

Measuring up: Testing measurement equivalence and developing a concise organizational
transparency scale

by

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B.S., Kansas State University, 2019

M.S., Kansas State University, 2024

AN ABSTRACT OF A DISSERTATION

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Abstract

The current study had two aims, the first was to test the measurement equivalence (ME) of an organizational transparency scale, and the second aim was to develop a shorter organizational transparency scale. For the first aim, multi-group confirmatory factor analysis and item response theory (IRT) methods were used to investigate two research questions regarding the potential ME of the organizational transparency scale between public and private sector employees as well as employees who belong to one of two different government agencies in the same facility within the public sector. The results found evidence in support of ME in both cases of the private vs. public sector comparison and between the two agencies within the private sector, although the latter did have differential item functioning for one item. The ME results provide evidence for the benefits of utilizing both factor and item level analyses to capture a fuller picture and provide more nuanced information. For the second aim, IRT was used to develop a more concise organizational transparency scale. The developed shortened scale was made up of eight items and demonstrated validity and reliability. The newly shortened scale will hopefully aide in spurring more research on organizational transparency and in turn further develop its nomological network as researchers and practitioners alike will now be able to incorporate it more easily into their surveys with the reduction in survey length compared to the original 23-item scale and they can balance it with considerations of compensation costs, total survey length in conjunction with other constructs, participant experience, etc. With these two lines of research, the study findings have the potential to stimulate more research on the construct of organizational transparency with knowledge on the generalizability of the scale across industry sectors and within the public sector as well as through the creation of the shortened scale which provides benefits to survey participants, researchers, and practitioners.

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Approved by:

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Dedication

To my dad, who has had his bags packed and ready to go since day one. Love you.

Chapter 1 - Introduction

Organizational Transparency is defined as “the deliberate attempt to make available all legally releasable information – whether positive or negative in nature - in a manner that is accurate, timely, balanced, and unequivocal, for the purpose of enhancing the reasoning ability of the publics and holding organizations responsible for their action, policies, and practices” (Rawlins, 2009, p. 75). This definition led to the development of an organizational transparency scale comprised of four subdimensions: participation, substantial information, accountability, and secrecy that has a total of 23 items.

While the idea of organizational transparency in the business context was first seen in the research literature in the 1990s, it started to gain more popularity between 2008 to 2015 (Albu & Flyveverbom, 2016). Anecdotally, this rise in popularity could potentially be attributed to the occurrence of a variety of organizational crises that were widely covered in the media that related to issues with transparency. These include scandals with companies such Enron (Sims & Brinkmann, 2003), Volkswagen (Ewing, 2015; Parloff, 2018; Jung & Sharon, 2019), and Wells Fargo (Arnold, 2016; Egan, 2016) as just a few prominent examples. This same trend can be seen on a wider scale more recently with the global COVID-19 pandemic, as how transparently organizations communicated with their employees about the situation was heavily analyzed in the media. An example can be seen in The Wall Street Journal, which covered the differences between organizational transparency for two companies in car manufacturing, Volkswagen and Toyota (Foldy & Cutter, 2020) in terms of how transparently they were communicating COVID rates in their operating plants that required in-person work.

Organizations should be concerned with their employees’ perceptions about organizational transparency as it has been shown to be a significant antecedent to variables such

as perceived organizational support, perceived organizational trust, and organizational cynicism (Stuckey, 2024) which have been well established to relate to important organizational outcomes such as job satisfaction (Akar, 2019; Güçer & Demirdağ, 2014; Lee et al., 2013), organizational citizenship behaviors (Chiaburu et al., 2013; Guh et al., 2013; Hansen et al., 2011), turnover intentions (Akar, 2019; Eder & Eisenberger, 2008), and job performance (Akar, 2019; Biswas & Kapil, 2017). Furthermore, organizational transparency itself has been empirically shown to be related to important organizational outcomes such as employee engagement (Jiang & Shen, 2023; Hadziahmetovic & Salihovic, 2022), performance (Bernstein, 2012; Brandes & Darai, 2017), job satisfaction (Guo, 2022; Hofmann & Strobel, 2020) and turnover intentions (Hofmann & Stroble, 2020; Jiang & Shen, 2023). Research has also shown that employees' can relatively accurately infer the level of organizational transparency in organizational communications (Stuckey, 2024), pointing to the need for organizations to monitor themselves in this aspect to mitigate negative impacts or to leverage it to improve their image and relationship with their employees. However, the currently available organizational transparency scale has not been investigated for measurement equivalence to ensure its applicability in a wide variety of situations such as across different industries. Furthermore, the current organizational transparency scale is lengthy with 23 items total and could see increased utility and use if shortened. This leads to the aims of the current study which are to 1) test the measurement equivalence of the organizational transparency scale and 2) develop a shortened scale.

Chapter 2 - Literature Review

Organizational Transparency

In the currently available literature, there are two overall approaches to investigate organizational transparency which are performativity and verifiability (Albu & Flyverbom, 2016). The performativity approach is process focused, highlighting how companies' efforts to be transparent create complexities with communication and interpretation as well as focusing on issues that can develop due to the efforts. On the other hand, the verifiability approach focuses on the operation of transparency itself, shedding light on how information itself is disclosed and is utilized to communicate about a situation (Albu & Flyverbom, 2016). In the current study, the covered research and focal scale of organizational transparency used will fall under the verifiability approach.

Research under the verifiability approach has traditionally focused on the sender side of the communication process (i.e., the organization's point of view), often defining transparency as the increased frequency of information disclosure. In this line of research, the organization is typically disclosing information about their organization to the public (Bushman et al., 2004; Eijffinger & Geraats, 2006). However, there is also research from the receiver's perspective which investigates organizational transparency between an organization and its outside stakeholders, such as from the consumers perspective. For example, Holland et al. (2018) examined how two types of transparency, an organization's reputation for transparency and its attempts to communicate transparency, impacts the organization's perceived trustworthiness from an outside stakeholder perspective. This was accomplished through the use of faux newspaper articles to communicate various levels of transparency to the participants (who were not employees at the organization). The results indicated both types of transparency were tied to

external organizational trust, such that the more transparency that was perceived, the higher the level of trust indicated by external stakeholders (Holland et al., 2018). Similar findings were also found regarding more ‘authoritative’ organizations like the government and CDC during COVID-19, where organizational transparency, in terms of being provided substantial information about the pandemic, significantly increased the public’s trust in these organizations (Lee & Li, 2021). Additional studies have investigated consumers perceptions of organizational transparency based on an organization’s publicly available website (Bernardi & LaCross, 2005; Lee & Joseph, 2013) and how observable the company is to the public in terms of private versus open office space (Bernstein, 2012).

Notably, there has been a lack of research on organizational transparency from the perspective of internal stakeholders for an organization (i.e., employees). This gap was first addressed in a study by Rawlins (2008) which utilized a healthcare organization to explore the relationship between organizational transparency and trust. Empirical support was found for a positive relationship between organizational transparency and trust, illustrating as employee’s perceptions of organizational transparency increased, the trust in the organization increased as well (Rawlins, 2008). Continuing this line of research, Rawlins (2009) validated two scales regarding organizational transparency, one scale measuring an organization’s reputation for transparency as well as a scale measuring the organizations actual efforts to be transparent to its employees, the latter of which will be what is considered as organizational transparency and will be utilized as the focal scale in the present study.

