ABSTRACT

The study aims to develop and psychometrically test an instrument to assess trust in public sector organizations. Although trust-based management is of interest in many municipalities in the Nordic countries, an instrument to assess trust adapted for this context is lacking. The present study complies with Luhmann’s system theory and commonly used instruments in this tradition. Data from 240 first-line managers (RR 75%) and 1,871 employees (RR 47%) from all departments in one Swedish municipality were analyzed with a multi-level approach. Out of 16 initial items presented to first-line managers and employees, 8 were retained after the psychometrical testing in both samples. Factor loadings at both within and between levels, and the multilevel homology when exploring convergent and criterion-related validity, showed a similar pattern of two distinct factors. Similar to other previously developed instruments, Supervisory Trust was one dimension. The second construct Organizational Trust included items on trust in politicians and administrative specialists, in addition to trust in top-level managers. The Public Sector Organizational Trust Inventory can be recommended for use in future research on trust at individual as well as group levels.
INTRODUCTION

Politically governed organizations are mostly large and complex, with many stakeholders and relational nodes, where trust can both be developed and destroyed. Trust needs to be built between the political boards and committees, layers of management, expert functions, professions, and front-line workers so that efforts can be coordinated also when difficult decisions must be made, or when resources are scarce (Astvik et al., 2020; Höglund et al., 2018). Strategic management depends on trustful intra-organizational relations to provide high-quality services (Bentzen, 2019; Kroeger, 2017). However, most trust research in the public sector has mainly focused on citizens’ trust in welfare services, not in trust between the actors within the organizations (Bouckaert, 2012).

In recent years there has been an increasing interest in trust within public sector organizations (Bentzen, 2019; Vallentin & Thygesen, 2017). The way the public sector is governed since the introduction of New Public Management (NPM) (Hood, 1995) has been criticized for having contributed to decreased professional autonomy (e.g., Andersson, 2023). As a response, the Swedish government appointed a delegation (Swedish Government Official reports, 2019), suggesting avenues for a trust-based public sector management where all levels in the organization should contribute to the building of trustful relations (Bringelius, 2018). Since then, many municipalities and counties in Scandinavian countries have begun their journey towards trust-based management. Reviews conclude that many of the interventions are mainly directed at lower-level managers (Dellve, 2023; Dellve & Williamsson, 2022). However, case studies have shown that successful implementation needs congruence in discourse and actions between strategic and lower-level management (Astvik et al., 2020; Bentzen, 2019; Torfing et al., 2021). This means that in order to achieve a complex understanding of trust in public sector organizations, instruments based on Luhman’s work (Luhman, 1979) separating personal trust and system trust should be relevant. Furthermore, in line with the embedded agency theory (Lumineau & Schilke, 2018), we define trust as a phenomenon that is reciprocal and involves referents and referees at several organizational levels. This approach has seldomly been applied in psychometric testing of instruments measuring trust.

Organizational trust research has been prevalent since the 1980’s and has mainly focused on interpersonal trust and trust in vertical relationships (McEvily & Tortiorello, 2011). There is a consensus that the construct of trust in organizations is complex and needs to be adapted to the specific context and target group under study (Mishra & Mishra, 2013; Nyhan, 2000; Schoorman et al., 2007; Vanhala et al., 2011). Thus, studies testing the commonalities in existing instruments in different organizational contexts have been requested (McEvily & Tortiorello, 2011). However, to the best of our knowledge, no instruments that include both personal trust and trust in the organization have been developed and tested in public sector organizations, which is the overall aim of the present study. Such an instrument should be applicable in research as well as in intervention practices, meaning that the indexes should be valid to use both at the individual and workplace level. As a consequence, when composing group-level constructs, it is necessary to perform psychometric testing on data where individuals are nested in groups (van Mierlo et al., 2009).

Based on earlier work on the measurement of organizational trust, we find three specifically relevant questions. First, as public sector organizations have many actors at different levels, who should be referred to as the trustees? Secondly, can the same instrument be used for employees, aggregated to groups as well as for first-line managers in the same organizations (a multi-referent approach)? Thirdly, what dimensions of trust in the trustees are most interesting to be included in an overall construct?

