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# Identifying social participation subgroups of individuals with severe mental illnesses: a latent class analysis

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## Abstract

**Purpose** To investigate factors that influence participation in and needs for work and other daytime activities among individuals with severe mental illnesses (SMI).

**Methods** A latent class analysis using routine outcome monitoring data from 1069 patients was conducted to investigate whether subgroups of individuals with SMI can be distinguished based on participation in work or other daytime activities, needs for care in these areas, and the differences between these subgroups.

**Results** Four subgroups could be distinguished: (1) an inactive group without daytime activities or paid employment and many needs for care in these areas; (2) a moderately active group with some daytime activities, no paid employment, and few needs for care; (3) an active group with more daytime activities, no paid employment, and mainly met needs for care; and (4) a group engaged in paid employment without needs for care in this area. Groups differed significantly from each other in age, duration in MHC, living situation, educational level, having a life partner or not, needs for care regarding social contacts, quality of life, psychosocial functioning, and psychiatric symptoms. Differences were not found for clinical diagnosis or gender.

**Conclusions** Among individuals with SMI, different subgroups can be distinguished based on employment situation, daytime activities, and needs for care in these areas. Subgroups differ from each other on patient characteristics and each subgroup poses specific challenges, underlining the need for tailored rehabilitation interventions. Special attention is needed for individuals who are involuntarily inactive, with severe psychiatric symptoms and problems in psychosocial functioning.

**Keywords** Latent class analysis · Severe mental illnesses · Social participation · Paid employment and daytime activities · Routine outcome monitoring

## Introduction

Social participation, defined as engaging in paid or unpaid employment and other daytime activities such as education, is an important facilitator of recovery for individuals with severe mental illnesses (SMI) [1]. It seems to be linked to better self-esteem, enhanced feelings of self-efficacy, less severe symptoms [2–4], and a higher quality of life for individuals with SMI as well as those in the general population [5–8]. Paid employment is particularly valued, as it promotes financial independence, societal recognition, structure, and identity while providing coping strategies for psychiatric problems [4, 9–11]. It also promotes social inclusion and is associated with higher empowerment, better recovery, and a lower number of unmet needs for care [12, 13]. In fact, paid employment and other daytime activities are an important part of many definitions of recovery [14, 15].

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Considering these benefits, it is not surprising that most individuals with SMI express a wish to engage in employment and other daytime activities, with numbers generally ranging from 50 to 60% [16–18], but as high as 97% [19].

These numbers sharply contrast with the fact that many individuals with SMI face problems when participating in work or other activities [14, 20]. Unemployment rates for this group range from 65 to 93% [21–23], whereas these rates hover around 5% for the general population in western countries [24–26]. Problems with participation are not limited to employment. Global studies show that individuals with SMI also spend little time on education or other activities. Rather, a large portion of their time is spent on passive activities such as sleeping, sitting, and watching TV or their surroundings [9, 27–32], which seem to have detrimental consequences for physical health, promote boredom, and lead to underuse of capacities [33–35].

The discrepancy between the large majority of individuals with SMI who desire to engage in employment and other daytime activities and those who actually engage is caused by factors such as stigmatization by society and potential employers, lack of experience and education, fear of losing financial benefits, psychiatric symptoms, and cognitive impairments [36–39]. Self-stigmatization and anticipated discrimination also discourage individuals with SMI to engage in work or other meaningful daytime activities (the ‘why try’ effect [40, 41]).

Although evidence-based vocational rehabilitation approaches have been developed in the past years, access to these services remains limited [23], a phenomenon known as the science to service gap [42]. In consequence, many individuals with SMI experience unmet needs for care regarding social participation [43–45]. To overcome these barriers, it is important to understand which patient-related factors influence whether individuals with SMI participate in work and other daytime activities or not, and to gain insight into the extent to which these individuals’ social participation needs are addressed by mental health care (MHC).

Age, educational level, work history, psychotic symptoms, social functioning, and cognitive impairments are identified factors related to the level of social participation [22, 36, 46, 47]. However, since most research in this area is based on small samples of clients of vocational services, generalization is difficult and can lead to contradictory results [48].