This leads to the operationalized definition of organizational transparency, which is “the deliberate attempt to make available all legally releasable information—whether positive or negative in nature—in a manner that is accurate, timely, balanced, and unequivocal, for the

purpose of enhancing the reasoning ability of publics and holding organizations accountable for their actions, policies, and practices.’’ (Rawlins, 2009, p. 75). Using this operationalization, organizational transparency is comprised of four components: participation, substantial information, accountability, and secrecy. Participation refers to the level of detail of the provided information, the ease of finding the information, and the ability to provide feedback or have involvement with regards to this information (e.g., the organizations allowing employees to request specific types of information, asking for continued updates, etc.). Substantial information refers to characteristics of the provided information such as relevance, clarity, completeness, accuracy, reliability, and verifiability of the provided information (e.g., provided reports use language that is easy to understand, provided information has been put into context and is comprehensive). Accountability deals with how the information addresses not only information which reflects the organization positively, but also information which can reflect negatively on the organization, such as admitting mistakes that are due to the actions of the organization (e.g., provided information such as company performance results should be able to easily be compared to industry standards or previous performance, information should be reported in a timely manner so it is useable for decision making). The last element is secrecy which reflects a lack of openness or an organization’s attempts at secrecy. Secrecy can include elements such as the organization using unclear language, only sharing one part of a situation, or only disclosing information when it is required (e.g., financial interests are not disclosed, there are not prompt communications about errors done by the organization and a lack of information provided regarding efforts to address these errors). These elements together and their varying presence or lack thereof, inform an individual’s perception of their organization’s level of transparency (Rawlins, 2009).

Research has shown organizational transparency to be related to and have an influence on a wide variety of constructs that have been found to impact an organization's employees and performance. An increasingly popular view of transparency is that it benefits organizational performance through increased trust between employees and their organization (Schnackenberg & Tomlinson, 2016). The presence of transparency from the organization in keeping their employees informed and up to date about what is going on in the organization can be perceived as informational fairness which has been empirically shown to be positively related to employee's organizational commitment and trust (Malla & Malla, 2023), and performance (Khattak et al., 2020). Furthermore, transparency has been investigated as a motivator for performance beyond its contribution to creating trust. Brandes & Darai (2017) found in a controlled experiment, which removed the impact of trust, that transparently disclosing information even when it is already known by an individual increased performance due to the value of interpersonal communication even though there was no informational value. This has important implications for organizations, as it points to the value transparency can add beyond keeping employees informed and building trust.

Furthermore, more research is coming out looking at the potential benefits organizational transparency can have to reduce workplace inequality and help promote diversity in the workplace. Organizational transparency was shown to help reduce equality issues with performance-based pay decisions (Castilla, 2015; Dobbin et al., 2015). When performance reward system procedures were altered to increase transparency in a company, pay disparity in relation to gender, race, and nationality decreased as the more transparent system made it easier to notice such issues and then correct them (Castilla, 2015). This points to the potential of transparency to aid in reducing pay gap issues. Dobbin et al. (2015) argued that organizational

transparency has the potential to increase diversity when hiring and promoting. Transparency can increase available information regarding job availability and eligibility to increase diversity in the applicant pool externally and internally. It can also create accountability for managers by activating evaluation apprehension when they know the process for their decision making will be transparent and visible to others. This will lead management to scrutinize their own behavior for signs of bias more when hiring and promoting. In fact, Dobbin et al. (2015) found empirical evidence supporting that more transparency in these aspects did positively impact workplace diversity. Overall, these studies help illustrate the important impact organizational transparency can have in the workplace.

Theoretical Background

There are a variety of theories that can help explain the mechanism of organizational transparency. Many studies have focused on transparency being a core tenant used for an organization's management for their reputation and decisions around disclosure, utilizing theories that cover resource dependence theory (Nie et al., 2016; Zainon et al., 2014), stakeholder theory (Tremblay-Biore & Prakash, 2015; Zainon et al., 2014), and legitimacy theory (Lightstone & Driscoll, 2008; Tremblay-Biore & Prakash, 2015).

Resource dependency theory posits organizations that rely on external resources from others, such as donations, will demonstrate organizational transparency through behaviors such as voluntary disclosure of information (Nie et al., 2016). This increased transparency is due to external pressures from key stakeholders and the organization relies on these stakeholders for resources to function. Stakeholder theory emphasizes the power external stakeholders have on an organization and the organization needs to focus and address the demands of the most powerful stakeholder groups, often leading to the organization having to overlook or even

ignore the less powerful stakeholder groups. In terms of organizational transparency, this means how much transparency is put forth or what an organization is transparent about is determined by the organization's key stakeholders. For example, nonprofits that depend on government funding were shown to voluntarily disclose more on their public websites, making the information easily found and readily available to the key stakeholders (Tremblay-Biore & Prakasj, 2015). Legitimacy theory suggests that organizations' behaviors are done in an attempt to maintain or enhance outside perspectives of the legitimacy of the organization. In terms of transparency, organizations' transparent behaviors are done in an attempt to increase perceptions of outside stakeholders of the legitimacy of the organization. For example, some high-risk organizations carefully selected and managed what information they released to the public to try to control the overall perception of legitimacy of their organization (Lightstone & Driscoll, 2008). Altogether, these theories are focused on the external drivers of organizational transparency.

There has also been some, although much fewer studies that look at theories from a more internal perspective, such as sensemaking theory (Albu & Wehmeier, 2014; Sendlhofer & Tolstoy, 2022; Stuckey, 2024) to explain organizational transparency from an employee's perspective on the individual level, often incorporating leadership styles and theory (i.e., identification theory) as a driving force as well (Lacey, 2023; Stuckey, 2024).

For example, Stuckey (2024) utilized a framework made up of sensemaking theory and identification theory facilitated through authentic leadership to explain the influence of organizational transparency on employee perceptions of organizational trust, support, and cynicism. Sensemaking theory claims individuals use relevant contextual information to give meaning to their experiences through social interaction and information processing (Weick et

al., 2005). According to the theory, this is an ongoing process where shared perceptions are created regarding what are accepted values, beliefs, and behaviors in a given situation such as transparency. It is important to note and place emphasis that this process is ongoing, because if one encounters a new situation or a situation that goes against the previously held shared values/beliefs or mental models, the individual will make adjustments based on the noted changes experienced in the given new context, such as experiencing situations in a continually changing pandemic.

Identification theory posits that individuals form their sense of self by internalizing the values, beliefs, and norms of their social groups, with group membership and identification influencing their attitudes, behaviors, and self-concept. Identification theory argues not all forms of identification influence an individual to the same degree and that a given identity may be more salient and frequently activated than others (Mallin et al., 2022). There are different types of identification, most of which require a reciprocal relationship. However, personal identification does not require a reciprocal relationship and depends mainly on the focal person's observation and reflection of a different, specific individual's attributes. Personal identification is defined as "an individual's intrapersonal perception of oneness with another individual, is distinct from other forms of social identification, which involve a comparison to an entire group, workgroup, or interpersonal relationship" (Mallin et al., 2022, pg. 243). In the case of organizational transparency, the focus is on personal identification specifically as it can occur in situations where employees observe their supervisors' behaviors/attitudes around transparency in the workplace. Stuckey (2024) found support for this combination of theories as organizational transparency was found to be a significant positive antecedent for employees perceived organizational trust and perceived organizational support and significantly negative

for organizational cynicism, although the role of authentic leadership was only found to be significant for organizational cynicism, where an authentic leader could help further reduce organizational cynicism through their behavior of relational transparency.

Unlike the external-focused theories, such as dependence and stakeholder theories, the theories of sensemaking and identification focus more on internal organizational members, particularly from the employee's perspective. These theories emphasize the role of social interaction and the employee's experiences within their work environment and with their coworkers, supervisors form the reputation of the organization as an entity the employee works for. These interactions and developed perceptions surrounding the organization's norms of operation as deduced by employee's continuous experiences inform how the employee perceives their organization's level of transparency as an internal stakeholder. While the external focused theories perspectives are centered around the external pressures the organization responds to or the external façade the organization puts forth to society as a whole in terms of organizational transparency.

