

# Service satisfaction among a language minority: a randomized survey experiment on the satisfaction of Swedish- speaking Finns with early childhood education

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## Abstract

**Purpose** – This study explores the effect of language on service satisfaction among Finland-Swedes, a national minority language group in Finland, in the context of early childhood education. Models of public service satisfaction hold standard process and outcome related factors, such as availability and quality, as drivers of the satisfaction. However, although research has shown significant variation in satisfaction between different groups of citizens (race, ethnicity, age etc.), research has largely overlooked group specific factors as explanations for the satisfaction.

**Design/methodology/approach** – A randomized survey experiment with a  $2 \times 2 \times 2$  factorial design analyzed the impacts of language, service accessibility, and quality on service satisfaction. The data was analyzed with ANOVA.

**Findings** – The results revealed that language significantly impacts Swedish speakers' satisfaction, suggesting that for minority groups, language may override typical satisfaction determinants like quality and accessibility. Interestingly, special linguistic needs are relatively more pertinent in low-quality services than in higher-quality ones.

**Originality/value** – The study shows how group related factors of public service, in our case language, in an important factor explaining satisfaction with the service. The findings have implications for the literature on citizens' satisfaction with public services with demographic and identity facets, especially in a typical Nordic welfare state.

**Keywords** Public service delivery, Experimental research, Behavioral public administration, Public managers

**Paper type** Research paper

## Introduction

Public service satisfaction has become increasingly important to track since the 1990s public sector reforms, which have shaped citizens' perceptions of themselves as consumers

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of public services (Newman, 2013). Indicators of public service satisfaction help managers govern and politicians predict future needs (Luoma-aho *et al.*, 2020; Osborne and Brown, 2013). Research in wealthy Western democracies highlights the complexity of public service satisfaction and its implementation in practice, showing that both general attitudes and perceptions of specific services are important to consider (Van de Walle, 2017), the congruence between bureaucrats and citizen satisfaction (Petrovsky *et al.*, 2023), as are the organization of service delivery (Angius and Van Thiel, 2024; Berg and Johansson, 2020). However, despite progress in understanding the mechanisms of public service satisfaction and its consequences for public service management, research appears to have ground to a halt with the theories of general determinant factors for service satisfaction or the Expectation-disconfirmation model (EDM) (Grimmelikhuijsen and Porumbescu, 2017). Interestingly, public service satisfaction varies systematically between different groups such as race, ethnicity, and age (Bucaite Vilke and Vilkas, 2018; Choi and Hwang, 2022; Van Ryzin *et al.*, 2004), an aspect that has been insufficiently scrutinized by previous scholarship. For example, it remains unclear how specific demography related factors affect the satisfaction within these groups.

This study examines whether language is a determinant of public service satisfaction among a national language minority. Previous research has indicated quality issues and different rationales for service ratings from a minority perspective (Henriksson, 2011; Himmelroos *et al.*, 2021). However, the importance of language relative to other service features, such as availability and output quality, has not been examined. By investigating the impact of language, availability, and output quality on minority evaluations of welfare services, this study aims to provide valuable insights for public service satisfaction and management with demographic diverse communities. Understanding these micro-level dynamics of satisfaction among diverse demographics can be important for both administration and equity, as it can enhance performance management and ensure equitable service delivery (Van Dooren *et al.*, 2015).

The focus is on Swedish-speaking Finns, a resourceful language minority with official national language status and local autonomy in Finland (Liebkind *et al.*, 2004; Myntti, 2009). As a recognized national minority in a modern welfare state (5.2% of the population of Finland with separate education system in Swedish), they serve as an ideal case for analyzing the importance of language and other service features for service satisfaction.

This study aims to contribute novel knowledge to behavioral public administration research by integrating a language-identity perspective (Bouwman and Grimmelikhuijsen, 2016). It seeks to clarify the causal relationship between language services and minority satisfaction using a randomized survey experiment design, which offers methodological advantages over previous observational studies (Huntington-Klein, 2022).

### **Theories on citizens' satisfaction with public service**

The citizens' perception and satisfaction with public service have been under increasing scientific scrutiny in the last decades. Public service in general refers to the services and products provided by the government or local authorities and encompasses infrastructure, such as roads and traffic lights, as well as more complex services, such as education or health care (Van Dooren *et al.*, 2015). Public services also include welfare services, which generally refer to programs and other activities directed at groups that are in a vulnerable position (Vedung, 1997). There are several models explaining service satisfaction, but the core of the models attribute satisfaction to citizens' perceptions of procedural and outcome related factors (Van de Walle, 2017). In the US, where the local managers' interest for citizens' ratings and satisfaction with public service has for longest generated customer satisfaction measurements (Stipak, 1980), a standard model the *American Customer*

*Satisfaction Index* (ACSI), is widely applied for identifying service quality determinants that drives service satisfaction (Van Ryzin *et al.*, 2004). In the ACSI, citizens' ratings of service process and outcome factors are weighed to a comprehensive index of service satisfaction.

