I18

Introduction

Under the Dutch Social Support Act ("Wet maatschappelijke ondersteuning – Wmo"), public social-support services have progressively been transferred to local governments. Since 2006, municipalities manage a wide range of non-medical facilities to support adult inhabitants with impairments in the field of domestic tasks, mobility and social life. In 2015, facilities for individual and group guidance also became part of Wmo [1]. Simultaneously, the Participation Act and Youth Act enhanced municipalities' mandate in the field of employment and youth care [2-3].

The decentralisation of responsibilities in the 'social domain' is related to national policies that aim to reform the welfare state. People with impairments and disabilities should participate in 'normal life' and be as self-reliant as possible. Government policies should foster an enabling environment, support should strengthen people's ability to participate. This is a major change with the past, when government policy was oriented towards taking over the care for these people, based on the assumption that inactivity is a logical consequence of impairments [4]. This change in national policies is in line with the paradigm change introduced by the WHO in 2001 with the ratification of the International Classification of Functioning, Disability and Health (ICF) [5]. The new emphasis on social functioning of people with impairments is expected to increase their quality of life and contain the rise in public care costs[6].

Along with the decentralisation of social support, budget cuts were imposed as municipalities were expected to organise services in a more efficient way. This resulted in a renewed interest in integrated service delivery and outcome-based payment (instead of the current production-related reimbursement systems)[7]. In a study commissioned by the Ministry of Health, the possibilities for outcome-driven social-support systems were explored [8]. Based on Brickley et al [9], three key elements for outcome-driven systems were identified: adequate organisational design, well-aligned incentives in payment models and reliable assessment of outcomes. The Impact on Participation and Autonomy (IPA) questionnaire was identified as a promising instrument to assess relevant outcomes. IPA was developed in the Netherlands in order to identify needs and measure outcomes of interventions for rehabilitation clients, parting from their own perspective [10]. Rehabilitation science and practice have a long-standing tradition in enhancing participation in society of people with disabling conditions, which is also the newly adopted focus in social support. The body of knowledge and experience developed in rehabilitation science may therefore be useful in developing new social-support strategies oriented towards self-reliance and participation.

Specific reasons to select the IPA instrument were:

1) IPA offers a broad overarching scope that matches target groups and responsibilities of municipalities under the Social Support and Participation Acts: it is a generic instrument (designed for adults with any disabling condition) and covers all relevant life domains (domestic tasks, mobility, social life and relationships, self-care, income, work, education and leisure);

2 IPA is a validated questionnaire that assesses self-perceived participation of individuals. A distinctive quality is the inclusion of autonomy - the extent to which an individual has control over the way he lives – as inseparably linked to participation [10]. Autonomy is closely linked to self-reliance that the new social-support policies in the Netherlands seek to reinforce [11];

3) IPA measures participation in terms of 'performance', described as 'what an individual does in his or her current environment'. The current environment is understood to include assistive devices, personal assistance and public facilities used by the individual [5]. In other words, performance reflects how people function in everyday life *with* the available support. As such, it may serve as an indicator of the effectiveness of social support policies;

4) IPA is a self-reported questionnaire. Subjective measures are increasingly seen as preferable to assess 'needs met' for qualitative goals such as quality of life [12] and participation [13]. Whiteneck [14] even argues that participation, by its very nature, can only be evaluated by self-report. The Social Support Act (Wmo 2015) itself also stresses the importance of clients' perception in quality assessment of social support [11].

The objective of this study is to assess reliability and validity of the IPA instrument to assess participation of social-support clients on population level.

The study is based on data recollected in surveys in eight municipalities in the Netherlands in the years 2014 to 2016. The surveys included cohorts of people with physical, mental and cognitive impairments as well as persons who are unable to earn a living and depend on income support. All participants live in the community (not in institutional homes).

First, the characteristics of the IPA instrument will be presented as well as the adaptations made for use among social-support clients. The next section covers data recollection and methodology, followed by a presentation of the results of our analysis. The article ends with conclusions and a discussion of our findings.

Characteristics of the Impact on Participation and Autonomy instrument

The Impact on Participation and Autonomy questionnaire assesses two different aspects of participation: perceived participation and perceived problem-experience [15]. Perceived participation is assessed by 32 items, concerning mobility (4), self-care (5), domestic tasks and role (6), income (1), leisure (1), social contacts and relations (7), helping others (1), work (5), education (1) and a final item on overall autonomy and participation as perceived by the participant. The items are phrased in a way that emphasizes control over tasks and activities (decisional autonomy) rather that the fact if they can be implemented with or without support (executional autonomy). As an illustration, an item on personal care is: "my chances to decide when I get washed and dressed are.." Items are scored on a five-point Likert scale, ranging from very good, good, fair, poor to very poor. Perceived problem-experience is scored independently and results are used to establish goals in individual rehabilitation programmes that reflect personal preferences.

Cardol [15] found that perceived-participation items load onto four scales called 'participation domains': autonomy indoors (AI), family role (FR), social life and relationships (SOC) and autonomy outdoors (AO). She assumed a fifth participation domain, work and education (WORK) but could not confirm it since few participants in her study had employment. The five latent scales contribute to the overarching concept of participation. Cardol and colleagues [10] validated the IPA questionnaire extensively. Psychometric properties such as internal reliability and test-retest reliability proved to be good on a domain level, though some items were psychometrically weak. Responsiveness to change was good for three domains (WORK, AO, FR) while moderate to no responsiveness was found for two scales (AI, SOC). Convergent and divergent validity were tested with instruments such as London Handicap Scale, Sickness Impact Profile and Short Form-36 and generally confirmed [15]. The IPA questionnaire has since been validated and adopted in many countries in and outside Europe [16-22]. Most studies focused on rehabilitation clients with well-defined, specific physical impairments. Construct validity was tested with various methods: exploratory factor analysis, the Rasch methodology, Principal Component Analysis and Confirmatory Factor Analysis. Only the UK study [16] validated the WORK scale. Most studies confirm the model of Cardol, with the exception of an Iranian study that found participation domains were clustered into two dimensions: performance-based and social-based participation [20]. Wilkie et al [23] conclude that the instrument has good face validity and its measurement of participation is comprehensive and relevant according to patients. He recommends further testing of construct validity and responsiveness since study populations have not been very large and Confirmatory Factor Analysis has hardly been used in validity studies.