Importantly, Král and Schnackenberg (2024) point out the lack of theoretical understanding of the construct of organizational transparency as a whole. They propose three main forces, institutional, societal and leadership, which influence organizational transparency. Due to transparency being a complex phenomenon, the authors suggest these three core forces should be considered in a configural approach to account for the many paths that can lead to and influence organizational transparency. Král and Schnackenberg (2024) argue that focusing on only one of these forces in isolation can be deceptive. For example, only looking at social calls from the public for more transparency ignores other levels such as the organization's administrative capability to be transparent or if they are legally required to be transparent in

order to qualify for government subsidies (institutional level), or the individual differences by leaders on their approaches to fostering transparency (leadership level).

By adopting the configural approach, researchers could potentially be able to capture higher levels of complexity and incorporate more levels, thus more accurately capturing organizational transparency and the different ways it can manifest¹. This possibility to capture the multiple levels and complexity is important since it is possible that one of these three forces unfolds in combination with the other two (the principle of conjunction in configural theorizing; Furnari et al., 2021) which helps the theory explain the complexity of how an outcome emerges and that there could actually be multiple paths that unfold to reach a certain outcome (the principle of equifinality; Fiss, 2011), so not necessarily all three forces will be present to drive transparency. Configural theorizing, in attempting to explain all the potential complexity, also incorporates causal factors that influence the three main forces, where they too can vary in strength or presence to influence the overall force which helps to explain differences in organizational responses (Král & Schnackenberg, 2024). For example, the overall leadership force can be impacted by various leadership styles where perhaps in one case one leadership style exists and in another style is absent, while in another case the opposite is true or both styles of leadership exist. This can explain why in two cases where the leadership force is present there can still be an outcome in terms of organizational transparency that is different.

¹ Appendix A has a table from Král & Schnackenberg (2024) that visualizes configural theorizing with organizational transparency which can be used to lead to or identify various ‘types’ of organization transparency that can occur depending on the forces present. This is not the focus of the present study, but illustrates configural convention which is why it is provided in an appendix and not in-text.

Král & Schnackenberg (2024) identify what they consider to be potential lower-level determinants of each force. Institutional forces are identified as drivers that stem from formal rules, regulations, or entities that promote transparency. Examples include legal bodies that regulate practices or compliance, perform audits or provide requirements for disclosure and reporting, informal institutions that provide accountability by building standards or initiatives and providing resources that organizations can voluntarily participate in, and industry where some industries are more sensitive to transparency or naturally have built in standards or requirements surrounding transparency (i.e., the banking industry needing to provide financial information compared to manufacturing where companies need to protect intellectual property from their competitors). Societal forces are identified as pressures put on an organization based on societal expectations for transparency on their operations. These can include aspects such as stakeholder perspectives shown through media coverage or collective actions such as boycotts, investors wanting financial and strategic information, as well as culture and values such as acceptance of corruption or if transparency is viewed as weakness. Leadership forces are identified as factors impacting leaders in the organization such as leadership style such as authentic or authoritative, education and professional experience such as their personal exposure and education on ethics, personal values surrounding transparency and personality such as their level of honesty or general openness can influence how likely they are to share information (Král & Schnackenberg, 2024). Overall, the configural theorizing of these three forces informs how organizational transparency is not resulting from a simple linear relationship between them, but complex relationships and the different attributes that could be in play or not within each force, helping account for the various relationships and difference ways we see with organizational transparency today.

Previous Psychometric Analysis

Despite the dearth of research available on the concept of organizational transparency, there is little currently available research on its psychometric properties. Part of this issue is transparency often is measured with one item or simply measuring if the disclosure of information occurred (Tremblay-Boire & Prakash, 2015; Zainon et al., 2014), which does not necessarily encompass what organizational transparency truly is. For the scale of transparency used in the current study, only one study has been done testing its psychometric properties and was done when it was first developed in Rawlins (2009). The scale for organizational transparency was developed using a sample that consisted of 361 employees from a large regional (two states in the U.S.) healthcare organization. An exploratory factor analysis revealed the four-factor structure of transparency previously covered (participation, substantial information, accountability and secrecy, which was a reversed item factor). A confirmatory factor analysis was also run and supported the four-factor model with adequate fit. Reliability was also looked at using Cronbach's alpha, which ranged from .78 to .93, with the lowest being for the secrecy factor which was deemed acceptable since it consisted of reverse-item statements but was confirmed to be its own factor with the factor analyses conducted (Rawlins, 2009).

While this was the only formally conducted psychometric focused study done on the scale of transparency, Stuckey (2024) did check validity and reliability on the scale using a confirmatory factor analysis and Cronbach's alpha which found support for the same factor structure of the scale and acceptable reliability. Additionally, measurement models were tested with the study's variables, and evidence was found in support of organizational transparency being a distinct construct from related variables such as perceived organizational trust, perceived organizational support, and organizational cynicism (Stuckey, 2024). Overall, this points to the

need for further psychometric research on organizational transparency as very little currently exists. Research on psychometric properties is vital because if the measurement of a construct is insufficient, then the observed relationships from that measure of the construct provide little or no meaningful information. While some psychometric evidence has been found in support of the organizational transparency scale, more nuanced investigation is needed to provide evidence on the generalizability of the scale and if there is potential to increase the scale's utility.

Chapter 3 - Potential Measurement Equivalence Issues

Currently available research on organizational transparency suggests that transparency may be a double-edged sword. While there is potential for organizational members to benefit from increased access to knowledge about their organization, there is also the potential for negative effects due to this increased availability of information. Bernstein (2012) coined this the ‘transparency paradox’. While some employees could feel increased satisfaction, trust, etc. in their organization with more transparency, other employees may feel uncomfortable providing or receiving more detailed information, leading to issues such as feeling increased competitive pressure (Bernstein, 2012). In some cases, consistently providing transparency could cause undue stress and reduce employee’s capability to effectively perform their job duties. For example, in policing it has been described if every potential threat was disclosed before being confirmed for legitimacy, it could greatly increase fear and anxiety in the public, while also hindering the police force to do their jobs surrounding these events as resources get diverted towards answering the public’s questions and managing increases in false alarms (Tomkins & Bristow, 2024). Research on organizational transparency thus far has primarily consisted of private sector employees and has not included public sector employees (public sector employees are individuals employed directly by government agencies). There is potential for there to be distinct differences in terms of organizational transparency which needs to be empirically investigated. Thus, the main aim of the current study is to investigate measurement equivalence with the current organizational transparency scale between the private and public sectors and within the public sector itself, both of which will be covered in more detail further in this chapter.

Measurement Equivalence (ME) refers to how consistently items or tests possess the same meaning across measurement contexts (Vandenberg & Lance, 2000). The testing of measurement equivalence is important to investigate in research to establish whether psychometrics properties of an instrument remain valid and reliable across different sample groups as these assumptions are rarely tested statistically. The purpose of this paper is to determine the potential measurement equivalence of the organizational transparency scale across various groups through the use of six measurement equivalence steps based on confirmatory factor analysis (CFA) to look at ME from the factor level and item response theory (IRT) to look at ME from the item level. IRT will also be used to develop a shorter scale. Both are explained in detail in the methods section under data analysis procedure.