A theoretically more elaborate account is the EDM, which supposes satisfaction to be relative between an individual's expectations and a succeeding experience of the service, which either disconfirms or confirms one's expectations (Van de Walle, 2017). The theory assumes higher prior expectations to yield lower satisfaction on average than lower prior expectations that are easier to beat (Young Mok *et al.*, 2017). However, subsequent scholarship has provided mixed empirical evidence for the mechanism; research has found the effect of expectations to only have an indirect positive effect on satisfaction, whereas performance has a direct effect on satisfaction (Van Ryzin, 2013). The evidence has amounted to the level of discomfort with the EDM theory that its assumptions have been called into question and for fundamental reconsideration (Grimmelikhuijsen and Porumbescu, 2017). There are some interesting recent findings suggesting a distinction between different types of expectations (Favero and Kim, 2021), but it remains to see whether this will revitalize the research on EDM.

In this study, we follow contemporary research on public service satisfaction and focus on the welfare-related service of the concept, which includes education, health care, and such services (Zhang *et al.*, 2022). Scholarship on the subject has shown citizens to mix general attitudes towards the public sector, and perceptions of specific services; Citizens without first-hand experience of the service will commonly rate the level of public service when asked, and they are more prone to answer based on prejudices compared to citizens with experience of public service (Van de Walle, 2017). Focusing on the subjective perception of a specific generally provided public service decreases the inflation based on prejudices and general attitudes. Another natural reason for this demarcation is that the value creation in this kind of service, where the commodity has a social dimension and is based on a series of activities, is much more complex and heterogenic than in commodities with clear borders between producer, product and user, *e.g.* most basic infrastructure (Vakkuri and Johanson, 2021). On the other hand, we also exclude the welfare service to groups in vulnerable positions because the logic of value creation is particular to the more marginal service type.

The growing body of knowledge of the determinants of public service satisfaction has, however, been vague on the heterogeneity of satisfaction in the population. There is ample evidence of how satisfaction diverges between different racial, ethnic and demographic groups, categorically with the minority group disparaging the public service (Bucaite Vilke and Vilkas, 2018; Choi and Hwang, 2022; Van Ryzin, 2013; Zhang *et al.*, 2022). Furthermore, the effect of service failure seems to be asymmetrical to service success for satisfaction, meaning discontent with service leads to greater dissatisfaction than equal content with the service would in proportion lead to satisfaction (Olsen, 2015). Indeed, it is unclear how specific service factors relevant for minority groups, such as service in their language (*e.g.* Latinos in the US), place of residence or open hours or similar (*e.g.* black communities in the US), affect their satisfaction with the service.

Additionally, most evidence is from the US or other big or middle-sized OECD countries, while research on small Nordic countries are more uncommon (Van de Walle, 2017). This matters, because the Nordics have the most inclusive public service models of all, departing from a universalist tax-funded welfare model. The research on welfare service attitudes in the Nordics specifically has shown that, in general, there is a strong support for the welfare model both among citizens and public officials (Blomberg and Kroll, 2012). However, research is scarcer on satisfaction with specific public service in the Nordics. Moreover, it is unclear to what extent standard service-related factors, such as quality and availability of the

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service, determine satisfaction with public service with a resourceful minority group such as the Swedish-speaking Finns of Finland.

#### *Determinants of service satisfaction among a language-minority*

Recent research has confirmed the earlier findings regarding the determinants of public service satisfaction, *i.e.* performance drives the ratings and satisfaction with specific public service (Zhang *et al.*, 2022). The empirical findings indicate that the normative expectations only marginally change over time by the experience of actual services (Zhang *et al.*, 2022). Whereas the EDM has been applied in institutionally different contexts, such as in Hong Kong (Chen *et al.*, 2022) and Mexico (Petrovsky *et al.*, 2017), the performance factors explaining satisfaction with service have been insufficiently applied in the context of a strong welfare system and a heterogenic demography with codified minority rights to public service.

Research on value creation of such services has shown different procedural-related qualities, such as competence of staff and availability of the service, are important factors (Parker *et al.*, 2023; Vakkuri and Johanson, 2021). Findings from Southern Europe indicate service quality factors to be important determinants for satisfaction (Alemán *et al.*, 2018). To test the applicability of the standard service quality factors in a Nordic welfare country from a language minority's perspective, we put forth the first two hypotheses concerning satisfaction based on service accessibility and quality among a language minority:

- H1. Service with higher accessibility receives higher satisfaction than service with lower accessibility among the language minority.
- H2. Service with higher quality receives higher satisfaction than service with lower quality among the language minority.

The above formulated hypotheses seek to validate the significance of determinants of service satisfaction as showed in previous research in other contexts. However, the standard service-related factors will not account for satisfaction that are attributable to a group's specific factors and often endogenous to the public service for specific groups, such as those for officially recognized language groups. The language, which is often formative for such groupings' identity (Phinney and Ong, 2007), is also important as the quality of public services in places with national or local language requirements in service provision (Himmelroos *et al.*, 2021). In the next, we discuss the language-related service factor from a minority group's perspective.

#### *Language-identity and service satisfaction*

Realist accounts of contemporary political and administrative science have shown identity and group-related factors to explain political and administrative attitudes, opinions, and behavior (Achen and Bartels, 2017). Language can be important for a minority group for both practical and identity reasons. From a practical point of view, the service in the minority's language is a necessary requirement for individuals not proficient in the majority language. For instance, seeking basic services such as medical treatment without a common language with the medical professionals can make the citizen feel uncertain about being understood, and in the worst case result in an incorrect diagnosis.

