



How do older people achieve well-being? Validation of the Social Production Function Instrument for the level of well-being–short (SPF-ILs)



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ABSTRACT

In a time of aging populations and an enormous increase in frailty within them, examination of these populations' ability to achieve well-being has become increasingly important. This study aims to validate a theory-driven instrument for the measurement of well-being in three community-dwelling older populations: (i) a general population, (ii) a frail population, and (iii) Turkish migrants. The short (15-item) version of the Social Production Function Instrument for the Level of Well-being (SPF-ILs) measures whether a person's needs for stimulation, comfort, behavioral confirmation, affection, and status are met. This instrument has been validated only in adult (aged 18–65 years) populations. Three datasets were used to validate the SPF-ILs in samples of the general older population (945 respondents aged ≥ 70 years), frail older people (414 respondents aged ≥ 70 years), and older Turkish migrants (680 respondents aged ≥ 65 years) residing in Rotterdam, the Netherlands. Psychometric results showed that the SPF-ILs is a valid and reliable instrument for the assessment of well-being and need-related goals to achieve well-being among (frail) native and migrant older populations. Worldwide, countries face the challenge of maintaining community-dwelling older people's well-being. This study clearly showed that older people differ in their realization of well-being which increased our understanding of the ability of community-dwelling older people in various populations to achieve well-being.

1. Introduction

Older people's well-being is becoming an urgent topic of policy and economic debates, and its improvement is emerging as a key societal aspiration (Steptoe et al., 2015). Aging populations worldwide pose the challenge of maintaining older people's well-being. Older people's ability to remain independent as long as possible is becoming increasingly important, not least because it can relieve increasing demands on healthcare systems (Barlow et al., 2002). Support of this ability requires an increased understanding of community-dwelling older people's ability to achieve well-being.

Vulnerable groups, such as frail older people, may have more difficulty than the general older population in achieving a certain level of well-being when facing life changes. Frailty, defined as the presence of multiple interacting medical and functional problems associated with low levels of well-being (Andrew et al., 2012), makes older people more vulnerable to adverse outcomes (e.g., falls, disability, hospitalization, care home admission, mortality) through generally subtle and progressive physical changes, but how exactly it limits their ability to maintain overall well-being remains unclear. The ability to pinpoint

how certain circumstances affect older people's ability to maintain well-being, and which dimensions of well-being are compromised, may help to determine the changes needed to protect their well-being and prevent adverse outcomes. Because frailty is progressive, care should enable the early detection and prevention of difficulties in achieving well-being (Andrew et al., 2012).

Older Turkish migrants in Western Europe have been identified as a vulnerable population as well. The majority of these migrants has received little or no education, have been recruited mainly for low-skilled and low-paid manual labor, and live on small, incomplete pensions, which may not favor the achievement of overall well-being (Warnes et al., 2004). These populations report poorer physical health, more functional limitations and chronic conditions (Dijkshoorn et al., 2003; Lewinter et al., 1993; Schellingerhout, 2004), but the areas in which they experience difficulties achieving overall well-being and potential ways to substitute and buffer certain losses remain unclear. Although decreased well-being among immigrants could be considered a robust and well-validated finding, most studies have compared average scores for overall well-being without assessing potential differences within well-being. Given the higher prevalence of functional limitations, poor

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health, and chronic conditions, older Turkish people may experience difficulties with physical well-being; in turn, they are respected highly in their communities, which might enhance social well-being. The Muslim social hierarchy places older people at the top, which may create better opportunities to achieve social well-being compared with older Dutch people. In the Muslim community, younger family members are expected to support older people, leading to less institutionalization (Elsaman and Arafa, 2012), which contributes to the achievement of social well-being. A theory-driven approach to identify differences in older people's ability to achieve social, physical, and overall well-being in various older populations is needed (Nieboer et al., 2010).

1.1. Social production function (SPF) theory

SPF theory (Lindenberg, 1996) assumes that people take diverse approaches to improving their living conditions, with the general aim of achieving physical and social well-being. Physical well-being is achieved by obtaining sufficient stimulation (e.g., physical exercise, mental and sensory stimuli) and optimal comfort (lack of physiological needs, a pleasant and safe environment). Social well-being is achieved by obtaining status (with regard to occupation, lifestyle, talents), behavioral confirmation (living according to one's norms or those of relevant others), and affection (love, intimacy, support from family and friends). These five goals serve as resources for physical and social well-being, which, in turn, serve to fulfill the ultimate goal of subjective well-being (Fig. 1). Recognition of this hierarchy of goals enables determination of how well-being is achieved in various populations, and identification of the types of care and support required to overcome difficulties with such achievement.

Certain levels of physical and social well-being are required for overall subjective well-being; limited substitution between physical and social well-being is possible (Lindenberg, 1996). Similarly, certain levels of all aspects of social and physical well-being are required for the achievement of each. As activities and resources, which lie at the base of the hierarchy, are readily substitutable, losses can have minor or

temporary effects on the overall level of well-being. Substitution is based on the relative costs of alternative goals; for example, an individual may intensify social contact (affection, behavioral confirmation) when opportunities to gain status (e.g., at work) decrease. Buffering ability also increases with the number and diversity of resources, but the resources yield declining marginal returns. For example, affection from one's family members and/or friends is important, but numerous friendships or those forged in addition to relationships with one's spouse and children may contribute only marginally to the achievement of affection. People are likely to pursue resources with marginal returns for higher-level goals (including overall subjective well-being) when the means are readily available, thereby increasing reserves as buffers when needed (Nieboer and Lindenberg, 2002).

Functional limitations, disabilities, and illnesses do not affect everyone's well-being in the same way. A person's resources (e.g., income, assets, social relationships, physical condition) influence well-being in times of poor as well as good health. In addition to the important buffering function and endowments of having a partner and other social relationships, they also enable people to participate in activities. During times of disruption of such important (social) activities, for example due to loss of a spouse, people have greater difficulty achieving physical and social well-being (Nieboer, 1997; Nieboer et al., 1998). Functional limitations that hamper the opportunity to engage in such activities, therefore, have far-reaching consequences for well-being, unless one can substitute for losses. In times of functional limitation, support should allow people to continue engaging in important activities, which protects against deterioration of their well-being (Williamson and Schulz, 1992, 1995).