The main samples for the current study include a unique sample from a U.S. government federal facility to represent the public sector and a sample from the private sector. Thus, in the case of this study, ME analyses will be investigating if an organizational transparency scale has similar meaning across the public and private sectors, as well as between two different agencies within the public sector. The organizational transparency scale was developed using a private sector sample and its psychometric properties have only been investigated using the private sector thus far (Rawlins, 2008; Rawlins, 2009) and measurement equivalence has never been investigated with this scale. It is important to empirically test whether or not this scale has measurement equivalence despite these sample differences, as if there are differences, this could impact the utility of the scale and conclusions drawn when it is being used if not accounted for. For example, measurement equivalence has been used in increasingly used organizational research because with the rise in globalization and immigration it is possible various scales do not measure the focal construct or are understood equivalently across different cultures and if

measurement equivalence is not established, conducting tests that are cross-group become meaningless (Schmitt & Kuljanin, 2008). There is a dearth of studies available on measurement equivalence in organizational research varying greatly in terms of construct and groups tested. A few examples include, job satisfaction (Chinese vs Americans; Wang & Russell, 2005; language and culture; Liu et al., 2004), organizational climate (gender and military vs. civilian populations; Dierdorff et al., 2006), job characteristics, health and absenteeism (four Swedish occupational groups; Pousette & Hanse, 2002) and leadership (males vs females; Xu et al., 2016).

Research has shown public and private sectors differ on a wide variety of aspects, from fundamental differences in operating such as how they approach business process management/change (Jurisch et al., 2013; Tregear & Jenkins, 2007), in their work values and organizational commitment (Lyons et al., 2006; Markovits et al., 2010), organizational values (Van der Wal et al., 2008), and even job satisfaction (Markovits et al., 2010). For example, it was found for U.S. public sector employees that they value work which contributes to society more, while private sector employees value prestigious work more and also have higher organizational commitment than public sector employees (Lyons et al., 2006). Van der Wal et al. (2008) found that organizational value preferences were attached more to sector than to other factors such as age, gender, work experience or previous employment in the opposite sector.

Overall, public and private sector employees work under very different circumstances which can lead to potential differences in how they perceive organizational transparency in the workplace and how they respond to a scale trying to measure this. Public sector employees often face more overall scrutiny as they work for the entity under an entire government body. Their ‘customers’ are the citizens of the government, so a lot of information is public (i.e., budgets),

and open to political scrutiny. Overall, there is a wider focus of accountability compared to private industries who do not answer to high-level government bodies such as Parliament or Congress (Tregear & Jenkins, 2007). Private sector organizations often can choose what they are opting to disclose to the public or their customers, and in many cases can disclose minimal information to meet the base requirements required of them by law (Fung, 2014; Weil et al., 2006). At the same time, the public sector can also have certain areas of highly sensitive information that will not be released to the public and they are monitored to ensure this information stays contained to protect the public, the involved public sector employees themselves, and the country represented. This can occur in the private sector but is usually done to protect proprietary information and to stay competitive in their market against competitors. Additionally, the U.S. public sector is forced to consistently go through constant changes as well as they are dictated by the current administration which changes with elections and the evolving financial, social, and political needs and challenges of the country they represent. This leads to the first research question of the current study which is:

Research Question 1: Will there be measurement equivalence found or not in the organizational transparency scale between private versus public sector employment?

The federal government is a unique sample that has the potential to have distinctive constraints compared to the private sector. The main public sector sample for the current study comes from a unique U.S. federal government facility that houses two different agencies. These agencies have distinct missions, yet they work cooperatively in some respects and fall under the same government department. There is the potential in the federal sample utilized the organizational transparency scale operates differently depending on the agency the participant

belongs to. This has not been investigated empirically before and there is no currently available research on the potential differences within the public sector itself.

The two different agencies are housed together in a single facility, but they have different missions, human resources, personnel, internal structure, budgets, and so on. At the same time, they share certain aspects, such as leadership, the overall government they report to, and societal pressures from similar places such as the local community since they are housed in the same facility. For example, in terms of mission agency one is more focused on innovation and research, as well as help transfer and distribute this work to other relevant partners (other government entities, private companies, the public, etc.) in their areas of expertise, while agency two is focused on providing program support and development, and diagnostic, regulation, and inspection services in their areas of expertise. Essentially, from the theoretical perspective of Král and Schnackenberg (2024), the agencies differ in their institutional, societal, and leadership forces in some respects and share others.

Due to these differences each agency might have different perspectives on organizational transparency. For example, due to the currently available resources, structure, and mission of each agency, the two agencies might have different capacities in which they can engage in the four different dimensions of organizational transparency. However, at the same time the two agencies are working to create a singular working culture within their shared facility and increase cooperation with one another to improve their knowledge to meet their needs and achieve their mission goals. It is important to establish if there is measurement equivalence, because if there is not that could have important implications for how the facility approaches trying to untie these two agencies as well as how each individual agency operates in terms of their organizational transparency and future attempts to measure employee perceptions to make sure it is as efficient

and informative as possible. If it is found there is measurement equivalence, the measure can be disseminated and interpreted the same way across these. If measurement invariance is found, then adjustments will need to be made to the measure and/or the interpretation of the organizational transparency scale depending on the agency. This leads to the second research question of the current study:

Research Question 2: Will there be measurement equivalence found or not in the organizational transparency scale depending on agency of employment (agency one vs agency two)?

Chapter 4 - Shortened Scale Development

Finally, to further increase the utility of the organizational transparency scale, the second aim of this research was to develop a shorter version of the scale using IRT methods. The rigorous testing of the scale and development of a shorter scale is important as organizational transparency has been identified as “one of the great themes in management theory today” (Bernstein, 2017, p. 23). With its growing popularity, it is important to ensure the method in which it is being measured is accurate and generalizable for all the various areas of research it will be used in, but also that it will be actually used. With such a long scale in its standard form at 23 items, the current organizational transparency scale could be seen to be lacking utility if there is hesitancy to use it due to its length. It could be viewed as cumbersome and the length a barrier to its own usage in research when researchers/organizations have to be mindful of the length of their survey. Researchers or practitioners in organizations who might be interested in the impact or measurement of organizational transparency might not include it when they see the long length of the scale by itself, let alone in consideration with the combination of any other variables of interest they are investigating when developing their complete survey battery.

When administering a survey or survey battery, the developers have to consider a variety of factors such as the experience of the participants. For example, the advertised survey length can impact whether or not an individual will even attempt the survey to begin with (Crawford et al., 2001; Galesic & Bosnjak, 2009) which in turn was shown to impact the quality of the responses collected. This can impact the conclusions that can be drawn from the research if the response quality is lower or even impact the cost to collect data in the first place (e.g., many research platforms pay participants based on the time it takes the survey to complete, where a longer survey could require a level of compensation the researcher cannot afford or if a longer

survey leads to more lower quality responses, thus it costs more to get the appropriate number of usable responses when having to continue to gather more). Without the existence of a short scale, it is easy to consider not including it in lieu of other variables with already shorter scales available or to decide the research will need to exclude organizational transparency to balance other needs/goals. It has been noted that reducing scale length can help balance between participants' experience and researcher needs to have acceptable psychometric characteristics for their utilized scales (Fischer et al., 2016).

Furthermore, adaptations of scales are growing in prevalence in organizational research, especially in terms of shortening scales. In Heggstad et al. (2019) it was found in their sample of four prestigious organizational journals that 46% of all scales administered were reported by the authors as having been adapted and out of all the various alternations seen in research for adapting scales, shortening the scale itself was the most prominent at almost 17%, pointing to an overall desire or need to have shorter scales to use in organizational research. Importantly however, out of those who did adapt shorter scales, about 70% did not provide details about what they shortened (i.e., how many items they kept, which ones were removed), let alone the reasoning behind the decisions around this. So, while the need for shortened scales is recognized and it is occurring, it is not always being ensured that the adapted shorter scales are psychometrically sound.

Any adaptation of a scale does raise questions about the validity (Aguinis & Vandenberg, 2014), so it requires evidence to support the validity of the new version of the scale. This is because typically validation is done in a scale-specific manner, so empirical evidence is collected on and applies to the specific scale tested with a sample using the scale's fixed items, response scale, instructions, etc. (DeVellis, 2016). Due to the empirical support being collected scale-

specific only, adaptations need to be reinvestigated to ensure the changes didn't also impact the validity and it is still accurately measuring the construct (Aguinis & Vanderberg, 2014; Cronbach & Meehl, 1955). This study aimed to increase the utility of the organizational transparency scale through the research objective of creating an adapted shortened, yet still psychometrically sound, organizational transparency scale.

