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# Measuring Attitudes of Mental Health Care Staff Toward Suicidal Patients

Anne-Marie Aish,[1] Inga-Lill Ramberg,[2] and Danuta Wasserman[3]
[1]*The National Swedish Centre for Suicide Research and Prevention, National Institute for Psychosocial Medicine*
[2]*Department of Public Health Sciences/Karolinska Institute and Stockholm County Council*
[3]*WHO Collaborating Centre on Suicide Research and Prevention*

*Measurement, because of its role in the scientific process, is one of the principal concerns in human sciences. This study investigates three measurement instruments for attitudes of mental health care staff toward suicidal patients in terms of their dimensionality and the validity and reliability of the individual indicators: the instruments designed by Suokas & Lönnqvist (1989), Samuelsson, Åsberg & Gustavsson (1997) and by Ramberg and Wasserman. The empirical analyses are done with LISREL, a structural equation modeling approach that is particularly useful to study measurement instruments for abstract concepts. This approach provides an explicit test of the dimensionality of a construct and of the validity of each the indicators. It also gives explicit information on measurement error in the observed variables. The results show that each measurement instrument contains several components as hypothesised, but only some of them, tested as confirmatory factor analysis models, produced a good fit. Moreover the validity and the reliability of their indicators varied considerably. Empathy was the most consistently measured component in the three measurement instruments.*

**Keywords** attitudes, exploratory and confirmatory factor analysis, mental health care staff, reliability and validity, suicidal patients

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Address correspondence to Anne-Marie Aish or Inga-Lill Ramberg, National Swedish Centre for Suicide Research and Prevention, Box 230, SE-171 77 Stockholm, Sweden. E-mail: amaish@compuserve.com; inga-lill.ramberg@ipm.ki.se

Suicidologists have a major interest in the attitudes of the health care staff toward suicidal patients and in a potential change in these attitudes. Indeed, they believe that the attitudes of health care staff toward suicidal patients have a strong influence on the quality of the care, on the effectiveness of treatment as well as on the patients' future suicidality (Maltsberger & Buie, 1974; Wolk-Wasserman, 1987). Positive attitudes are regarded as protective, giving the patients a feeling of being loved and cared for. Negative attitudes, on the other hand, are perceived as a judgment and a rejection and may therefore reinforce the patients' feelings of worthlessness and hopelessness. Negative attitudes may not be intentional. They may be due to a lack of knowledge of the specificity of suicidal problems and of the way in which suicidal patients should be approached. An educational program and specific information about suicidal patients and their needs may alter negative attitudes (Samuelsson, Åsberg & Gustavsson, 1997).

Attitudes refer to some psychological process which determines individual behavior (Ajzen, 1988; Allport, 1935; Eagly & Chaiken, 1993; Lemon, 1973; Rokeach, 1968; Summers, 1970). Such a conceptualization implies that attitudes cannot be observed directly. On the contrary, they can only be inferred indirectly from observable indicators, which makes their measurement more difficult. The difficulty consists in finding a random sample of reliable and valid indicators for the attitudes to be measured. Although attitudes refer to some relatively stable disposition (Manstead, 1996; Rokeach, 1968) they are also capable of modification. This is particularly relevant to researchers whose interests lie in attitude change and stability.

Researchers have used different approaches and measurement procedures to measure attitudes and behavior toward suicidal patient such as *Mood Adjective Checklists* (Dressler, Prusoff, Mark & Shapiro, 1975; Nowlis, 1965), *psychodynamic approaches* (Wolk-Wasserman, 1985), *case vignettes* (Ansel & McGee, 1971; Hawton, Marsach & Fagg, 1981; Platt & Salter, 1987; Ramon, Bancroft & Skrimshire, 1975; Ramon & Breyter, 1978; Ramon, 1980; Samuelsson et al., 1997) and *questionnaires* (Alston & Robinson, 1992; De Rose & Page, 1985; Domino, Moore, Westlake & Gibson, 1982; Domino & Leenars, 1989; Domino & Perrone, 1993; Samuelsson et al., 1997; Suokas & Lönnqvist, 1989).

Suokas & Lönnqvist (1989), Samuelsson et al. (1997), and Ramberg and Wasserman developed measuring devices to specifically deal with the attitudes of mental health care staff toward suicidal patients.

The first measurement instrument by Suokas & Lönnqvist (1989) contains 41 statements to measure attitudes toward work in general, toward all patients, toward patients who have attempted suicide, toward the nature of the attempted suicide, toward relationships between staff and suicide attempters and toward staff training. Orthogonal factor analyses of their data collected on 85 individuals in a psychiatric hospital yielded seven factors: categorical attitudes, empathy, importance of psychiatric treatment, good treatment, development of care, centralized-decentralized care and training and attitude.

Samuelsson and his colleagues (1997) borrowed 22 statements from Suokas & Lönnqvist (1989) but they changed the wording of some of them. They argued that the 22 items were measuring three fundamental components: emotional attitudes (empathic or rejecting), attitudes toward further training, and attitudes toward the need for psychiatric care. An item analysis of the 16 indicators assumed to measure emotional attitudes indicated that 11 of them formed a uni-dimensional scale which they labelled the understanding Suicidal Patients Scale (USP scale). The analysis was made on a sample of 193 psychiatric and assistant nurses.