Nieboer et al. (2005) developed a short version of the Social Production Function Instrument for the Level of well-being (SPF-ILs), a measure of well-being dimensions based on SPF theory in adult (aged 18–65 years) populations. This instrument provided evidence to be reliable and valid for assessment of the hierarchy of human goals, with need-related goals in the general population comprising affection, behavioral confirmation, and status for social well-being, and comfort and stimulation for physical well-being (Nieboer et al., 2005). However,

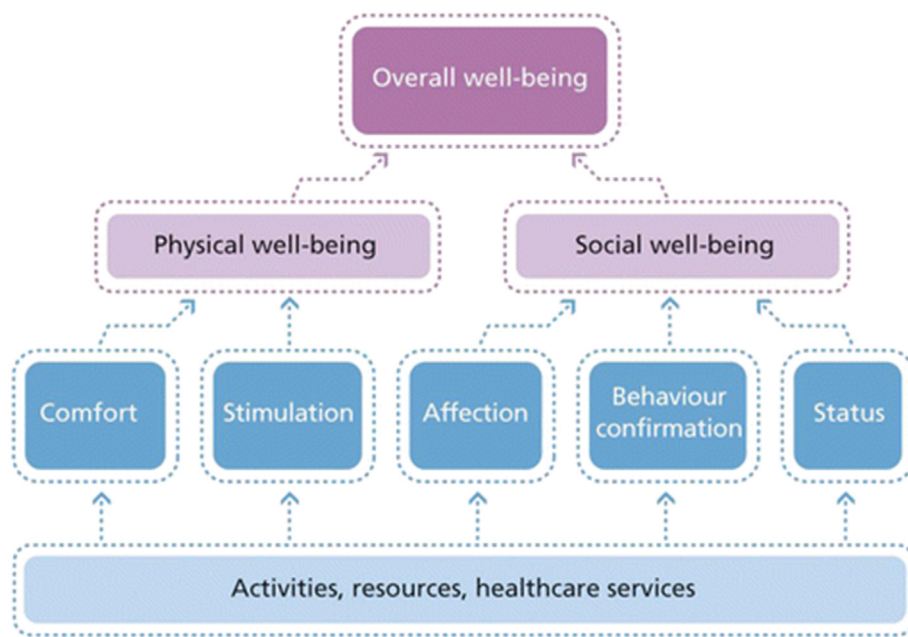


Fig. 1. Social production function theory explaining the hierarchy of well-being.

Based on Lindenberg (1996); Figure from Cramm JM, Nieboer AP: Social cohesion and belonging predict the well-being of community-dwelling older people. BMC Geriatrics 2015. 15:30. <http://dx.doi.org/10.1186/s12877-015-0027-y>.

whether this instrument can be used reliably and validly to assess well-being and need-related goals to achieve it in diverse older populations remains to be determined. Given that background characteristics such as frailty, age, and culture are known to affect the validity of survey instruments (Caballero et al., 2013; Kim et al., 2013), this study aims to validate the SPF-ILs among community-dwelling older people in general, the frail, and Turkish migrants in Rotterdam, the Netherlands.

1.2. Construct validity

To test the validity of the SPF-ILs, we examined differences in the levels of need-related goals within and between study samples, as expected based on previous research. For social well-being, previous findings led us to expect higher levels of affection and behavioral confirmation among older women, but higher status among older men (Nieboer et al., 2005; OECD, 2013). Women generally have more and larger multifaceted networks than do men, which explains their higher affection levels (Verhofstadt et al., 2007). Moreover, women's social network interactions more often involve affiliative, expressive, and supportive behaviors, whereas men's interactions tend to be instrumental (Hanazono et al., 2011), making behavioral confirmation more likely among women. However, despite enormous achievements in women's status in recent decades, persistent gender inequality means that men continue to have higher status (OECD, 2013). For physical well-being, we expected lower comfort levels among women than among men. Middle-aged and older women are more likely than their male counterparts to have functional limitations (Rohlfen and Jacobs Kronenfeld, 2014) and lower perceived health (Vlassoff, 2007; Palència et al., 2017). Thus, hypothesis 1 (H1) was:

Older women will have higher affection and behavioral confirmation levels, but lower status and comfort levels, than will older men.

Second, we expected the production of status, comfort, and stimulation, but not affection, to be more difficult for older people (Steverink, 2001). Social ties formed over the life course act as buffers, protecting the realization of affection (Nieboer and Lindenberg, 2002). The production of status and stimulation is likely to become more difficult after retirement because of the loss of important activities (van Eijk, 1997). Older age is associated with low general activity and lower participation rates in multiple domains (van Eijk, 1997). The comfort level is also expected to deteriorate because of increasing chronic conditions and physical limitations (OECD, 2013; Steverink, 2001). Older persons are likely to turn to others for support, resulting in stable or even increased levels of affection, although substitution is limited in cases of diminishing social networks and loss of loved ones (Nieboer, 1997; Nieboer and Lindenberg, 2002). Thus, hypothesis 2 (H2) was:

The production of status, comfort, and stimulation, but not affection, will be more difficult among older people.

Third, based on earlier work (e.g., Nieboer and Lindenberg, 2002; Nieboer et al., 2005), we expected higher levels of status and stimulation among older persons with more resources (having a partner, higher education, high income). For example, the risk of social exclusion is greater among older people with lower incomes and those who live alone (Barnes et al., 2006; Lyons et al., 2009). Thus, hypothesis 3 (H3) was:

Older persons with a partner, higher education, and high income will have higher status and stimulation levels than will those with no partner, lower education, and low income.

