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Functional autonomy measurement system: development of a social subscale

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Abstract

The purpose of this study was to develop a subscale assessing social functioning for the functional autonomy measurement system (SMAF). The development of this new dimension was based on consultations (focus groups and nominal groups) of experts from different health care disciplines in Quebec, Canada, and France. Two interrater reliability studies were carried out with older people presenting a loss of functional autonomy and living either in an institution or at home. With the focus groups, the experts clarified the definition of social functioning and identified the factors involved. The nominal groups were used to construct a subscale composed of six items. The results of the first interrater reliability study showed a mean agreement percentage of 60% for the subscale and an intraclass correlation coefficient (ICC) of 0.70 (CI: 0.57–0.80). The results of the second interrater reliability study showed higher coefficients with an agreement percentage of 74% for the subscale and an ICC of 0.83 (CI: 0.61–0.93). These preliminary results demonstrate that the new social functioning subscale has good reliability, but more studies are needed to show its validity. The new SMAF, including the social functioning subscale, should help clinicians and researchers to obtain a comprehensive profile of functional autonomy. It could also contribute to the improvement of

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health care for older people.

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1. Introduction

It is now well established that the percentage of older people in the population is increasing and that they are living longer. However, longer life is not necessarily associated with good health. In fact, ageing is accompanied by biological, psychological, and social vulnerability which can result in a loss of functional autonomy in many older people who could need health care to reduce disabilities and prevent the development of handicap situations.

To facilitate the planning of care, it is important to adequately assess the level of functional autonomy. The evaluation generates a profile of functional abilities and disabilities and can be used to adjust the care given to elders. Generally, functional autonomy measuring instruments primarily assess activities of daily living and mobility. Some also consider instrumental activities, mental functions and communication. One of these is the functional autonomy measurement system (SMAF), a 29-item scale based on the WHO classification of disabilities (Hébert et al., 1988; Desrosiers et al., 1995).

The SMAF measures functional ability through five subscales: activities of daily living, mobility, communication, mental functions, and instrumental activities of daily living. Disability on each item is scored on a five-point scale: 0 (independent), −0.5 (difficulty), −1 (needs supervision), −2 (needs help), and −3 (dependent). The SMAF must be administered by a health professional who obtains information on the subject either by questioning the subject and proxies, or by observing and even testing the subject. The interviewer scores the ability of the subject to perform each task. Validation studies have demonstrated that the SMAF has excellent psychometric properties (Hébert et al., 1988; Desrosiers et al., 1995).

However, to date and to our knowledge, there are no functional autonomy measuring instruments, including the SMAF, that evaluate the social functioning of older people.

The term 'social functioning' is widely used in the literature but is often undefined. According to MontPlaisir and Tremblay (1986), social functioning is a concept involving different social aspects such as social relationships, social behaviours, and social activities. In fact, when reference is made to the broad concept of social functioning, it is generally related to social participation (Starr et al., 1983; MontPlaisir and Tremblay, 1986; Kane, 1987; Bennet and Morgan, 1992), social network, social support (Kane, 1987; Bennet and Morgan, 1992), social resources, social relationships (Starr et al., 1983; Kane, 1987), and social roles (Starr et al., 1983; Bloom and Spiegel, 1984; Kane, 1987 Williams et al., 1989; Patterson et al., 1997).

Many studies have shown that a decrease in one of the components of social functioning is associated to an increase of the risk of mortality and morbidity (Bangerter and Smith, 1981; Fabrigoule et al., 1985; Adams et al., 1989; O'Connor, 1995; Lang et al., 1997; Su and Ferraro, 1997; Unger et al., 1997). In fact, when social functioning is optimal, it can help to maintain and restore a person's health. It seems, therefore, that social functioning may have a substantial impact on health and functional autonomy and thus it becomes essential to consider it.

The aims of the present study were: (1) to develop items measuring social functioning in order to add them to the SMAF; and (2) to verify the interrater reliability of this new subscale.

2. Method

2.1. Items development

The items were developed through two types of expert panels (focus groups and nominal group technique) organised in Quebec, Canada, and France (Fig. 1). Twenty-five health workers from different fields (medicine, nursing, psychology, social work, occupational therapy and recreology), whose work environment relates to the social aspect of older people in a clinical or research setting, participated in one of the three focus groups and one of the two nominal groups.