However, many minority citizens are proficient in the majority language. Moreover, often the reason for seeking and valuing service in the minority's own language is identity (Lindell *et al.*, 2023). Generally, language is among the most important factors in constructing an ethnic minority group, *e.g.* the Catalans in Spain, the Quebecois in Canada, and the Finland-Swedes in Finland (Allardt, 1981). Such officially recognized language groups are also

entitled to public service in their own language locally and to some extent with national authorities. Indeed, the language service can be important for identity reasons regardless of the individuals' skills in the majority language (Himmelroos *et al.*, 2021).

Research in such language service, or public service in the minority's language, has provided indicative findings that such service is often lacking in quality compared to service in the majority language (Henriksson, 2011). Interestingly, language appears to have a strong normative standpoint in the overt evaluation of public service among a national language minority, trumping the rational need-based approach to public service in the minority's language (Himmelroos *et al.*, 2021). Based on the normative expectations model gaining traction on behalf of the experiential, we can assume that a language minority holds normative expectations regarding language service, *i.e.* expect the public service to be available in their own language despite encountering actual situations where it is not.

Despite some theoretical work on the subject, there is no framework for testing systematized assumptions regarding a national language minority's satisfaction with language service. However, the research has been observational and due to the endogenous nature of one's mother tongue and language of public service provision, it is impossible to know the proportion of service satisfaction that can be attributed to the different service factors (Van Ryzin, 2013). Based on the practical and language identity mechanisms, we assume service in a minority language to be a performance factor directly affecting service satisfaction among the language minority. A third conditional main effect concerning the evaluation of the language of the public service is formulated:

*H3.* Swedish language service receives higher satisfaction than Finnish language service among the language minority.

To test the cumulative effect of the service's language and the standard determinants for service satisfaction, quality and availability, we form a hypothesis expecting to see that language service in the minority's own language amplifies the quality addition of qualified staff and good accessibility. We assume that:

*H4.* Swedish language service with qualified staff and good accessibility receives higher satisfaction than identical Finnish language service among the Swedish-speaking Finns.

Moreover, if we assume dissatisfaction to have a stronger effect on service satisfaction, as found by (James and Jilke, 2017; Olsen, 2015), we can ask whether the dissatisfaction with service quality is stronger with a service in the majority language than with a service in the minority's language.

### **The case of the Finland-Swedes**

Our study focuses on the Swedish-speaking minority in Finland, a historical minority differing from the Finnish-speaking majority in cultural, political, and language aspects (Bengtsson, 2011). Swedish has been a part of Finland since the era when it was under the Swedish Kingdom (1157–1809). Post-independence from Russia in 1917, the Finnish constitution of 1919 declared both Finnish and Swedish as national languages. Today, this minority comprises about 287,000 individuals (Statistics Finland, 2024). Most Swedish-speaking Finns reside along the coastal areas of Uusimaa, Turunmaa, and Pohjanmaa. About half live in municipalities where Swedish is the main language, while the other half are in predominantly Finnish-speaking areas. Many of these municipalities have legal bilingual status, requiring equal provision of public services in both languages (Harjula, 2023).

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Finland's welfare system is largely tax-funded, representing the Nordic model, although user fees now provide complementary funding for key public services like healthcare (Kananen, 2014). This contrasts with the Anglo-American model of private funding and the Continental model of public-funded insurance. Studying satisfaction determinants in this Nordic context may offer broader explanatory power than previous studies focused on Anglo-American or Continental systems (Van Ryzin, 2013; Zhang *et al.*, 2022).

The Finnish constitution grants several language rights to the Swedish-speaking population, allowing them to conduct daily affairs in Swedish. This includes a Swedish educational system and the right to perform military service in Swedish. In terms of early childhood education, the Finnish municipalities are obliged by law to provide the service to its inhabitants according to their mother tongue in the official languages of Finland, Finnish and Swedish [1]. They can also access services in Swedish when interacting with state departments like the police or tax authorities. Most Swedish-speaking Finns are proficient in Finnish but often use Swedish services, particularly in education, which is viewed as a cultural and identity-preserving institution (Lindell, 2021).

Previous research indicates that the Swedish educational system plays a central role in how children linguistically identify themselves (Kovero, 2011, p. 53) and that the educational system is very important for the future of the Swedish language (Saarela, 2021, p. 9). Early childhood education, or kindergarten, is especially relevant from a language perspective. These units are small, typically with 40–70 children, and are located closer to homes compared to larger elementary and upper secondary schools. Municipalities provide most early childhood education, with about 90% of children aged 1–6 attending municipally run kindergartens. The service is heavily subsidized by taxes, with a small progressive user fee. It is popular, with almost 80% of the age cohort attending. The proportion of Swedish-speaking Finns in early childhood education (5.9%) is slightly higher than their national population share (Finnish National Agency for Education, 2024). However, the organization of these units and their proximity to homes might lead to greater use of Finnish services by Swedish-speaking Finns. Thus, early childhood education is a suitable context for studying service satisfaction determinants among a language minority.

### Experimental design, data and methods

We tested our hypotheses using a randomized  $2 \times 2 \times 2$  factorial survey-based vignette experiment. Randomized survey experiments have become popular instruments for gauging causal explanations in social research. By harnessing the methodology of the potential outcomes framework with its strength in providing explanations based on estimates of counterfactuals (Angrist and Pischke, 2009), and administering the research efficiently in online surveys that contemporary high-standard polling software and infrastructure make possible, randomized survey experiments can claim to offer both internal and external validity (Sniderman, 2018).