Fourth, we expected higher levels of affection, behavioral confirmation, and status among Turkish migrants than among frail Dutch older people because of these migrants' better social resources and social hierarchy positions. Palmberger (2017) showed that older Turkish migrants felt more socially well-embedded, which facilitates the production of affection and behavioral confirmation, than did older

natives. Respect of and loyalty to older people is a major traditional Turkish social norm (Ersoy and Altun, 1998). Thus, hypothesis 4 (H4) was:

Older Turkish migrants will have higher levels of affection, behavioral confirmation, and status than will community-dwelling older people in general and frail older people.

Fifth, given that frail older adults report poorer health outcomes (e.g., Morley et al., 2012; Vermeulen et al., 2011), we expected them to have lower levels of physical well-being compared with the general sample of community-dwelling older people. As older migrants (particularly Turks) experience more health problems and related functional limitations at a younger age than do native Dutch older adults (van der Gref and Droogleeveer Fortuijn, 2017), we also expected to observe lower comfort and stimulation levels among the former. Thus, hypothesis 5 (H5) was:

Frail older adults and Turkish migrants will have lower comfort and stimulation levels than will community-dwelling older Dutch natives.

Finally, we expected greater overall well-being among community-dwelling older individuals than in the older frail and migrant samples because of the former's higher levels of comfort and stimulation, and we expected Turkish migrants to have greater overall well-being than frail older adults because of these migrants' higher levels of affection, behavioral confirmation, and status. Thus, hypothesis 6 (H6) was:

Overall well-being will be higher among community-dwelling older people than among frail older individuals and Turkish migrants, and higher among Turkish migrants than among frail older individuals.

2. Research design and methods

Datasets from three community-dwelling older samples selected from the Rotterdam's population register were used to validate the SPF-ILs. Those with serious medical issues, death, language problems (except for the Turkish sample), change of address, nursing home residence were considered not eligible.

1 General Older Population

In 2011 a total of 1440 eligible respondents age ≥ 70 years were asked to participate using a phased approach (mail/telephone/face-to-face), which yielded a 66% ($n = 945$) response rate.

2 Frail Older People

A sample of 2798 eligible respondents (age ≥ 70 years) was asked to participate in 2012/2013. Respondents were asked to participate via mail which yielded a 46% ($n = 1280$) response rate. We selected frail individuals from this sample based on the Tilburg Frailty Indicator (TFI) (Gobbens et al., 2010), leading to a final sample of 414 frail community-dwelling older people. Following the most recent findings for the TFI, we used the cut-off value of 6 (Mulasso et al., 2016).

3 Older Turkish Migrants

A total of 2137 eligible older Turkish migrants (age ≥ 65 years) were invited to participate in 2015/2016 via email and home visits. A total of 680 Turkish respondents filled in the questionnaire (32% response rate).

2.1. Measures

2.1.1. Well-being

The 15-item SPF-ILs (Nieboer et al., 2005) measures whether a person's needs for stimulation, comfort, affection, behavioral

Table 1
Socio-demographic characteristics of the study samples.

	Community-dwelling older people (n = 945)	Frail older people (n = 414)	Older Turkish migrants (n = 680)
Sex (female)	57.0%	65.5%	47.6%
Age (years)	77.48 (5.78)	81.01 (6.48)	72.90 (5.02)
Marital status (single/ widowed)	63.9%	72.5%	28.7%
Education (low)	22.1%	23.5%	80.3%
Income (low)	47.6%	50.1%	83.4%

Data are reported as % or mean (standard deviation).

confirmation, and status are met. Examples of items are “Do you really enjoy your activities?” and “Do people help you if you have a problem?”. One comfort item was modified for the older population (“In the past few months did you feel you *were in good health*,” rather than “*perfectly healthy*”). Mean scores range from 1 (never) to 4 (always), with higher scores indicating greater well-being. The reliability and validity of this instrument have been tested thoroughly and proven in the general population aged 18–65 years (Nieboer et al., 2005), but not in (frail) older populations. Since its validation in 2005, the SPF-ILs has been used frequently among (chronically ill) patients and (frail) older people in various countries (e.g. Cramm and Nieboer, 2015; Cramm et al., 2015; Cramm et al., 2014; van Dijk et al., 2016), but these studies have not provided in-depth psychometric information.

Professional native Turkish translators living in the Netherlands translated the 15-item SPF-ILs into Turkish (see Additional File). These were official and certified translators who studied Turkology which ensures high-quality translation. We used the following procedure: (i) a first translator translated the Dutch instrument into Turkish; (ii) a second translator then checked all steps of this procedure (e.g., spelling, grammar, terminology, and cultural interpretation of words); (iii) a third translator performed back translation to ensure that the items had been translated properly; (iv) the questionnaire was tested among older native Turkish people to ensure content validity for the target population. We provided Dutch as well as Turkish questionnaires and used interviewers who could speak the Dutch and Turkish languages.

2.1.2. Socio-demographic variables

The questionnaire solicited information on respondents' age, gender, monthly net income, educational level, and marital status. Marital status, educational level, and income were dichotomized. Male gender, monthly net income \geq €1350, elementary-school education or higher, and married/living together functioned as reference categories.

2.2. Analyses

Our analyses involved the following steps. First, the sample characteristics were analyzed using descriptive statistics. Second, we data-screened the items by examining the number of missing values and the mean and standard deviation of each item. Third, we used confirmatory factor analyses to test the validity of the SPF-ILs using the LISREL program (Jöreskog and Sörbom, 1996). Structural equation modeling enabled us to specify a measurement model by loading each item on its respective latent factor (the need-related well-being goals). In accordance with the 2005 paper by Nieboer and colleagues in which the development of the SPF-ILs and validation of the instrument in an adult population (18–65) are described, we did not test alternative structures. We treated the data as ordinal and used robust diagonally weighted least-squares (DWLS) estimation with polychoric correlations to fit factor models. Use of the robust DWLS method has been recommended for ordinal data with five or fewer categories (Hancock and Mueller, 2013). Respondents who did not respond to any of the well-being

questions were excluded (two from the general sample, five respondents from the frail older sample and eight Turkish migrants were excluded). Fourth, to test the measurement models, we used multiple imputation techniques with an expected maximization algorithm. We used the cut-off criteria proposed by Hu and Bentler (1999): 1) overall goodness of fit, for which normal-theory weighted least-squares analysis is used to characterize the discrepancy between model and sample covariance (Cramm et al., 2015; Hayduk, 1987); 2) the standardized root means square residual (values < 0.08 indicate good fit); 3) the root mean square error of approximation (preferably ≤ 0.06); and 4) the index of comparative fit between the independent (i.e., unrelated variables) and estimated models (preferably > 0.95). Fifth, we calculated Cronbach's alpha values to evaluate internal subscale consistency and assessed conceptual relatedness among (sub)scales by correlation analysis. We assessed overall scale reliability by calculating a composite reliability index based on the factor loadings of the need-related goals. Sixth, we tested the hypotheses to investigate the construct validity of the instrument by analyzing expected differences in need-related goals using independent *t*-tests and analysis of variance as appropriate.