Feasibility of the IPA questionnaire for social-support clients was tested in a pilot among some 500 participants in 2013. This resulted in the following adaptations to the questionnaire:

a) the section of self-care was positioned more towards the end of the questionnaire, in order to avoid participants feeling addressed as 'patients'

b) three new items were added in the section on income (3a-c) at the request of municipalities, who are responsible for debt prevention and relief. The new items were derived from a validated instrument for assessment of financial capacities of individuals: Mesis [24];

b) the item on intimate relationships (5f) was rephrased into 'my chances to give and receive love and affection', thus avoiding the impression that the item refers to sexual relationships

only and broadening the scope to all affective bonds;
c) the items on perceived problem-experience were left out;
d) an extensive inventory of support available to participants (informal care, assistive devices, public facilities, privately acquired services and personal assistance) was included.

The adapted questionnaire is known as IPA-MO[1] and contains 35 items on perceived participation (annex 1).

Data collection and methodology

Between August 2014 and October 2016, surveys with the IPA-MO were implemented among large cohorts of social support clients in eight municipalities that wanted baseline information before the Social Support 2015 and Participation Act came into force. Three of them repeated the survey after two years. Municipalities belong to population categories 20.000-50.000 inhabitants (6),100.000-150.000 (1) and 150.000 -200.000(1). Four municipalities are predominantly urban, four have a rural character. Survey population comprised people who receive individual or collective guidance due to severe physical impairments, mild cognitive of mental health impairments (the 'new' groups for municipalities under the Wmo 2015), persons with mild physical impairments that receive support by assistive devices, transport facilities or domestic help ('traditional' Wmo clients). Also, people who have received income support for a long period (> 1 year) were included on the assumption that their participation might be hampered due to physical or mental impairments [25]. Participants were recruited by random samples when possible. Participants from categories without readily-available registration (guidance clients in 2014/15, mild physical impairment clients in all years) were recruited through care providers. All participants received a questionnaire (hard copy) accompanied by a letter of invitation signed by the alderman of their municipality. The majority of questionnaires was self-administered. People with (mild) cognitive impairments received support of family members or care providers, who received instructions stressing that client perspective should prevail. Though interference of the helpers' view is a risk of this procedure, we considered it worthwhile to try and capture the perspective of this group too.

The study population is highly heterogeneous, including participants with physical, cognitive and mental impairments and income-support clients that may not have any health-related impairment. Moreover, it covers a wide age spectrum (18 - 103 yrs) whereas Cardol [15] restricted participation to the age of 18 – 75. We chose to include (very) old people since they form an important segment of the population that receive assistance under Social Support Act[2]. Besides, validity and relevance of the IPA questionnaire for elderly people (up to 99 yrs) is confirmed by Ottenval Hammar [27]. In order to create more homogeneous groups within the study population, two approaches are taken. The first distinguishes participants by the reason they are entitled to social support. Wmo-clients are divided into four impairment-based groups: mild physical impairments (using assistive devices, special transport facilities or domestic help), severe physical impairments (using individual or collective guiding), mild cognitive impairments and mental-health impairments. In 2016, impairments of Wmo clients were no longer registered by the local governments. For this study, these clients' impairments were scored by the researchers, based on available data (assistance used, care provider, age, personal remarks). Participants recruited among the Participation-Act clients form a fifth group. Please note that these are broad categories which are not completely mutually exclusive.
A second approach distinguishes participants by age. The life cycle theory poses that people face different needs and challenges in subsequent stages of their lives [28]. As a consequence, intensity and domains of participation vary in different phases of life [29]. Additional pragmatic advantages are objectivity and mutual exclusiveness of age categories,

[1] MO = Maatschappelijke Ondersteuning (Social Support)
[2] Up to the age of 95 years old, the majority of Dutch inhabitants live independently. Under the Social Support Act (Wmo), local governments have the responsibility to assist them with technical aids and ambulant support if needed. Given the ageing Dutch population and the fact that government policies aim at a further reduction of the proportion of elderly people in intramural settings, the number of elderly Wmo clients is likely to increase [26].

as well as the fact that no information on impairment is needed. We use five age-groups: young adults (18 - 35), grown adults (36-50 and 51-66) and late adults (67-80 and 81+).

In order to validate the IPA-MO instrument, we proceeded as follows:
First, we tested scale reliability and validity of Cardol's model [15] with the original IPA items for our research population. Construct validity was analysed by Principal Component Factoring (PCF) and Comparative Factor Analysis (CFA). Goodness of fit was assessed by Comparative Fit Index (CFI), Tucker-Lewis Index (TLI) and standardized root mean squared residual (SRMR). In line with Hu and Bentler [30], SRMR< .08 in combination with CFI or TLI >= .95 is used as cut-off criteria for good model fit, SRMR <.08 in combination with CFI/TLI >= .90 for acceptable fit.

Next, the IPA-MO questionnaire with the new items (3a-c) was tested). We expected the new items to form a new scale together with the original item on financial autonomy (3d). We excluded the final item (9) from the model as we consider it to be distinct in nature: as concluding item, it is meant and phrased as an overall appreciation rather than a predictor of perceived participation. Reliability of the IPA-MO scales is tested and PCF is used to explore the new model structure. Results are tested on goodness of fit by sem/CFA.

Stata 15 was used for all analyses.

Results
All data from the baseline and repeated surveys were combined in a single database. Records with 4 or more sections with invalid response[3] (n=75) as well as those of respondents under the age of 18 (n=9) were removed. Of the remaining 4.576 records, income-support participants of one baseline survey (n=341) were excluded since this group was not limited to long-term clients as in the other surveys. Wmo-respondents that did not report use of formal support (n=110) or whose impairment could not be assessed (n=5) were also removed. The remaining 4.120 records were used for this study (Table 1).