A factorial survey experiment enables the isolated manipulation of treatment variables at varying levels, thus facilitating the evaluation of distinct causal effects on service satisfaction within a controlled environment. A vignette can be defined as a: “short, carefully constructed description of a person, object, or situation, representing a systematic combination of characteristics.” (Atzmüller and Steiner, 2010, p. 127). In our survey-based vignette experiment, respondents are presented with a set of different vignettes to assess or respond to, and each vignette is slightly manipulated to include different features. Vignette experiments are empirically relatively robust (Hainmueller *et al.*, 2015), and combines the internal validity of experiments with the external validity of surveys (Migchelbrink and Van de Walle, 2020).

The data was collected in an omnibus survey, administered in the Swedish-speaking language, utilizing the Barometern-online panel, which is a randomly recruited citizen panel

for the Swedish-speaking population of Finland. This panel is administered by the Social Science Research Institute at Abo Akademi University as part of the Finnish Research Infrastructure for Public Opinion (FIRIPO). The survey was a self-administered online questionnaire in field 17th September to 1st October 2023 distributed to a total of 4,103 by e-mail, and after one reminder the total amount of respondents was 1967 rendering a response rate around 48%. [Table 1](#) presents the response sample of the survey both before and after our quality and robustness checks, which led to the exclusion of some participants, a topic we will elaborate on later [\[2\]](#). For descriptive statistics on the sample for each experimental group, please refer to the [Appendix, Table A1](#).

Our experimental design involved three factors, each manipulated at two levels, resulting in eight unique combination options (e.g. a  $2 \times 2 \times 2$  design). Unlike traditional one-factor experiments, full-factorial designs allow for the simultaneous manipulation of multiple factors and consequently allow for more realistic and valid experimental scenarios ([Atzmüller and Steiner, 2010](#)). The objective of the factorial design was to investigate the effects of language, service accessibility, and quality, which were assessed based on factors operationalized as travel time and staff qualifications, on service satisfaction. The design is intended to probe the effect of two conventional but different service factors, accessibility and quality, against the language factor, which is of particular interest in this study. The drawback with factorial design is that the main effects are always conditional on the two other factors ([Auspurg and Hinz, 2015](#)).

Moreover, although laudable if possible but not absolutely necessary for most studies in social sciences ([Sniderman, 2018](#)), we do not employ a traditional control condition but instead apply and study the difference between two treatments. This is done for the practical reason that it is not clear what a natural control condition for Swedish service would be since public service is either provided in Swedish or Finnish in Finland, and adding a third control condition without any language cue would require allocating a significant share of respondents to the control group, thus possibly reducing the statistical power of the analysis ([Gaines et al., 2007](#)).

[Table 2](#) provides an overview of the dimensions, levels, and operationalization of the factorial design. An English translation of the vignettes is presented in [Figure 1](#).

	Pre-exclusions	Post-exclusions
<i>Gender</i>		
Woman	1,016 (52)	650 (55)
Man	940 (48)	529 (45)
<i>Age</i>		
18–29	169 (9)	96 (8)
30–39	241 (12)	143 (12)
40–49	256 (13)	158 (13)
50–59	312 (16)	184 (15)
60–69	439 (22)	298 (25)
70–	549 (28)	315 (27)
<i>Educational level</i>		
Basic education	91 (5)	44 (4)
Upper secondary education	666 (34)	384 (32)
Higher education	1,210 (61)	757 (64)
<i>Total</i>	1967 (100)	1,195 (100)

**Note(s):** The presence of N/A-values contributes to discrepancies in *n*-values

**Source(s):** Authors' own creation/work

**Table 1.**  
Sample, *N*(%)

**Dependent variable: service satisfaction**

The dependent variable is *service satisfaction* operationalized as an index of five outcome variables. After reading the vignette, respondents were asked to rate the service on five individual items, which capture the respondents’ perception of the business’s trustworthiness, service impact, competence, responsibility and efficiency. We operationalized our outcome variables related to service satisfaction using the following question: “What do you think of the activity?” All five items were asked to be rated on an 11-point Likert-like scale (0 = Completely disagree, and 10 = Completely agree). The items being: “I have confidence in the activity”, “The activity serves the children and families well”, “The activity seems competent”, “The activity operates responsibly” and “The activity is an efficient use of tax funds”. These five outcome variables were subsequently calculated as a mean index of service satisfaction for each respondent and re-coded into a range between 0–1.

To ensure the reliability of our measurement, we conducted a check for measurement invariance, and the high Cronbach’s alphas for each item, as presented in the [appendix \(Table A2\)](#), indicate strong internal consistency. This confirms that the service satisfaction index is a reliable measure.

*Covariates*

Generally, the random allocation of participants to treatment or control groups employed in the data collection is designed to reduce the influence of confounding factors on the relation between the predictor and the outcome, thus making the estimation of a cause-effect relation possible.

However, the context of the experiment, which in this study is early childhood education, is naturally most relatable for parents with children in the age of 1–6 who are most likely to be in kindergarten. We assume the treatment effectiveness to be related to the experience of kindergarten, and although not all children in Finland go to kindergarten it is quite common

Dimension	Level	Operationalization
<i>Language</i>	1 = <i>Other domestic</i> 2 = <i>Mother tongue</i>	1 = <i>Finnish-speaking</i> 2 = <i>Swedish-speaking</i>
<i>Availability (distance)</i>	1 = <i>Long</i> 2 = <i>Short</i>	1 = <i>30 min</i> 2 = <i>10 min</i>
<i>Quality</i>	1 = <i>Low</i> 2 = <i>High</i>	1 = <i>Significant lack of qualified personnel</i> 2 = <i>Good access to qualified personnel</i>

**Source(s):** Authors’ own creation/work

**Table 2.**  
Vignette experimental design

Next, you will read about a fictitious investigation into early childhood education in your area. Read the text carefully and answer the questions that follow.