3. Results

Compared with the general community sample, frail older people were older and more often single; Turkish migrants were younger, more often married, and most often less educated and with lower incomes (Table 1). Missing value rates for SPF-ILs items did not exceed the commonly used threshold of 10% (Table 2).

3.1. Measurement model findings

The community sample yielded a significant chi-squared value for overall goodness of fit, reflecting the sensitivity of this value to sample size. The standardized root mean square residual (SRMR) value, however, was well below 0.08, suggesting good overall model fit. The root mean square error of approximation (RMSEA) was < 0.06 , indicating small differences between the estimated and observed models. The comparative fit index (CFI) was > 0.95 , indicating that the data supported the specified relations between variables (Table 3). Similar results were obtained for frail older persons, but model fit was worse for older Turkish migrants, due mainly to problematic scalability of item 13 (“Are your activities challenging to you?”). Removal of this item improved the model fit, although the RMSEA value (0.0708) remained above the cut-off value of 0.06.

The completely standardized solution of the confirmatory factor model for the study samples is presented in Table 4. Strong relationships were observed between the indicators and respective latent constructs, with the exception of item 13 in the Turkish sample, which did not load on the stimulation factor.

We also tested a second-order factor structure for the community-dwelling general sample. The second-order solution showed good model fit (CFI = 0.98, RMSEA = 0.058, SRMR = 0.078), with all loadings exceeding 0.50 ($p < 0.001$). Given the chi-squared test's sensitivity to sample size, we compared the alternative goodness-of-fit indices RMSEA, CFI, and SRMR. The results were comparable, although the RMSEA value for the second-order model was higher (0.058 vs. 0.044).

All Cronbach's alpha values were acceptable, with ranges of 0.652–0.872 for the community sample, 0.631–0.836 for the frail older sample, and 0.618–0.859 (excluding item 13) for the Turkish migrant sample (Table 5a–c). All associations between subscales and between the subscales and the overall score were significant ($p < 0.001$).

3.2. Construct validity

Table 6 provides an overview of SPF-ILs scores in the community sample according to socio-demographic characteristics. Women had

Table 2
SPF-ILs item characteristics.

Item	Community-dwelling older people (n = 945)				Frail older people (n = 414)				Older Turkish migrants (n = 680)			
	Valid n	Missing	Mean	SD	Valid n	Missing	Mean	SD	Valid n	Missing	Mean	SD
<i>Affection</i>												
1. Do people pay attention to you?	922	23 (2.4%)	2.61	0.866	531	8 (1.9%)	2.85	0.799	406	10 (1.5%)	3.22	0.862
2. Do people help you if you have a problem?	904	41 (4.3%)	2.68	0.968	530	9 (2.2%)	3.00	0.921	405	11 (1.6%)	3.19	0.916
3. Do you feel that people really love you?	900	45 (4.8%)	2.58	1.008	522	15 (3.6%)	3.06	0.876	399	16 (2.4%)	3.25	0.852
<i>Behavioral confirmation</i>												
4. Do others appreciate your role in the group?	880	65 (6.9%)	2.56	1.054	511	26 (6.3%)	2.55	1.017	388	26 (3.8%)	3.17	0.892
5. Do people find you reliable?	897	48 (5.1%)	3.37	0.803	523	16 (3.9%)	3.46	0.763	398	14 (2.1%)	3.53	0.719
6. Do you feel useful to others?	914	31 (3.3%)	2.65	0.949	525	14 (3.4%)	2.63	0.897	400	22 (3.2%)	2.90	1.000
<i>Status</i>												
7. Do people think you do better than others?	873	72 (7.6%)	1.96	0.832	522	15 (3.6%)	1.97	0.743	399	26 (3.8%)	2.52	0.953
8. Do people find you an influential person?	889	56 (5.9%)	1.81	0.845	515	22 (5.3%)	1.85	0.804	392	20 (2.9%)	3.06	0.958
9. Are you known for the things you have accomplished?	896	49 (5.2%)	1.93	0.950	526	12 (2.9%)	2.11	0.914	402	23 (3.4%)	2.68	1.023
<i>Comfort</i> In the past few months, have you felt:												
10. ... relaxed?	909	36 (3.8%)	2.68	0.885	520	17 (4.1%)	2.26	0.689	397	28 (4.1%)	2.13	0.842
11. ... in good health?	921	24 (2.5%)	2.58	0.961	525	13 (3.1%)	1.99	0.770	401	22 (3.2%)	2.10	0.867
12. ... physically comfortable?	945	22 (2.3%)	2.62	0.934	526	12 (2.9%)	2.06	0.713	402	23 (3.4%)	2.11	0.860
<i>Stimulation</i>												
13. Are your activities challenging to you?	924	21 (2.2%)	2.58	0.976	526	12 (2.9%)	2.24	0.848	402	26 (3.8%)	2.32	0.976
14. Do you really enjoy your activities?	930	15 (1.6%)	2.97	0.850	527	11 (2.7%)	2.64	0.846	403	20 (2.9%)	2.64	0.990
15. How often are you fully concentrated when doing something?	932	13 (1.4%)	2.76	0.814	526	11 (2.7%)	2.62	0.803	403	21 (3.1%)	2.53	0.921

Table 3
Model fit of the SPF-ILs for the study samples.