This study investigates characteristics related to social participation from a large representative sample of individuals with SMI using data gathered through routine outcome monitoring (ROM). The first aim is to explore whether subgroups of individuals with SMI can be distinguished based on their actual level of participation and expressed needs for support in this area. A second aim

is to analyze differences between subgroups with regard to psychiatric symptoms, quality of life, and sociodemographic factors.

By describing the different groups based on participation in and expressed needs for work or other activities, we hope to help MHC practitioners in better supporting individuals with SMI to overcome barriers and tailor rehabilitation services to the needs of specific subgroups.

## Methods

### Procedure

Data were obtained through ROM, the routine assessment of patients at regular intervals during treatment [49]. ROM has been implemented in various countries such as the UK, Australia, New Zealand, and The Netherlands [50]. Its main goal is to monitor patients’ progress and measure clinically significant change over time [49, 51, 52]. Routine assessments were gathered through interviews by trained psychologists. Patients’ informed consent was obtained for scientific use of the data. This procedure was approved by the scientific board of the participating regional MHC center.

### Study population

The study population consisted of patients between 18 and 65 who received care from 12 Flexible Assertive Community Treatment (FACT) teams [53] at a MHC center in a predominantly urban area in the center of The Netherlands. These teams serve 2176 individuals with SMI. The FACT model was developed in The Netherlands and contains all elements of the renowned Assertive Community Treatment (ACT) model [54], one difference being that FACT also targets patients who function in a more or less stable manner. Participating FACT teams consisted of a psychiatrist, psychologist, experience expert, case managers and mental health nurses, and closely collaborated with experts delivering supported employment and supported housing. They provide medical, psychiatric, social, financial, and vocational support which can be intensified according to patients’ needs [55]. All teams showed good fidelity [56] and were certified by the Dutch Centre for Certification ACT and Flexible ACT (CCAF; <http://www.ccaf.nl>). All patients had SMI, indicated by service contact of more than 2 years, a psychiatric diagnosis according to DSM-IV and disabilities in functioning on several life domains [57]. Patients were selected who completed their last ROM measurement in 2012–2017 and had less than 20% missing information. In total, 1069 patients matched the inclusion criteria.

## Measurements

Instruments used for ROM with individuals with SMI have to be short, valid, reliable, measure multiple domains, measure from the patients' viewpoint and be used in international research [51, 58]. For this study, the following measures were selected.

The actual level of social participation was obtained through patient reports on the present hours worked in paid and unpaid employment.

Needs for care in the areas paid work, daytime activities, and social contacts were measured with three items of the extended 25-item research version of the Camberwell Assessment of Need Short Appraisal Schedule (CANSAS) [59, 60]: items 5 (needs concerning daytime activities), 23 (needs concerning paid work), and 14 (needs concerning social contacts). Response options were: 0 = no problem (no need for care in this area); 1 = no/moderate problem because of continuing intervention (met need); 2 = current serious problem (unmet need). The CANSAS shows a moderate to high interrater reliability [61].

Quality of Life (QOL) was measured with the total score on the 12 subjective items of the Manchester Short Assessment of quality of life (MANSA) [62, 63]. These are scored by the patient on a seven-point Likert scale ranging from 1 = could not be worse to 7 = could not be better. Total scores range from 0 to 84. Internal consistency is adequate ( $\alpha=0.81$ ; [64]).

Clinical and social functioning was measured with the Health of the Nation Outcome Scales (HoNOS) [65]. The 12 items that make up 4 subscales (behavioral problems, impairments, symptoms and social problems) were scored by the MHC practitioner on a five-point Likert scale that runs from 0 (no problems) to 4 (very severe problems). Total scores range from 0 to 48, with higher scores indicating poorer functioning. Both the total and separate symptoms subscale (items on psychotic hallucinations and delusions, depressed mood and other mental, and behavioral problems) were used. HoNOS was found to have good reliability with intra-class correlations above 0.71 [65].