A recent investigation of the [**Finnish-speaking/Swedish-speaking**] early childhood education in your area has, for the first time, mapped the average distance children have to travel to daycare centers and the personnel situation at these centers. The investigation shows that the one-way travel time for children is approximately [**30 minutes/10 minutes**], and the investigation further reveals that in many of the daycare centers, there is [**a significant lack of qualified personnel/good access to qualified personnel**].

**Source(s):** Authors’ own creation/work

**Figure 1.**  
The vignette



due to the universal model of free or low-cost early childhood education, and therefore having children can be assumed a good proxy for first-hand experience of early childhood education. Furthermore, the factor of service accessibility, which is tested to probe the conditional effect of language over accessibility on service satisfaction, can be related to the area of residence. In the center of big cities travel time in rush hours can be high, which for the treatment means that the higher level (30 min) may not be perceived as negatively as it is in smaller cities.

To control for covariates, we collected data on respondents' gender (1 = Woman, 2 = Man), language identification (1 = Swedish-speaking, 2 = Bilingual), self-reported competence in the Finnish language (Scale from 4–10) area of residence (1 = City center of a large city (more than 100,000 inhabitants), 2 = City center of a smaller city (less than 100,000 inhabitants), 3 = Suburb or outskirts, 4 = Municipal center or other urban area, 5 = Rural countryside) and family status (children) (1 = No children, 2 = Children).

### Data analysis

The main method of analysis is three-way ANOVA where we examine the impact of our three factors (language, availability and quality) including their interactions with the service satisfaction index. We also provide descriptive statistics on the outcome variable (see [Table A2](#) in the [Appendix](#) for the items and the index), the treatments, and the outcome over the treatment groups. The differences between the groups are also analyzed initially with a student *t*-test.

If the main model with interactions generates statistically significant results on the chosen confidence level of alpha 0.05 and beta 0.2, we visualize the effects for understanding the micro-dynamics.

#### *Data quality and robustness checks*

Firstly, to validate our experimental design, we introduced attention checks. Participants were asked to identify the precise service language in the vignette they encountered within the hypothetical investigation. This step was particularly critical since linguistic context served as a pivotal attention check for our analytical framework. Those who provided no answer, indicated a lack of recall or gave incorrect responses were subsequently excluded from the analysis as is common practice ([Ejelöv and Luke, 2020](#)). Consequently, we excluded 113 respondents who provided no answer, 217 respondents who indicated a lack of recall and 413 respondents who gave an incorrect response on the linguistic service of their vignette. Additionally, 28 respondents with no outcome index value and 1 respondent who identified as Finnish-speaking were excluded. As a result, a total of 772 respondents were excluded from the analysis, leaving a sample of 1,195 respondents.

Secondly, we assessed the randomization using a balance test. As mentioned, out of the 413 respondents who provided inaccurate responses to the manipulation check regarding the service language in the received vignette, a substantial portion exhibited this discrepancy due to the misperception that they had received a Swedish-language service vignette. Consequently, this has resulted in an oversampling of Swedish-speaking vignettes ( $n = 764$ ) relative to Finnish-speaking vignettes ( $n = 431$ ), following the exclusion of these respondents. To further validate the effectiveness of the experimental design concerning demographic characteristics such as gender, age, and education, we conducted  $\chi^2$ -tests (for descriptive statistics on the sample for each experimental group, please refer to the [Appendix, Table A1](#)). Our analysis found no statistically significant differences in age or educational level within the sample after the exclusion of respondents, as evidenced by *p*-values of 0.062 and 0.129, respectively. These results indicate that after the exclusion there are no significant associations between age or educational level and the treatment groups.

However, a  $p$ -value ( $<0.05$ ) revealed a statistically significant difference between gender and treatment groups. Apart from this small oversampling of women, the absence of statistically significant differences in the parameters of the overall sample compared to the individual vignette samples indicates a balanced and successful randomization. To exclude the potential confoundedness following the skewed gender balance between the treatment and control group, we control for gender in the main analysis of covariance between treatment and service satisfaction.

### Research ethics

Following the highest scientific research standards to ensure the objectivity of results, the study's required sample size, power analyses, hypotheses, and intended analyses were preregistered on Open Science Framework {<https://doi.org/10.17605/OSF.IO/79TNF>} before data collection. A notice of the privacy statement and a link to it was provided to all participants in the invitation and on the entry site to the online survey. All participants were asked for informed consent before participating in the survey and had the opportunity to opt out at any time. As the respondents provided informed consent and there were no considerable risks involved in the experiment, we did not seek approval from the Finnish National Board of Research Integrity, as per their instructions ([Ethical review in human sciences.Pdf, 2019](#)).

### Results

The analysis yielded several significant treatment effects. We present our findings as follows: firstly, we provide descriptive statistics on our sample by our eight unique vignette combinations. Subsequently, we conduct an analysis of variance (ANOVA) for the  $2 \times 2 \times 2$  treatment combinations and visualize the results.