Sample and model	χ^2 (p)	RMSEA	CFI	SRMR
Community-dwelling older adults (n = 943) ^a				
Model 1: 15 items	534.631 (0.0)	0.044	0.990	0.045
Frail older persons (n = 409) ^b				
Model 1: 15 items	379.939 (0.0)	0.051	0.981	0.061
Older Turkish migrants (n = 672) ^c				
Model 1: 15 items	927.328 (0.0)	0.072	0.975	0.079
Model 2: 14 items	800.161 (0.0)	0.071	0.979	0.074

Multiple imputed data, obtained with an expected maximization algorithm, are presented.

^a After exclusion of two respondents who did not fill in any of the well-being questions.

^b After exclusion of five respondents.

^c After exclusion of eight respondents.

higher affection and behavioral confirmation levels, but lower status compared with men. However, the expected higher comfort level for older men than for older women was not found. Status production was more difficult and affection levels were higher in older people. The stimulation data also show an age effect. The reduction in the comfort level was not significant, although the comfort score was significantly higher in the youngest age group (70–74 years) than in all other age groups combined [70–74 (n = 344) vs. 75+ (n = 567) years: 2.71 ± 0.79 vs. 2.58 ± 0.84; t = 2.26, p < 0.05]. Status and stimulation levels were higher among older persons with partners, high education levels, and high incomes.

We also checked SPF-ILs scores in the frail and Turkish samples according to socio-demographic characteristics (see appendix Tables 1 and 2). Given that the frail are more often female, of older age, and single (Table 1), we expect less variation in their SPF-ILs scores compared to the general community sample. Within the Turkish population, we know that the majority has a low income level and older people receive more status; we therefore did not expect age-related status declines or differences between low and high income older Turkish migrants as we did in the general community sample. Results presented in the appendix (Tables 1 and 2) support these expectations.

3.3. Comparative well-being

Levels of affection, behavioral confirmation, and status were higher among Turkish migrants than among community-dwelling and frail older natives (Table 7). Comfort and stimulation levels were lower for frail older people and Turkish migrants than for community-dwelling older people in general. The overall level of well-being was higher among community-dwelling older people in general than among frail older people, but highest among older Turkish migrants due to higher levels of affection, behavioral confirmation, and status.

4. Discussion

The results of this study show that the SPF-ILs is a reliable and valid instrument for the assessment of well-being and its component dimensions in older populations. Confirmatory factor analyses revealed good indices of fit for the SPF-ILs, providing support for the use of SPF theory to assess older persons' well-being. The only concern was an RMSEA value of 0.07 in the Turkish migrant sample, but this value still indicates reasonable fit with the use of a stringent upper limit of 0.07, according to general consensus (Hooper et al., 2008; Steiger, 2008).

Although all SPF-ILs items loaded on corresponding latent dimensions in the general and frail older populations, item 13 did not load on the stimulation dimension among older Turkish migrants. This item is intended to assess engagement in stimulating and enjoyable activities, but it also may be interpreted negatively; activities may be challenging because of functional limitations, pain, or fatigue. Further research is needed to determine how older Turkish people interpret this item and to identify the types of activity they have in mind when providing responses.

After the removal of item 13 for the Turkish migrant sample, all SPF-ILs dimensions showed acceptable reliability in all three samples. Inter-factor correlations supported the instrument's construct validity. Good overall reliability was also supported by the high composite reliability index and the detection of a second-order structure, which indicated that the subscales could be accounted for by a single underlying higher-order construct.

Regarding construct validity, the study results largely support H1, as they demonstrate higher levels of affection and behavioral confirmation among women, but higher status among men in the general older

Table 4
SPF-ILs factor loadings.

Item	Community-dwelling older people (n = 943)	Frail older people (n = 409)	Older Turkish migrants (n = 672)
	λ	λ	λ
<i>Affection</i>			
1. Do people pay attention to you?	0.853	0.908	0.833
2. Do people help you if you have a problem?	0.816	0.830	0.773
3. Do you feel that people really love you?	0.865	0.861	0.877
<i>Behavioral confirmation</i>			
4. Do others appreciate your role in the group?	0.667	0.708	0.762
5. Do people find you reliable?	0.620	0.698	0.739
6. Do you feel useful to others?	0.803	0.655	0.697
<i>Status</i>			
7. Do people think you do better than others?	0.806	0.748	0.813
8. Do people find you an influential person?	0.830	0.728	0.760
9. Are you known for the things you have accomplished?	0.851	0.716	0.760
<i>Comfort</i> In the past few months have you felt:			
10. ... relaxed?	0.759	0.725	0.766
11. ... in good health?	0.924	0.810	0.923
12. ... physically comfortable?	0.963	0.928	0.950
<i>Stimulation</i>			
13. Are your activities challenging to you?	0.745	0.719	— ^a
14. Do you really enjoy your activities?	0.898	0.840	0.893
15. How often are you fully concentrated when doing something?	0.743	0.814	0.844

λ = single factor loadings on the intended dimensions. All factor loadings had p values < 0.001. Results are based on data imputed using the expected maximization algorithm.

^a Item 13 was excluded from the analysis for the Turkish migrant sample because it did not load on the intended factor.

population. Although the status gap between men and women is closing (OECD, 2013), the results of this study confirm that it persists among older people. The onset and increasing severity of limitations begin before late-middle and old age, but we found little evidence suggesting that health inequalities decline with age (Vlassoff, 2007; OECD, 2013). The conceptualization of physical comfort in terms of feeling relaxed, in good health, and physically comfortable may be less prone to reveal gender differences, especially because these concepts are not related directly to physical limitations. The study hypotheses did not address a difference in stimulation between older men and women, and we found no such difference among the general and frail older populations. Although women participate in a larger diversity of activities than do men (van Eijk, 1997), activity types differ between genders. Women, for example, more often participate in hobby/cultural groups and senior citizens' clubs, whereas men more often participate in volunteer groups, sports groups, and neighborhood/community associations (Tomioka et al., 2017). Optimal stimulation is obtained by the selection of an activity repertoire that provides a satisfying level of challenging and interesting activities, which may be as easy (or difficult) to obtain for men as for women.