## Data analysis

Latent class analysis (LCA) was used to identify subgroups of individuals with SMI based on their level of social participation. LCA posits that class membership based on an underlying unobserved variable (here: social participation) can be inferred from a set of measured variables. Instead of assigning individuals to classes, a probabilistic approach is used to determine class membership in which the uncertainty of belonging to a certain class is taken into account [66]. Classes were determined based on paid work (yes/no), unpaid work (yes/no), and needs for care regarding paid

work and daytime activities (CANSAS items 5 and 23) using LatentGold version 5.0 [67, 68]. Initially, a model was tested with one class, which presumes that there is no relation between indicator variables. Then, the number of classes was gradually increased. The model with the most suitable number of classes was chosen based on the lowest values of the Bayesian Information Criterion (BIC) and Akaike Information Criterion (AIC3). According to Bozdogan [69], the AIC3 is particularly suited for categorical variables. Model choice was also based on bivariate residuals, which should be  $< 3$ , because values  $> 3$  suggest possible correlations between indicator variables, a classification error not exceeding 10%, entropy  $R^2$  with higher scores representing better-fitting models and a non-significant  $p$  value for the goodness-of-fit statistic [70].

To test whether the subgroups differed with regard to sociodemographic characteristics, psychosocial functioning, psychiatric symptoms, and QOL, analyses were conducted using 'Step 3' in Latent Gold. This enables correction of the classification errors and uses the Wald-F statistic to determine significance. Two separate analyses were conducted for, respectively, the continuous outcomes age, duration in MHC, psychosocial functioning, symptoms, and QOL and the categorical outcomes clinical diagnosis (psychosis: yes/no), living situation (living independently vs. in sheltered accommodation or hospitalized), educational level, and needs for care regarding social contacts. Vignettes will be used to describe the four classes.

## Results

Mean age of the total sample was 44.06 years and mean duration in MHC 16.57 years. Most participants were male (65.5%) and many participants had a psychotic disorder (76.8%). Most individuals lived independently (79.3%) and had a lower educational level (42.2%) as opposed to a medium (35%) or higher educational level (22.8%) [71]. Approximately 16.2% of participants were engaged in paid and 29.5% in unpaid employment. More than half of participants did not report needs for care regarding daytime activities (58.7%), 24.7% reported met needs for care and 16.6% reported unmet needs for care regarding daytime activities. Most participants did not have needs for care regarding paid employment (65.9%), for 14.1% these needs were unmet, for 20% these were met.

## Results of the LCA

Models with 1–6 classes were compared (Table 1). The model with 4 classes was chosen as the best model because it had the best fit based on AIC3, Entropy  $R^2$  and goodness-of-fit statistic, all bivariate residuals were below  $< 3$

**Table 1** Fit statistics latent class analysis

Classes	LL	BIC	AIC3	Entropy $R^2$	Class error	$\chi^2$	$p$
1	−3030.4834	6102.8137	6078.9669	1	0	423.498	0.000
2	−2956.3182	6003.3046	5951.6364	0.4710	0.1361	237.065	0.000
3	−2907.8203	5955.1302 <sup>a</sup>	5875.6406	0.5736	0.1764	134.358	0.001
4 <sup>b</sup>	−2888.6732	5965.6574	5858.3465 <sup>a</sup>	0.6228 <sup>a</sup>	0.161	87.418	0.27
5	−2880.8509	5998.8341	5863.7018	0.5792	0.21	71.969	0.51
6	−2877.2824	6040.5184	5877.5647	0.5402	0.2645	65.077	0.51

<sup>a</sup>Best fitting model according to criterion<sup>b</sup>Chosen model

and the classification error was 0.161, which is acceptable. In addition, the 4-cluster model resulted in distinct and clinically meaningful classes. The model with three classes had a better fit according to the BIC value, but this model had bivariate residuals > 3, a lower Entropy  $R^2$  and a larger classification error than model 4.

## Description of classes

Descriptive variables for the total sample and per class are displayed in Table 2.

Class 1 (42.6% of participants) contains almost no individuals with paid employment (1%). However, 32.3% of class members were engaged in unpaid employment (Table 2). Most members of class 1 did not express needs for care concerning paid employment (94%) or daytime activities (76%). Individuals belonging to class 1 were labeled as moderately active without needs (Fig. 1).

Class 2 (21.5% of participants) contains individuals who most often did not have paid employment (3.5% employed). However, the majority was active in unpaid employment (60.4%). Members of class 2 most often had fulfilled needs for care in the area of paid work and no or fulfilled needs for care regarding daytime activities. These individuals were labeled as active with fulfilled needs.