#### *Descriptive statistics*

First, we display mean index scores and standard deviations grouped by vignette treatments in [Table 3](#). The descriptive statistics show us the mean service satisfaction is lowest for Finnish service with long distance and low quality, and highest for Swedish service with short distance and high quality. These results indicate our treatment has largely been effective because Finnish service, long distance and low quality were all designed to provoke negative service satisfaction while Swedish service, short distance and high quality were designed to provoke positive satisfaction with the service. We can also see that satisfaction is somewhat higher between Finnish and Swedish service with long distance and low quality, and markedly higher between Finnish and Swedish service with short distance and low quality. The difference

Group	Language	Distance	Quality	N	Mean	SD	Min	Max
1	Finnish	Long	Low	108	0.55	0.21	0.00	1
2	Swedish	Long	Low	174	0.62	0.24	0.00	1
3	Finnish	Short	Low	106	0.59	0.20	0.04	1
4	Swedish	Short	Low	203	0.70	0.19	0.00	1
5	Finnish	Long	High	121	0.71	0.18	0.00	1
6	Swedish	Long	High	186	0.75	0.17	0.20	1
7	Finnish	Short	High	96	0.77	0.18	0.14	1
8	Swedish	Short	High	201	0.80	0.17	0.00	1

**Table 3.**  
Descriptive statistics  
for service satisfaction  
index grouped by  
vignette  
treatment ( $n = 1995$ )

**Note(s):** Abbreviations:  $N$ , observation; SD, standard deviation; min, minimum value; max, maximum value  
**Source(s):** Authors' own creation/work

between the language services with long distance and high quality, and short distance and high quality, is very small but in favor of the Swedish language service.

If we test the differences pairwise, we find clear differences in mean index scores between the cells, which are significantly different for several of the treatment groups ( $p < 0.001$ ) (Table 4). In particular, it seems like respondents presented with a favorable language Swedish-speaking vignette perceive the services as more satisfactory when quality is low.

### Analysis of (co)variance

The subsequent question concerns which of the differences between the eight unique treatment groups are significant? We address this question through a three-way ANOVA applied to the outcome index, as presented in Table 5. This analysis allows us to explore both the conditional main effects and interaction effects. Consequently, we conduct four separate models: the first with only the predictor variables, the second with predictors and covariates, the third with predictors and interaction effects, and the fourth, a full model including predictors, covariates, and interaction effects.

The conditional main effect of language on service satisfaction is  $F(1, 1199) = 31.96$ ,  $p < 0.001$  with a partial Eta squared as effect size 0.03, meaning the Swedish language causes a small but statistically significant increase in service satisfaction (Table 5, model 1). The conditional main effects of the two other factors, accessibility and quality, are  $F(1, 1199) = 22.99$ ,  $p < 0.001$  and  $F(1, 1199) = 147.49$ ,  $p < 0.001$ , which are also positive and significant. The effect size of service quality, 0.11 partial Eta squared, is considerable and around half the standard deviation of the service satisfaction index (Mean 0.7, SD 0.22, see Table A2 in Appendix).

To secure unconfoundedness, we control for the covariates: language identity, place of residence, children, language competence in Finnish, and gender (Table 5, Model 2). The covariates do not markedly change the  $F$ -values, partial Eta squared, or the  $p$ -values of the predictors. Among the covariates, we can note that having children indeed is associated with service satisfaction. The association is, however, at greatest only a third of the least affective predictor, availability, and less than a tenth of the strongest predictor, quality.

The full three-way interaction between service language, availability and quality shows there is no effect on service satisfaction (Table 5, Model 3). However, there is a significant two-way interaction between service language and quality,  $F(1, 1199) = 3.99$ ,  $p < 0.05$ . The interaction effect is only slightly reduced by the covariates (Table 5, Model 4), but the statistical significance drops just below the 95% threshold by the reduced effect.

The significant interaction effect between service quality and language in Model 3 is visualized in Figure 2. Satisfaction with low-quality service is markedly higher for Swedish language service than for Finnish. Moreover, the difference in low-quality service is visibly greater than for high-quality service in the two languages.

Group	Language	Distance	Quality	N	Mean	SD	Min	Max	$P$
1	Finnish	Long	Low	108	0.55	0.21	0.00	1	0.013
2	Swedish	Long	Low	174	0.62	0.24	0.00	1	
3	Finnish	Short	Low	106	0.59	0.20	0.04	1	0.0001
4	Swedish	Short	Low	203	0.70	0.19	0.00	1	
5	Finnish	Long	High	121	0.71	0.18	0.00	1	0.499
6	Swedish	Long	High	186	0.75	0.17	0.20	1	
7	Finnish	Short	High	96	0.77	0.18	0.14	1	0.163
8	Swedish	Short	High	201	0.80	0.17	0.00	1	