Chapter 5 - Methods

Participants

The current study will utilize participants from two different studies. Both studies were conducted using a Qualtrics survey.

Study 1

Participants were primarily recruited using snowball sampling. A Qualtrics link was circulated to Kansas State University's daily announcements page (K-State Today) and SONA systems, as well as to individuals through the principal investigator's personal network and social media accounts during the summer of 2023. Participants were compensated by being entered into a raffle where they had a chance to win one of 18 prizes: One \$100 award, two \$50 awards, and fifteen \$20 awards (a total of \$500 in prizes). Participants could have increased the number of entries in the raffle by sending the survey link out to their network and having the referred participant acknowledge who sent them the link when they take the survey. Participants were required to be currently employed to participate in the survey and be employed at the same current organization for at least two years. Initially a total of 255 participants were collected. As part of data cleaning, participants were removed if they did not fully complete the organizational transparency scale (18), they failed the attention check (22), they did not answer what industry they belong to (29) or identified they were part of the public sector (11). The final sample was 174 participants. The participants were primarily part of the following industries: Educational Services (51%), Professional, scientific or technical services (10%), and healthcare or social assistance (9%). All private industry sectors from the sample can be seen in Table 5.1. This sample of participants represents the private industry sector employees in the current study.

Table 5.1. Sample 1 Included Industry Sector Demographics

Sector	<i>n</i>	%
Accommodation or food services	3	2%
Admin, support, waste management or remediation services	6	3%
Arts, entertainment or recreation	1	1%
Construction	5	3%
Educational Services	88	51%
Finance or insurance	7	4%
Forestry, fishing, hunting or agriculture support	5	3%
Health care or social assistance	15	9%
Information	6	3%
Management of companies or enterprises	1	1%
Manufacturing	8	5%
Professional, scientific or technical services	18	10%
Real estate or rental and leasing	2	1%
Retail trade	6	3%
Transportation or warehousing	1	1%
Unclassified establishments	1	1%
Utilities	1	1%

Notes. *n* = 174

Study 2

Participants were recruited from a government facility located in the Midwest that houses employees who are part of two U.S. government agencies. A Qualtrics link for the survey was circulated to employees in the facility through internal communication channels and announced at a reoccurring facility-wide bi-weekly meeting over the course of a month (i.e., announced

twice at the facility-wide meeting) during the fall of 2024. Participation was voluntary and anonymous, and no compensation was given for taking the survey, as the survey was a part of a larger study that was being conducted over the course of a year at the facility. Initially a total of 196 participants were collected. As part of data cleaning, participants were removed if they did not fully complete the organizational transparency scale or indicated careless responding (21). The final sample was 174 participants and will represent the public sector sample that will be used to answer research question one. For research question two, the data was further cleaned to remove any participants who did not provide their unit information which was necessary to identify if they belonged to agency one or agency two. 30 participants did not provide this information and were removed. This resulted in a final private sector sample of 144 participants, where 103 participants belonged to agency one and 41 participants belonged to agency two and represents the final public sector sample in the current study for research question two.

Measures

Organizational Transparency

The organizational transparency scale (Rawlins, 2009) was comprised of 23 items ($\alpha = .97$) and had four subdimensions which are described below. The response scale was a five-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*)². Confirmatory factor analysis

² The original scale has a 1 (strongly disagree) – 7 (strongly agree) Likert response scale. The public sector sample used this original response scale, but the private sector sample used an adjusted 1 (strongly disagree) – 5 (strongly agree) response scale. This was because the data for the private sector sample was from a much larger research project where participants took around 100 items and the response scale was adjusted to match the rest of the response scales present to make it easier on the participants as the organizational transparency scale was the only one that used a 7-point Likert scale. As the private sector sample was larger than the public sector sample and would be used in both sets of analyses of the current project, the public sector data was adjusted into the 5-point Likert scale. To convert the response scale, a linear transformation was used on all items: $(\text{item score} - 1) \times 2/3 + 1 = \text{newly}$

(CFA) results have supported a four-factor model structure with adequate fit (Rawlins, 2009). CFA results were confirmed using the study 1 sample, which indicated acceptable fit CFI = .93, RMSEA = .08 [90% CI: .07 - .10], and SRMR = 0.05 and the study 2 sample, which indicated not a strong, but still adequate fit CFI = .90, RMSEA = .09 [90% CI: .09 - .10] and SRMR = .06 (Hu & Bentler, 1999). The same scale in its entirety was used for both samples and the entire scale can be seen in the Appendix B.

The subdimension of participation was made up of six items ($\alpha = .92$). Example items included “asks for feedback from people like me to help identify the information I need.” and “Takes the time with people like me to understand who we are and what we need.” The subdimension of substantial information was made up of seven items ($\alpha = .92$), with example items such as “provides information that is relevant to people like me” and “provides information that is easy for people like me to understand”. The subdimension of accountability was made up of five items ($\alpha = .86$). Example items included “is forthcoming with information that might be damaging to the organization” and “freely admits when it has made mistakes”. The subdimension of secrecy is a reverse construct that was made up of five items ($\alpha = .78$). Example items included “only discloses information when it is required.” and “provides only part of the story to people like me.” (Rawlins, 2009).

adjusted score. Another potential method is to match the response scores (1 to 1, 2,3 to 2, 4 to 3, 5,6 to 4, 7 to 5). Both methods were used and they were correlated with the original response scores. For the correlation between the original and the linear transformation was $r(172) = .999, p < .001$, and the original and the matching $r(172) = .993, p < .001$ indicating either is an equally viable option to be used to adjust the response scores from 1-7 Likert in the public sample to the 1-5 Likert response scale match and be combined with the private sector sample that used the 1-5 Likert response scale and move forward with the main analyses. The matching scores method was chosen in this case in order to do the differential item functioning testing. If the formula was chosen, each different value calculated would be represented as a ‘response option’ rather than the overall 5 possible response options.

Data Collection Procedure

Study 1 Procedure

After the informed consent, participants were instructed to answer the randomized variables of interest scales in reference to the current organization they are employed with. After this, they experienced a randomly assigned a COVID-related vignette manipulation and answered follow-up questions about their perspective regarding information in the vignette. This was followed by basic demographic information (e.g., sex, age, industry) and a fear of COVID scale.

After that was completed, they were thanked for their time and will also be given the option to click a link which would take them to another survey to input their information if they wanted to enter the raffle. If they chose to not participate in the raffle, this completed their participation in the survey. If they selected that they wanted to enter the raffle, the follow-up survey asked them to input their email, provide the email of who sent them the link if applicable, and directions with the main survey link to distribute to others if they wanted to have the chance to receive additional entries in the raffle. After this was done, their participation in the survey was complete.

Study 2 Procedure

After the informed consent, participants were instructed to answer a variety of scales relating to the main project's research goals (i.e., psychological safety, trust in leadership, etc.) which included the organizational transparency scale in reference to the current organization they are employed with. This was followed by asking them to provide basic organizational level identifiers of what unit and general schedule they belonged to. Demographic information was not

collected to protect the identities of the participants. After this was done, they were thanked for their time and their participation in the survey was complete.