Table 1 Origin of data used for study

Year	Type of survey	Region (# municipalities)	Respondents	
			#	%
2014	Baseline	Twente/East Netherlands (1)	889	21.6
		Zuid Holland/West Netherlands (2)	714	17.3
		Friesland /North Netherlands (2)	609	14.8
2015		Zuid Holland/ West Netherland (3)	310	7.5
2016	1-measurement	Twente /East Netherlands(1)	784	19.0
		Zuid Holland/West Netherlands (2)	814	19.8
Total		3regions/8 municipalities	4.120	100,0

A description of the study population is given in table 2. People with mild physical impairments are the most numerous group; in terms of age, 51-66 years is the largest group. Cross tabulation reveals that mental and cognitive impairments prevail in younger age groups whereas in older groups, physical impairments are predominant (table 3).

Table 3 Cross tabulation impairment and age groups in research population

Impairment Age (yrs)	Mild physical	Severe physical	Cognitive	Mental	Income support	Total
18 - 35	29	28	271	146	78	552
36 - 50	52	53	252	228	254	839
51 - 66	147	150	179	201	371	1.048
67 - 80	417	273	40	38	0	768
81 +	538	291	2	3	0	913
Missing	20	21	13	15	10	79
Total	**1.203**	**816**	**757**	**631**	**713**	**4.120**

[3] Following the manual of instructions, sections of the questionnaire are invalid when less than 75% of the items have been answered

Table 2 Descriptive statistics of research population

	All	Mild physical impairment	Severe physical	Mild cognitive	Mental impairment	Long-term income support	18-35 yrs	36-50 yrs	51-66 yrs	67-80 yrs	81+ yrs
N=	4.120	1.203	816	757	631	713	552	839	1.048	768	834
Gender											
Female	59%	70%	61%	49%	52%	56%	50%	55%	54%	64%	72%
Male	41%	30%	39%	51%	48%	44%	50%	45%	46%	36%	28%
Age											
Mean (yrs)	59,8	75,6	72,3	42,0	45,9	50,4	27,5	43,7	58,2	74,3	86,2
St.dev	20,0	14,0	15,9	14,6	13,4	10,5	4,9	4,2	4,4	4,0	4,1
Range	18-103	18-103	18-102	18-92	18-85	20-65	18-35	36-50	51-66	67-80	81-103
Living											
Alone	54%	58%	48%	44%	64%	59%	37%	47%	63%	50%	65%
With partner	25%	33%	41%	18%	12%	10%	13%	15%	21%	44%	30%
With family	19%	8%	9%	35%	21%	31%	46%	34%	14%	6%	5%
Other	2%	1%	2%	4%	3%	1%	4%	4%	2%	-	-
Work											
None	65%	87%	84%	35%	50%	56%	40%	43%	59%	87%	97%
Paid job	12%	5%	3%	25%	15%	15%	17%	23%	16%	1%	-
Guided work (unpaid)	13%	1%	6%	34%	22%	8%	34%	21%	14%	4%	-
Voluntary activities	10%	7%	6%	5%	13%	21%	9%	12%	15%	8%	2%
Caregiving tasks											
Yes, on a regular basis	11%	7%	5%	13%	14%	19%	14%	17%	14%	6%	3%
Sources of income*											
Retirement pension	58%	84%	73%	6%	9%	2%	-	-	9%	97%	99%
Salary	11%	6%	5%	24%	15%	12%	15%	22%	15%	2%	2%
Incapacity allowance	27%	10%	18%	64%	49%	6%	63%	41%	35%	-	-
Income support	27%	5%	6%	13%	32%	94%	27%	47%	49%	2%	-
Using support:											
Assistive devices	41%	69%	70%	16%	14%	10%	7%	14%	32%	64%	80%
Informal help**	35%	37%	51%	41%	27%	15%	40%	27%	24%	38%	52%
Private services	26%	42%	47%	14%	10%	5%	7%	8%	15%	38%	60%
Special transport	36%	48%	60%	33%	18%	8%	15%	18%	32%	53%	57%
Domestic help (subsid)	44%	75%	65%	23%	27%	8%	7%	20%	37%	66%	83%
Personal assist.	63%	29%	91%	96%	93%	26%	84%	70%	58%	55%	54%

* more than one source possible

** on a regular basis, at least once a week

Compared to national population, Wmo-clients in the age of 18-66 are overrepresented in our research population while the group on income support is underrepresented (table 4). At the municipal level, composition of social-support populations may vary substantially due to local factors such as labour market, age distribution, presence of care institutions etc.

Table 4 National social-support clients (2015) and research population [31,32]

	Subgroups	Total population		Research population	
Social Support Act	80+ yrs	235.000	24%	834	21%
	65-80 yrs	250.000	26%	768	19%
	20-64 yrs	201.000	21%	1.736	42%
	age unknown			69	2%
Participation Act	> 1 year	288.720	30%	713	17%
Totals		974.720	100%	4.120	100%

Reliability and validity of IPA model for research population

The four IPA scales show good internal reliability, with Cronbach's alpha between .81 and .91. Item-test correlations range from .51 to .87. Item-rest correlations are low (<.50) for three items: 3d "spending money as wished" in FR, 7e "contact with colleagues" and 8 " chances for education" in WORK. Average inter-item covariance is high (>50) in AI and very high (>.8) in FR and AO (table 5). This is an indication that items are very similar to each other and possibly redundant [33].