Finally, Ramberg and Wasserman, two of the authors, designed a battery of 37 questions (Table 1), 21 of which were taken, either in their original form or reformulated, from Suokas & Lönnqvist (1989) and from Samuelsson et al. (1997). Sixteen new items were added (Salander Renberg & Jacobsson, 1998). According to Ramberg, the 37 items measure very different attitudinal dimensions: attitudes toward the *time* invested in suicidal patients, toward the *possibility to prevent* suicides, toward the *treatment* of suicidal patients, toward *personal relationships* with suicidal patients, *empathy* for suicidal patients, *negative attitudes* towards suicidal patients and attitudes toward the *mental status* of suicidal patients.

One of the aims of the study is to cross-validate the measurement models derived from the empirical analyses of Suokas & Lönnqvist (1989) and from Samuelsson et al. (1997). A second aim is to test the new measurement hypothesis proposed by Ramberg in order to arrive at an optimal measurement instrument for the attitudes toward suicidal patients. To achieve these aims LISREL, a structural equation modeling approach, is applied. LISREL provides an explicit test of the hypothesized dimensionality of attitudes and of the validity of each of the hypothesized indicators. It also gives explicit information on measurement error in the observed variables.

## MATERIAL AND METHOD OF ANALYSIS

### Material

The data used for the analyses were collected by Ramberg and Wasserman in the context of a study of the effects of training in suicidology offered by the National Swedish Centre for Suicide Research and Prevention. The study was approved by the Ethical Committee of Karolinska Institute, Stockholm.

The data were collected on a stratified random sample of medical staff members in 22 psychiatric care sectors in the Stockholm County Council. The sample was drawn from the register of employees in psychiatric care services. Stratification was based on three professional categories (psychiatrists, psychologists/social workers and nurses/assistant nurses) and different work settings. The questionnaire was sent to 1,724 individuals. The final sample consisted of 1,010 individuals who completed the questionnaire about work with suicidal patients that included the 37 items given in Table 1. The respondents' ages ranged between 19 and 63 (mean age = 41.6). The gender composition was as follows: 28.2% male and 71.8% female. Sixty seven respondents were psychiatrists, 816 were nurses or assistant nurses and 127 were psychologists or social workers.

### Method of Analysis

To cross-validate the measurement models derived from the empirical analyses of Suokas & Lönnqvist (1989) and from Samuelsson et al., and to test Ramberg's models, we carried out several confirmatory factor analyses with LISREL. Detailed information about this research method and its applications can be found in several publications (Bollen, 1989; Bollen, Scott & Long, 1993; Jöreskog & Sörbom, 1993; Maruyama, 1998). Here, a brief description is given of the specific application of the structural equation modeling approach when testing measurement instruments. The application of LISREL in this context consists of specifying a confirmatory factor analysis model, testing the model-data consistency and extracting from the analysis information about the dimensionality of the measurement instrument and the validity and reliability of the indicators. Confirmatory factor analysis has several advantages over exploratory factor analysis.

***TABLE 1.*** **Attitudes Toward Suicidal Patients. Items Used in Ramberg & Wasserman's Questionnaire to Mental Health-care Staff**

1. A patient who has tried to commit suicide usually takes up a great deal of staff time **STAFFTIME**(*)[a)]
2. The care of patients who have tried to commit suicide reduces the time available for patients who are in greater need **PATTIME**(*)[a)]
3. The quantity of medicine used in an attempted suicide expresses the seriousness of the attempt **DRUGTAKE**(*)
4. There is always hope for people even if they are thinking of killing themselves **HOPE**
5. All attempted suicides should be taken care of at a psychiatric clinic **CARECLIN**(*)(**)[b)]
6. Psychotherapy can be a way of preventing another suicide attempt **PSYCHOTH**
7. Psychiatric clinics should concentrate solely on the treatment of people making serious suicide attempts **CONCENTR** (*)(**)[c)]
8. A patient who has tried to commit suicide is usually so mentally disturbed that (s)he should be admitted to a psychiatric clinic **MENTALLY** (*)(**)
9. It is possible to prevent suicides **PREVENT**
10. Treatment with antidepressants is a means of preventing suicides **ANTIDEPR**
11. People should be prevented from killing themselves **PREVKILL**
12. Some people who have tried to commit suicide are misusers of treatment facilities **MISUSERS**(*)
13. I feel secure in my work with suicidal patients **SECURE**
14. It makes no difference what is done for suicidal patients – they succeed sooner or later anyway **NODIFFER**
15. Sometimes I get very angry with patients who have attempted suicide **ANGRY**(*)(**)(***)[b)]
16. I feel more sympathy for patients who have tried to take their lives for the first time than for those who have tried one or more times before **FIRSTIME**(*)
17. If people really want to kill themselves, they will succeed in spite of receiving the best treatment **SUCCEED**
18. People who have made several suicide attempts run a high risk of dying from suicide **HIGHRISK** (*)(**)(***)[a)]
19. I nurse/treat patients who have attempted suicide as willingly and with as much care as I nurse/treat other patients **ICARE**(*)(**)(***)[d)]
20. Suicide is always an expression of a mental disorder **MDISORDER**
21. There are ways of preventing a person from making another suicide attempt **ANOTHSUI**
22. A patient who has tried to commit suicide needs the best possible treatment **BESTREAT (*)(**)(***)**[a)]
23. The staff usually devote too little time to patients who have tried to commit suicide **DEVOTE**
24. I often think it is difficult to understand a person who has tried to commit suicide **UNDERSTA (*)(**)(***)**[b)]
25. People who have suicidal thoughts can be helped so that they do not take their own lives **CANHELP**
26. I like helping people who have tried to take their own lives **LIKEHELP (*)(**)(***)**
27. Most people who try to take their own lives are not responsible for their actions **NRESPONS (*)**[a)]
28. Treatment with antidepressants combined with psychotherapy is a good way of preventing suicide in depressed patients **COMBINED**
29. Most people who try to commit suicide live in difficult circumstances **DIFFICUL (*)(**)(***)**[a)]
30. Most people who try to commit suicide need understanding **NEEDUNDS(*)**[a)]
31. Psychiatric care of patients who have tried to commit suicide is satisfactory **CARESATI (**)**
32. The care associates of psychiatric clinics provide satisfactory care and treatment of patients who have tried to commit suicide **ASSOCIAT**
33. It is often difficult to nurse/treat patients who have tried to commit suicide **DIFFCARE (*)(**)(***)**[b)]
34. Staff attitudes and behavior may have a bearing on whether a patient repeats the suicide attempt **BEARING(*)**
35. I am usually sympathetic and understanding toward patients who have tried to commit suicide **SYMPUNDS (*)(**)(***)**
36. Once people have made up their minds to commit suicide, you cannot stop them **CANNOTST**
37. I want to have the right to take my own life **RIGHT**