The focus group technique was used to allow the experts to gain a similar understanding of social functioning. In fact, according to the experts, social functioning could be related to a person's ability to have social relationships, to maintain significant emotional ties, to interact with the social network, to be socially

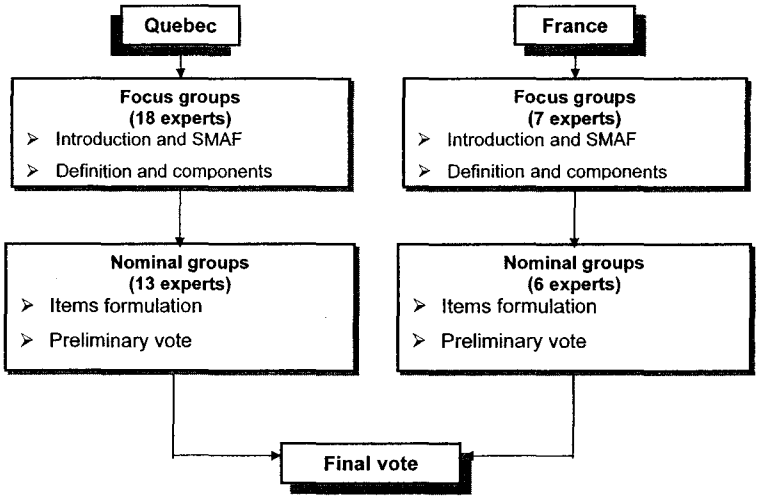

Fig. 1. Items development of the SMAF social subscale.

active, and to adapt to the environment. Furthermore, the experts consider that social functioning is composed of social relationships, social resources, social network, social support, social and leisure activities, and social roles.

The nominal groups were used to develop the items of the new subscale. During these group sessions, the experts were first asked to write items (in silence and by themselves) that they thought best represent social functioning. Then, one at a time going round the table, the experts discussed and clarified the items they proposed. Afterwards, during the preliminary vote, the experts each had to choose five items, which they thought were most representative of social functioning. The items voted by the French and the Canadian experts were grouped together. The development procedure ended with a final vote where, for a second time, the experts were asked to pick five items, which they thought should be on a social functioning subscale. The first version (1.0) emerged from this procedure.

The nominal group technique generated six items related to social activities, social relationships, social network, respect for others, social role, and assertiveness. The SMAFs four-point rating scale [0 (independent) to −3 (dependent)] was applied to the new subscale for the sake of uniformity. Furthermore, this type of rating should allow the professional to get a good overview of the social autonomy of older people. The scores on each item are added to obtain a total score of 18 for the subscale.

2.2. Interrater reliability study, version 1.0

Because of the subjective nature of the new subscale and because the SMAF is often used by more than one person in clinics and in research and at different times, the interrater reliability of the new subscale was verified.

The study was carried out in Quebec and France. To be eligible, the participants had to present a decrease in functional autonomy, to live in an institution or at home, to show no signs of cognitive impairment, and to be 55 years of age or older. In Quebec, the participants living in institutions were recruited in four long term care units at the Sherbrooke Geriatric University Institute (SGUI). Those living at home were recruited from the SGUI day hospital. The French participants living at home were selected in a geriatric community health care centre and those living in institutions were recruited in a long term care hospital.

The participants were assessed twice by two different interviewers (a nurse and a research assistant with university training in psychology) who had previously received training in administering the SMAF. There was a 24–72 h interval between the two evaluations. The interview order was randomised, with half the participants being assessed by the nurse first and the other half by the research assistant first. The information was obtained by questioning each participant directly. The high number (29) of items in the SMAF should have decreased potential memory bias.

2.3. Interrater reliability study, version 1.1

An improved version of the social functioning subscale (see Appendix A) was obtained after analysing the results of the first interrater reliability study. In order to

increase the exclusiveness of the subscale, the wording of the scoring scale and some of the items were modified and clarified.

The second interrater reliability study was carried out only in Quebec. This time, to be eligible for the study, the participants had to show signs of cognitive impairment and live in an institution. However, like the participants in the first study, they also presented a decrease in functional autonomy and were 55 or older. They were recruited in two long term care units at the SGUI.

The participants were assessed twice by two different interviewers and the interview order was randomised. There was a 24–72 h interval between the two evaluations. Because the participants showed signs of cognitive impairment, it was not possible to question them directly. As a result, the information was obtained by interviewing only their nurses.

3. Statistical analysis

All the data from the interrater reliability studies were analysed using the SPSS System for Windows, version 10.0. Cohen's weighted kappas were calculated in order to verify the level of agreement between the interviewers for each of the six items. Weighted kappas take into account the probability of agreement due to chance and weights the disagreement according to the magnitude of the difference in the scores (Cohen, 1960, 1968).