Class 3 (20.9%) contains individuals that were predominantly not engaged in paid (90.6%) or unpaid employment (90.2%). Class 3 can be further characterized by having unfulfilled or no needs for care regarding paid employment and a high percentage of unfulfilled needs concerning daytime activities. These individuals were labeled as involuntarily inactive.

Class 4 (14.9% of participants) is characterized by having paid employment (86.9%) and almost no unpaid employment (4.4%). Members of class 4 mostly did not have needs for care regarding paid work or daytime activities (88%) and were labeled as active in paid employment.

## Differences between classes

Differences between the classes with regard to sociodemographic characteristics, QOL, psychosocial functioning, and psychiatric symptoms are listed in Table 2. Members of the four classes significantly differed in age, duration in MHC, psychiatric symptoms, psychosocial functioning, living situation, educational level, having a life partner, needs regarding social contacts and QOL, but not in clinical diagnosis or gender.

Members of class 1, moderately active without needs, were on average older and had a longer duration in MHC than the other classes. They had few needs for care regarding social contacts. In addition, they had the fewest psychiatric symptoms and highest QOL after individuals with paid employment. Psychosocial functioning was poorer and educational level was lower than that of the paid employment and active with fulfilled needs classes but better than the involuntarily inactive class.

Members of class 2, active with fulfilled needs, were on average younger, more often living in sheltered housing or hospitalized and had more met needs for care regarding social contacts than members of the other classes. They least often had a life partner. Psychosocial functioning in this group was better than that of moderately active without needs and involuntarily inactive individuals, but poorer than that of individuals with paid employment. They had fewer psychiatric symptoms than involuntarily inactive individuals, but more than the other two classes.

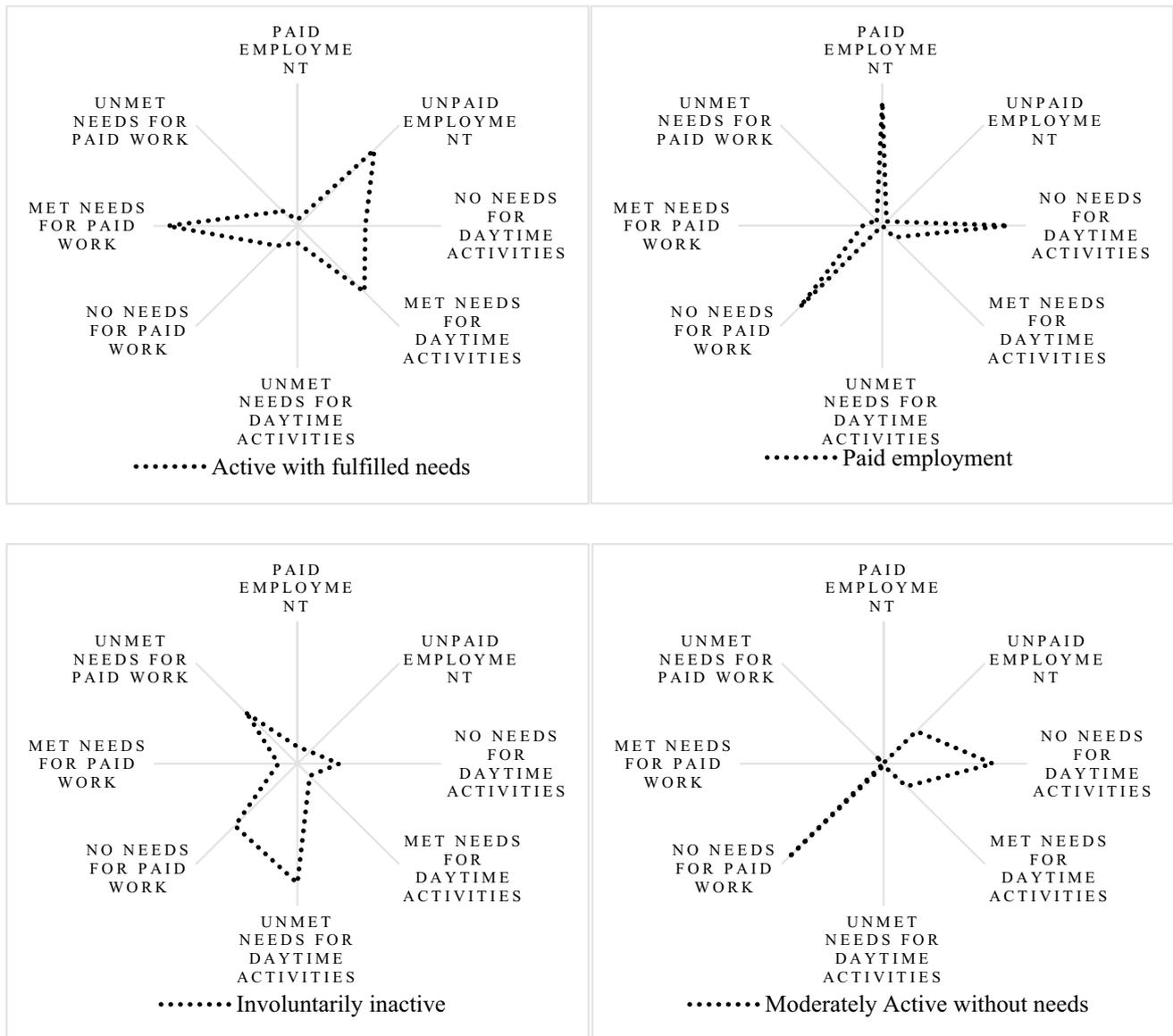
Members of class 3, involuntarily inactive individuals, had the lowest educational level, most unmet needs for care regarding social contacts (57.1% unmet needs), lowest QOL, poorest psychosocial functioning, and the most psychiatric symptoms of all classes. However, involuntarily inactive individuals more often had a life partner than moderately active without needs or active with fulfilled needs individuals. Furthermore, they were comparable