Table 5 Internal reliability IPA scales

IPA – scale	N	Item-test correlation (range)	Item-rest correlation (range)	Average inter-item covariance	Cronbach alpha
AI (item 6a-6e, 1b-1c)	4025	.782 - .865	.683 - .805	.576	.909
FR (item 2a-2f, 3d)	3876	.507 - .884	.349* - .831	.871	.900
AO (item 1c,1d,5h,9,4)	3976	.760 - .813	.633 - .681	.811	.852
SOC (5a-5g)	3970	.684 - .807	.522 - .720	.468	.862

* one item: 'spending money as wished' showed item-rest correlation below .50

As the maximum likelihood method produced Heywood cases, PCF retaining four factors was used to test validity of the 4-scale IPA model. (The WORK scale will be tested separately). As Cardol, we used orthogonal rotation. Results by and large sustain the IPA model (table 6). Variance explained is 66%, comparable to that found (67%) by Cardol [15]. Misfits occur with both items on mobility indoors and the item on financial independence. The latter was found psychometrically weak in Cardol's study as well [15]. The remaining 23 items show highest rotated loadings (ranging from .44 to .85.) on the predicted scale. Five of them had high loadings (>=.40) on other scales as well.

CFA showed poor fit indices for the (4 scale) IPA model (CFI .791, TLI .768, SRMR .091). In order to identify improvements in the model, CFA was conducted for each individual scale. AO and FR showed best fit whereas AI and SOC had poor fit indices. High error covariances between pairs of items were found in all scales: 1a-1b (MI 3129.95, EPC .68) and 6a-6b (MI 2193.850, EPC .29) in AI, 2c-2d (MI 265.54, EPC.17) in FR, 1c-1d (MI 376.534 EPC.38) and 4-9 (MI 232.628, EPC .21) in AO, 5d-5e (MI 1115.63, EPC .34), 5b-5c (MI 338.207, EPC .13) and 5a-5b (MI 253.69, EPC .14) in SOC. Most pairs of items are on an identical subject and sometimes even phrased in the same words. In these cases, one of the items was eliminated (1a, 2c, 5b, 5e, 6b). The items 1c-1d (visits and trips) and 4-9 (leisure time and overall quality of life) were considered to cover distinct concepts and therefore maintained. Instead, we opted for adjusting error covariance between item 1c-1d. These modifications improved model fit considerably and resulted in good fit for all scales (table 7).

The modified scales were tested on internal reliability. Cronbach's alpha, though slightly lower than in the original scale, is still good (> .80) for all scales. Item-rest correlation is still low for

Table 6 Rotated factor loadings* original IPA model for social-support clients (principal component factoring, Varimax rotation N=3.301)

	AI	FR	AO	SOC
6a Washing, dressing and grooming as one wants	0.77			
6b Washing, dressing, grooming when one wants	0.78			
6c Going to bed when one wants	0.76			
6d Going to the toilet when one needs	0.77			
6e Deciding when to eat and drink	0.77			
1a Getting around indoors where one wants	0.36	0.33	0.71	
1b Getting around indoor when one wants	0.39	0.34	0.71	
2a Contribution to looking after the home		0.68	0.40	
2b Minor housework jobs the way one wants	0.44	0.59	0.39	
2c Heavy housework jobs the way one wants		0.85		
2d Heavy housework jobs when one wants		0.83		
2e Repairs and upkeep of the home		0.81		
2f Fulfilling one's role at home	0.38	0.55		
3d Spending income as wished		0.26		0.46
1c Visiting neighbours/friends when one wants		0.34	0.71	
1d Trips and holiday as one wants		0.33	0.69	
5h Frequency of social contacts			0.55	0.48
9 Living life the way one wants			0.47	0.45
4 Spending leisure time the way one wants		0.35	0.49	0.36
6a Communication with nearest				0.72
6b Relationship with nearest				0.78
6c Respect from nearest				0.74
6d Relationship with less-known people				0.69
6e Respect from less-known people				0.66
6f Giving and receiving love and affection				0.74
6g Supporting other people			0.44	0.44

items not (optimally) corresponding to factor as found by Cardol

coinciding items for the research population

*only factor loadings > .32 are shown in non-predicted factors[4]

Table 7 Goodness of fit original and adapted IPA subscales (total research population)

Scale	Autonomy indoors		Family role		Autonomy outdoors		Social life & relations	
	original	ex 1a,6b	original	ex 2c	original	+ cov e.1c*e.1d	original	ex 5b, 5e
N=	3922	3938	3711	3718	3715	3715	3846	3881
CFI	.711	.987	.953	.973	.941	.985	.842	.961
TLI	.567	.973	.930	.955	.881	.963	.764	.923
SRMR	.110	.021	.036	.026	.044	.022	.079	.034

the financial item (3d, FR), average inter-item covariance is lower but still high for FR (.80). Differences between mean scores of the short-version and original scales are small and correlation is high (.98-1.00; table 8). We therefore conclude that the short version is a reliable and conceptually similar alternative for the original IPA. Model fit for IPA-short version improved but was still below levels of acceptability (table 9).

Table 8 Comparison of scales in 27-item vs 21-item IPA, total research population

	# items		Item-test corr	Item-rest corr	Av. interitem covariance	Cronbach alpha	Mean score	SD	Correlation of scales
Scale									
AI original	7		.782-.865	.683 - .805	.576	.909	3.83	0.79	
AI short version		5	.754-.849	.573 -.769	.524	.870	3.86	0.77	0.99
FR original	7		.507-.884	.349 - .831	.871	.900	3.15	0.99	
FR short version		6	.544 -.863	.359 -.784	.804	.876	3.19	0.96	0.99
AO original	5		.760-.813	.633 - .681	.811	.852	3.06	0.98	
AO short version		5	Unchanged						1.00
SOC original	7		.684-.807	.522 - .720	.468	.862	3.50	0.74	
SOC short version		5	.706-.813	.530 - .680	.483	.808	3.45	0.77	0.98
	27	21							

[4] .32 is suggested as minimum loading of an item in factor analysis [34]

Table 9 Model fit of 4-scale IPA original and short version for social support clients

	N	CFI	TLI	SRMR
IPA 27 items	3301	.791	.768	.091
IPA 21 items	3333	.885	.867	.074

PCF of the 21-items IPA revealed a 3-factor model, with FR and AO loading on the same factor. Oblique rotation was used since scales are not independent. Four items did not fit in the predicted scale (1b, 3d, 5g, 9). One item (5h) has high loadings on two scales: AO and SOC. The remaining 16 items coincide with the predicted scales in the IPA model (rotated factor loadings .56 to .83).