These three questions are presented below as an introduction to the methodology chosen. The procedure for selecting items to be tested and for item reduction are presented in the appendix. Finally, the results of the psychometric testing are presented and discussed.

WHO SHOULD BE REFERRED TO AS THE TRUSTEES?

Organizational research often refers to Luhmann’s differentiation between system trust and personal trust (Luhmann, 1979). In earlier research, personal trust is often measured as the employee’s assessment of the trustworthiness of their immediate manager. Most scales referring to Luhmann’s second construct, system trust, are operationalized by asking employees for the trustworthiness of top-level managers as representatives of the overall organization. According to Luhmann, employees carry images of latent expressions of the organization that are based on the decisions and actions of the executive group. The trust that these images can generate is distinct from the trust that is based on daily-basis contacts with immediate supervisors. Instead of using personal interaction, top-level managers need to create and communicate via abstract systems of rules, roles and structures that promote trust (Atkinson & Butcher, 2003). Depending on the trustworthiness of even distant and symbolic expressions of decisions, norms and actions, trust can thus be built also in impersonal relations (Kroeger, 2017). The question then arises; who is sending these signals of trust, apart from top-level managers in public sector organizations?

Politicians, in their roles as members of committees for administrations, are important actors when it comes
to communicating decisions, values, and norms to managers and employees. Administrative functions, placed in central administrations, are involved in the development, communication, and implementation of management technologies that govern daily work in the core operations. Together with the politicians, these administrative experts contribute to trust or distrust at a system level and should arguably be included in a measure of overall system trust.

WHO CAN BE THE REFERENTS OF TRUST IN PUBLIC SECTOR ORGANIZATIONS?

Earlier studies have, to the best of our knowledge, not performed psychometric testing of different types of referents in the same organization. As many public sector organizations are large and hierarchically structured, first-line managers in the core operations mostly have an immediate manager between them and the top management. Thus, it is relevant to ask both employees and first-line managers to assess trust in their immediate manager. Furthermore, employees are both individuals and constituents of work teams. Some possible outcomes of organizational trust, such as performance and turnover rates, are often measured at the work-unit level. The sample of employees in the present study is nested in work-units, which means that multi-level confirmative factor analyses can be applied, as well as the exploration of convergent and criterion-related validity at both the individual and aggregated level.

WHAT DIMENSIONS OF TRUST SHOULD BE ASSESSED?

In a review on the measurement of organizational trust, more than a hundred instruments were identified (McEvily & Tortoriello, 2011). Many of them identified three key dimensions of trust in terms of the trustee’s trustworthiness; ability, integrity, and benevolence, as suggested by Mayer et al. (1995) in their integrative model of organizational trust. As it has not been explored before, it is important to test whether these dimensions are relevant also in studies of public sector organizations. Furthermore, it has been argued that reciprocity is a key dimension, that is, trust needs to be perceived as mutual between trustors and trustees (Göbel et al., 2013; Tsounis et al., 2023). Previous studies suggest that coherence in goals and values (Kim, 2018) as well as sharing information and knowledge (Choi, 2016; Kim, 2018; Scott, 1980) are particularly important in relation to trust in public sector organizations.

To summarize, the overall aim of the present study is to develop and psychometrically test an instrument to assess trust in public sector organizations. The instrument should be applicable both on individual and aggregated levels. The psychometric test is administered to both first-line managers and employees within the same organization to determine the validity of the instrument for both trustor groups. The psychometric tests consider the hierarchical and interdependent nature of organizations, and a multilevel approach is therefore used. Expanding current instruments, we will include the roles of not only top-level managers but also politicians and experts as trustees. Lastly, we will evaluate the reliability and validity of the instrument scales to measure trust outcomes in public sector settings.

METHODS

The present study was performed in two steps. The pilot study comprised screening the existing items relevant for the purpose of the study, construction of a larger instrument, and initial item reduction (see appendix). The main study comprised distribution and analyses of a questionnaire to a municipality with both managers and employees. The methods of the psychometric testing of the final scales (sample, measures, and analytical strategy) are presented in Table 1.