**Table 2** Descriptive variables for the total sample and per class ( $N=1069$ )

Variable	Total sample ( $N=1069$ )	Class 1 Moderately active without needs ( $N=455$ )	Class 2 Active with fulfilled needs ( $N=230$ )	Class 3 Involuntarily inactive ( $N=224$ )	Class 4 Paid employment ( $N=160$ )	Wald $F$	$p$
	$N$ (%)	$N$ (%)	$N$ (%)	$N$ (%)	$N$ (%)		
<b>Daytime activities</b>							
<b>Paid employment</b>							
Yes	173 (16.2)	5 (1.1)	8 (3.5)	21 (9.4)	139 (86.9)	5.667	0.13
No	896 (83.8)	450 (98.9)	222 (96.5)	203 (90.6)	21 (13.1)		
<b>Unpaid employment</b>							
Yes	315 (29.5)	147 (32.3)	139 (60.4)	22 (9.8)	7 (4.4)	48.419	0.00*
No	754 (70.5)	308 (67.7)	91 (39.6)	202 (90.2)	153 (95.6)		
<b>Needs for care on daytime activity (CANSAS item 5)</b>							
No needs	627 (58.7)	347 (76.3)	87 (37.8)	52 (23.2)	141 (88.0)	63.881	0.00*
Met needs	264 (24.7)	102 (22.4)	121 (52.6)	22 (9.8)	19 (12.0)		
Unmet needs	178 (16.6)	6 (1.3)	22 (9.6)	150 (67.0)	0 (0.0)		
<b>Needs for care on paid employment (CANSAS item 23)</b>							
No needs	704 (65.9)	427 (93.9)	36 (15.7)	111 (49.6)	130 (81.3)	63.469	0.00*
Met needs	214 (20.0)	2 (0.4)	167 (72.6)	24 (10.7)	21 (13.1)		
Unmet needs	151 (14.1)	26 (5.7)	27 (11.7)	89 (39.7)	9 (5.6)		
<b>Gender</b>							
Male	700 (65.5)	292 (64.2)	148 (64.3)	144 (64.3)	116 (72.5)	2.914	0.41
Female	369 (34.5)	163 (35.8)	82 (35.7)	80 (35.7)	44 (27.5)		
<b>Living situation</b>							
Independent <sup>a</sup>	848 (79.3)	355 (78.0)	169 (73.5)	178 (79.5)	146 (91.3)	11.293	0.01*
Dependent	221 (20.7)	100 (22.0)	61 (26.5)	46 (20.5)	14 (8.7)		
<b>Educational level<sup>b</sup></b>							
Low <sup>c</sup>	451 (42.2)	210 (46.2)	77 (33.5)	119 (53.1)	45 (28.1)	35.007	0.00*
Medium <sup>d</sup>	374 (35.0)	159 (34.9)	95 (41.3)	71 (31.7)	49 (30.6)		
High <sup>e</sup>	244 (22.8)	86 (18.9)	58 (25.2)	34 (15.2)	66 (41.3)		
<b>Clinical diagnosis</b>							
Psychotic disorder	821 (76.8)	352 (77.4)	169 (73.5)	175 (78.1)	125 (78.1)	1.107	0.78
Other disorder	248 (23.2)	103 (22.6)	61 (26.5)	49 (21.9)	35 (21.9)		
<b>Having a life partner</b>							
Yes	320 (29.9)	123 (27.0)	56 (24.3)	79 (35.3)	62 (38.8)	8.683	0.03*
No	749 (70.1)	332 (73.0)	174 (75.7)	145 (64.7)	98 (61.2)		
<b>Needs for care on social contacts (CANSAS item 14)</b>							
No needs	683 (63.9)	339 (74.5)	136 (59.1)	73 (32.6)	135 (84.4)	112.620	0.00*
Met needs	163 (15.2)	62 (13.6)	61 (26.5)	23 (10.3)	17 (10.6)		
Unmet needs	223 (20.9)	54 (11.9)	33 (14.4)	128 (57.1)	8 (5.0)		
	$M$ (SE)	$M$ (SE)	$M$ (SE)	$M$ (SE)	$M$ (SE)		
Age (years)	44.06 (0.33)	48.17 (0.56)	40.89 (0.76)	43.64 (0.88)	43.54 (0.83)	60.740	0.00*