Validity of the 'Work and education' scale

Work and education (WORK) is the fifth scale in the IPA model [15]. The only study we found to validate this scale was among disabled people in the UK [16]. In our research group, 234 respondents under the age of 66 (retirement age) answered all items on work and education. This group was used to test validity of the WORK scale. Mean age is 42 (s.d. 12), female/male distribution is 46/54. Roughly one third belonged to the long-term income support group, one third to the mentally impaired, 24% had mild cognitive impairments and ten percent had mild or severe physical impairments. The vast majority had paid or unpaid work: 40 percent had a salaried job, 26 percent worked without payment (in guided workshops) and 20 percent did voluntary work. Eight percent had a training-on-the-job position and six percent had no work but was interested in getting it.

Internal reliability of the WORK scale was confirmed by Cronbach alpha (.81). Item-test correlations ranged from .57 to .83. Sibley [16] found alpha .90 and item-total correlations .52-.77. Item-rest correlations are low (<0.50) for two items (table 10).

CFA for the WORK scale gave close to acceptable fit indices: CFI .936, TLI .882 and SRMR .049. High error covariance was found between items 7c "chances to get a job" and 7f "chances to find another job or employer" (MI 24.621, EPC.33). Since the vast majority of respondents had a job, 7c and 7f basically cover the same topic and therefore, 7c was excluded from the model. Mean score was affected more than in the other scales but correlation between the original and short version was high (.98). The short-version of the WORK scale showed lower but acceptable scale reliability (alpha 0.77) (table 10). Model fit proved excellent: CFI .993, TLI .978 and SRMR .022.

Table 10 Internal reliability of the scale 'work and education'

WORK - scale	N	Item-test correlation	Item-rest correlation	Av inter-item covariance	Cronbach alpha	Mean score	s.d.	Correlation scales
6 items (7c-7g, 8)	234	.568 - .826	.426*- .724	.588	.815	2.91	.85	
5 items (7d-7g, 8)	234	.601 -.850	.382*- .730	.538	.771	3.03	.84	.98
*item 7e and 8 have item-rest correlation < .50								

Factor analysis (pcf) with the complete IPA (short version items, 26 items) reveals a 5-factor model in which all work-related items form a separate scale (factor loadings.46-.88). Contact with colleagues loads high on SOC as well. Education loads on AO (table 11). CFA shows poor model fit (CFI .873, TLI .858, SRMR .073)

Table 11 Factor structure and loadings for IPA-short with social-support clients (n=206)

Scales as found by Cardol Corresponding items	**AI**	**FR**	**AO**	**SOC**	**WORK**
6aWashing and dressing as one wants	0.78				
6c Going to bed when one wants	0.69				
6d Going to the toilet when one needs	0.91				
6e Deciding when to eat and drink	0.73				
1b Getting around indoor when one wants	0.38		0.35		
2a Contribution to looking after the home		0.65			
2b Minor housework jobs as one wants		0.59			
2d Heavy housework jobs when one wants		0.76			
2e Repairs and upkeep of the home		0.73			
2f Fulfilling one's role at home		0.64			
3d Spending income as wished		0.01	0.72		
1cVisiting neighbours/friends when wanted	0.34		0.37		
1d Trips and holiday as one wants			0.61		
5h Frequency of social contacts			0.47		
9 Living life the way one wants			0.71		
4 Spending leisure time the way one wants			0.54		
5a Communication with nearest				0.46	
5c Respect from nearest				0.82	
5d Contact with other people				0.84	
5f Give and receive love and affection				0.51	
5g Supporting other people				0.68	
7b Carry out work as one wishes					0.70
7c Contact with colleagues				0.44	0.46
7d Keep or obtain position aspired					0.88
7e Chances to change position/employer					0.74
8 Possibility to follow course or training			0.61		0.29
Only factor loadings > .32 are shown in non-predicted factors					

Towards a model for IPA-MO

For the construction of an adequate model for social-support clients, we proceeded with the short version IPA, included the three new items on financial independence and excluded the final item for reasons explained before. Principal component factoring with oblique rotation was used to determine factor structure. For total research population, a four-factor structure was found in which the IPA scales (AI, FR, SOC and AO) are visible with slight modifications: 1b (mobility indoors) moves from AI to FR, 5g from SOC to AO. The financial items form a new scale that we call Financial Autonomy (FIN). FR and AO load on the same factor.