For H2, the expected age effects were found for status and stimulation, the production of which is increasingly difficult in older age groups. For comfort, however, we found a significant difference only between the youngest and oldest age groups. Higher affection levels in the older age groups were in accordance with our expectations. This

finding may point to substitution as a response to losses in other need-related goals (status, stimulation, and comfort). However, given the cross-sectional nature of the data, we could not test whether the higher affection levels in the oldest age groups were due to substitution processes. We did not expect to find differences in behavioral confirmation among age groups because older persons try to increase this aspect to substitute for losses in other domains, despite the loss of important activities, which makes the production of behavioral confirmation more difficult (Steверink, 2001). For example, older persons report providing more emotional support to others as they age, when the provision of instrumental support becomes more difficult (Van Tilburg et al., 1995). The production of affection depends less on activity patterns, facilitating its function as a substitute for losses. Higher affection levels in older age groups are in line with the existence of buffers built over the life course, which protect the production of affection as one ages. The cross-sectional design of our study, however, did not allow us to distinguish between buffering and substitution processes (Nieboer and Lindenberg, 2002).

As expected, older persons with partners, higher education, and high incomes reported higher status and stimulation levels than did those who lacked these resources. These findings confirm H3 and are important, given that older people without such resources are at greater risk of deterioration of well-being (Barnes et al., 2006; Lyons et al., 2009), beginning with lower status and stimulation levels. Interventions targeting people's ability to maintain these levels, for example, by

Table 5A
Scale characteristics and (inter)correlations of the SPF-ILs, community sample.

	Cronbach's alpha	1	2	3	4	5
1. Affection	0.836					
2. Behavioral confirmation	0.652	0.553***				
3. Status	0.807	0.300***	0.522***			
4. Comfort	0.872	0.181***	0.305***	0.202***		
5. Stimulation	0.779	0.254***	0.417***	0.386***	0.469***	
6. Overall	0.837 ^a	0.666***	0.792***	0.674***	0.631***	0.717***

***p < 0.001 (two-tailed).

^a Composite reliability score based on standardized factor loadings and error variances.

Table 5B
Scale characteristics and (inter)correlations of the SPF-ILs, frail older people sample.

	Cronbach's alpha	1	2	3	4	5
1. Affection	0.836					
2. Behavioral confirmation	0.631	0.472***				
3. Status	0.705	0.192***	0.440***			
4. Comfort	0.768	0.161***	0.132**	0.135**		
5. Stimulation	0.773	0.220***	0.341***	0.319***	0.313***	
6. Overall	0.781 ^a	0.660***	0.744***	0.632***	0.513*	0.674***

****p* < 0.001 (two-tailed).

^a Composite reliability score based on standardized factor loadings and error variances.

maintaining important activities, may help to protect against such deterioration.

Regarding H1-3 within the other populations, it stands to reason that we found less variation among frail older people in SPF-ILs scores compared to the general community sample, given that frail older persons are more often female, older and single. Also, as expected, no age-related status declines or differences between low and high income older Turkish migrants were found as we did in the general community sample.

In accordance with the findings of [Palmerberg \(2017\)](#) and in confirmation of H4, the older Turkish migrants in our study reported greater social well-being than did (frail) older Dutch natives. This finding is interesting, given that most research conducted among older Turkish migrants to date has documented higher levels of depression and greater loneliness ([Fokkema and Naderi, 2013](#); [Van der Wurff et al., 2004](#)). These studies, however, were conducted among people aged 55–74 and 50–79 years, respectively, whereas we investigated Turkish migrants aged ≥ 65 years. Given their status in the Muslim community, these individuals may experience higher levels of social well-being and the need-related goals of affection, behavioral confirmation, and status.

In line with the findings of [van der Gref and Droogleeve Fortuijn \(2017\)](#), we found a markedly lower physical comfort level among Turkish migrants than in the general population of community-dwelling older people. In addition, and as expected, migrants reported lower stimulation levels. Physical well-being levels were also lower among frail older people than in the general older population. These results confirm H5. We found no differences between the older general and frail populations in the behavioral confirmation or status level, but frail older people reported higher levels of affection, possibly pointing to substitution processes. The only differences between frail older people and Turkish migrants, favoring the latter, were related to social well-being.

The data partially support H6. As expected, we found greater overall well-being in the general older population than among frail older people. Furthermore, levels of need-related goals to achieve well-being, as well as overall well-being, were lower among (frail) older people compared with the general Dutch population aged 18–65 years. In the analysis used to develop the SPF-ILs ([Nieboer et al., 2005](#)), we found

that affection [mean 3.02, standard deviation (SD) 0.48], behavioral confirmation (mean 3.18, SD 0.43), status (mean 2.09, SD 0.63), comfort (mean 2.78, SD 0.70), stimulation (mean 3.03, SD 0.56), and overall well-being (mean 2.82, SD 0.35) levels were significantly higher in the general adult population (aged 18–65 years) than among community-dwelling older people (aged ≥ 70 years) in the current study. These findings support the increased difficulty of realizing these need-related goals with increasing age ([Steverink, 2001](#)), and the ability of the SPF-ILs to measure these changes over time.

Our analysis yielded unexpected results regarding the overall well-being of older Turkish migrants. Although we expected greater social well-being and lesser physical well-being, we did not expect greater overall well-being among Turkish older people compared with the general older population. We checked whether this result was due to the difference in inclusion criteria regarding age (≥ 65 years vs. ≥ 70 years). Additional analyses revealed no significant differences in need-related goals between Turkish older people aged 65–70 years and those who were older. The (U-shaped) relationship between age and well-being might differ between the Turkish and general Dutch populations, as found previously among other populations ([Graham and Pozuelo, 2017](#)). The Turkish population may experience lesser well-being until around the age of 60 or 65 years, but better social and overall well-being compared with the general Dutch older population at older ages. Earlier research also showed that Turkish migrants in the Netherlands are deprived in terms of health status and chronic diseases, but given their strong social network and the rarity of single marital status, for example, they are not necessarily a vulnerable group ([SCP, 2004](#)).

