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## AN INTERNATIONAL STUDY ON MEASURING SOCIAL SUPPORT: INTERACTIONS AND SATISFACTION\*

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**Abstract**—Recently, a new instrument was developed to measure social support. It consists of two parts: the Social Support Questionnaire for Transactions (SSQT) and the Social Support Questionnaire for Satisfaction with the supportive transactions (SSQS). The SSQT measures the number of supportive interactions and has proved to have good psychometric properties. From the taxonomy that was used for the present study, it results that social support in general consists of two aspects. These are, on the one hand, actual supportive transactions and, on the other hand, the perception of being supported or the satisfaction with the social support provided. In the present study, two research questions were addressed. The first concerned the psychometric properties of the SSQS, measuring the individual's satisfaction with the supportive interactions provided. Secondly, the relative contribution of both supportive interactions (the SSQT) and the satisfaction with the support provided (the SSQS) were assessed, in explaining the level of health related quality of life outcome. The data of 744 rheumatoid arthritis (RA) patients from four different countries (116 French, 238 Norwegian, 98 Swedish and 292 Dutch patients) were used in the present study. At the entry of the study, all patients fulfilled four out of seven American Rheumatism Association (ARA) criteria and had a disease duration of 4 years or less. The results of the study indicate that the SSQS has good psychometric properties across countries. Cronbach's  $\alpha$  for the emotional support scales was 0.80 or more, and for the instrumental support subscales around 0.60. The standardized regression coefficients demonstrated that, compared to supportive interactions, support satisfaction was more relevant in explaining health related quality of life measures, although it is recommended that the SSQT and SSQS be used to complement each other. Copyright © 1996 Elsevier Science Ltd

**Key words**—social support, supportive interactions, support satisfaction, quality of life

### INTRODUCTION

Over the past two decades, a large number of social support studies has been conducted, using a considerable number of questionnaires for the measurement of social support (see, for example [1–6]). The complexity of the subject is the main reason for this phenomenon, which has led to a lot of confusion both theoretically and empirically. Due to differences in theoretical analysis of the construct, instruments vary and, consequently, the nature of the social support measured will vary as well.

A worthwhile taxonomy of social support was developed by Procidano and Heller [7]. They defined social networks as the social connections provided by the environment. Besides a *structural network component*, comprising a set of properties like density, reciprocity, sex composition and homogeneity of one's network, they also identified a *functional network component*. The latter is being referred to

as “social support” and includes, for example, emotional support, the provision of information, material aid, and companionship. This is what Schwarzer and Leppin have called the *relational content* component of the social network structure [8].

The functional network component (i.e. social support), comprises supportive interactions as well as perceptions of social support. Whereas actual supportive interactions are objective transactions of social support, the perception of being supported depends on the perceptions of the “actors” involved, which is a subjective quality. In former research, perceptions of social support were found to be most closely related to health outcomes [4, 5, 9, 10]. Perceiving certain interactions as being supportive (i.e. the satisfaction with the support provided) is based on the subjective definition of the situation (in terms of “needs”) as well as on the expectations with respect to that situation (e.g. the availability of supportive structures and the experience of having been supported sufficiently in the past). Therefore, the number of interactions gives important information. In its most primary form it indicates the

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presence or absence of supportive interactions. In this respect, Procidano and Heller have stated that as the perception of being supported depends upon supportive interactions, perceived support and the support provided are not identical [7]. Perceived social support is defined by them as "the extent to which an individual believes that his or her need for support, information and feedback are fulfilled". It corresponds to Thoits' definition of social support, which is "...the degree to which a person's basic social needs are gratified through interaction with others" [11]. Both definitions refer to the satisfaction people experience, which depends on both the actual number of supportive interactions that were provided and the need for such supportive interactions. Consequently, although most explicit in the latter definition, the interactions as well as the satisfaction with these supportive interactions are relevant in both.

How exactly the support mechanism works is not completely understood. With respect to supportive interactions, receivers are directly provided with instrumental or material help, information and companionship. These transactions directly contribute to the solution of some kind of problem or desire. What is transmitted in case of supportive interactions with respect to emotional support is more difficult to understand, because these transactions have to do with *feelings* and are, as such, intangible. Satisfaction with the support provided is completely a state of mind and is partly based on supportive interactions that have been provided before. This feeling of being supported (or not) is also intangible and its positive effect on health must be sought in the physiological reactions in the human body [12].

To measure actual social support, an instrument was developed based on the above-mentioned theoretical considerations, which takes both *supportive interactions* and *satisfaction* with these interactions into account. This instrument has been used in a large, multi-centre, international, longitudinal and multi-disciplinary study on "social support and rheumatoid arthritis" and recently Suurmeijer *et al.* [13] have analysed the first part of this social support instrument which assesses supportive interactions or transactions, the Social Support Questionnaire for Transactions (SSQT).

The second part of the social support instrument, developed to measure "satisfaction with supportive transactions", runs parallel to (the subscales and items of) the SSQT and is called the "Social Support Questionnaire for Satisfaction with the supportive transactions" (SSQS).