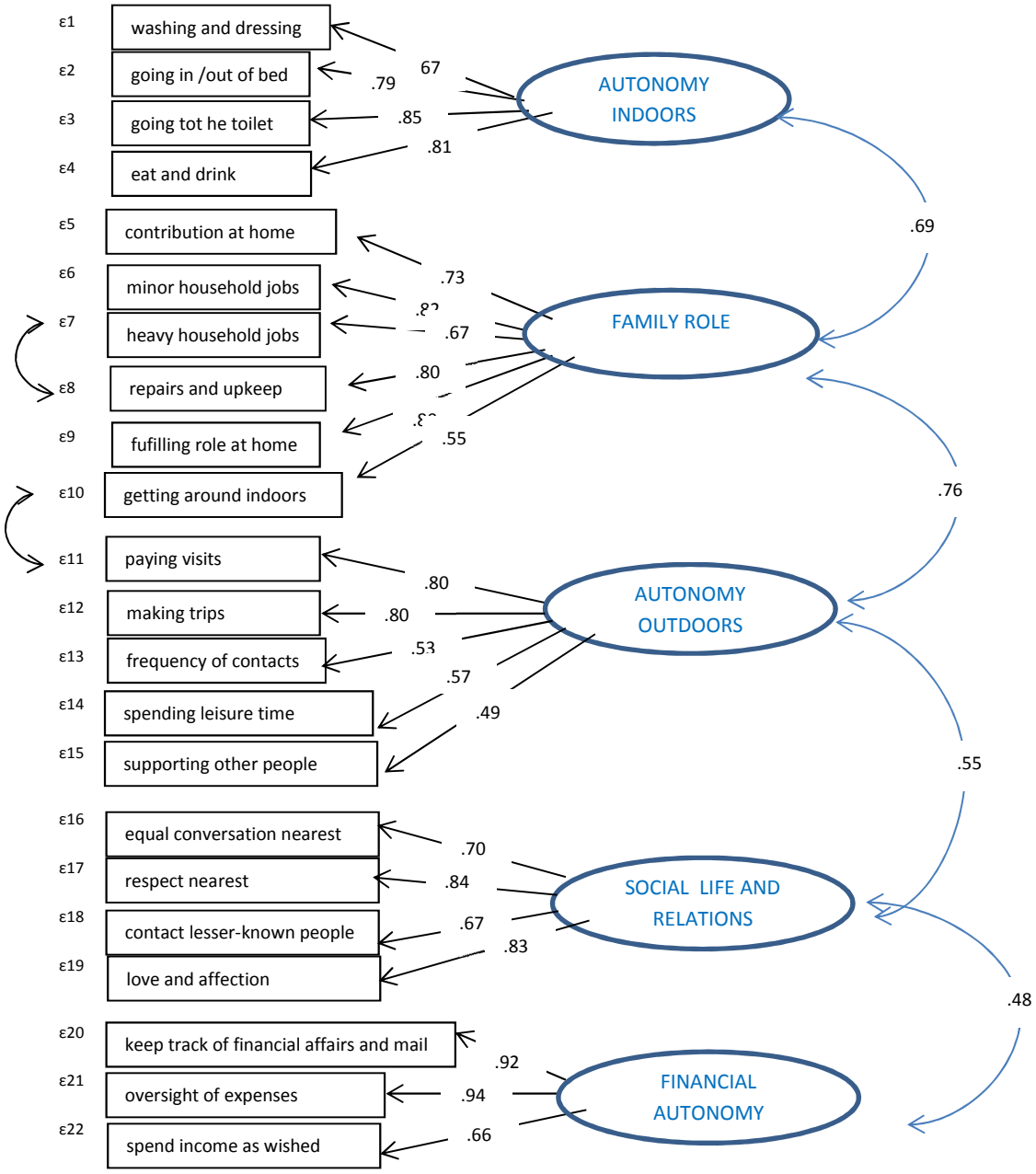
All scales showed good reliability with alpha's ranging from .80 and .93. High inter-item covariances are observed in scales AO, FR and FIN. In the new scale on financial independence, item 3a has low correlation (.49) with other items in this scale. Excluding this item gives a slightly higher alpha but very high inter-item covariance as well (table 12).

Table 12 Internal reliability of IPA_MO scales

IPA-MO scale	# items	N	Item-test correlation (range)	Item-rest correlation (range)	Average inter-item covariance	Cronbach alpha
AI (6a, 6c-e)	4	4.046	.85 - .87	.71 -.76	.55	.88
FR (2a,2b,2d,2e,2f, 1b)	6	3.876	.77 -. 87	.68 - .80	.91	.91
AO (1c,1d,4,5g,5h)	5	3.970	.76 - .82	.63 - .70	.84	.85
SOC (5a, 5c, 5d, 5f)	4	3.975	.75 -.83	.54 - 66	..47	.80
FIN	4	4.007	.69 - .85	.49*- .71	.78	.82
FIN ex 3a	3	4.020	.78 - .92	.55 - .80	.97	.83
*one item (3a) below .50						

CFA showed best model fit for a 5-scale model (AI, FR, AO, FIN, SOC) leaving out item 3a from the FIN scale (CFI .920, TLI .907, SRMR .053). High covariance errors between items still hampered model fit. Adding a path between measurement errors of two pairs or items (1b-1c, 2d-2e) improves model fit (CFI .936, TLI .925, SRMR .051). A path diagram of the model is represented in figure 13.

Figure 13 The IPA-MO model – perceived participation of social-support clients



Model fit for subgroups

Using CFA, the 5-scale IPA-MO model was tested on goodness of fit for each one of the impairment-based groups and age groups. Acceptable fit was confirmed for all of them. Differences between most groups are small, only the group with severe physical impairments has clearly lower fit indices than the others.

Table 14 Model fit of IPA-MO model (5 scales)

Measure	Mild physical	Severe physical	Mild cognitive	Mental	Income support	18-35	36-50	51-66	67-80	81+
N=	*916*	*652*	*649*	*550*	*627*	*483*	*733*	*902*	*625*	*651*
CFI	.939	.914	.939	.927	.925	.935	.928	.923	.930	.932
TLI	.928	.899	.929	.915	.912	.924	.916	.910	.918	.920
SRMR	.053	.064	.049	.055	.057	.049	.059	.060	.060	.055

Exploratory factor analysis (PCF) revealed differences between groups in factor structure. For most groups, a 4-factor model was found with scales AO and FR located on the same factor. The items 5h 'frequency of social contacts' and 5g 'supporting others' often showed highest loadings on 'SOC'. However, adapting model structure accordingly did not improve model fit.

For the 81+ and 'mild physical impairments' group, all scales loaded on separate factors in a 5-factor model. Items 5h and 5g had significant loadings on AO only.

IPA-MO model including work & education

Including the WORK scale in the IPA-MO model, factor analysis (pcf) reveals a six-factor model in which each scale forms a separate factor. 'Contact with colleagues' best fits in the SOC scale, leaving the WORK scale with four items (7d, 7f,7g, 8). Scale reliability is still acceptable (Cronbach alpha .76, item-test correlation .66-.86). Item 5g moved from AO to SOC, as in the original IPA. Scale composition and factor loadings are shown in table 16. Model fit was on the verge of acceptability (CFI .906, TLI .892, SRMR .072). Including an additional path to correct highest error covariance (3b-3c) improved goodness of fit to acceptable values: CFI .915, TLI .903, SRMR .067.