**(*)**Suokas and Lönnqvist items, **(**)** Samuelsson et al. items, **(***)** Part of Samuelsson et al. USP-scale.
[a)]Item 1 and 2, 18 and 30, 27, 29 and 30 constituted one single item in Suokas and Lönnqvist. Item 22 and 29 constituted one single item in Suokas and Lönnqvist and in Samuelsson et al.
[b)]Item 5, 15, 24 and 33 were modified by Samuelsson et al. and Ramberg took them over.
[c)]Item 7 is differently formulated in all three investigations.
[d)]Modified by Ramberg.

Exploratory factor analysis, one of the most used approaches in survey research, is a method that enables the researcher to isolate a small number of common factors underlying a large number of items or measures making up a scale and which are necessary to explain the relationships between these measures. The problem with exploratory factor analysis is that it often produces results which are difficult to interpret and an interpretation that often differs from researcher to researcher. Unlike exploratory factor analysis with its post-hoc interpretation, confirmatory factor analysis starts with the conceptual specification of a measurement model for each concept. In other words, it forces one to be explicit about measurement hypotheses to be tested.

Take, as an example, a concept such as locus of control generally specified as a two-dimensional concept. Assume that the first component, internal locus of control, is measured with four items whereas the second component, external locus of control, is measured with three items. A confirmatory factor analysis model for this two-dimensional concept and seven indicators is symbolically presented in Figure 1.

Figure 1 distinguishes between the latent variables (the two components, $\xi_1$ and $\xi_2$), the observed variables (the indicators, $x_1, x_2, x_3, x_4, x_5, x_6, x_7$) and the measurement errors $(\delta_1, \delta_2, \delta_3, \delta_4, \delta_5, \delta_6, \delta_7)$. The observed variables $x_1$–$x_4$ are assumed to be indicators of the first latent variable (the first component, $\xi_1$) and the observed variables $x_5$–$x_7$ are assumed to be indicators of the second latent variable (the second component, $\xi_2$). All observed variables are assumed to be reliable measures although each of them may contain a certain amount of random measurement error $(\delta_1 - \delta_7)$. The arrows represent the direction of the relationships between the variables. As can be seen, the latent variables influence the observed variables, as do the measurement errors. Each observed variable is a linear

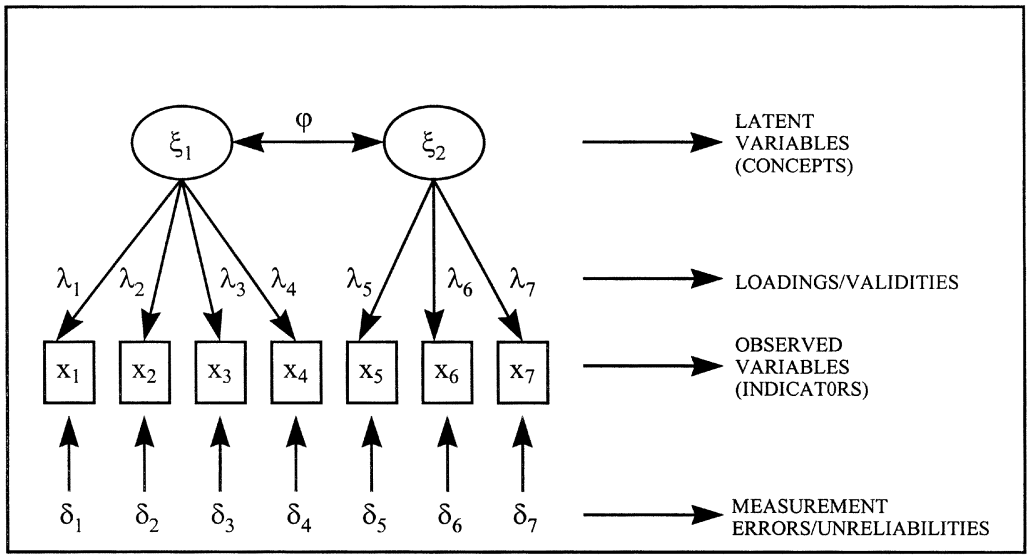


***FIGURE 1.*** *Graphical presentation of a confirmatory two-factor analysis model.*

function of a latent variable and an error term. In structural equation terms:

$$x_1 = \lambda_{11}\xi_1 + \delta_1$$
$$x_2 = \lambda_{21}\xi_1 + \delta_2$$
$$x_3 = \lambda_{31}\xi_1 + \delta_3$$
$$x_4 = \lambda_{41}\xi_1 + \delta_4$$
$$x_5 = \lambda_{52}\xi_2 + \delta_5$$
$$x_6 = \lambda_{62}\xi_2 + \delta_6$$
$$x_7 = \lambda_{72}\xi_2 + \delta_7$$

The non-directional arrow $(\varphi_{12})$ between the latent variables means that they are related because they are believed to be subcomponents of an overall latent variable.