SAMPLE

Data for the main study was collected in a Swedish municipality during 2019. Two questionnaires were distributed—in October 2019 to the managers in the organization (Sample A) and a month later to the employees (Sample B). Each employee was coded with a unit ID, which means that a nested design was applied. This allowed for the instrument to be tested at an individual and aggregated level on the employee sample.

<table>
<thead>
<tr>
<th>SAMPLE A</th>
<th>SAMPLE B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Participants</strong></td>
<td><strong>Participants</strong></td>
</tr>
<tr>
<td>N</td>
<td>240</td>
</tr>
<tr>
<td>Analysis</td>
<td>Descriptive statistics, correlations, factor analysis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SAMPLE A1</th>
<th>SAMPLE A2</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>119</td>
</tr>
<tr>
<td>Analysis</td>
<td>EFA</td>
</tr>
</tbody>
</table>

Table 1 Description and analyses made on the study samples.
The municipality samples consisted of managers and employees from eight municipality departments (Municipal Administration, Childcare and Education, Labor market and Welfare, Culture, Leisure and Recreation, Rescue Services, Technical Services, Urban Planning and Environment Department, and Care). In six of the departments, all managers and employees were invited to participate in the study. In the two largest departments (Childcare, Education and Care), all managers and a random sample of units representing 40% of the employees were chosen.

Taken together, 257 managers participated (RR 75%) as well as 1,871 employees (RR 47%). Higher level managers were excluded, resulting in a sample of 240 first-line managers and 1,871 employees. Due to missing data, the final employee sample included 1,571 individuals and 171 work-unit groups (clusters). The average cluster size was 9 employees per group.

**MEASURES**

In the final psychometric testing, trust was measured with 8 items, 5 reflecting Organizational Trust and 3 reflecting Supervisory Trust. Participants marked their response on a five-point scale (ranging from 1 = do not agree at all to 5 = completely agree). The items are presented in Table 2. Below we present the psychometric properties of indexes measuring similar constructs used to explore convergent and criterion-related validity (see Adcock & Collier, 2001; Tangsgaard, 2022). Alpha and omega are estimates of internal consistency (reliability) for multi-item scales. For one item measures, only ICC is presented. Distributive justice (Colquitt, 2001) (M = 3.16, SD = 1.13, $\alpha$/O/ICC(1): .967/.968/.073) is theoretically close to trust, and thus, the two constructs could be expected to be correlated. Participants marked their response on a scale ranging from 1 = to a low degree to 5 = to a high degree. In addition, two indexes and two single items were chosen as indicators of outcomes of trust and can thus be used for tests of criterion-related validity. Turnover intention (M = 1.95, SD = 1.18, $\alpha$/O/ICC(1): .892/.895/.088) was measured with a three-item index (Sjöberg & Sverke, 2000). Participants marked their response on a scale ranging from 1 = do not agree at all to 5 = agree completely. Self-rated performance was measured with two single items measuring how the respondent assessed possibilities to perform well. The

<table>
<thead>
<tr>
<th></th>
<th>MANAGERS (SAMPLE A2) FACTOR LOADINGS WITHIN</th>
<th>EMPLOYEES (SAMPLE B) FACTOR LOADINGS WITHIN</th>
<th>EMPLOYEES (SAMPLE B) FACTOR LOADINGS BETWEEN</th>
<th>EMPLOYEES (SAMPLE B) ICC(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organizational Trust</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 I have confidence in the top management and in their way of leading the organization.</td>
<td>.96</td>
<td>.91</td>
<td>.99</td>
<td>.22</td>
</tr>
<tr>
<td>2 I trust that the top management provides correct and honest information about conditions that affect the work being done.</td>
<td>.91</td>
<td>.93</td>
<td>.99</td>
<td>.20</td>
</tr>
<tr>
<td>3 I trust that the administrative staff (HR, finance, etc.) has sufficient knowledge about the operations at our workplace.</td>
<td>.48</td>
<td>.51</td>
<td>.86</td>
<td>.13</td>
</tr>
<tr>
<td>4 I trust that the political leadership is sufficiently familiar with the operations at my workplace.</td>
<td>.45</td>
<td>.62</td>
<td>.91</td>
<td>.13</td>
</tr>
<tr>
<td>5 The top management trusts that we know how to do our jobs and that we do our best for the organization.</td>
<td>.78</td>
<td>.72</td>
<td>.95</td>
<td>.15</td>
</tr>
<tr>
<td><strong>Supervisory trust</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 I have confidence in my immediate manager and in their way of leading the work.</td>
<td>.93</td>
<td>.89</td>
<td>.99</td>
<td>.26</td>
</tr>
<tr>
<td>7 I can discuss difficulties and problems with my immediate manager without the risk of having this being used against me.</td>
<td>.86</td>
<td>.83</td>
<td>.96</td>
<td>.18</td>
</tr>
<tr>
<td>8 If I have problems at work that I or my work group cannot solve, I trust that the immediate manager can help take care of the situation.</td>
<td>.83</td>
<td>.89</td>
<td>.99</td>
<td>.23</td>
</tr>
</tbody>
</table>