The reliability of the total score on the six items was also estimated with the intraclass correlation coefficient (ICC), which is obtained by an analysis of variance comparing the within-subject variability with the between-subject variability (Fleiss, 1986; Bravo and Potvin, 1991). Finally, to ensure that there were no biases related to the interview time and the interviewers, paired t-tests on the mean difference were calculated.

4. Results

4.1. Interrater reliability study, version 1.0

Seventy-eight people aged 57–96 ($\bar{x} = 77.5$; SD = 8.3) participated in the study. Table 1 shows their characteristics.

The agreement percentages between the interviewers were 60% for the subscale and ranged from 47 (social activities) to 81% (respect for others) for the different items (Table 2). Cohen's weighted kappas (k_w) varied from 0.25 (social network) to 0.49 (social activities), suggesting a slight to moderate agreement between the interviewers (Table 2). The ICC obtained was 0.70 (Table 3). No bias was detected between measurement times and between the interviewers.

The results of this first study demonstrated that version 1.0 showed some weaknesses. The wording of the items and the scoring scale was not exclusive enough, which could have reduced the percentage of agreement between the judges.

Table 1
Sociodemographic profile of the participants in the interrater reliability studies

	Version 1.0			Version 1.1
	Quebec	France	Quebec–France	Quebec
	$n = 39$	$n = 39$	$n = 78$	$n = 19$
Age				
Years	75 (7.4)[a]	80 (8.3)	77.5 (8.3)	81.9 (7.4)
Range	57–89	62–96	57–96	62–92
Gender				
Men	17 (44%)[b]	13 (33%)	30 (38%)	3 (16%)
Women	22 (56%)	26 (67%)	48 (62%)	16 (84%)
Marital status				
Single	2 (5%)[b]	3 (8%)	5 (6%)	2 (10%)
Divorced	6 (15%)	2 (5%)	8 (10%)	1 (5%)
Married	18 (33%)	10 (26%)	28 (36%)	6 (32%)
Widowed	13 (47%)	24 (61%)	37 (48%)	10 (53%)

[a] Mean (SD).
[b] Frequency (%).

From the analysis of the weighted kappas, it was determined that the disagreements were mostly at one level and mainly between the scores 0 and 1. As a result, the entire subscale was reviewed, modified, and clarified. A second version of the subscale was then obtained (version 1.1).

Table 2
Agreement percentages and Cohen's weighted kappas, version 1.0

	Quebec ($n = 39$)	France ($n = 39$)	Quebec–France ($n = 78$)
Social activities	46%[a]	49%	47%
	0.35 (0.16–0.55)[b]	0.48 (0.30–0.65)	0.49 (0.37–0.60)
Social relationships	74%	56%	65%
	0.44 (0.15–0.74)	0.38 (0.14–0.62)	0.42 (0.23–0.61)
Social network	61%	36%	49%
	0.23 (−0.10–0.57)	0.16 (−0.08–0.40)	0.25 (0.06–0.43)
Respect for others	92%	69%	81%
	0.54 (0.04–1.04)	0.24 (−0.11–0.60)	0.33 (0.02–0.63)
Social roles	59%	54%	56%
	0.37 (0.11–0.63)	0.44 (0.22–0.67)	0.48 (0.31–0.63)
Assertiveness	67%	51%	59%
	0.18 (−0.24–0.61)	0.24 (−0.06–0.55)	0.28 (0.05–0.51)
Total subscale (%)	66	53	60

[a] Agreement percentage.
[b] k_w (95% CI).

Table 3
ICCs, version 1.0

	Rater 1, R1	Rater 2, R2	R1–R2	*P* value	ICC*
Quebec (/18)	2.2 (2.1)[a]	2.3 (3)	−0.1 (0.3)	0.68	0.68[b] (0.47–0.82)
France (/18)	5.0 (3.1)	5.4 (3.8)	−0.4 (3.1)	0.41	0.60 (0.35–0.77)
Quebec–France (/18)	4.4 (3.7)	3.9 (3.7)	0.5 (0.3)	0.12	0.70 (0.57–0.80)

[a] Mean (SD).
[b] k_w (95% CI).
* Intraclass correlation coefficients.

Table 4
Agreement percentages and Cohen's weighted kappas, version 1.1

	Agreement percentages (%)	Cohen's weighted kappas (k_w)
	($n = 19$)	($n = 19$)
Social activities	74	0.67 (0.43–0.92)[a]
Social relationships	37	0.38 (0.11–0.65)
Social network	100	1
Respect for others	68	0.67 (0.43–0.91)
Social roles	89	0.81 (0.56–1.06)
Assertiveness	79	0.74 (0.49–0.98)
Total subscale	74.5	

[a] k_w (95% CI).