Data Analysis Procedure

Measurement Equivalence Analyses

As mentioned earlier, Measurement Equivalence (ME) refers to how consistently items or tests maintain the same meaning across measurement contexts (Vandenberg & Lance, 2000). Essentially, ME analyzes whether or not a psychological measurement has similar meaning across different situations. In this case, ME analyses are used to investigate if an organizational transparency scale has similar meaning across the public and private sectors. ME analyses first take a multi-group confirmatory factor analysis (CFA) based linear approach (Vandenberg & Lance, 2000) to evaluate the equivalence of the overall factor structure, factor loadings, item intercepts, measurement errors, factor variances, and factor covariances of the organizational transparency scale in both cases to answer RQ 1 and RQ 2. Fit statistics were reported corresponding to the six ME testing steps, which include χ^2 , degrees of freedom, comparative fit index (CFI), root mean square error of approximation (RMSEA), and RMSEA 90% confidence interval. The ME analyses conducted go through the following steps of CFA analyses: step 1 configural invariance, step 2 metric invariance, step 3 scalar invariance, step 4 invariant residuals, step 5 invariant factor variances, and step 6 invariant factor covariances (Vandenberg & Lance, 2000). Each step was run twice, once to test ME across the public and private sector samples, and once to test ME between the two different agencies that make up the private sector sample. To move through each of these steps, acceptable model fit indices must be found to have acceptable fit and as each step is progressed through, the fit indices should not experience significant deterioration from step to step as the constraints increase. Significant deterioration is

be indicated by the presence of both a CFI decrease $> .002$ (Meade et al., 2008) and the absence of RMSEA 90% confidence interval overlap (Wang & Russell, 2005)³.

To test configural invariance (step 1), all parameters will be freed to be different across the organizational transparency ratings while the same structural model is specified to see if the dimensional structure of organizational transparency is consistent across different situations. If this is failed, it means configural variance is not found and the measurement structure based on organizational transparency is not equal across the public and private sector samples and/or the two different agencies that make up the private sector sample for this study. If this were to occur, it would mean that different dimensions of the organizational transparency scale do not discriminate well or what the dimensions intended to measure are not captured well in a particular group of the sample being tested.

To test metric invariance (step 2), the factor loadings for like items will be investigated to see if they are invariant across the different samples/agencies. This will indicate how consistent the items of the organizational transparency scale are to the corresponding latent dimension factors. If invariance is found at this step, it indicates some of the items on the organizational transparency scale may not reflect the latent factors the same in different samples/agencies.

To examine scalar invariance (step 3), the intercepts in the organizational transparency items that are higher or lower than those from one sample/agency to the other are investigated and when there are differences it can indicate if a particular sample/agency has a tendency to be more lenient or rigorous with their rating on organizational transparency. This step aims to

³ Significant changes in χ^2 (Vandenberg & Lance, 2000) is often used as well to determine ME from step to step, but this will not be used as χ^2 is sensitive to large sample sizes.

essentially identify and examine the presence of either systematic response inflation or deflation for organizational transparency in the different samples/agencies.

To check residuals invariance (step 4), the variances and covariances of the error terms are held constant across the different samples/agencies to examine the variance of measurement error. This step tests whether the individual organizational transparency items across the different samples/agencies have equivalent reliability. If they do not, it could mean the organizational transparency scale in certain samples/agencies could have systematic floor or ceiling effects that others do not.

For factor invariance testing (step 5), the composite dimension scores are investigated to see if they are equal across the different samples/agencies. If they are found to be inconsistent, it indicates that the composite dimension scores for organizational transparency are either more or less informative (i.e., smaller or greater factor variance) in a particular sample or agency.

When examining invariant factor covariances (step 6), the associations among the organizational transparency dimensions are inspected to see if they are consistent across the different samples/agencies. If they are found to not be equal, it could indicate the different samples/agencies have different associations among the latent factors in terms of organizational transparency.

Item Response Theory (IRT) Analyses

An IRT analytical approach was also utilized to test ME because it allows the assessment of psychometric features of individual scale items, compared to classical test theory with focuses more on the scale's composite score. This allows for identifying and choosing the items from the current scale that offer the most information in terms of measuring organizational transparency. In IRT, when there is measurement invariance it is referred to as differential functioning. Since

there is the potential for there to be differences among between the various groups in the sample as covered previously, differential item functioning (DIF) analyses was used to help achieve the second aim of this study to develop a shorter organizational transparency scale.

IRT does assume that the scale items represent and are measuring a single construct, in this case organizational transparency, so the unidimensionality of the scale was examined before running the DIF analyses to ensure all the items are truly measuring the same construct of organizational transparency. DIF is defined as the difference in the likelihood of endorsing an item between the different groups when the scores are measured on a common scale. Items that are determined to have DIF due to the group differences will be removed for the scale. In order to identify if there is DIF, discrimination and difficulty parameters will be calculated for each item in the scale and compared. The discrimination parameter represents the slope of the item option response functions (ORFs) which captures the relationship between the latent construct (overall perception of organizational transparency) and the probability of endorsing a particular response option (ranging from 1 *strongly disagree* to 5 *strongly agree*) for each item. The standardized discrimination parameter (e.g., z-score) can be used to judge the statistical significance of the item's trait differentiating capacity, such that if it is greater than 1.96, it is significant at $p < 0.05$. Meanwhile, the difficulty parameters determine the location of the ORF along the axis of θ (i.e., the latent trait; representing the overall level of organizational transparency perception). Item Characteristic Curves (ICC) can aid in visually detecting DIF. A single ICC shows the probability of endorsing a correct response across different ability levels of the latent trait. In this case, it would show the relationship between how an individual's latent trait (in terms of their perception of organization transparency in this case) and the probability of correctly responding to an item. By comparing the ICCs across the different groups visually, you

can see if there is significant DIF in the various items of the organizational transparency scale by differences in the curves that are plotted.

Then an Item Information Curve (IIC) is generated for each item of the organizational transparency scale based on the discrimination and difficulty parameters. The IIC visualizes the distribution of information an item provides on a continuum of the estimated level of the latent trait, θ . The area of IIC above the θ axis represents the amount of information provided by that item across the entire continuum of the latent trait of organizational transparency. Typically, an item that offers a larger amount of item information has a greater discriminating parameter (seen visually with steeper slopes) and a broader range of difficulty parameters along the θ axis.

Next, a Test Information Function (TIF) is created by aggregating all the IICs of the for all the scale items (23 for organizational transparency). The TIF is similar to the IIC in that the area above the θ axis represents the total test information. When doing these analyses to condense the organizational transparency scale, the goal is to ensure the TIFS of the shortened scale maintains a similar shape to those of the original version of the scale. In order to create a shorter version of the scale two approaches covered in the next two subsections will be utilized.

Scale Shortening via item information criteria. The organizational transparency scale was then shortened by selecting items which offer above average information and still represent the four subdimensions of organizational transparency in order to maintain content validity. This is done because an item with more information can more precisely differentiate the overall level of organizational transparency based on the participants' ratings on the item. The amount of the information is indicated by the area under the IIC across the θ axis. This method has been used before to create a reliable and valid, but condensed safety climate scale (Huang et al., 2017). For the 23-item organizational transparency scale, if each item is assumed to differentiate the level of

the construct by an equal amount, each item should provide 4.35% of the total test information (i.e., 100% divided by 23 items). However, in reality, some items will have better discriminating ability than others, so they will provide more than this equal 4.35% across the board. Thus, the organizational transparency scale was first condensed by selecting items that have better than average discriminating ability across the four subdimensions, which would be items that have more than 4.35% total test information.

Scale Shortening via total test information. If the resulting shortened scale from the steps covered above is still quite lengthy, the next method is to shorten the scale using total test information. The organizational transparency scale is further condensed by selecting the most discriminating items that will in total, retain at least 30% of the original total scale information. 30% is chosen because a minimum of three items is needed to ensure model identification in a CFA (Kenny, 2016) and have acceptable levels of reliability of the scale (Cortina, 1993). The correlations will be tested between the shortened version of the organizational transparency scale to the original 23 item version to evaluate the representativeness of the newly developed version and to justify the appropriateness of using at least 30% of total scale information at this step to further shorten the scale if needed.