Based on a further conceptual analysis of the construct of social support, Suurmeijer *et al.* [13] distinguished four main types of social support: a *social-emotional type* vs an *instrumental type* of social support and a "*crisis*" or "*problem-oriented*" type vs an "*everyday*" or "*daily*" type of social support. Built on Lin [14], the daily social-emotional type of

support was further divided into a "social" or "relational" and an "emotional" component. In this manner they arrived at five components or subscales of social support: "Social Companionship" (SC), "Daily Emotional Support" (DES) and "Problem-oriented Emotional Support" (PES) within the social-emotional type of social support, while the instrumental type of social support consisted of the "Daily Instrumental Support" (DIS) and the "Problem-oriented Instrumental Support" (PIS). Together, these components constituted the SSQT. The components or subscales of the SSQT were invariant across four different countries, which makes the SSQT suitable for international comparative research [13]. A satisfactorily internal consistency (Cronbach's  $\alpha$ ) was found for all subscales but one (DIS).

The first aim of this study is to examine the structure and the psychometric properties of the SSQS. Since the SSQS runs parallel with the (items and components of the) SSQT, the SSQS is expected to show the same intended five-component structure as was found for the SSQT. The second purpose of the present study is to explore whether it is preferable to use the SSQT or the SSQS separately or both together. Hereto, the relative contribution of both instruments in explaining the level of quality of life outcome is explored.

## SUBJECTS AND METHODS

### *Subjects*

The European Research on Incapacitating Diseases and Social Support (EURIDISS) is a multi-centre, multi-disciplinary, longitudinal study set up to explore the relationships between several disease variables, social support and a number of quality of life measures among patients with rheumatoid arthritis (RA). Before the start of the study, a number of inclusion and exclusion criteria were formulated in order to obtain samples of RA patients that enabled a comparison between countries [15]. Extensive pilot studies were conducted in France and in The Netherlands in order to test the research protocol and the instruments used [16].

At the entry of the study, the patients were aged 20–70 and all fulfilled four or more out of seven ARA criteria for RA [17]. The patients had a disease duration of 4 years or less. The presence of ARA criteria was assessed by the treating rheumatologist who also determined the year of disease onset, which was the year in which the patient fulfilled the fourth ARA criterion for the first time. Conforming to these criteria, a total number of 744 patients were included, in four countries: 116 French, 292 Dutch, 98 Swedish and 238 Norwegian patients. The non-response rate varied from 12% (The Nether-

lands) to 30% (France). For further information on sample and non-response, see Suurmeijer *et al.* [13].

For the total sample, the mean age of the respondents was 52.4 years (SD 12.3). The mean disease duration was 2.5 years (SD 2.3), and 70% of the respondents were females. Regarding sex, age and disease duration, only a few small differences were found between countries [18].

### Measures

*The SSQT and SSQS.* As mentioned before, a two-part instrument for the assessment of social support was developed by Suurmeijer *et al.* [13]. The first part is referred to as the SSQT and the second as the SSQS (see the Appendix for a complete list of the items). The items were to a certain extent based on the "Social Support List for Transactions and Discrepancies" which resulted from the reliability and validity study on social support and social networks by Van Sonderen [3, 4]. The satisfaction with the social support provided was defined as the *discrepancy* between the actual level and the desired (or needed) level or number of supportive interactions: support satisfaction (or discrepancy) = needed or desired number of supportive interactions – received number of supportive interactions.

Initially, the items of the SSQT and SSQS were formulated in Dutch. Next, the items were translated from Dutch into English by a native English speaker who had mastered the Dutch language. Then, the items were re-translated from English to Dutch, this time by a native Dutch speaker, who had mastered the English language. Discrepancies were discussed. The English version was sent to all EURIDISS participants, who followed the same translation procedure. Because of difficulties with translation, items 4a and 4b were omitted from the French data. These missing values were estimated on the other variables of the subscale by a regression analysis with maximum likelihood estimation. Other missing values were replaced by the item mean in each country.

Each item assessing the level of interactions was directly followed by a question asking about the discrepancy between the actual and the desired number of interactions. An example of one question from both instruments is:

a<sub>(SSQT)</sub> Does it ever happen to you that people are warm and affectionate towards you?

b<sub>(SSQS)</sub> Is this just as much as you need?

All SSQS-items had the b-format. The response categories of the SSQS were (1) much less than I like,

(2) less than I like, (3) just as much as I like, and (4) more than I like; and those of the SSQT items were (1) seldom or never, (2) now and then, (3) regularly and (4) often (see the Appendix).

Because the last response category of the SSQS is not linearly connected with the other three, it had to be recoded in order to use the response categories of the items as an ordinal scale. Although there were several possible ways to cope with this scaling problem, empirical tests did not yield important differences. For this reason it was decided to consider people who responded "more than I like" as having at least enough support in comparison with respondents receiving "too little" support, and thus, category 4 (more support than I like) was combined with category 3 (sufficiently supported). As a result, the categories of the SSQS constitute an ordinal scale.