**Note(s):** Particular focus on the language vignette as the point of interest of the study

**Source(s):** Authors' own creation/work

**Table 4.**  
Independent sample  $t$ -  
test grouped by  
language ( $n = 1995$ )

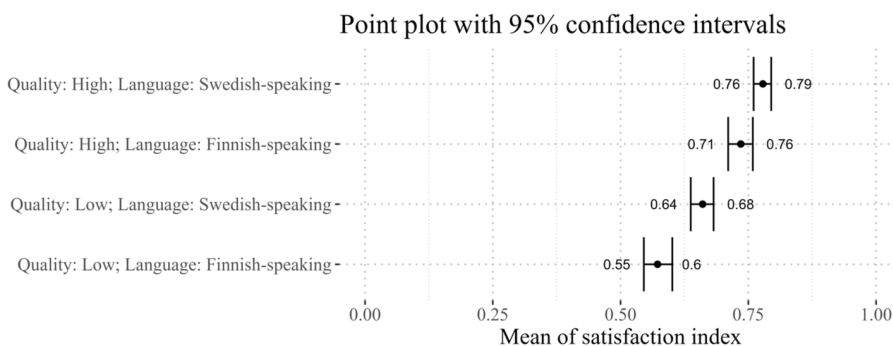
Factors (df)	Model 1 F ( $\eta_p^2$ )	Model 2 F ( $\eta_p^2$ )	Model 3 F ( $\eta_p^2$ )	Model 4 F ( $\eta_p^2$ )
T1: Language (1)	31.98*** (0.03)	32.48*** (0.03)	32.03*** (0.03)	32.50*** (0.03)
T2: Availability (1)	22.99*** (0.02)	23.31*** (0.02)	23.02*** (0.02)	23.32*** (0.02)
T3: Quality (1)	147.49*** (0.11)	148.55*** (0.11)	147.68*** (0.11)	148.64*** (0.11)
Language identity (1)		0.05 (0.00)		0.05 (0.00)
Residence (4)		0.83 (0.00)		0.83 (0.00)
Children (1)		5.26* (0.00)		5.26* (0.00)
Language competence (1)		1.35 (0.00)		1.35 (0.00)
Gender (1)		0.26 (0.00)		0.26 (0.00)
T1:T2 (1)			0.23 (0.00)	0.20 (0.00)
T1:T3 (1)			3.99* (0.00)	3.39 (0.00)
T2:T3 (1)			0.30 (0.00)	0.17 (0.00)
T1:T2:T3 (1)			1.04 (0.00)	0.96 (0.00)
Residual (1,191)				

**Note(s):** Abbreviations: df, degrees of freedom; F, F-statistic (ratio of variance);  $\eta_p^2$ , partial eta-squared (effect-size)

\*Signif. Codes ( $p$ -value): "\*\*\*\*" 0.001, "\*\*\*" 0.01, "\*" 0.05

**Source(s):** Authors' own creation/work

**Table 5.**  
Three-way ANOVA  
analyses



**Figure 2.**  
Mean of satisfaction  
index by the  
interaction between  
language and quality  
with 95%  
confidence band

**Source(s):** Authors' own creation/work

## Discussion

The analysis told us a story of the impact of language and other service qualities on satisfaction among a national language minority group. Descriptive statistics indicated a language premium in service satisfaction, with statistically significant differences in satisfaction between Finnish and Swedish early childhood education.

The covariance analysis from the experiment provided further explanatory evidence: language, quality of qualified staff, and accessibility (measured by travel time) all directly influence satisfaction with early childhood care among Swedish-speaking Finns. These findings support [hypotheses 1](#) and [2](#), which assumed higher accessibility and quality would lead to higher service satisfaction among Swedish-speaking Finns. This means that the typical service quality determinants for public service satisfaction is applicable also in a Nordic welfare context among an official language minority group. This adds to existing scholarship on service satisfaction in diverse contexts like China and Latin America ([Alemán et al., 2018](#); [Chen et al., 2022](#); [Olsen, 2015](#); [Petrovsky et al., 2017](#)), reinforcing the model's generalizability.

Theoretically even more intriguingly, language was found to be a significant factor for service satisfaction among the language minority, comparable in size to conventional service qualities such as accessibility. This supports [H3](#), which predicted that Swedish-language services would receive higher satisfaction from the Swedish-speaking minority. In line with our assumption that a language minority predominantly values service in their own language for identity reasons and not practical reasons, competence in the majority language, Finnish, was not a significant factor for satisfaction.

[H4](#), which assumed high-quality Swedish services would enjoy a language premium, was not strictly supported. However, the higher satisfaction with poor-quality native language services over majority language services indicates a dissatisfaction mechanism influenced by service language, similar to findings by [Olsen \(2015\)](#). It suggests that Swedish-language service is seen as a necessary but not sufficient factor for satisfactory public service, adding to satisfaction similarly to conventional service quality factors.

There are methodological and contextual limitations to consider. While the factorial experiment survey design is reliable for mapping causal effects, social surveys often face issues like skewed respondent samples and representativeness. Additionally, the effects analyzed are conditional upon other factors, so a simple “language effect” stripped of other service-related factors cannot be directly observed. Contextually, although Finland is a typical Nordic welfare state, the Finland-Swedes are a distinct group with codified language-based rights.

Nonetheless, the findings are perhaps the most robust evidence so far presented of how demographic factors are important for explaining service satisfaction in a diverse demography. The cumulative knowledge on the subject gives us reason to suggest a systematic research undertaking with a unified research agenda for understanding both more generally and in detail how different demographic factors affect service satisfaction in different institutional contexts. Future research should at least test the language factor in other contexts, for example other OECD countries, with similar official minorities to see how far the findings travel. Is there a congruence in service satisfaction among European national language minorities, such as the Catalan or Basque in Spain and Gaelic in Ireland?