Duration in MHC (in years)	16.57 (0.37)	19.71 (0.60)	15.51 (0.88)	15.55 (1.00)	15.52 (0.93)	23.970	0.00*
QOL (MANSA total)	58.06 (0.38)	60.82 (0.64)	58.32 (0.80)	48.33 (1.11)	64.75 (0.86)	136.310	0.00*
Psychosocial functioning (HoNOS total)	7.15 (0.16)	7.70 (0.28)	6.67 (0.35)	9.69 (0.45)	4.56 (0.37)	83.806	0.00*
Psychiatric symptoms (HoNOS symptoms)	2.82 (0.08)	2.75 (0.13)	2.85 (0.17)	3.73 (0.22)	1.96 (0.18)	38.154	0.00*

\*significant at 0.05

<sup>a</sup>Sheltered accommodation or hospitalized<sup>b</sup>Ref. [71]

**Table 2** (continued)<sup>c</sup>ISCED levels 0, 1 and 2<sup>d</sup>ISCED levels 3, 4 and 5<sup>e</sup>ISCED levels 6 and 7**Fig. 1** Latent class profiles

to these classes regarding independent living, with most members living independently.

Members of class 4, paid employment, were higher educated than the other classes (41.4% high educational level) and had the best psychosocial functioning and fewest psychiatric symptoms. Furthermore, they had fewer needs for care regarding social contacts, the highest QOL and most independent living members of all classes.

## Vignettes

To better understand differences between participation classes, fictional vignettes were created by the researchers for each, based on differences found.

### Moderately active without needs

Bob is a 50-year-old man with schizophrenia who has been in psychiatric care for more than 30 years, but is not experiencing symptoms at this moment. Bob quit school after 10th grade and has no working experience. Bob, who lives alone, spent his days watching television and taking care of his cat. Bob sometimes wishes he had more friends. However, for the most part, Bob is content with his quiet life and has no need for other daytime activities or paid work. He previously used to visit a day activity center, but has stopped doing so since its relocation.

### Active with fulfilled needs

Susan is a 37-year-old woman who lives in a sheltered housing facility. She is a high school graduate who had her first psychotic episode 12 years ago and over time experienced psychiatric symptoms in varying degrees. She likes being a coffee host in a neighborhood center, where she has made many friends. Her case manager was supportive when she expressed a wish for more daytime activities and helped her get this volunteer job. They briefly considered getting a paid job, but decided that she was too unstable. Overall, she is content with life, but believes life would be better if she had a boyfriend and a place to live on her own.