The five-component solution of the SSQT was analysed with Principal Component Analysis (PCA) and Simultaneous Components Analysis (SCA). The five-component solution encountered corresponded with the intended five-component structure. The reliability coefficients (Cronbach's  $\alpha$ ) of the SSQT were DES, 0.76; PES, 0.73; SC, 0.68; DIS, 0.39; and PIS, 0.64. The same sample ( $n = 744$ ) was used in this study. Because every b-item (measuring satisfaction) was directly related to the corresponding a-item (measuring transactions), the SSQS was assumed to have the same component structure as the SSQT.

### Quality of life measures

From the quality of life measures included in EURIDISS, three measures for validation were used in the present study. The General Health Questionnaire (GHQ [19]) was used as a measure of psychological well-being. Because depression is often used as an outcome of disease, the severe depression subscale of the GHQ was used as a specific type of psychological well-being. The total scale score of the GHQ ranges from 28 (few psychological problems) to 112 (many psychological problems), while the severe depression subscale ranges from 7 (little depressed) to 28 (highly depressed). Self-esteem, considered as another aspect of quality of life, was measured by Rosenberg's self-esteem scale (RSE [20]). This scale contains 10 items and runs from 10 (low) to 40 (high self-esteem). The Overall Evaluation of Health (OEH) is a visual analogue scale rating subjective health. The patients were asked to indicate their health on a ruler running from 0 (very poor) to 100 (excellent). The GHQ, as well as the RSE, have proved to be reliable and valid instruments.

### Statistical analysis

To observe the component structure of the SSQS, SCA [21] was used.\* By comparing the results of the SCA analysis with the results of a PCA

\*A "component" is defined in SCA as a variable that is constructed as a weighted sum of the original variables. Furthermore, a "loading" is defined as the correlation between a variable and a component. It should be noted that the term loading does *not* refer to an element of the pattern matrix [21].

it is possible to check whether a certain component structure is stable over several samples (e.g. countries). In PCA the optimal variable structure is assessed for all samples separately, whereas in SCA this structure is estimated for *all* samples simultaneously. Thus, PCA accounts for the maximum amount of variance, while SCA tests component weights in such a way that the components optimally summarize the variables in all populations simultaneously [21]. If the explained variance of the four separate PCAs is much larger than the explained variance found by the SCA, the idea of common components has to be reconsidered.

Another advance of the SCA program is that it has the possibility of constructing the components according to one's own insight (e.g. based on theoretical considerations). Based on a pooled PCA, a starting configuration for weights is assessed, which is used in an iterative process to reconstruct a weight matrix. Next, the *optimal weight matrix* is determined through a varimax procedure, followed by an oblique rotation. The use of the optimal weights matrix results in the optimal SCA solution, which yields a factor structure for every sample.

The optimal weight matrix can be simplified and be represented by a "simple" weights matrix, in which all weights are "0" or "1". The simple weights matrix can be adjusted according to one's preferences, by assigning a certain item to a component (1) or not (0). In this way, it is possible to test such a "forced" component solution by comparing the results (in terms of explained variance) with the results of the "unforced" (optimal) SCA solution.

The component structure of the SSQS was examined in this way, whereas the five theoretical components (DES, PES, SC, DIS and PIS) of the SSQT [13] were the intended components. Consequently, it is expected to find five components measuring the discrepancy for each of the five supportive transaction components of the SSQT: DES-SAT, PES-SAT, SC-SAT, DIS-SAT and PIS-SAT.

The loadings of the items of the factor structure that fit the intended component structure less well are either "incorrect" or "suspect". An item is called "incorrect" if the highest loading is on another component than was expected. An item is called "suspect" if its loading is not only on the intended component, but also loads relatively high on another component. Finally, the reliability coefficients (Cronbach's  $\alpha$ ) were computed for all components of the SSQS and the corresponding subscales of the SSQT and SSQS were correlated.

To explore the relative effect of the SSQT and SSQS on the selected health related quality of life measures, a regression analysis was performed. The betas, which are *standardized* regression coefficients, can be used to compare the relative importance of

each instrument. Also the levels of significance of the two instruments in assessing health related quality of life were compared.

The PCA and SCA were conducted with the SCA program for SCA [21]. All other analyses were performed with SPSS/PC + V4.1 [22].

## RESULTS

In this section, first the results of the SSQS are described, and the Cronbach's  $\alpha$  of the components both for the separate countries and the countries combined are presented. Next, the relative importance of both the SSQT and the SSQS was evaluated in assessing relevant health related quality of life measures.

### *The results of the SSQS*

The differences in variances accounted for by SCA (60.1%) and by the separate PCAs per country were rather small: 59.9%, 65.2%, 61.6% and 60.8% for the Dutch, French, Swedish and Norwegian samples, respectively. Although the figure for France is somewhat higher, it can be stated that the common components produced by the SCA fitted or explained the data (almost) as well as the components of the separate PCAs.

It appeared that the "forced" SCA solution (with the subscales of the SSQT as the intended components) accounted for 58.0% of the total variance, which was 2.1% less than the variance accounted for by the "unforced" solution (60.1%). This small difference indicates that the rotated weights matrix almost perfectly revealed the intended weights.

Since the components that corresponded to the intended scales were defined, the item loadings were checked for incorrect or suspect items per country. Table 1 shows the loadings of the scale components (item-scale correlations) of the 23 items of the SSQS, for all four countries.