The combination of the three social and two physical goals into one overall score likely explains the differences in findings among samples as compared with previous findings. Although we validated the instrument in various populations using the same weight for each goal, appropriate weights may vary across populations. A theory to distinguish the weights of the five need-related goals is currently lacking ([Nieboer et al., 2005](#)). Theoretically, the overall measure of well-being is defined by a Cobb–Douglas function of these goals ([Lindenberg, 1996](#)), which are assumed to be “needs” up to a certain point, after which they become “wants” (having little of one can be compensated by obtaining more of another). For this reason, the measure must allow a

Table 5C
Scale characteristics and (inter)correlations of the SPF-ILs, older Turkish migrant sample.

	Cronbach's alpha	1	2	3	4	5
1. Affection	0.801					
2. Behavioral confirmation	0.618	0.592***				
3. Status	0.758	0.383***	0.622***			
4. Comfort	0.859	0.182***	0.271***	0.284***		
5. Stimulation	0.442 ^a	0.236***	0.351***	0.392***	0.341***	
6. Overall	0.866 ^b	0.680***	0.807***	0.777***	0.601***	0.644***

****p* < 0.001 (two-tailed).

^a 0.795 without item 13.

^b Composite reliability score based on standardized factor loadings and error variances without item 13. In SPSS: Cronbach's alpha is .759 without item 13 (.740 with item 13 in SPSS).

Table 6
Average SPF-ILs scores in the community sample.

	Affection	Behavioral confirmation	Status	Comfort	Stimulation
Sex					
Male	2.49 (0.79)	2.78 (0.73)	1.97 (0.73)	2.59 (0.84)	2.78 (0.73)
Female	2.73 (0.83)*	2.92 (0.73)*	1.85 (0.76)*	2.69 (0.80)	2.77 (0.74)
Age (years)					
70–74	2.54 (0.83)	2.87 (0.74)	1.99 (0.75)	2.71 (0.79)	2.86 (0.69)
75–79	2.63 (0.79)	2.81 (0.71)	1.89 (0.71)	2.55 (0.81)	2.71 (0.73)
80–84	2.68 (0.82)	2.93 (0.69)	1.88 (0.76)	2.61 (0.89)	2.74 (0.78)
85 +	2.79 (0.84)*	2.82 (0.79)	1.67 (0.74)*	2.62 (0.86)	2.69 (0.78)*
Marital status					
Married	2.54 (0.80)	2.86 (0.70)	1.98 (0.74)	2.77 (0.77)	2.84 (0.69)
Widowed/divorced	2.72 (0.83)*	2.86 (0.75)	1.86 (0.75)*	2.55 (0.85)*	2.73 (0.76)*
Education					
Low	2.67 (0.84)	2.89 (0.72)	1.80 (0.73)	2.47 (0.86)	2.68 (0.75)
High	2.61 (0.82)	2.76 (0.76)*	1.93 (0.75)*	2.68 (0.81)*	2.80 (0.73)*
Income					
Low	2.59 (0.85)	2.78 (0.75)	1.82 (0.73)	2.49 (0.83)	2.66 (0.77)
High	2.65 (0.80)	2.93 (0.70)*	1.99 (0.75)*	2.77 (0.78)*	2.87 (0.68)*

Data are presented as mean (standard deviation).

Table 7
Mean SPF-ILs scores in the three samples.

	Community-dwelling older people (n = 945)	Frail older people (n = 414)	Older Turkish migrants (n = 680)
Affection	2.63 (0.82) ^{a,b}	2.97 (0.75) ^{a,c}	3.22 (0.74) ^{b,c}
Behavioral confirmation	2.86 (0.73) ^b	2.88 (0.68) ^c	3.20 (0.67) ^{b,c}
Status	1.90 (0.75) ^b	1.98 (0.66) ^c	2.75 (0.81) ^{b,c}
Comfort	2.63 (0.82) ^{a,b}	2.10 (0.60) ^a	2.11 (0.76) ^b
Stimulation ^d	2.77 (0.74) ^{a,b}	2.50 (0.69) ^a	2.50 (0.67) ^b
Overall ^d	2.56 (0.53) ^{a,b}	2.48 (0.44) ^{a,c}	2.76 (0.51) ^{b,c}

Data are presented as mean (standard deviation).

^a $p < 0.01$, community-dwelling older people vs. frail older people.

^b $p < 0.01$, community-dwelling older people vs. older Turkish migrants.

^c $p < 0.01$, frail older people vs. older Turkish migrants.

^d The 15-item SPF-ILs was used for all three samples. Without item 13, the stimulation score was 2.58 (0.87) and the overall SPF-ILs score was 2.77 (0.55) for older Turkish migrants.

low score for any need-related goal to reduce the overall well-being score. A Cobb–Douglas function is well suited for expressing these relations, but we used summed need-related goal scores because the overall scores based on the Cobb–Douglas function were quite similar ($r = 0.99$). However, this approach may not have captured appropriate weighting. Further development of this well-being indicator might involve adjustment of the exponents for application to particular groups or cultures. In principle, the exponents can be considered to be open parameters that can be estimated for particular populations. Unfortunately, we did not have similar outcome measures across samples that could help us to establish these parameters.