### Involuntarily inactive

Fred is a 44-year-old man with schizophrenia who has experienced many symptoms for over 16 years and lives with his girlfriend. Fred dropped out of school early and now fills his time with watching television and sleeping. He is bored and eager to do more, but he does not know what. His neighbor sometimes makes suggestions, but otherwise, Fred receives no help with activities. The sessions with his case manager and psychiatrist are primarily focused on symptoms. Fred is very unhappy with the fact that he has nothing to do and no social contacts besides his partner and neighbor.

### Paid employment

Jill is a 42-year-old woman who lives with her husband. She was diagnosed with schizophrenia after two episodes 15 and 12 years ago. Occasionally, she has symptoms, but with adequate medication, she can prevent them from interfering much with daily life. After graduation, Jill started working at a bank. After two episodes, she found a part-time job and currently works as a manager. Her job, husband, and other social contacts keep Jill well-occupied and she has no wish for other activities. Although she would like to be free of psychiatric medication, Jill is happy with her life and considers herself lucky being able to work.

## Discussion

Social participation, here defined as having paid employment or other daytime activities, is highly valued [72, 73], promotes QOL, and as such, is a key aspect of recovery [14]. This study aimed to investigate which factors are related to the level of social participation of individuals with SMI by identifying subgroups based on needs for care in this area and actual participation. Four subgroups were identified that differ significantly in socio-demographics, QOL, psychosocial functioning, and psychiatric symptoms.

The subgroup that was most actively engaged in paid employment can be described as high-functioning, not only in terms of social participation, but members also had the fewest psychiatric symptoms, best psychosocial functioning, and highest educational level overall. Possibly as a result, they expressed the highest QOL and mostly no needs for more social contacts or support regarding paid work or other daytime activities. Rehabilitation support for this subgroup should focus on keeping a stable employment situation—while keeping an open mind for career opportunities—and dealing with possible problems caused by psychiatric symptoms [74].

At the other end of the spectrum was the subgroup involuntarily inactive with individuals with almost no paid or unpaid employment but an alarmingly high percentage of unmet needs for care regarding social contacts, daytime activities, and paid employment. This seems to be a particularly vulnerable group and special attention should be given to better facilitate them, as this is also the subgroup with the most problems in psychosocial functioning, many psychiatric symptoms, and low QOL.

The third subgroup (active with fulfilled needs) had high percentages of members active in voluntary work with mostly met needs, suggesting that they have benefited most from vocational rehabilitation. Compared to the others, they are younger with relatively good psychosocial functioning, but more often hospitalized or in sheltered accommodation. Albeit less obvious than the involuntarily inactive consumers, this subgroup contains individuals in need of special attention because of unmet needs for care regarding paid employment. These individuals, and to a lesser extent, all members of this group are at risk of settling for unpaid work while paid work could be a realistic option considering their age and psychosocial functioning. To prevent widening the gap with the labor market whilst working on recovery, it is important to keep discussing needs for support regarding paid work and to avoid losing hope and aspiration, which can be a consequence of coping with severe mental illnesses. Since a core task of supported and sheltered housing is supporting inhabitants

with daytime activities, the high percentage of met needs for care in this subgroup could be related to their specific living environment rather than a characteristic of the individuals themselves [75, 76].

Finally, the subgroup moderately active without needs can be characterized as older, stable in a chronic phase of the illness and with few needs for care in the social and vocational domain. Strikingly, this ‘silent majority’ has relatively few psychiatric symptoms and the second highest QOL. On the other hand, they have the second poorest psychosocial functioning and a low educational level. Social participation in this subgroup may be restricted more by problems in psychosocial functioning than by symptom severity, which makes it interesting to further investigate why some individuals in this group do find satisfactory daytime activities, whereas others do not.

These four different subgroups, particularly the high-functioning group and the older chronic group with few needs for care, have been identified in earlier research [77–80]. Hannah [80] found that high-functioning chronic patients score high on social interaction, a dimension that in this study comprises meaningful activities. Hannah’s mainstream chronically mentally ill cluster is comparable to the moderately active without needs individuals with their lack of extreme features (except age), relatively low level of psychiatric symptoms and few activities.