Table 2 Factor loadings from CFA and MCFA.
items have been used in similar studies investigating working conditions and performance for managers (Björk et al., 2014). The first item reflected performance satisfaction \((M = 3.01, SD = 0.65, ICC(1) = 0.140)\), whereas the second item reflected to what extent the organization could fulfill the needs of the end user. For both items, participants marked their response on a scale ranging from \(1 = \text{not at all}\) to \(4 = \text{to a high degree}\), \((M = 3.19, SD = 0.61, ICC(1) = 0.127)\). Work engagement \((M = 2.96, SD = 0.53, \omega/\Omega/ICC(1) = 0.769/0.771/0.094)\) was measured with a three-item index, based on Hultell and Gustavsson (2010). Participants marked their response on a scale ranging from \(1 = \text{not at all}\) to \(4 = \text{all of the time}\).

### RESULTS

In the EFA (carried out on half of the managerial sample (A1), see Table 1), principal axis factoring was used with an oblimin rotation. After the exploratory analyses, five items reflecting organizational trust and three items reflecting supervisory trust loaded similarly and clearly on two separate factors. The factor structure was confirmed in the other half of the managerial sample (A2). The results from this CFA, presented in Table 2, indicated a satisfactory fit with a two-factor model, indicating the best fit to data as compared to a null model and a one-factor model. The two-factor model, with one factor measuring Organizational Trust and one factor measuring Supervisory Trust, \(\chi^2(19, N = 121) = 28.67, p = .071; \text{RMSEA} = 0.066; \text{CFI} = 0.984; \text{TLI} = 0.976; \text{SRMR} = 0.065\), met the cut-off value for a good fit (Hu & Bentler, 1999; non-significant \(\chi^2\); RMSEA and SRMR below .08; CFI above .90 and TLI above .95).

In the employee sample, ICC ranged from .13–.26, justifying a multilevel approach (Table 2). In the Multilevel confirmatory factor analysis (MCFA), we tested an isomorphic factor structure at both group and individual levels of analysis. This means that the same two-factor solution was expected as the one confirmed for the sample of managers. The MCFA model fit the data well \(\chi^2(38, N = 1571) = 241.012, p < .001; \text{RMSEA} = 0.058; \text{CFI} = 0.972; \text{TLI} = 0.959; \text{SRMR}_{\text{within}} = 0.043, \text{SRMR}_{\text{between}} = 0.038\). Factor loadings at both within and between levels were high (see Table 2). The two factors were moderately correlated \(r_{\text{within}} = 0.47, r_{\text{between}} = 0.49\) (see Table 3).

Moreover, we expected the constructs to show multilevel homology, i.e., the same pattern of correlations was expected at both individual (within level) and workplace levels (between levels) in the employee sample.