An important strength of this study is the inclusion of three large older populations. A limitation is the lack of an alternative measure of subjective well-being, such as Cantril's ladder or an examination of depressive symptomatology. SPF theory states that physical and social well-being can be substituted for one another to only a limited degree; certain levels of both are required to achieve overall subjective well-

being. Establishment of these substitution limits requires longitudinal data and other measures of well-being to assess the impact of low levels of, for example, physical well-being on overall well-being or life satisfaction in older populations. Another limitation is the response rate among the Turkish migrant older population (32%). While non-response analyses revealed no difference in gender between respondents and non-respondents, their mean age did differ significantly (72.11 [SD = 5.10] non-responders versus 72.90 [SD = 5.02] responders). We do not know if for the Turkish sample those with worse satisfaction of social needs did not respond, in which case the higher scores on status, behavioral confirmation, and affection would be overrepresented due to selection effects. The response rate, however, was expected given that contact and response rates are generally low among ethnic minorities, especially Turks (Schellingerhout, 2004; Schmeets, 2005). Non-response may be reduced by further increasing the number of contact attempts and lengthening the period of data collection (Schmeets, 2005), which was not possible in the current study. Finally, we investigated older populations in the Netherlands only. Investigating well-being and need-related goals to achieve well-being among older populations in other countries are needed for study comparison.

5. Conclusions

In a time of aging populations, an enormous increase in frailty within them, and millions of Turkish migrants reaching retirement age, examination of the ability of these populations to achieve well-being has become increasingly important. Valid, reliable instruments for well-being assessment in (frail) older populations and across ethnic groups are needed. This study showed the SPF-ILs is a valid and reliable instrument for the assessment of well-being and need-related goals to achieve it in older general, frail, and Turkish migrant populations in the Netherlands. Comparison of findings across samples provided clear insight into differences in the realization of physical (comfort and stimulation) and social (affection, behavioral confirmation, and status) goals. These findings are important in global efforts to maintain and address any deterioration of older people's well-being.

Appendix 1

Table 1
Average SPF-ILs scores in the frail older people sample.

	Affection	Behavioral confirmation	Status	Comfort	Stimulation
Sex					
Male	2.77 (0.72)	2.76 (0.63)	1.96 (0.64)	2.10 (0.59)	2.48 (0.63)
Female	3.08 (0.75)*	2.95 (0.71)*	1.99 (0.66)	2.10 (0.61)	2.51 (0.72)
Age (years)					
70–74	2.75 (0.76)	2.84 (0.70)	2.05 (0.68)	2.07 (0.53)	2.49 (0.66)
75–79	2.92 (0.77)	3.00 (0.66)	2.09 (0.69)	2.09 (0.58)	2.57 (0.66)
80–84	2.99 (0.81)	2.84 (0.70)	1.82 (0.62)	2.14 (0.63)	2.51 (0.75)
85+	3.18 (0.61)*	2.84 (0.67)	1.96 (0.61)*	2.09 (0.65)	2.42 (0.68)
Marital status					
Married	2.93 (0.73)	2.86 (0.65)	2.05 (0.69)	2.04 (0.63)	2.58 (0.63)
Widowed/divorced	2.98 (0.76)	2.88 (0.70)	1.93 (0.63)	2.12 (0.59)	2.46 (0.71)
Education					
Low	3.04 (0.80)	2.86 (0.73)	1.99 (0.67)	2.07 (0.61)	2.32 (0.73)
High	2.95 (0.73)	2.88 (0.67)	1.96 (0.63)	2.11 (0.60)	2.55 (0.67)*
Income					
Low	2.99 (0.75)	2.87 (0.75)	1.93 (0.63)	2.07 (0.59)	2.50 (0.68)
High	2.96 (0.73)	2.89 (0.62)	2.00 (0.62)	2.11 (0.61)	2.47 (0.67)

Data are presented as mean (standard deviation).

Table 2
Average SPF-ILs scores in the older Turkish migrant sample.

	Affection	Behavioral confirmation	Status	Comfort	Stimulation ^a
Sex					
Male	3.12 (0.79)	3.25 (0.67)	2.85 (0.79)	2.29 (0.81)	2.52 (0.69)
Female	3.33 (0.68)*	3.15 (0.66)	2.65 (0.81)*	1.91 (0.64)*	2.48 (0.64)
Age (years)					
65–69	3.18 (0.74)	3.24 (0.63)	2.78 (0.76)	2.20 (0.79)	2.56 (0.67)
70–74	3.17 (0.79)	3.22 (0.68)	2.76 (0.85)	2.04 (0.74)	2.49 (0.65)
75–79	3.30 (0.67)	3.21 (0.66)	2.72 (0.79)	2.19 (0.76)	2.39 (0.66)
80–84	3.33 (0.75)	3.10 (0.67)	2.75 (0.78)	1.98 (0.69)	2.63 (0.68)
85+	3.37 (0.78)	2.80 (0.86)	2.60 (0.92)	1.82 (0.70)*	2.31 (0.75)
Marital status					
Married	3.21 (0.74)	3.25 (0.65)	2.80 (0.78)	2.17 (0.76)	2.52 (0.67)
Widowed/divorced	3.25 (0.76)	3.09 (0.69)*	2.61 (0.84)*	1.99 (0.73)*	2.45 (0.66)*
Education					
Low	3.25 (0.72)	3.18 (0.65)	2.72 (0.79)	2.05 (0.71)	2.46 (0.65)
High	3.14 (0.83)	3.29 (0.72)	2.89 (0.83)*	2.36 (0.88)*	2.63 (0.70)*
Income					
Low	3.23 (0.72)	3.18 (0.67)	2.76 (0.79)	2.09 (0.74)	2.50 (0.66)
High	3.06 (0.80)*	3.24 (0.67)	2.79 (0.78)	2.40 (0.77)*	2.64 (0.70)

Data are presented as mean (standard deviation). ^a The 3-item version of the stimulation scale was used. For the 2-item version: Sex (male 2.67 (0.88) and female 2.48 (0.85), $p < .05$); Age (65–69: 2.67 (0.88), 70–74: 2.61 (0.86), 75–79: 2.46 (0.87), 80–84: 2.68 (0.83), 85+: 2.09 (0.85), $p < .05$); Marital status (married 2.61 (0.88) and widowed/divorced 2.50 (0.86), $p = ns$); Education (low 2.52 (0.85) and high 2.83 (0.90), $p < .05$); Income (low 2.58 (0.87) and high 2.83 (0.89), $p < .05$).

Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.socscimed.2018.06.036>.

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