For all countries, the component structure of the five components of the SSQS fitted the intended structure well. Only one incorrect item was encountered, item 17 of DIS-SAT for the Swedish sample: the highest loading (0.63) was on the fifth (the PIS-SAT subscale) instead of on the intended fourth component (0.51).

Table 2 shows the reliability coefficients (Cronbach's  $\alpha$ ) for the five subscales. The coefficients for the emotional support subscales (DES-SAT, PES-SAT and SC-SAT) were 0.80 or more, for all countries combined, and for the instrumental support subscales (DIS-SAT and PIS-SAT) around 0.60. Additional analysis revealed that Cronbach's  $\alpha$  for DIS-SAT increased a little (0.07) when item 17 was omitted.

The correlations between the corresponding subscales measuring supportive interactions (SSQT) and the subscales measuring support satisfaction (SSQS)

Table 1. The loadings of the scale components (item-scale correlations) of the 23 items of the SSQS, for the samples of The Netherlands, France, Sweden and Norway

|                        |         | 1    | 2    | 3     | 4    | 5                |
|------------------------|---------|------|------|-------|------|------------------|
| <i>The Netherlands</i> |         |      |      |       |      |                  |
| DES-SAT                | var. 1  | 0.66 | 0.40 | 0.31  | 0.16 | 0.25             |
|                        | var. 2  | 0.67 | 0.49 | 0.23  | 0.21 | 0.25             |
|                        | var. 3  | 0.79 | 0.57 | 0.34  | 0.22 | 0.27             |
|                        | var. 4  | 0.82 | 0.57 | 0.35  | 0.17 | 0.25             |
|                        | var. 5  | 0.76 | 0.52 | 0.46  | 0.27 | 0.33             |
| PES-SAT                | var. 6  | 0.57 | 0.82 | 0.44  | 0.26 | 0.42             |
|                        | var. 7  | 0.53 | 0.78 | 0.28  | 0.24 | 0.24             |
|                        | var. 8  | 0.59 | 0.76 | 0.33  | 0.25 | 0.31             |
|                        | var. 9  | 0.57 | 0.84 | 0.40  | 0.32 | 0.37             |
|                        | var. 10 | 0.44 | 0.73 | 0.32  | 0.25 | 0.25             |
| SC-SAT                 | var. 11 | 0.49 | 0.70 | 0.32  | 0.29 | 0.42             |
|                        | var. 12 | 0.43 | 0.39 | 0.72  | 0.03 | 0.24             |
|                        | var. 13 | 0.46 | 0.35 | 0.71  | 0.22 | 0.39             |
|                        | var. 14 | 0.26 | 0.28 | 0.75  | 0.19 | 0.30             |
|                        | var. 15 | 0.26 | 0.36 | 0.69  | 0.20 | 0.25             |
| DIS-SAT                | var. 16 | 0.23 | 0.24 | 0.72  | 0.15 | 0.22             |
|                        | var. 17 | 0.27 | 0.25 | 0.19  | 0.49 | 0.31             |
|                        | var. 18 | 0.15 | 0.22 | 0.12  | 0.76 | 0.43             |
|                        | var. 19 | 0.02 | 0.09 | 0.07  | 0.76 | 0.46             |
| PIS-SAT                | var. 20 | 0.32 | 0.39 | 0.22  | 0.72 | 0.51             |
|                        | var. 21 | 0.35 | 0.37 | 0.31  | 0.42 | 0.74             |
|                        | var. 22 | 0.16 | 0.29 | 0.11  | 0.62 | 0.75             |
|                        | var. 23 | 0.30 | 0.30 | 0.44  | 0.34 | 0.73             |
| <i>France</i>          |         |      |      |       |      |                  |
| DES-SAT                | var. 1  | 0.76 | 0.54 | 0.36  | 0.27 | 0.38             |
|                        | var. 2  | 0.78 | 0.50 | 0.45  | 0.27 | 0.32             |
|                        | var. 3  | 0.84 | 0.50 | 0.42  | 0.25 | 0.38             |
|                        | var. 4  | 0.95 | 0.59 | 0.41  | 0.34 | 0.49             |
|                        | var. 5  | 0.82 | 0.47 | 0.27  | 0.32 | 0.40             |
| PES-SAT                | var. 6  | 0.63 | 0.75 | 0.34  | 0.34 | 0.41             |
|                        | var. 7  | 0.43 | 0.78 | 0.34  | 0.38 | 0.57             |