<table>
<thead>
<tr>
<th>1. Organizational trust</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Supervisory trust</td>
<td>.493</td>
<td>.669</td>
<td>–.665</td>
<td>.400</td>
<td>.773</td>
<td>.630</td>
</tr>
<tr>
<td>2. Distributive justice</td>
<td>.359</td>
<td>.480</td>
<td>1</td>
<td>–.886</td>
<td>.597</td>
<td>.762</td>
</tr>
<tr>
<td>3. Turnover intention</td>
<td>–.360</td>
<td>–.478</td>
<td>–.362</td>
<td>1</td>
<td>–.668</td>
<td>–.835</td>
</tr>
<tr>
<td>4. Work engagement</td>
<td>.326</td>
<td>.309</td>
<td>.292</td>
<td>–.412</td>
<td>1</td>
<td>.658</td>
</tr>
<tr>
<td>5. Pleased with work outcome</td>
<td>.362</td>
<td>.376</td>
<td>.346</td>
<td>–.461</td>
<td>.627</td>
<td>1</td>
</tr>
<tr>
<td>6. Users’ needs met</td>
<td>.226</td>
<td>.212</td>
<td>.195</td>
<td>–.250</td>
<td>.295</td>
<td>.464</td>
</tr>
</tbody>
</table>

*Table 3* Correlations between trust factors and theoretically related variables in the employee sample. Within level correlations below diagonal. Between level correlations above diagonal. Note. Covariates were grand mean centered, \(N_{\text{within}} = 1586, N_{\text{between}} = 171\). With sample size as presented in the note, all correlations are significant at \(p < 0.01\).
DISCUSSION

The rational for developing a new instrument measuring organizational trust in a public sector context is that previous instruments have not been adapted to and tested in public sector organizations. Three main issues based on observations from earlier studies on aspects that have been neglected in earlier developments of organizational trust scales were addressed; 1) Who should be referred to as trustees? 2) Who can be the referents on trust? and finally, 3) What dimensions belong to the construct?

The construction and development of items to be tested was based on theory and earlier empirical research in organizations. The resulting instrument labelled Public Sector Organizational Trust Inventory contain two separate constructs: Organizational Trust and Supervisory Trust. The instrument complies with Luhmann’s theory from 1979. The factor analysis confirmed that system trust, or trust in the organization, is a separate construct from personal trust, or more specifically, trust in the immediate manager (supervisor) for both employees and first-line managers. All items that were more general or impersonal, such as trust in the management or in the organization at large, did not load sufficiently in any of the factors (see appendix, table A). The results indicate that the highest managers act as “faces” of the organization as a system, and that employees that are linked to the same work unit perceive the trustworthiness of this system in a similar way (Kroeger, 2017).

Moreover, the factor analysis shows that the trustworthiness of politicians and administrators, such as HR and financial specialists, should be included in the construct Organizational Trust in a public sector setting.

WHO SHOULD BE REFERRED TO AS THE TRUSTEES?

The answer to the first question is consequently that items on trust in the top-level managers as well as in politicians and experts should be included in the dimension Organizational Trust. This means that our instrument is adapted to a plethora of actors in a public sector context, which is a contribution to the field of trust measurement in the public sector.

WHO CAN BE THE REFERENTS ON TRUST?

A second contribution is that the new scales are valid for individual employees as well as for groups of employees nested in work-units, and for first-line managers. In this respect, the same factor structure was found for first-line managers as well as for employees in the same organizations.

WHAT DIMENSIONS BELONG TO THE CONSTRUCT?

Thirdly, the dimensionality of the developed trust scale show similarities with earlier scales, but also some differences. The factor analysis confirmed earlier studies on organizational trust, in that the trustworthiness of the trustee’s ability, integrity, and benevolence constitute the factor Supervisory Trust. However, the factor Organizational Trust contains only the trustee’s ability and integrity items. One explanation might be that the chosen item on trust in organizational benevolence did not specify the level or the function of the trustee, as the other items in the dimension did. Furthermore, the item on reciprocity loaded significantly on the factor on Organizational Trust. However, the items on Coherence In Work Goals and Knowledge Sharing did not. It is worth mentioning that these items did not include the words “trust” or “confidence” which was the case in 7 of the 8 items that constituted the two factors. Our result is in line with some earlier studies indicating that these constructs are distinct from, however reciprocally related to, trust (Cosimir et al., 2012; Choi, 2016; Kim, 2018; Nyhan & Marlowe, 1997).

Finally, the psychometric testing indicated that the reliability and the validity of Organizational Trust and Supervisory Trust for both managers and employees in the same organization are satisfactory. The multilevel homology, that is, the correlations between the scales and other dimensions, shows the same pattern both within levels and between levels. This indicates that the scales can be applied both on individual level data and on aggregated data for employees nested in groups (Chen et al., 2005).