What has to be tested is 1) whether the observed data (variances and covariances) are consistent with the two-factor model. In other words, whether a two-factor structure can sufficiently account for the observed variances and covariances (overall model fit) and 2) whether the specific hypotheses concerning the hypothesised indicators are confirmed within the context of a model that fits (local fit).

Testing a confirmatory factor analysis with LISREL implies two basic steps:
1) *statistical fitting* the factor model to observed data (variances and covariances), that is, estimating the parameters of the model with one of the several estimation methods that LISREL provides (Maximum Likelihood, Weighted Least squares, Generalized Weighted Least Squares etc.). The parameters in measurement models are the loadings of the observed variables on the latent variables ($\lambda$ = factor loadings), the covariances or correlations between the latent variables $(\varphi)$ and the measurement error variances $(\delta)$.
2) *assessing the overall fit and local fit* according to some criteria. There exist several measures to evaluate the overall fit of the model, formal and descriptive (e.g. $\chi^2$, Goodness-of-fit Indices, Information measure of fit Incremental Fit Indices, RMSEA). Essentially, they all assess the overall congruence between a specific model and observed data. Local fit concerns the individual parameters. The criteria used here are the statistically significant critical ratios or t-values (estimate/standard error) associated with the estimated parameters, and the modification indices for each of the fixed parameters.

If the model does not fit the data, that is statistically significant values of the chi-square result in model rejection, the modification indices and standardized residuals are investigated to revise the model in combination with a judgment on the theoretical adequacy of any modification.

If the model cannot be rejected, the results are substantively interpreted. For example, in a confirmatory factor analysis, they will concern the dimensionality of the concepts and the validity and reliability of the indicators. Within a structural equation modeling framework, the validity and reliability of the individual indicators are given an alternative definition to the classical measures (see Bollen, 1989). The validity of an indicator of a concept is the magnitude of the direct structural relation between the concept and the indicator. The validity estimate is the loading of the observed variable on the latent variable ($=\lambda$, see Figure 1). Its reliability is the magnitude of the direct structural relations that all latent variables have on it. The measure of reliability is the $R^2$. It measures the proportion of variance in an indicator that is explained by the variables that directly affect it.

## STATISTICAL ANALYSES AND RESULTS

A LISREL analysis generally starts with a preliminary examination of the observed variables in order to identify problem variables, that is, variables with a large number of missing values, high skewness, excessive kurtosis and so on, and then computes the input matrix to be analyzed.

The percentage of missing values (No Answer) was small. They ranged between 2% and 6% except for variable "The care associates of psychiatric clinics provide satisfactory care and treatment for the patients who have tried to commit suicide" (14%) and for variable "I want to have the right to take my own life" (8%). Since all the observed variables were ordinal, the polychoric correlations were computed (Jöreskog, 1990).

## Cross-validation of the Suokas & Lönnqvist (1989) Measurement Models

The first group of measurement models was derived from the findings of Suokas & Lönnqvist (1989). Table 2 shows which items were found to measure the different factors. It contains only those items that were taken over by Ramberg and Wasserman in their 37 item battery. When presenting the items only abbreviations are used. The full wording of the items is listed in Table 1.

As can be read from the table, several items measure more than one factor. Because of the complexity of this factor structure, it was decided to test seven one-factor models, each corresponding to a factor identified by Suokas & Lönnqvist (1989). The testing of these models was done on the total sample (psychiatrists, nurses, assistant nurses, psychologists and social workers) because the findings of Suokas & Lönnqvist (1989) were based on a similar sample.

Two of the seven one-factor models fitted the data very well according to the chi-square goodness-of-fit test: the model for *empathy* ($\chi^2 = 4.01,\ df = 5,\ p = 0.55$) and the model for *attitudes towards training* ($\chi^2 = 1.95,\ df = 2,\ p = 0.38$). A small chi-square relative to the degrees of freedom corresponds to a good fit and a large chi-square relative to the degrees of freedom corresponds to a bad fit. Associated with the chi-square value and the degrees of freedom is the p-value which should be larger than 0.05 (the conventional significance level) for a model to be accepted. Since both measurement models for *empathy* and *attitudes towards training* were acceptable, a further assessment con-

***TABLE 2.*** **Specification of Measurement Models Derived from the Results of Suokas and Lönnqvist (*)(**)**

| Model 1 Categorical attitude | Model 2 Empathic attitude | Model 3 Importance of psychiatric treatment | Model 4 Patients good treatment | Model 5 Development of care | Model 6 Centralized-decentralized care | Model 7 Training and attitude |
|---|---|---|---|---|---|---|
| STAFFTIME | DRUGTAKE | MENTALLY | | **BESTREAT** | CARECLIN | BEARING |
| PATTIME | **ANGRY** | **FIRSTIME** | | **DIFFICUL** | CONCENTR | **NRESPONS** |
| MISUSERS | ICARE | **HIGHRISK** | | | | **DIFFICUL** |
| **ANGRY*** ** | **BESTREAT** | **NRESPONS** | | | | **NEEDUNDS** |
| **FIRSTIME** | LIKEHELP | **DIFFICUL** | | | | |
| **HIGHRISK** | | **NEEDUNDS** | | | | |
| UNDERSTA | | | | | | |
| **NEEDUNDS** | | | | | | |
| DIFFCARE | | | | | | |
| SYMPUNDS | | | | | | |