4.2. *Interrater reliability study, version 1.1*

Nineteen participants aged 62–92 ($\bar{x} = 81.9$; SD = 7.4) participated in the study (Table 1).

The results of the second interrater reliability study showed higher coefficients with agreement percentages of 74% for the total subscale and between 37 (social relationships) and 100% (social network) for the different items (Table 4). The k_w varied from 0.38 (social relationships) to 1 (social network), suggesting a moderate to almost perfect agreement (Landis and Koch, 1977) (Table 4). The ICC was 0.83 (Table 5). No bias was detected between the measurement times and between the interviewers.

Table 5
ICCs, version 1.1

	Rater 1, R1	Rater 2, R2	R1–R2	*P* value	ICC*
Social functioning (/18)	12.2 (3.4)[a]	11.9 (3.3)	0.32 (2.1)	0.53	0.83[b] (0.61–0.93)

[a] Mean (SD).
[b] k_w (95% CI).
* Intraclass correlation coefficients.

5. Discussion

The objectives of this study were to develop items measuring social functioning for the SMAF and to verify the interrater reliability of this new subscale.

The expert panels constituted a valuable tool to validate the scientific literature and the content of the subscale, and to obtain a clearer definition of social functioning. The definition of social functioning produced by the experts was consistent with that found in the literature. In fact, according to MontPlaisir and Tremblay (1986), social functioning is a concept that covers different aspects such as social relationships, social attitude, and social activities. The expert panels were also helpful in constructing the six social functioning items. The items developed attempt to measure a person's autonomy and ability to perform social behaviours. Given the similarity in the vision of social functioning of the Canadian and French experts, a single subscale for both cultures could be constructed.

The results of the first interrater reliability study demonstrated that the agreement between the interviewers was slight to moderate (Landis and Koch, 1977). Also, some kappas (0.25–0.49) in the first study were clearly lower than the agreement percentages (47–81%) associated with them. For example, with item #4 (respect for others), an agreement percentage of 81% was observed while a k_w of 0.33 was calculated. According to Feinstein and Cicchetti (1990), the distribution of the scores in a matrix could play an important role in the interpretation of the kappas. When there is a marginal distribution of the data, where the majority of the participants get the same score, a low k_w can be observed even though there is a good agreement percentage (Feinstein and Cicchetti, 1990).

However, the subscale did show some weaknesses and its level of reliability was not acceptable. Some changes in the wording of the scoring scale and the items were made in order to improve the subscale, and the reliability of the second version needed to be verified. The results of the second interrater reliability study showed that the agreement between the interviewers rose to moderate to almost perfect (Landis and Koch, 1977). According to the latter authors, kappas between 0.61 and 0.80 are acceptable.

Even though the results of the second interrater reliability study demonstrated higher and more acceptable coefficients, the increase might not necessarily be due to the improvement of the subscale. The interview procedure and participants were not the same as in the first study. However, the interview procedure followed was the one usually used with older people showing cognitive impairments. Also, the nurses interviewed might have been more consistent in their answers. They might have asked the interviewers to clarify some of the questions whereas the participants in the first study might not have. Furthermore, the distribution of the data was more balanced in the second study. All these aspects might have influenced the reliability coefficients of the second version.

We are confident that the modifications made to the first version were appropriate. However, more validation studies need to be carried out in order to clarify and address this point. Finally, we believe that this new subscale, added to the SMAF, should help clinicians and researchers to obtain a more comprehensive profile of functional autonomy.