|                        | var. 8  | 0.58 | 0.78 | 0.45  | 0.32 | 0.40             |
|                        | var. 9  | 0.41 | 0.81 | 0.48  | 0.39 | 0.49             |
|                        | var. 10 | 0.26 | 0.68 | 0.25  | 0.33 | 0.40             |
| SC-SAT                 | var. 11 | 0.50 | 0.68 | 0.55  | 0.29 | 0.23             |
|                        | var. 12 | 0.40 | 0.45 | 0.71  | 0.12 | 0.18             |
|                        | var. 13 | 0.31 | 0.39 | 0.69  | 0.14 | 0.22             |
|                        | var. 14 | 0.31 | 0.31 | 0.77  | 0.05 | 0.25             |
|                        | var. 15 | 0.38 | 0.40 | 0.79  | 0.14 | 0.28             |
| DIS-SAT                | var. 16 | 0.29 | 0.41 | 0.71  | 0.21 | 0.26             |
|                        | var. 17 | 0.43 | 0.42 | 0.23  | 0.50 | 0.22             |
|                        | var. 18 | 0.13 | 0.16 | 0.04  | 0.76 | 0.48             |
|                        | var. 19 | 0.02 | 0.16 | -0.13 | 0.67 | 0.48             |
| PIS-SAT                | var. 20 | 0.36 | 0.47 | 0.33  | 0.69 | 0.57             |
|                        | var. 21 | 0.58 | 0.58 | 0.36  | 0.48 | 0.81             |
|                        | var. 22 | 0.18 | 0.27 | 0.05  | 0.65 | 0.80             |
|                        | var. 23 | 0.40 | 0.51 | 0.38  | 0.49 | 0.82             |
| <i>Sweden</i>          |         |      |      |       |      |                  |
| DES-SAT                | var. 1  | 0.68 | 0.35 | 0.51  | 0.14 | 0.27             |
|                        | var. 2  | 0.69 | 0.51 | 0.31  | 0.19 | 0.49             |
|                        | var. 3  | 0.72 | 0.53 | 0.31  | 0.24 | 0.44             |
|                        | var. 4  | 0.72 | 0.49 | 0.45  | 0.27 | 0.48             |
|                        | var. 5  | 0.69 | 0.46 | 0.28  | 0.22 | 0.45             |
| PES-SAT                | var. 6  | 0.54 | 0.70 | 0.45  | 0.17 | 0.31             |
|                        | var. 7  | 0.47 | 0.69 | 0.21  | 0.10 | 0.24             |
|                        | var. 8  | 0.61 | 0.79 | 0.50  | 0.17 | 0.37             |
|                        | var. 9  | 0.37 | 0.60 | 0.23  | 0.08 | 0.12             |
|                        | var. 10 | 0.21 | 0.55 | 0.12  | 0.07 | 0.12             |
| SC-SAT                 | var. 11 | 0.39 | 0.57 | 0.42  | 0.46 | 0.44             |
|                        | var. 12 | 0.42 | 0.43 | 0.72  | 0.12 | 0.25             |
|                        | var. 13 | 0.32 | 0.32 | 0.78  | 0.26 | 0.29             |
|                        | var. 14 | 0.39 | 0.34 | 0.69  | 0.18 | 0.22             |
|                        | var. 15 | 0.42 | 0.40 | 0.82  | 0.35 | 0.47             |
| DIS-SAT                | var. 16 | 0.48 | 0.40 | 0.81  | 0.31 | 0.45             |
|                        | var. 17 | 0.52 | 0.44 | 0.41  | 0.51 | 0.63 (incorrect) |
|                        | var. 18 | 0.25 | 0.16 | 0.29  | 0.80 | 0.52             |
|                        | var. 19 | 0.01 | 0.07 | -0.03 | 0.74 | 0.14             |
| PIS-SAT                | var. 20 | 0.07 | 0.09 | 0.21  | 0.77 | 0.30             |
|                        | var. 21 | 0.54 | 0.48 | 0.35  | 0.39 | 0.80             |
|                        | var. 22 | 0.20 | 0.09 | 0.30  | 0.47 | 0.64             |
|                        | var. 23 | 0.62 | 0.36 | 0.34  | 0.42 | 0.81             |
| <i>Norway</i>          |         |      |      |       |      |                  |
| DES-SAT                | var. 1  | 0.84 | 0.67 | 0.55  | 0.59 | 0.56             |
|                        | var. 2  | 0.75 | 0.45 | 0.41  | 0.42 | 0.59             |
|                        | var. 3  | 0.81 | 0.53 | 0.41  | 0.49 | 0.57             |
|                        | var. 4  | 0.79 | 0.59 | 0.43  | 0.49 | 0.47             |
|                        | var. 5  | 0.82 | 0.58 | 0.51  | 0.48 | 0.48             |