*The table contains only those items which have been taken over by Ramberg. A label is used for each item. The full wording of the items can be found in Table 1.
**The indicators are the observed variables and are written in capital letters. The concepts are the latent variables and are written in lower case letters.
***The items that were measuring more than one component (factor) are in bold.

cerned the validity coefficients ($\lambda$) and the measurement errors ($\delta$). All loadings were significant (critical ratios = estimate/standard error larger than 1.96) except for DRUGTAKE (The amount of medicine used in an attempted suicide expresses the seriousness of the attempt). DRUGTAKE was not an indicator of *empathy* since the coefficient corresponding to its validity was not significant (loading = 0.02, t-value = 0.46). The content of the indicator seems to have little to do with empathy. Besides, this item contained a large amount of measurement error (1.00). Although the other indicators were valid and reliable, there was substantial variation in their validity and the reliability: LIKEHELP (validity = 0.79; reliability = 0.62), ICARE (0.67 and 0.45), BESTREAT (0.48 and 0.23), ANGRY (0.22 and 0.05). The validity of the indicator ANGRY was small and it contained mostly measurement error (0.95). The original question in Suokas & Lönnqvist (1989) "I sometimes show my *irritation* when I am nursing a patient who has tried to commit suicide" had been changed by Ramberg and Wasserman by replacing "showing irritation" with "getting angry." Showing irritation might have been a better expression with respect to empathy than getting angry. As for the extremely large amount of measurement error, it is evident that part of it is systematic and could be due to a social desirability effect (one should not get angry with suicidal patients and therefore some respondents might have systematically answered in such a way as to give a positive image of themselves) as well as to some item-specific influence.

Three of the indicators for *attitudes towards training*, NEEDUNDS, BEARING, and DIFFICULT had acceptable validities (0.64, 0.52 and 0.51) but the reliabilities of two of them were rather small (0.41, 0.27, 0.26). NRESPONSE was not a very valid indicator (0.15) and contained a large amount of measurement error (0.98).

The two one-factor models for *attitudes towards development of care* and toward *centralised-decentralised care* could not be tested separately because Ramberg and Wasserman's questionnaire included only two items for each of them (a measurement model with only two items is under-identified). However, when both factors were combined into a two-factor model, the fit was excellent ($\chi^2 = 0.043$, df = 1, p = 0.84). For both components, one of the items had a much higher validity and reliability than the other. For the first component, it was CARECLIN (0.86 and 0.74) compared to CONCENTR (0.55 and 0.30) and for the second component, it was BESTREAT (0.68 and 0.46) compared to DIFFICUL (0.23 and 0.05).

The model for *attitudes towards good treatment* could not be tested because Ramberg and Wasserman's questionnaire did not include any of the Suokas & Lönnqvist's (1989) items for this factor.

Finally, the models for *categorical attitudes* and *attitudes towards psychiatric treatment* did not fit the data ($\chi^2 = 226.77$, df = 35, p = 0.00; $\chi^2 = 33.54$, df = 9, p = 0.00) and several attempts to modify the original models did not produce any satisfactory results.

## Cross-validation of the Samuelsson et al. (1997) Measurement Models

A second group of measurement models was derived from the arguments and findings of Samuelsson et al. (1997), see Table 3.

The testing of the Samuelsson et al. (1997) hypotheses was done on the nurses' sample since their analysis was done on data collected on a sample of nurses.

The data did not fit the one-factor model for the USP scale. The value of the chi-square was too large relative to the degrees of freedom: $\chi^2 = 93.73$, df = 27, p = 0.00. In other words, the one factor

*TABLE 3.* **Specification of Measurement Models Derived from the Results of Samuelsson et al. (*)(**)**

| Model 1 Understanding suicidal patients | Model 2 Need for further training | Model 3 Need for psychiatric care |
|---|---|---|
| ANGRY | | CARECLIN |
| HIGHRISK | | CONCENTR |
| ICARE | | MENTALLY |
| BESTREAT | | CARESATI |
| UNDERSTA | | |
| LIKEHELP | | |
| DIFFICUL | | |
| DIFFCARE | | |
| SYMPUNDS | | |

*The table contains only those items which have been taken over by Ramberg. A label is used for each item. The full wording of the items can be found in Table 1.
**The indicators are the observed variables and are written in capital letters. The concepts are the latent variables and are written in lower case letters.

structure was too parsimonious to account for the polychoric correlations. The items seemed to measure different subcomponents as indicated by the modification indices. Subsequent modifications led to a final well fitting one-factor model ($\chi^2 = 10.12$, df = 9, p = 0.34) with six observed variables: ICARE, BESTREAT, UNDERSTA, LIKEHELP, SYMPUNDS and ANGRY. Of the six indicators, LIKEHELP had the highest validity (loading = 0.76), followed by ICARE (loading = 0.69), BESTREAT (loading = 0.55), SYMPUNDS (loading = 0.54), UNDERSTA (loading 0.41), ANGRY (loading = 0.23). However, the reliabilities of BESTREAT (0.30), SYMPUNDS (0.30) and UNDERSTA (0.17) were rather low and the reliability for ANGRY (0.05) was extremely low. A one-factor model without ANGRY also produced a slightly better fit ($\chi^2 = 5.26$, df = 5, p = 0.39).