Table 15 Scale composition and rotated factor loadings (pcf, Promax) for IPA-MO including work (N=211)

Factor/scale	Items (rotated loadings)
Autonomy indoors	6a(.76) 6c (.67) 6d (.90) 6e (.72)
Family role	2a(.67) 2b (.55) 2d (.78) 2e (.74) 2f (.68) 1b (.17)
Social life and relations	5a(.80) 5c (.82) 5d (.58) 5f (.67) 5g (.44) 7e(.49)
Autonomy outdoors	1c (.54) 1d (.74) 5h (.53) 4 (.60)
Work and education	7d (.74) 7f (.94) 7g (.77) 8 (.36)
Financial autonomy	3b (.89) 3c (.91) 3d (.56)

Table 16 summarizes results for the IPA-MO participation, based on mean score, for total research population and individual client groups.

Conclusions and discussion

The present study examined reliability and validity of the IPA-MO instrument for social-support clients. We used data from large cohorts of social support populations (N=4.120) from various parts of the Netherlands. Research population comprised the full range of client types of municipal support: elderly people with mild and severe physical impairments, people with mild cognitive and mental conditions and inhabitants dependent on income support. In order to create more homogeneous groups, both impairment-based and age-based groups were used in this study.

We found that IPA-MO is a reliable and valid instrument for this population and for each of these client groups. Five participation domains are found to compose the model of perceived participation for total research population: autonomy indoors, family role, autonomy outdoors, social life and relationships (as in IPA) and a new scale: financial autonomy. CFA showed acceptable fit of this model for total research population and each of the subgroups, though fit was marginally acceptable for people with severe physically impairments.

Table 16 Results of the IPA-MO questionnaire for the research population (N=4.120)

Client group Participation domain	**All**	**Mild physical impairment**	**Severe physical**	**Mild cognitive**	**Mental impairment**	**Long-term income support**	**18-35 yrs**	**36-50 yrs**	**51-66 yrs**	**67-80 yrs**	**81+ yrs**
Autonomy Indoors (AI)											
N =	4.056	1.174	789	751	629	713	549	837	1.039	757	874
Mean score	**3.88**	**3.82**	**3.51**	**4.10**	**3.96**	**4.06**	**4.10**	**4.00**	**3.94**	**3.68**	**3.71**
St dev	.79	.70	.88	.74	.73	.77	.77	.77	.76	.80	.76
% missing	1.6%	2.4%	3.3%	0.8%	0.3%	0%	0.5%	0.2%	0.9%	1.4%	4.3%
Family role (FR)											
N=	3.908	1.114	763	731	609	691	535	810	1008	724	831
Mean score	**3.31**	**2.98**	**2.76**	**3.76**	**3.61**	**3.68**	**3.85**	**3.66**	**3.41**	**2.84**	**2.88**
St. dev	1.00	.90	.98	.89	.88	.90	.88	.87	.93	.95	.96
% missing	5.2%	7.4%	6,5%	3.4%	3.5%	3.1%	3.1%	3.5%	3.8%	5.7%	9.0%
Autonomy outdoors (AO)											
N=	4.012	1.151	784	746	623	708	545	831	1036	744	856
Mean score	**3.03**	**2.81**	**2.52**	**3.54**	**3.19**	**3.25**	**3.58**	**3.29**	**3.07**	**2.73**	**2.63**
St. dev	.99	.89	.95	.94	.96	.93	.96	.92	.96	.93	.93
% missing	2.6%	4.3%	3.9%	1.5%	1.3%	0.7%	1.3%	1.0%	1.2%	3.1%	6.2%
Social life & relations (SOC)											
N=	4.029	1.162	795	744	624	704	543	831	1.038	745	872
Mean score	**3.55**	**3.73**	**3.37**	**3.55**	**3.34**	**3.65**	**3.62**	**3.50**	**3.46**	**3.55**	**3.66**
St. dev	.77	.67	.75	.78	.85	.79	.81	.77	.83	.73	.69
% missing	2.2%	3.4%	2.6%	1.7%	1.1%	1.3%	1.6%	1.0%	1.0%	3.0%	4.5%
Financial autonomy (FIN)											
N=	3.972	1.158	785	727	607	695	530	812	1.016	743	871
Mean score	**3.06**	**3.39**	**2.58**	**2.87**	**3.05**	**3.24**	**3.03**	**3.01**	**3.10**	**3.05**	**3.07**
St. dev	1.08	.94	1.10%	1.17	1.06	.95	1.16	1.05	1.05	1.12	1.05
% missing	3.6%	3.7%	3.8%	4.0%	3.8%	2.5%	4.0%	3.2%	3.1%	3.3%	4.6%
Work & education (WORK - based on items 7d 7f 7g 8)											
N=	975	59	69	399	242	206	265	380	274	30	26
Mean score	**3.00**	**2.72**	**2.70**	**3.17**	**2.96**	**2.86**	**3.17**	**3.02**	**281**	**2.72**	**3.15**
St. dev	0.93	0.92	1.01	0.88	0.90	0.97	0.90	0.89	0.94	1.07	1.15
% missing	76.3%	95.1%	91.5%	47.3%	61.7%	71.1%	52.0%	54.7%	73.9%	96.1%	97.2%
Possibility to live the way one wants											
N=	3.976	1.143	779	739	617	698	541	821	1.022	735	857
Mean score	**3.12**	**3.17**	**2.89**	**3.54**	**3.05**	**2.94**	**3.37**	**3.09**	**3.03**	**3.06**	**3.16**
St. dev	1.09	1.03	1.09	1.01	1.14	1.09	1.11	1.10	1.11	1.07	1.03
% missing	3.5%	5.0%	4.5%	2.4%	2.2%	2.1%	2.0%	2.2%	2.5%	4.3%	5.6%
Source: IPA_MO_Validation											
Mean score is calculated if at least 75% of the items are answered											

Six items of the original IPA questionnaire were eliminated in the IPA-MO. These showed high correlation with other items. Whereas this does not hurt the instrument and may even be useful when used on an individual basis– as in rehabilitation practice –, in our surveys the similar items hardly added information and hurt validity of the instrument by causing high error covariances. The short versions of scales showed good reliability, high conceptual similarity with the original scales and resulted in acceptable fit for the overall model. Elimination of highly correlated items is often applied when screening instruments from medical practice are used for research purposes, also for efficiency purposes [35].