Table 1—Continued

|         |         | 1    | 2    | 3    | 4    | 5    |
|---------|---------|------|------|------|------|------|
| PES-SAT | var. 6  | 0.46 | 0.73 | 0.41 | 0.46 | 0.37 |
|         | var. 7  | 0.53 | 0.74 | 0.41 | 0.44 | 0.38 |
|         | var. 8  | 0.58 | 0.83 | 0.48 | 0.40 | 0.43 |
|         | var. 9  | 0.59 | 0.78 | 0.52 | 0.50 | 0.47 |
|         | var. 10 | 0.48 | 0.72 | 0.37 | 0.44 | 0.36 |
| SC-SAT  | var. 11 | 0.47 | 0.63 | 0.42 | 0.32 | 0.24 |
|         | var. 12 | 0.36 | 0.36 | 0.78 | 0.27 | 0.24 |
|         | var. 13 | 0.51 | 0.48 | 0.71 | 0.38 | 0.36 |
|         | var. 14 | 0.43 | 0.45 | 0.77 | 0.42 | 0.37 |
|         | var. 15 | 0.48 | 0.50 | 0.81 | 0.49 | 0.43 |
| DIS-SAT | var. 16 | 0.46 | 0.48 | 0.80 | 0.44 | 0.38 |
|         | var. 17 | 0.48 | 0.47 | 0.38 | 0.63 | 0.44 |
|         | var. 18 | 0.31 | 0.24 | 0.23 | 0.54 | 0.32 |
|         | var. 19 | 0.13 | 0.12 | 0.09 | 0.56 | 0.08 |
| PIS-SAT | var. 20 | 0.58 | 0.58 | 0.55 | 0.69 | 0.45 |
|         | var. 21 | 0.48 | 0.45 | 0.32 | 0.51 | 0.74 |
|         | var. 22 | 0.37 | 0.19 | 0.24 | 0.20 | 0.74 |
|         | var. 23 | 0.66 | 0.50 | 0.47 | 0.48 | 0.77 |

DES-SAT = Satisfaction with Daily Emotional Support; PES-SAT = Satisfaction with Problem-oriented Emotional Support; SC-SAT = Satisfaction with Social Companionship; DIS-SAT = Satisfaction with Daily Instrumental Support; PIS-SAT = Satisfaction with Problem-oriented Instrumental Support.

were 0.51, 0.36, 0.48, 0.14 and 0.28 for DES, PES, SC, DIS and PIS, respectively. Table 3 shows the intercorrelations of the subscales of the SSQS for the total sample.

#### *The relative importance of interactions and satisfaction*

To inspect the relationship between interactions and satisfaction, the SSQT and SSQS were both dichotomized (1 + 2 and 3 + 4) and cross-tabled (not presented here in a figure). Considering all 23 items, on average 16% of the respondents had both few interactions and were unsatisfied about it, while 39% had many interactions and were satisfied at the same time. Furthermore, 41% of the respondents reported that they received little support, but were satisfied about it anyway. Finally, 3% reported that they had many supportive interactions, but were still unsatisfied.

Table 4 shows the betas of the SSQT and SSQS for the selected health related quality of life measures. Most betas of the SSQS subscales were much larger compared to those of the SSQT subscales; for only a very few, the betas were about the same. Furthermore, it can be stated that for 16 of the 20 analyses the betas for the SSQS subscales are more than twice

as large as those for the SSQT subscales. With respect to the significance of the betas, it was found that all subscales of the SSQS contributed significantly to self-esteem, depression, the GHQ and, in most instances, to the OEH. On the other hand, the subscales of the SSQT had, in 4 of the 20 analyses, a significant contribution, of which 3 were caused by PES. The variance accounted for by one subdimension of the SSQT and SSQS was 0.14 at most. However, all subdimensions together explained up to a maximum of 20% (GHQ) of the selected quality of life measures.

## DISCUSSION

The aim of the present study was to give an answer on two research questions. The first concerned the psychometric properties of the SSQS. The second question concerned the relative contribution of the SSQT and SSQS in explaining the level of health related quality of life outcomes.

#### *Psychometric properties of the SSQS*

The small differences in variances accounted for by SCA and by the separate PCAs per country imply that the same linear combinations of variables could be used in all populations to describe the data

Table 2. Reliability coefficients (Cronbach's  $\alpha$ ) for the five subscales of the SSQS, for all four countries and for the total sample

| Subscales | Number of items | All countries | Nl   | Fr   | Sw   | No   |
|-----------|-----------------|---------------|------|------|------|------|
| DES-SAT   | 5               | 0.83          | 0.79 | 0.88 | 0.73 | 0.85 |
| PES-SAT   | 6               | 0.84          | 0.86 | 0.84 | 0.73 | 0.83 |
| SC-SAT    | 5               | 0.80          | 0.76 | 0.78 | 0.82 | 0.83 |
| DIS-SAT   | 4               | 0.57          | 0.64 | 0.55 | 0.58 | 0.43 |
| PIS-SAT   | 3               | 0.62          | 0.57 | 0.74 | 0.62 | 0.57 |

DES-SAT = Satisfaction with Daily Emotional Support; PES-SAT = Satisfaction with Problem-oriented Emotional Support; SC-SAT = Satisfaction with Social Companionship; DIS-SAT = Satisfaction with Daily Instrumental Support; PIS-SAT = Satisfaction with Problem-oriented Instrumental Support.

Nl = The Netherlands; Fr = France; Sw = Sweden, No = Norway.

Table 3. Intercorrelations of the subscales of the SSQS for the total sample

|         | DES  | PES  | SC   | DIS  | PIS |
|---------|------|------|------|------|-----|
| DES-SAT | —    |      |      |      |     |
| PES-SAT | 0.68 | —    |      |      |     |
| SC-SAT  | 0.48 | 0.51 | —    |      |     |
| DIS-SAT | 0.38 | 0.42 | 0.30 | —    |     |
| PIS-SAT | 0.51 | 0.50 | 0.39 | 0.63 | —   |

DES-SAT = Satisfaction with Daily Emotional Support; PES-SAT = Satisfaction with Problem-oriented Emotional Support; SC-SAT = Satisfaction with Social Companionship; DIS-SAT = Satisfaction with Daily Instrumental Support; PIS-SAT = Satisfaction with Problem-oriented Instrumental Support.