The model for *attitudes towards the need for psychiatric care* appeared to fit the data ($\chi^2 = 2.89$, df = 2, p = 0.24) but the concept was measured exclusively with CARECLIN.

The model for *attitudes towards the need for further training* could not be tested because Ramberg and Wasserman did not include these items in their attitude scale.

## Testing of the Ramberg's Measurement Hypotheses

The third measurement hypotheses were those proposed by Ramberg, see Table 4.

The testing of Ramberg's models was again done on the total sample. The model for *attitudes towards the mental status* fitted the data without any modification ($\chi^2 = 1.73$, df = 2, p = 0.42). However, only three of the items were valid and reliable: NRESPONS (0.56 and 0.32), MDISORDER (0.53 and 0.28) and DRUGTAKE (0.37 and 0.14).

Three models fitted the data after having been sequentially modified: the models for *attitudes towards prevention*, *towards treatment* and *towards the relationship with patients*. The model for *attitudes towards prevention*, respecified as a two-factor model with six items, fitted the data very well ($\chi^2 = 12.37$, df = 8, p = 0.14). One component referred to prevention (suicide can be prevented), whereas the other component concerned non-prevention (suicide cannot be prevented if a person has made up his/her mind). All indicators had good validity except PREVKILL, but their reliabilities differed a great deal: CANHELP (0.75 and 0.57), PREVENT (0.59 and 0.35), HOPE (0.59 and 0.35) and PREVKILL (0.42 and 0.17) for the first dimension; CANNOTST (0.77 and 0.59) and SUCCEED (0.74 and 0.55) for the second dimension. The correlation between the two components was −0.57.

The model for *attitudes towards treatment* needed to be re-specified as a three-factor model to take into account three seemingly different aspects of treatment: quality (CARESATI and ASSOCIAT), content

*TABLE 4.* **Measurement Models Proposed by Ramberg (*) (**)**

| Model 1 Time | Model 2 Prevention | Model 3 Treatment | Model 4 Relationship with patients | Model 5 Empathy | Model 6 Negative | Model 7 Mental status |
|---|---|---|---|---|---|---|
| STAFFTIME | HOPE | CARECLIN | SECURE | BESTREAT | MISUSERS | DRUGTAKE |
| PATTIME | PREVENT | PSYCHOTH | FIRSTIME | DIFFCUL | ANGRY | HIGHRISK |
| DEVOTE | PREVKILL | CONCENTR | ICARE | NEEDUNDS | DIFFCARE | MDISORDER |
| | NODIFFER | MENTALLY | UNDERSTA | | | NRESPONS |
| | SUCCEED | ANTIDEPR | LIKEHELP | | | |
| | ANOTHSUI | COMBINED | SYMPUNDS | | | |
| | CANHELP | CARESATI | | | | |
| | BEARING | ASSOCIAT | | | | |
| | CANNOTST | | | | | |

*A label is used for each item. The full wording of the items can be found in Table 1.
**The indicators are the observed variables and are written in capital lettes. The concepts are the latent variables and are written in lower case letters.

(ANTIDEPR and COMBINED) and kind of suicidal patients (CARECLIN and MENTALLY). The revised model produced a good fit ($\chi^2 = 10.05$, df = 6, p = 0.12). All indicators were valid and reliable although there were some rather large differences in their actual values. With respect to the *quality of care*, ASSOCIAT was the most valid and reliable indicator (0.90 and 0.82). The validity and the reliability of CARESATI were 0.74 and 0.55 respectively. For the *content of care*, ANTIDEPR was the most valid and reliable indicator (0.84 and 0.71) followed by COMBINED (0.65 and 0.43). Both indicators for the *kind of suicidal patients* had similar validities and reliabilities (CARECLIN = 0.74 and 0.54; MENTALLY = 0.70 and 0.48). The subcomponents were correlated although the correlations were not very high (0.44 between *content* and *patients*, 0.27 between *quality* and *content* and 0.21 between *quality* and *patients*). The question is whether they are three components of the attitudes toward care or independent concepts. Two items had to be left out to obtain good fitting models: "Psychotherapy can be a way of preventing another suicide attempt" and "Psychiatric clinics should concentrate solely on the treatment of people making serious attempts."

Finally, the model for *attitudes towards the relationship with patients*, re-specified by leaving out one of the items (feeling more sympathy for those making a first suicide attempt than repeaters) produced an excellent fit ($\chi^2 = 1.84$, df = 5, p = 0.87). The most valid and reliable indicators were LIKEHELP (0.75 and 0.56) and ICARE (0.69 and 0.48). The validity of SYMPUNDS was 0.51 and its reliability 0.26. UNDERSTA and SECURE, had considerably lower validity and reliability values: 0.35 and 0.12, and 0.38 and 0.14.

The models for *attitudes towards time spent with suicidal patients*, for *empathy* and for *negative attitudes* could only be tested in combination with another model because each of them was a just-identified or saturated model (having only three indicators per concept). The model for *attitudes towards time spent with suicidal patients* was combined with the re-specified and well fitting model for *attitudes towards prevention* and produced a good fit ($\chi^2 = 26.61$, df = 17, p = 0.06) but one of the time indicators, "The care of patients who have tried to commit suicide reduces the time available for patients who are in greater need of help" had to be left out. This item refers to time lost for other patients whereas the two other items stress

the need for more time to be spent with suicidal patients. The validity and the reliability of the time indicators were 0.46 and 0.21 for DEVOTE and 0.45 and 0.20 for STAFFTIME. The correlations between the time factor and the prevention factors were 0.37 for time and non-prevention and 0.02 between time and prevention. Thus time and prevention are not directly related.