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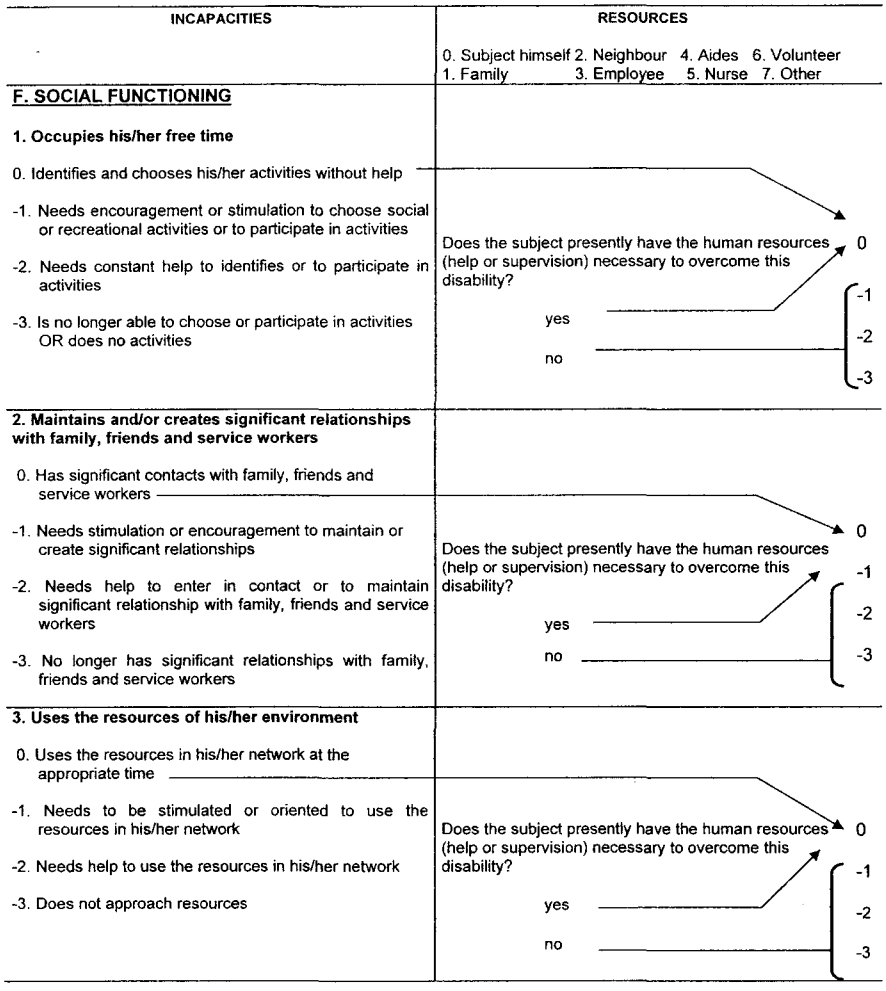
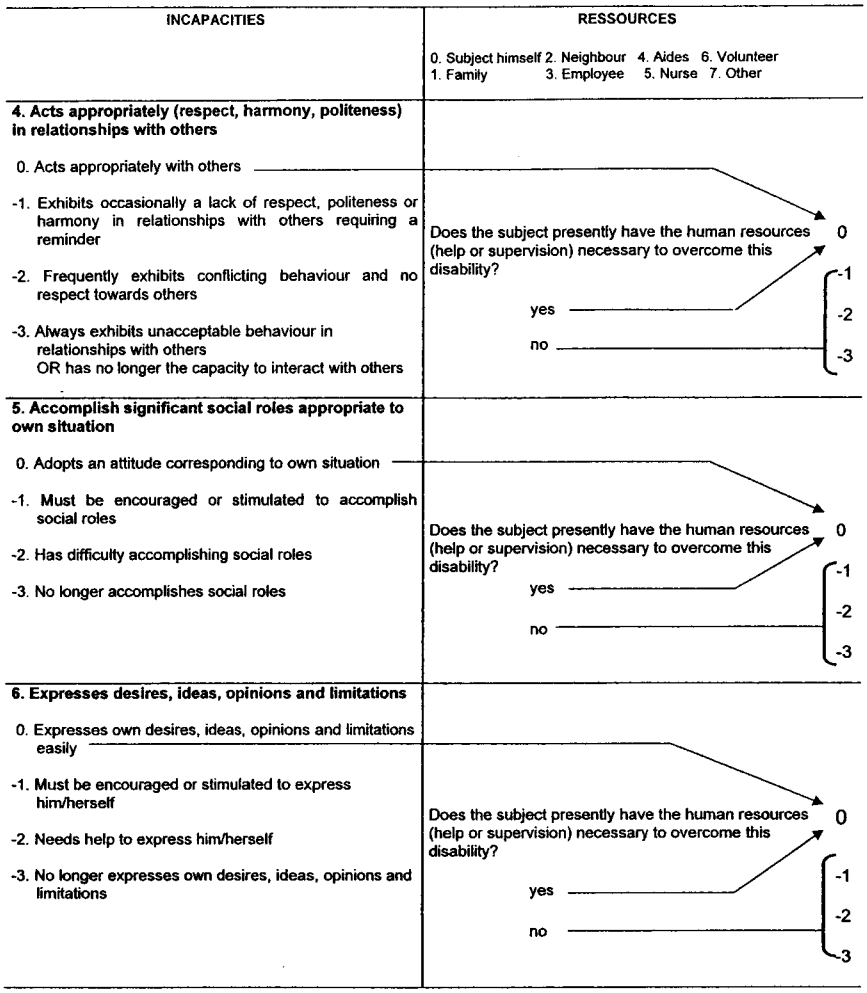
Appendix A: The social functioning subscale, version 1.1





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