Table 4. Comparison of the SSQT and SSQS betas, for relevant health outcome measures;  $n = 739$ 

|                    | Self-esteem |                | Depression |                | GHQ      |                | OEH     |                |
|--------------------|-------------|----------------|------------|----------------|----------|----------------|---------|----------------|
|                    | Beta        | R <sup>2</sup> | Beta       | R <sup>2</sup> | Beta     | R <sup>2</sup> | Beta    | R <sup>2</sup> |
| DES                | 0.14***     |                | -0.06      |                | -0.02    |                | -0.04   |                |
| DES-SAT            | 0.16***     |                | -0.34***   |                | -0.34*** |                | 0.16*** |                |
|                    |             | 0.07           |            | 0.14           |          | 0.12           |         | 0.02           |
| PES                | -0.07       |                | 0.07*      |                | 0.13***  |                | -0.11** |                |
| PES-SAT            | 0.26***     |                | -0.33***   |                | -0.37*** |                | 0.14*** |                |
|                    |             | 0.06           |            | 0.10           |          | 0.12           |         | 0.02           |
| SC                 | 0.07        |                | -0.03      |                | -0.00    |                | 0.03    |                |
| SC-SAT             | 0.24***     |                | -0.29***   |                | -0.32*** |                | 0.17*** |                |
|                    |             | 0.08           |            | 0.10           |          | 0.10           |         | 0.03           |
| DIS                | -0.06       |                | 0.08       |                | 0.08     |                | -0.07   |                |
| DIS-SAT            | 0.23***     |                | -0.21***   |                | -0.20*** |                | 0.07    |                |
|                    |             | 0.05           |            | 0.05           |          | 0.04           |         | 0.01           |
| PIS                | 0.03        |                | -0.01      |                | 0.02     |                | 0.03    |                |
| PIS-SAT            | 0.17***     |                | -0.26***   |                | -0.21*** |                | 0.05    |                |
|                    |             | 0.03           |            | 0.07           |          | 0.04           |         | 0.02           |
| SSQT (5 subscales) |             | 0.08           |            | 0.09           |          | 0.07           |         | 0.03           |
| SSQS (5 subscales) |             | 0.10           |            | 0.17           |          | 0.16           |         | 0.03           |
| SSQT + SSQS        |             | 0.14           |            | 0.19           |          | 0.20           |         | 0.06           |

\*\*\* $P < 0.001$ ; \*\* $P < 0.01$ ; \* $P < 0.05$

DES = Daily Emotional Support; PES = Problem-oriented Emotional Support; SC = Social Companionship; DIS = Daily Instrumental Support; PIS = Problem-oriented Instrumental Support; -SAT = Satisfaction with the support provided.

adequately [21]. The intended five-component structure of the SSQS, based on former research on the structure of the SSQT [13], accounted for only 2.1% variance less than the optimal weights solution. This encouraging result is supported by the fact that only one incorrect item (item 17) was found in the structure matrix. Instead of on the DIS-SAT-scale, this item loaded on the PIS-SAT scale. However, for reasons of content, item 17 belongs very much to the DIS-SAT subscale, and should therefore not be omitted (see also the discussion about item 17 of Suurmeijer *et al.* [13]). Also the reliability coefficient of the DIS factor of the SSQT was rather low for all countries combined (0.38). Perhaps in the case of "instrumental support" the distinction in "daily" and "problem oriented" support is less appropriate than was assumed beforehand. One could reason that in the case of instrumental support there is always some kind of problem that has to be solved. Therefore, the distinction might be not so much "daily" vs "problem oriented", but more a continuum with a varying degree of the size of the problem or how easily the problem can be solved.

However, the internal consistency (Cronbach's  $\alpha$ ) of the five SSQS subscales was rather satisfactory. For the total sample, the reliability coefficients can be considered as good for DES-SAT, PES-SAT and SC-SAT (0.80 and more), whereas Cronbach's  $\alpha$  for DIS-SAT and PIS-SAT were somewhat lower (about 0.60).

The rather low correlations between the SSQT and SSQS subscales is an indication that the two instruments measure different things, confirming our theoretical notions about "social support". The highest correlations were moderately strong (for DES and SC 0.51 and 0.48, respectively), while those between the two instrumental support subscales were more modest (0.14 and 0.28 for DIS and PIS, respectively).

#### *Interactions or satisfaction?*

Both supportive interactions and the satisfaction with these interactions at the same time have to be assessed in order to measure what Procidano and Heller [7] and Thoits [11] have called "the functional component of social networks". And as a result, both the SSQT and the SSQS should be used in combination in social support studies. The question that follows from this point of view is which part is more important in relation to health related quality of life measures.