The model for *empathy* was tested in combination with the model for *attitudes towards relationship with patients*. Only when allowing for cross-loadings for BESTREAT and for SYMPUNDS (thus indicators of both empathy and *relationship*) did the model fit ($\chi^2 = 18.35$, df = 17, p = 0.37). BESTREAT and SYMPUNDS were slightly more valid indicators of *attitudes towards relationship with patients* than of *empathy*. The correlation between *empathy* and *attitudes towards relationship with patients* was 0.36. Interestingly, when leaving out DIFFICUL and NEEDUNDS, the remaining items formed a good uni-dimensional scale ($\chi^2 = 10.10$, df = 9, p = 0.34). When the SECURE item was left out (in which case the scale corresponded to the modified *USP* scale but tested on the total sample) the model produced an even better fit ($\chi^2 = 6.12$, df = 5, p = 0.29).

The model for *negative attitudes* was combined with the model for *attitudes towards relationship with patients*. Again allowing for a cross-loading (UNDERSTA also as an indicator of *negative attitudes*), the combination yielded a good fit ($\chi^2 = 23.04$, df = 18, p = 0.19). UNDERSTA was a better indicator of *negative attitudes*. This is not surprising because this particular item could be negatively as well as positively interpreted.

The most relevant findings resulting from our analyses of the three measurement models are summarized in Table 5.

## DISCUSSION

The purpose of this study was to cross-validate measurement hypotheses derived from the empirical work by Suokas & Lönnqvist (1989), and by Samuelsson et al. (1997), and to test measurement models proposed by Ramberg for attitudes of the mental health care staff toward suicidal patients. The evaluation was done with structural equation modeling, a confirmatory multivariate technique of analysis that enabled us to test the dimensionality of the concepts. It also enabled us to evaluate the quality of the individual indicators. Whereas Cronbach's alpha provides an estimate of the reliability of the sum of items in a multi-item scale (under the assumption that the scale is uni-dimensional) confirmatory factor analysis gives information on the reliability as well as on the validity of the individual indicators of one concept or of one or more of its subcomponents.

The most important findings concern *empathy*, *attitudes towards care and treatment*, *attitudes towards prevention* and *attitudes towards the mental status of suicidal patients*, four dimensions which we believe to be the most relevant in a study of attitudes of mental health care staff toward suicidal patients.

### Empathy

The reduced *USP* scale with five items produced a very good fit for the sample of the nurses. Tested on the total sample of the mental health care staff, its fit was equally satisfactory. Suokas & Lönnqvist's (1989) *empathy* sub-scale, Samuelsson et al.'s (1997) modified *USP* subscale and Ramberg's *relationship with patients*, *empathy* and *negative attitudes* sub-scales shared several items in common but each sub-scale contained some additional items. For example, Suokas & Lönnqvist's (1989) *empathy* sub-scale had two additional items but the

***TABLE 5.*** **Relevant Findings from Cross-validation of the Measurement Models by Suokas & Lönnqvist and Samuelsson et al. and Test of Ramberg's Hypothesis**

| | Models | | Model fit | | | Quality of the indicators | |
|---|---|---|---|---|---|---|---|
| **Measurements hypothesis from** | **Concepts** | **Indicators** | **$\chi^2$** | **Df** | **P-value** | **Validity[1]** | **Reliability[2]** |
| Suokas & Lönnqvist, 1989 | Empathy | LIKEHELP* | 4.01 | 5 | 0.55 | 0.79 | 0.62 |
| | | ICARE* | | | | 0.67 | 0.45 |
| | | BESTREAT** | | | | 0.48 | 0.23 |
| | | ANGRY | | | | 0.22 | 0.05 |
| | | DRUGTAKE | | | | 0.02 | 0.00 |
| | Training and attitude | NEEDUNDS | 1.95 | 2 | 0.38 | 0.64 | 0.41 |
| | | BEARING | | | | 0.52 | 0.27 |
| | | DIFFCUL | | | | 0.51 | 0.26 |
| | | NRESPONS | | | | 0.15 | 0.02 |
| | Care sub-component 1 | CARECLIN | 0.04 | 1 | 0.84 | 0.86 | 0.74 |
| | | CONCENTR | | | | 0.55 | 0.30 |
| | Care sub-component 2 | BESTREAT | | | | 0.68 | 0.46 |
| | | DIFFICUL | | | | 0.23 | 0.05 |
| Samuelsson et al., 1997 | USP-scale | LIKEHELP* | 5.26 | 5 | 0.39 | 0.76 | 0.58 |
| | | ICARE* | | | | 0.69 | 0.48 |
| | | BESTREAT** | | | | 0.55 | 0.30 |
| | | SYMPUNDS*** | | | | 0.54 | 0.30 |
| | | UNDERSTA*** | | | | 0.41 | 0.17 |
| Ramberg, present article | Relationships with patients | LIKEHELP* | 1.84 | 5 | 0.87 | 0.75 | 0.56 |
| | | ICARE* | | | | 0.69 | 0.48 |
| | | SYMPUNDS*** | | | | 0.51 | 0.26 |
| | | UNDERSTA*** | | | | 0.35 | 0.12 |
| | | SECURE | | | | 0.38 | 0.14 |
| | Mental status | NRESPONS | 1.73 | 2 | 0.42 | 0.56 | 0.32 |
| | | MDISORDER | | | | 0.53 | 0.28 |
| | | DRUGTAKE | | | | 0.37 | 0.14 |
| | | HIGHRISK | | | | 0.01 | 0.00 |
| | Prevention sub-component 1 | CANHELP | 12.37 | 8 | 0.14 | 0.75 | 0.57 |
| | | PREVENT | | | | 0.59 | 0.35 |
| | | HOPE | | | | 0.59 | 0.35 |
| | | PREVKILL | | | | 0.42 | 0.17 |
| | Prevention sub-component 2 | CANNOTST | | | | 0.77 | 0.59 |
| | | SUCCEED | | | | 0.74 | 0.55 |