Moreover, other minority group-related factors, such as proximity of the service in minority communities, and opening hours that fit minorities predominantly employed in certain sectors with non-flexible office hours, to mention a few, could be studied to explore the reasons why minority groups often are less satisfied with public service. A comparative design of service satisfaction could yield interesting knowledge on migrant communities without natural language service rights, which are gaining social and political influence in Scandinavia, Continental Europe, and Anglo-Saxon countries. The research agenda could also seek to reconcile the EDM with demographic service-related factors by investigating the extent to which demographic service-related factors entertain normative and predictive expectations of the services.

Multimethod research is needed for the undertaking, where cross-sectional surveys with multiple cases or a comparative setup could provide indications on the prevalence of

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demographic factors in different contexts. Such an approach is readily combinable with a sequence of survey experiments, replicating the findings and gradually generating new knowledge of the causal mechanism of service satisfaction. There are naturally many ways that qualitative studies could ascertain interesting insights on the subject, for example interviews with public managers in a well-designed case study could tell how demographic factors are considered in a service organization or expectation management. Crucial for the scientific progress on the subject would be for the succinct studies to inform a shared theoretical framework.

### **Concluding remarks**

This study set out to test the determinants for public service satisfaction in a new context, namely the Nordic welfare state Finland. Furthermore, the objective was to probe a group-related service factor, language, as an explanation of service satisfaction among an official national language minority. Applying a randomized survey experiment with a representative sample of the language minority Finland-Swedes, the study provided both confirmatory and novel results. The study confirmed typical service components, accessibility and staff qualifications, as important for service satisfaction in Finland with a language minority. Moreover, the study showed that language is not only important as a factor among other service satisfaction-increasing components but can make a substantial difference in satisfaction with service of poor quality.

The theoretical implication of the study is that although the determinants of public service satisfaction are versatile and have general explanatory power regardless of state structure, political regime or social system, there should be an openness and curiosity toward the plurality of society. By considering the institutional and demographic factors that can be suspected to have an impact on the micro-level dynamic of service satisfaction in each context, one can have an improved explanation for satisfaction with public service.

The practical implication of the study is that one by surveying the overt satisfaction of a language minority group with public service is prone to conflate conventional service quality factors and the language factor. On the one hand, the canny public official could seek to optimize public service satisfaction with a minority group by providing language service regardless of service quality, since the language premium for high-quality service implies diminishing marginal benefits from improving all factors related to service satisfaction. The findings of the study underscore the importance for responsible public servants to exercise caution when managing services for minority groups based solely on customer information. It serves as a reminder that subjective satisfaction information alone may not accurately reflect underlying quality problems, emphasizing the need for a nuanced approach in service provision and management.

### **Notes**

1. <https://www.finlex.fi/sv/laki/ajantasa/2018/20180540>
2. For improved representativity, we weighted the data on standard population parameters. However, the analysis with weights produced different results with inflated statistical significance on most coefficients. For a conservative robust approach, we discarded the weights, meaning we minimize the risk of wrongly discarding a false null hypothesis.

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(The Appendix follows overleaf)

	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
<i>Gender</i>								
Woman	67 (63)	94 (54)	65 (68)	97 (48)	72 (59)	95 (51)	66 (68)	105 (53)
Man	40 (37)	79 (46)	31 (32)	104 (52)	49 (41)	90 (49)	31 (32)	95 (47)
<i>Age</i>								
18–29	10 (9)	12 (7)	12 (12)	11 (5)	5 (4)	16 (9)	12 (12)	16 (8)
30–39	16 (15)	24 (14)	16 (17)	15 (7)	11 (9)	18 (10)	16 (17)	26 (13)
40–49	16 (15)	23 (13)	13 (13)	28 (14)	13 (11)	32 (17)	13 (13)	20 (10)
50–59	21 (19)	32 (18)	10 (10)	31 (15)	23 (19)	29 (15)	10 (10)	25 (12)
60–69	27 (25)	33 (19)	22 (23)	49 (24)	39 (32)	47 (25)	22 (23)	58 (29)
70–	18 (17)	50 (29)	23 (25)	67 (34)	30 (25)	44 (24)	24 (25)	56 (28)
<i>Educational level</i>								
Basic education	3 (3)	9 (5)	1 (1)	12 (6)	5 (4)	5 (3)	1 (1)	5 (3)
Upper secondary education	34 (31)	62 (36)	23 (25)	57 (28)	31 (26)	71 (38)	24 (25)	73 (36)
Higher education	71 (66)	103 (59)	72 (74)	134 (66)	85 (70)	110 (59)	72 (74)	123 (61)
<i>Total</i>	108 (100)	174 (100)	106 (100)	203 (100)	121 (100)	186 (100)	97 (100)	201 (100)

**Table A1.**  
Experimental group  
sample, *N*(%)

**Note(s):** The presence of N/A values contributes to discrepancies in *n*-values  
**Source(s):** Authors' own creation/work

Item	Mean	SD	Cronbach's $\alpha$
I have confidence in the activity	0.70	0.21	0.952
The activity serves the children and families well	0.71	0.21	0.950
The activity seems competent	0.69	0.22	0.946
The activity operates responsibly	0.70	0.22	0.945
The activity is an efficient use of tax funds	0.68	0.24	0.964
Total (Service satisfaction index)	0.70	0.22	0.961

**Table A2.**  
Outcome  
variable items

**Note(s):** For the items Cronbach's Alpha represents the value for the index construct if items were deleted  
**Source(s):** Authors' own creation/work

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