Before both support measures were analysed, the assumption was made that more support leads to a higher quality of life. It is questionable, however, whether this assumption is true under all conditions, because, for example, in the case of need it is undesirable not only to receive too little social support, but also too much social support. In this respect one could think of "preferential treatment" and of "over-protection", through which people may become excluded from normal activities and experiences [23-25]. So, the desired amount of supportive interactions has an optimum distribution. To be of use in the analysis, the categories concerning the level of support satisfaction had to be recoded. As was mentioned, there were several ways in which this task could be done. In this respect, it was interesting to find that the several ways in which the SSQS was recoded (category 4 = 3; 4 = 2; or 1, 2 and 4 = 0 while 3 = 1) did not affect its relationships with the quality of life measures.

On average, 80% of the respondents reported that they were satisfied with the support provided. Half of them received many (regular or often) supportive interactions, while the other half received little support (seldom or never, or now and then). Only a small group (3%) reported that they were unsatisfied with the support provided, although they had received a lot of support.



The standardized regression coefficients (betas) demonstrated that support satisfaction is predominating the effect of supportive interactions in explaining health related quality of life measures. The betas for the SSQS were, in general, more than twice as large as the betas for the SSQT. Additional analyses demonstrated that without controlling for support satisfaction, all subscales with supportive interactions were significantly related to the health related outcome measures. Furthermore, the bottom of Table 4 has demonstrated that, although there is some overlap between the two instruments, the SSQT and SSQS each explain a separate part of the variance in the quality of life outcome. Therefore, it is recommended that the two instruments be used simultaneously to complement each other in analyses.

In summary, we conclude that the conceptually intended component structure of the Social Support Questionnaire for Satisfaction with the supportive transactions (the SSQS) was supported by our statistical procedures and coincided with that of the Social Support Questionnaire for Transactions (SSQT [13]). The five components or scales encountered were invariant across countries, making the combined use of the SSQS and the SSQT useful for international, comparative and longitudinal research, both across countries and diseases.

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#### APPENDIX

##### *Social Support Questionnaire for Transactions (SSQT) and Social Support Questionnaire for Satisfaction (SSQS)*

##### *A. Items measuring Daily Emotional Support (DES)*

- 1a. Does it ever happen to you that people are warm and affectionate towards you?
- 1b. Is this just as much as you like?
- 2a. Does it ever happen to you that people are friendly to you?
- 2b. Is this just as much as you like?
- 3a. Does it ever happen to you that people sympathize with you?
- 3b. Is this just as much as you like?
- 4a. Does it ever happen to you that people show their understanding for you?
- 4b. Is this just as much as you like?
- 5a. Does it ever happen to you that people are willing to lend you a friendly ear?
- 5b. Is this just as much as you like?

##### *B. Items measuring Problem-oriented Emotional Support (PES)*

- 6a. Does it ever happen to you that people make you feel at ease?
- 6b. Is this just as much as you like?
- 7a. Does it ever happen to you that people give you a nudge in the right direction, as it were?
- 7b. Is this just as much as you like?
- 8a. Does it ever happen to you that people perk you up or cheer you up?
- 8b. Is this just as much as you like?
- 9a. Does it ever happen to you that people reassure you?
- 9b. Is this just as much as you like?
- 10a. Does it ever happen to you that people tell you not to lose courage?
- 10b. Is this just as much as you like?
- 11a. Does it ever happen to you that you can rely on other people?
- 11b. Is this just as much as you like?

##### *C. Items measuring Social Companionship (SC)*

- 12a. Does it ever happen to you that people drop in for a (pleasant) visit?

- 12b. Is this just as much as you like?
- 13a. Does it ever happen to you that people just call you up or just chat to you?
- 13b. Is this just as much as you like?
- 14a. Does it ever happen to you that you do things like shopping, walking, going to the movies or sports, etc., together with other people?
- 14b. Is this just as much as you like?
- 15a. Does it ever happen to you that people ask you to join in?
- 15b. Is this just as much as you like?
- 16a. Does it ever happen to you that you go out for the day with other people just for the enjoyment of it?
- 16b. Is this just as much as you like?

##### *D. Items measuring Daily Instrumental Support (DIS)*

- 17a. Does it ever happen to you that people help you to do odd jobs?
- 17b. Is this just as much as you like?
- 18a. Does it ever happen to you that people lend you small things like, for example, sugar or a screwdriver or something like that?
- 18b. Is this just as much as you like?
- 19a. Does it ever happen to you that people lend you small amounts of money?
- 19b. Is this just as much as you like?
- 20a. Does it ever happen to you that people give you information or advice?
- 20b. Is this just as much as you like?

##### *E. Items measuring Problem-oriented Instrumental Support (PIS)*

- 21a. If necessary, do people help you if you call upon them to do so unexpectedly?
- 21b. Is this just as much as you like?
- 22a. If necessary, do people lend you valuable things?
- 22b. Is this just as much as you like?
- 23a. If necessary, do people help you, for example, when you are sick, when you have transport problems or when you need them to accompany you somewhere?
- 23b. Is this just as much as you like?

The a-items constitute the SSQT, for which the response categories are

1. seldom or never
2. now and then
3. regularly
4. often

The b-items constitute the SSQS, for which the response categories are

1. much less than I like
2. less than I like
3. just as much as I like
4. more than I like