(*continued*)

*TABLE 5.* **Continued**

| Measurements hypothesis from | Models | | | Model fit | | | Quality of the indicators | |
|---|---|---|---|---|---|---|---|---|
| | Concepts | | Indicators | $\chi^2$ | Df | P-value | Validity[1] | Reliability[2] |
| | Treatment | sub- | CARESATI | 10.05 | 6 | 0.12 | 0.74 | 0.55 |
| | | component 1 | ASSOCIAT | | | | 0.90 | 0.82 |
| | | sub- | ANTIDEPR | | | | 0.84 | 0.71 |
| | | component 2 | COMBINED | | | | 0.65 | 0.43 |
| | | sub- | CARECLIN | | | | 0.74 | 0.54 |
| | | component 3 | MENTALLY | | | | 0.70 | 0.48 |

*Indicators shared by Suokas & Lönnqvist, Samuelsson et al. and Ramberg.
**Indicators shared by Suokas & Lönnqvist and Samuelsson et al.
***Indicators shared by Samuelsson et al. and Ramberg.
[1]Validity = the loading ($\lambda$) of the observed variable on the latent variable
[2]Reliability ($R^2$) = the proportion of variance in an indicator that is explained by all the latent variables that directly affect it.

validity of the item referring to taking drugs was non-significant and the validity of the item referring to getting angry was very low. Ramberg's *relationship with patients* sub-scale had one additional item expressing a feeling of security when working with suicidal patients, but its validity was low. When the content of the items in the empathy sub-scales was analyzed, they seemed to refer to a willingness to care component, a need component and a compassion component, three components that are often considered fundamental aspects of empathy. The indicators of willingness to care (LIKEHELP and ICARE) had high validity and reliability. The validities of the indicators of the need component (BESTTREAT) and of the compassion components (SYMPUNDS and UNDERSTA) were somewhat lower.

## Care and Treatment

All authors considered *attitudes towards care and treatment* as important aspects of attitudes toward suicidal patients. However, the conceptualisation of attitudes toward care and treatment differed among them. Suokas & Lönnqvist (1989) distinguished between *attitudes towards the importance of psychiatric treatment* (where the focus seems to be on the patients) and *attitudes towards the organisational aspects of care*. The model for the *attitudes towards the importance of care* fitted the data well but this was not the case for the model for the *attitudes towards treatment*. Samuelsson et al. (1997) suggested a scale for *attitudes towards the need for psychiatric care* in which they combined items referring to the patients themselves and to the organizational aspects of care, but the scale proved to be largely unbalanced. Ramberg suggested a measurement model for *attitudes towards treatment* with care items and this model proved to be the most satisfactory one.

## Prevention

One of the good-fitting models concerned *attitudes about prevention* suggested by Ramberg. The first component, *attitudes towards prevention*, is measured with four items whereas the second component, *attitudes towards non-prevention*, is measured with only two items. An increase in the number of indicators for the negative perception of

prevention (suicide cannot be prevented) is recommended.

### Mental Status

A final good-fitting model concerned *attitudes towards the mental status of suicidal patients*, specified by Ramberg. However, it was felt that more indicators were needed to measure this specific attitude.

A final observation concerned items that were suggested as measures of different components. For example, Suokas & Lönnqvist (1989) found that NRESPONS was an indicator of *attitudes towards training* and that DRUGTAKE was an indicator of *empathy*. Ramberg argued that the both items were indicators of *attitudes towards the mental status of suicidal patients*. Testing both hypotheses with LISREL suggested that both items were much more valid indicators of *attitudes towards the mental status of suicidal patients* than of either *attitudes towards training* or *empathy*. To compare results such as these is one of the main advantages of LISREL. It can be used to select the items to be included in the measurement of our concepts.

## CONCLUSION

Structural equation modeling provided information on the dimensionality of the concepts and detailed information on the individual indicators in terms of their validity and reliability. Attitudes toward suicidal patients, as measured with 37 items, refer to very different aspects, and some of the aspects are not properly measured. Clearly, more work needs to be done in this important area. The concepts should be better defined, their relevant subcomponents specified, and more attention should be given to the development of indicators. If we want to study attitudes of the medical staff toward suicidal patients and change in these attitudes, we need adequate measurement.

Although several good-fitting models have been identified, this was often the result of necessary model modifications and we might have capitalized on chance. It is therefore necessary to replicate the findings on new material. This will be done on a different data set collected by the Center as a follow-up of the first study.

## CODE LIST

$\xi$ latent variable
$\chi$ observed variable
$\delta$ measurement error
$\lambda$ factor loading
$\varphi$ correlation

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