Although Hannah’s and our results suggest a continuum ranging from worse symptoms and less participation to few symptoms and more participation, the middle two subgroups do not follow this order and show that this is an oversimplification of reality. For instance, one would expect the worst functioning subgroup to be the most hospitalized but that is not the case, nor were there differences in clinical diagnosis, duration in MHC, having a life partner or age. This differs from a study by Lloyd-Evans [86], who found that those in competitive employment were typically younger. However, their finding that high educational level was related to employment was corroborated by our study. Whereas some earlier studies found that male gender was related to better employment outcomes [22], our study confirms others who showed this gender effect to be rather ambiguous [46]. The lack of a significant difference for diagnosis, expressed as having a psychotic disorder or not, implies that social participation is more related to symptoms than to diagnostic labels and confirms results from others [46].

An important conclusion of our study is that a fair number of individuals with SMI do not receive support in line with their needs (17% unmet needs for care regarding daytime activities, 14% unmet needs for care for paid work, and 21% for social contacts). The participating FACT teams in our study used external employment specialists whereas Kortrijk et al. [74] stress the importance of integrating specialized employment services according to the model of individual

placement and support [81, 82] in FACT teams, and show that employment needs are otherwise rarely addressed. Occupational therapists could also play a valuable role in attaining other daytime activities besides paid work [83].

A major limitation of this study is that data were not specifically gathered for these research questions and that detailed information about the level of social participation was lacking. In addition, the fact that all participants come from one region in the middle of The Netherlands could be seen as a limitation. Results may not be generalizable to areas with higher unemployment rates or with other opportunities to engage in employment and other daytime activities. However, this is mitigated by the large, representative sample size, its heterogeneity in terms of backgrounds, and the fact that the participating FACT teams were located in the center of a larger city but also in smaller surrounding towns.

Another drawback is that the sample may be a biased selection of relatively well-functioning patients who were able and willing to engage in routine outcome assessments, leaving out those with severe psychotic symptoms and limitations in functioning that prevent them from participating [84]. However, it is also possible that the worst as well as the best functioning individuals are underrepresented because of higher non-response in those who are doing well and distance themselves from mental health care.

A final limitation is the cross-sectional design that did not allow a dynamic and/or causal view on the factors associated with social participation. For instance, it is not clear whether the active with fulfilled needs and paid employment subgroups are engaged in work because their psychosocial functioning is good or whether this results from remaining active [74]. As Morgan et al. [85] put it, persisting poor mental health may be a cause but also a consequence of social exclusion and poverty. More longitudinal research is needed to clarify this relationship.

Strong points of this study are the large sample size, and the focus on unpaid vocational activities, which are mostly overlooked in the literature [86]. Furthermore, not only the actual level of social participation was taken into account, but also needs for care and support in this area. This distinction is important, because there seems to be a gap between an expressed desire to work and actual job-seeking behavior [36].

The study results are clinically relevant, because subgroups based on routinely measured outcomes can help clinicians identify which of their clients need more support with finding jobs or activities. Special attention in this regard should be given to involuntarily inactive individuals as well as individuals seemingly satisfied with unpaid work but who could experience a lack of support when trying to find paid employment.

The fact that the unemployment rates of individuals with SMI have been fairly constant over the past 25 years

[15, 36, 87, 88] despite increasing implementation of psychiatric rehabilitation indicates that there is a strong urge for new knowledge about predictors of social participation. The next step in this line of research would be to conduct growth analyses and make dynamic models to see whether individuals with SMI change subgroups over time.

More qualitative approaches, elucidating the complex interplay between positive and negative consequences associated with employment-related activities [89], could further increase understanding of why some people with SMI are engaged in social participation, while others are not. Next, it would also be valuable to have research focus on contextual barriers and facilitators that influence social participation. After all, participation is a reciprocal process, which means that where individuals with SMI want to participate in society, society also has the obligation and responsibility to let them in.

### Compliance with ethical standards

**Conflict of interest** The authors declare that there are no conflicts of interest.

**Ethical standards** Informed consent was obtained from all participants prior to data collection. Study protocol and informed consent form were approved by the Ethical review board of Altrecht Science (#1724). The study has been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

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