Reliability and Validity Analysis

McDonald's omega was calculated for the shortened scale to determine the reliability of the new version of the scale. The generally accepted criterion for good internal consistency of McDonald's omega $> .70$ will be used (Hayes & Coutts, 2020). McDonald's omega is used instead of the traditionally reported Cronbach's alpha because McDonald's omega does not assume all the items are weighted equally which fits with the procedures used to shorten the item scale, where items with more provided information will be selected. The mean scores of the

shortened and original scales are calculated and the correlation between the scale's mean scores was used to examine convergent validity. Typically, a correlation between two variables greater than 0.80 (Brown, 2006) or 0.85 (Kenny, 1979) indicates the two variables are measuring the same construct.

Chapter 6 - Results

RQ1: ME Testing for Private vs. Public Sectors

CFA-based ME Testing

In order to determine if the organizational transparency scale between private versus public sector employment has measurement equivalence on not (RQ1), ME was first tested using a multigroup CFA approach. The four-factor model of the organizational transparency scale showed adequate fit, CFI = .91, RMSEA = .08 [90% CI: .08-.09] and SRMR = .05 (Hu & Bentler, 1999). ME was supported for all levels for the scale (Table 6.1).

Table 6.1. Measurement Equivalence Testing Results for Private vs. Public Sectors

Model	χ^2	df	$\Delta\chi^2$	Δdf	CFI	ΔCFI	RMSEA	RMSEA 90% CI
Step 1	1243.46	448	-	-	.8824	-	.10	.10-.11
Step 2	1259.99	467	16.53	19	.8828	.0004	.10	.09-.11
Step 3	1325.38	486	65.39	19	.8760	.0068	.10	.09-.11
Step 4	1388.09	509	62.71	23	.8701	.0059	.10	.09-.10
Step 5	1395.09	513	7.00	4	.8696	.0005	.10	.09-.11
Step 6	1422.96	519	27.88	6	.8664	.0032	.10	.09-.11

Notes. CFI = comparative fit index; ΔCFI = change in comparative fit index; RMSEA = root mean square error of approximation; CI = confidence interval. A ΔCFI in bold and italics indicates that the item intercepts are identified to be significantly different between groups using the ΔCFI threshold of 0.002 (Meade et al., 2008). Step 1: A test for configural invariance (equal factor structure); Step 2: A test for metric invariance (equal factor structure + equal factor loadings); Step 3: A test for scalar invariance (equal factor structure + equal factor loadings + equal intercepts); Step 4: A test for invariant uniqueness (equal factor structure + equal factor loadings + equal intercepts + equal residual uniqueness); Step 5: A test for invariant factor variance (equal factor structure + equal factor loadings + equal intercepts + equal residual uniqueness + equal factor variance); Step 6: A test for invariant factor covariance (equal factor structure + equal factor loadings + equal intercepts + equal residual uniqueness + equal factor variance + equal factor covariance).

The configural invariance test (step 1) indicated marginal fit. Moving onto to step 2 where the constraint of equivalent factor loadings was added did not yield in significant ME deterioration. The addition of equal intercept constraints (step 3) did lead to a $\Delta CFI > .002$

(Meade et al., 2008), but there still was overlap for the RMSEA 90% confidence intervals so ME was supported for step 3. For step 4, where the residuals are constrained to be equivalent, it was once again found to have $\Delta CFI > .002$, but there still was overlap for the RMSEA 90% confidence intervals so ME was supported for this step. The factor invariance test (step 5) was supported as there was no significant ME deterioration seen at this step. For the final step, where equal factor covariance is imposed (step 6), a $\Delta CFI > .002$ was found, but once again there still was overlap for the RMSEA 90% confidence intervals so ME was supported for step 6. These findings are in support overall of good ME for the organizational transparency scale for the private and public sectors. A deeper investigation was conducted into steps 3, 4, and 5 to see the difference on the item level as the constraints were increased in these steps because they did fail the threshold for a $\Delta CFI > .002$ (Meade et al., 2008), but ultimately passed ME due to there not also being a lack of overlap for the RMSEA 90% confidence intervals. These results can be seen in Tables 6.2, 6.3, and 6.4. Overall, as ME was supported for the organizational transparency scale, this means that fair and meaningful comparisons across the public and private sectors can be made in terms of organizational transparency perceptions.

Table 6.2. Step 3: Scalar Measurement Equivalence Testing Item Intercepts Information for Private vs. Public Sectors

Scale item		Intercepts				Δ Intercepts	
		Step 2		Step 3			
		Testing Model		Testing Model			
		Public	Private	Public	Private	Public	Private
Factor 1							
	Item 1	3.42	3.30	3.33	3.33	.09	.03
	Item 2	3.23	3.24	3.21	3.21	.02	.03
	Item 3	3.18	3.18	3.16	3.16	.02	.02
	Item 4	3.02	3.22	3.08	3.08	.06	.14
	Item 5	2.61	2.80	2.67	2.67	.06	.13
	Item 6	2.90	2.95	2.89	2.89	.01	.06
Factor 2							
	Item 7	3.15	3.19	3.12	3.12	.03	.07
	Item 8	3.35	3.41	3.34	3.34	.01	.07
	Item 9	3.17	3.32	3.19	3.19	.02	.13
	Item 10	3.15	3.12	3.08	3.08	.07	.04
	Item 11	3.45	3.67	3.53	3.53	.08	.14
	Item 12	3.38	3.62	3.44	3.44	.06	.18
	Item 13	3.60	3.62	3.58	3.58	.02	.04
Factor 3							
	Item 14	3.12	3.00	3.10	3.10	.02	.10
	Item 15	2.99	2.74	2.92	2.92	.07	.18
	Item 16	3.07	2.83	3.00	3.00	.07	.17
	Item 17	2.87	2.93	2.93	2.93	.06	.00
	Item 18	3.28	3.49	3.40	3.40	.12	.09
Factor 4							
	Item 19	2.62	2.74	2.64	2.64	.02	.10
	Item 20	2.78	2.91	2.80	2.80	.02	.11
	Item 21	3.52	3.44	3.46	3.46	.06	.02
	Item 22	2.82	2.92	2.84	2.84	.02	.08
	Item 23	2.74	2.64	2.67	2.67	.07	.03

Notes. Items with comparatively ‘larger’ value for Δ intercept are bolded and italicized. Step 2 Testing model references the 2nd step (metric invariance) in multigroup confirmatory factor analyses-based measurement equivalence testing and Step 3 testing model refers to the 3rd step (scalar invariance) in this process. For organizational transparency factor 1= participation, factor 2 = substantial information, factor 3 = accountability, factor 4 = secrecy. Items 12 and 15 will be used as an example of looking deeper into the intercept changes that have been bolded due to being comparatively ‘larger’. For example, item 12 ($M_{step\ 2} = 3.62$, $SE_{step\ 2} = .08$; $M_{step\ 3} = 3.44$, $SE_{step\ 3} = .08$) and item 15 ($M_{step\ 2} = 2.74$, $SE_{step\ 2} = .08$; $M_{step\ 3} = 2.64$, $SE_{step\ 3} = .08$) for the private sector have the biggest intercept change at .18. When this information is taken in the context of the response scale (1-5 Likert scale) and the standard error being .08, this deeper look reveals that these differences from step 2 to step 3 are not concerning and still support the overall conclusion that ME is supported.