All participation domains of the original IPA model proved valid for social-support clients, though minor changes occur. One of the most salient changes is the shift of the item on reciprocity ('supporting other people') to Autonomy outdoors (instead of Social life). In studies among elderly people, Haak [36] and Sixsmith [37] found that 'doing things' for others is an important basis for participation and appeared to strengthen personal identity. Elderly people form a minority in our research population, so this may also be true for younger persons that do not participate in the labour process. The fact that supporting other people did not contribute to autonomy outdoors for participants with work, seems to support this assumption. Since reciprocity is an important feature of a participation society, its potential to improve participation deserves further research.

Financial autonomy is a new participation domain, with two new items added to the original single item. Whereas it is statistically reliable and valid, items in this scale are few and conceptually almost identical (extremely high interitem covariance). The new items are derived from an institutional screening instrument. Therefore, further research is recommended to investigate if clients' perception of financial autonomy is sufficiently covered.

Validation of participation domain Work and education was based on a small group of participants due to high non-response. Whereas good scale reliability was found, validity needs further testing. In our sample, education proved to correlate weakly with work items and contact with colleagues loaded onto Social life.

Based on the analysis in this study, both impairment-based groups and age groups are statistically valid options to create homogeneous groups within the social-support population. Impairment-based groups have higher discriminatory power though, since they reveal larger differences, both in terms of model fit, mean scores for participation domains and perceived well-being.

The domains in our model range from activity-based (autonomy indoors, family role, finance) to participation-based (social life, autonomy outdoors, work). All domains are interrelated, highest correlation exists between autonomy indoors, family role and autonomy outdoors. An IPA study among rehabilitation clients in Iran had similar findings, to the extent that these three domains were combined into one [19]. In our population, autonomy outdoors and family role load onto the same factor for most groups yet model fit is better when treated as separate domains.

By its very nature, autonomy outdoors – meeting and supporting people, spending leisure time, making trips – represents the way people link to and participate in the outside world. The near-symbiosis with family role suggests this is closely related to home-based activities for social-support clients. Taking into consideration that most of them do not work and many of them live alone, this suggests that they have weak connections with society. Precisely this weak link to the outside world is probably one of the reasons these people receive support. With the transformation from welfare to participation society in mind, a relevant question is whether support can re-establish connections with the outside world and improve participation (by reinforcing personal and social skills e.g.). The IPA-MO instrument can be helpful to monitor this development.

In conclusion, this study has demonstrated validity and reliability of the IPA-MO for heterogeneous social-support populations. Further research is needed on face validity and responsiveness of the new financial domain. The IPA-MO assesses client-perceived participation. We suggest the instrument is suitable for monitoring and on-going evaluation of outcomes of social-support policies.

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Annex 1 The IPA-MO questionnaire used for social-support clients (instructions not included)

response options: 'very good' 'good' 'fair' 'poor' 'very poor'

Mobility

(1a. My chances of getting around in my house ***where*** I want are)

1b. My chances of getting around in my house ***when*** I want are

1c. My chances of visiting neighbours, friends and relatives ***when*** I want are

1d. My chances of going on the sort of trips and holidays I want are

Tasks and activities in and around home

2a. My chances of contributing to looking after my home ***the way*** I want to are

2b. My chances of getting light tasks done around the house (e.g. making tea or coffee) either by myself or others, ***the way*** I want, are

(2c. My chances of getting heavy tasks done around the house(e.g. cleaning), either by myself or by others, ***the way*** I want are)

2d. My chances of getting heavy tasks done around the house(e.g. cleaning), either by myself or by others, ***when*** I want them done are

2e. My chances of getting minor repairs and maintenance work done in my house and garden, either by myself or others, ***the way*** I want them done are

2f. My chances of fulfilling my role at home (e.g. as partner, parent or boss in my own home) ***as*** I would like to are

Financial affairs

(3a. My chances of paying with my income what is ***really necessary***, are)

3b. My chances of ***keeping track*** on my financial affairs and mail are

3c. My chances to maintain ***oversight of my expenses*** are

3d. My chances to choose ***how*** I spend my money are

Leisure time

4. My chances of using leisure time *the way* I want to are

Social contacts and relationships

5a. My chances of talking to people close to me on equal terms are

(5b. The quality of my relationships with people close to me is)

5c. The respect I receive from people who are close to me is

5d. The quality of my relationships with people I do not know very well is

(5e. The respect I receive from people I do not know very well is)

5f. My chances to give and receive love and affection are

5g. My chances of seeing people as often as I want are

5h. My chances to support people who need me are

Self care

6a. My chances of getting washed and dressed ***the way*** I want are

(6b. My chances of getting washed and dressed ***when*** I want are)

6c. My chances of getting up and going to bed ***when*** I want are

6d. My chances of going to the toilet ***when*** I wish and need to are

6e. My chances of eating and drinking ***when*** I want to are

Paid or voluntary work

(7a. My chances of getting a paid or voluntary job ***I would like to do*** are)

7b. My chances of doing my work ***the way*** I want are

7c. My contacts with colleagues at my work are

7d. My chances of achieving or keeping the position ***I want*** in my work are

7e. My chances to get different work or another employer are

Education and training

8. My chances to continue or start the education or training I want are

Overall

9. My chances of living life the way I want to are

(Items between brackets) are excluded from the model