METHODOLOGICAL CONSIDERATIONS

This study was performed with a multilevel approach because the data consisted of individuals nested in a large number of workplaces. This is a strength because it means that the indices could be tested both within and between levels. Another strength is that the study design allowed for testing the scales on both first-line managers and employees working in the same organizations. A
limitation of the study is the cross-sectional sample, causing risk for common method bias (Podsakoff, 2003). Criterion-related validity should be tested longitudinally in future studies to secure that the indices can predict outcomes of trust in organizations over time.

Another limitation is that all data was collected in one single municipality, and with a rather low response rate in the employee sample. This may imply low variation in the sample and consequently a biased estimation of coefficients and correlations. However, the employees and managers work in a large number of different workplaces in all types of operations and public administrations. Moreover, the municipality is structured in a way that is typical of most public sector organizations in Sweden. Additionally, the response rate is comparable to that of many other studies. Therefore, this municipality shares similar characteristics with other public organizations.

IMPLICATIONS

An instrument that is valid at the individual as well as at an aggregated level is valuable in research on predictors and outcomes of trust in nested study samples. This is an advantage for future research, since outcomes of trust in organizations—such as performance and staff turnover—are often measured at the workplace level. This type of instrument is also useful in surveying and comparing the level of trust in organizations, and to take measures to promote healthy and efficient organizations (Berthelsen et al., 2019). Furthermore, the two scales, valid for both employees and first-line managers can be applied in multilevel research on trust development in large organizations as requested in the literature (Lumineau & Schilke, 2018; Schoorman et al., 2007).

CONCLUSION

Even though trust is seen as particularly important in complex organizations and so-called trust-based management is implemented on a large scale in the Scandinavian public sector, research and instruments adapted to this context are lacking. The study contributes with an instrument—the Public Sector Organizational Trust Inventory—that is tested and adapted to assess trust in public sector organizations. The instrument contains two separate constructs; Supervisory Trust and Organizational Trust, similar to previous instruments tested in the private sector. Our study confirms the integrative theory of Luhmann, including both personal trust and system trust. Also, it joins a tradition of trust measurement that considers the trustworthiness of the trustee’s ability, integrity, and benevolence (McEvily & Tortirello, 2011).

The main contribution is the inclusion of trust in politicians as well as administrators in the Organizational Trust construct. They represent important actors at the top of the organization that should not be neglected when trust is assessed in a public sector setting. Furthermore, the two scales can be applied with both employees and first-line managers as respondents, which is useful when exploring trust in large organizations. The instrument is recommended to be applied in future research on trust, using individual level data as well as data aggregated to the unit level.

ADDITIONAL FILE

The additional file for this article can be found as follows:

- Appendix. Construction of an instrument for public sector organization. DOI: https://doi.org/10.16993/sjwop.234.s1

FUNDING INFORMATION

This work was made possible by a grant from AFA Insurance (Dnr: 180066) who insures employees within the private sector, municipalities and county councils.

COMPETING INTERESTS

The authors have no competing interests to declare.

AUTHOR AFFILIATIONS

Annika Härenstam orcid.org/0000-0003-1709-2004
Stockholm University, SE
Erik Berntson orcid.org/0000-0002-0108-1637
Swedish Defence University, SE
Lisa Björk orcid.org/0000-0002-2004-6351
University of Gothenburg and Institute of Stress Medicine, SE
Linda Corin orcid.org/0000-0002-6056-2190
University of Gothenburg and Institute of Stress Medicine, SE
Rebecca Fältén orcid.org/0000-0002-8725-4702
Department of Psychology, Stockholm University, SE
Aleksandra Bujacz orcid.org/0000-0002-6968-6157
Karolinska Institutet, SE

REFERENCES

Andersson, Th. (2023). Professionen, NPM, ansvar och tillit – vad är problemet och vad är lösningen? [Professions, NPM, responsibility and trust], Ch 2, In Björk & Tengblad (Eds.), Tillförlitlig styrning och organisering av välfärden. SNS förlag.