Table 6.3. Step 4: Invariant Residuals Measurement Equivalence Testing Residuals Information for Private vs. Public Sectors

Scale item		Residuals (ϵ)				$\Delta \epsilon$	
		Step 3		Step 4			
		Testing Model		Testing Model			
		Public	Private	Public	Private	Public	Private
Factor 1							
	Item 1	0.61	0.62	0.62	0.62	0.01	0.00
	Item 2	0.39	0.45	0.42	0.42	0.03	0.03
	Item 3	0.26	0.40	0.33	0.33	0.07	0.07
	Item 4	0.40	0.52	0.46	0.46	0.06	0.06
	Item 5	0.51	0.49	0.50	0.50	0.01	0.00
	Item 6	0.45	0.39	0.42	0.42	0.03	0.04
Factor 2							
	Item 7	0.39	0.39	0.39	0.39	0.00	0.00
	Item 8	0.26	0.33	0.30	0.30	0.04	0.03
	Item 9	0.36	0.65	0.51	0.51	0.15	0.14
	Item 10	0.40	0.42	0.41	0.41	0.01	0.01
	Item 11	0.54	0.51	0.52	0.52	0.02	0.01
	Item 12	0.29	0.37	0.33	0.33	0.04	0.04
	Item 13	0.34	0.41	0.37	0.37	0.03	0.03
Factor 3							
	Item 14	0.41	0.53	0.46	0.46	0.06	0.06
	Item 15	0.42	0.46	0.45	0.45	0.02	0.02
	Item 16	0.39	0.52	0.45	0.45	0.06	0.06
	Item 17	0.36	0.52	0.44	0.44	0.08	0.08
	Item 18	0.43	0.57	0.50	0.50	0.07	0.07
Factor 4							
	Item 19	0.25	0.51	0.38	0.38	0.14	0.13
	Item 20	0.19	0.40	0.31	0.31	0.11	0.10
	Item 21	0.72	0.74	0.73	0.73	0.01	0.01
	Item 22	0.38	0.36	0.36	0.36	0.02	0.00
	Item 23	0.50	0.55	0.51	0.51	0.01	0.04

Notes. Items with comparatively ‘larger’ value for Δ intercept are bolded and italicized. Step 3 Testing model references the 3rd step (scalar invariance) in multigroup confirmatory factor analyses-based measurement equivalence testing and Step 4 testing model refers to the 4th step (invariant residuals) in this process. Items 9 and 19 will be used as an example of looking deeper into the residual changes that have been bolded due to being comparatively ‘larger’. For the residuals, the R^2 will be referenced which have an inverse relationship with residuals. For R^2 good convergence is seen at $> .05$ (Fornell & Larcker, 1981). Item 9 ($\epsilon_{step\ 3} = 0.36$, $R^2_{step\ 3} = 0.50$; $\epsilon_{step\ 4} = 0.51$, $R^2_{step\ 4} = 0.60$) and item 19 ($\epsilon_{step\ 3} = 0.25$, $R^2_{step\ 3} = 0.60$; $\epsilon_{step\ 4} = 0.38$, $R^2_{step\ 4} = 0.70$) for the public sector have the biggest residual change at .15 and .14 respectively. When this information is taken in the context of the R^2 and the residuals do not exceed these values, this deeper look reveals that these differences from step 3 to step 4 are not concerning and still support the overall conclusion that ME is supported.

Table 6.4. Factor Covariances Measurement Equivalence Testing Information for Private vs. Public Sectors

Scale item		Factor Covariances				Δ Factor Covariances	
		Step 5		Step 6			
		Testing Model		Testing Model			
		Public	Private	Public	Private	Public	Private
Factor 1							
	Factor 2	.79	.79	.76	.78	.03	.01
	Factor 3	.56	.61	.58	.58	.02	.03
	Factor 4	.36	.60	.47	.47	.11	.13
Factor 2							
	Factor 3	.62	.65	.62	.62	.00	.03
	Factor 4	.41	.68	.52	.52	.11	.16
Factor 3							
	Factor 4	.37	.55	.44	.44	.07	.11

Notes. Items with comparatively ‘larger’ value for Δ intercept are bolded and italicized. Step 5 Testing model references the 5th step (factor variances) in multigroup confirmatory factor analyses-based measurement equivalence testing and Step 6 testing model refers to the 6th step (Factor Covariances) in this process. Factor1 = participation (items 1-6), Factor 2 = substantial information (items 7-13), Factor 3 = accountability (items 14-18), and Factor 4 = secrecy (items 19-23). When looking deeper into the factor covariance changes that have been bolded due to being comparatively ‘larger’, we see a trend of them occurring when the factor covariances are including factor 4 (secrecy). When looking between the public and private sector, the results support that overall, the four dimensions of organizational transparency are more correlated in the private sector compared to the public sector. This could point to the idea that sub-facet interpretations of the scale might be more informative for the private sector compared to the public, although caution needs to be considered with over generalizing this as the overall ME were supported, so this finding would need to be replicated and include other public departments/agencies.

IRT-based ME Testing

Once the multigroup CFA-based ME testing was conducted, IRT methods were used to investigate ME using differential item functioning (DIF) to see if there were any items the function inconsistently across the public and private sectors. First, the unidimensionality of the model was tested to see if uni- or multi-dimensional IRT needed to be used for the analyses. As can be seen in Table 6.5, the unidimensional model had better fit and was used for the IRT analyses.

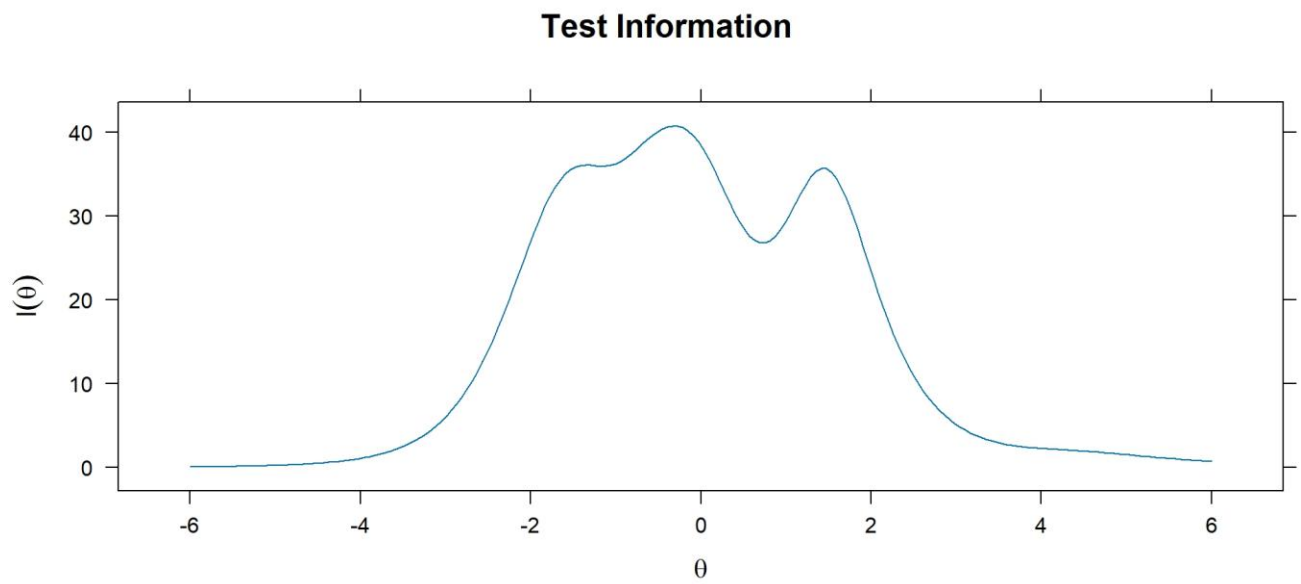
Table 6.5. Model Results for Determination of Model Dimensionality for IRT Analyses for Private vs. Public Sectors

Model	AIC	BIC
Unidimensional	17782.77	18235.96
Multidimensional	18264.50	18717.70

Notes. AIC stand for Akaike Information Criterion, and BIC stands for Bayesian Information Criterion; The multidimensional model consisted of the four subfactors (participation, substantial information, accountability, and secrecy) for the organizational transparency scale (Rawlins, 2008).

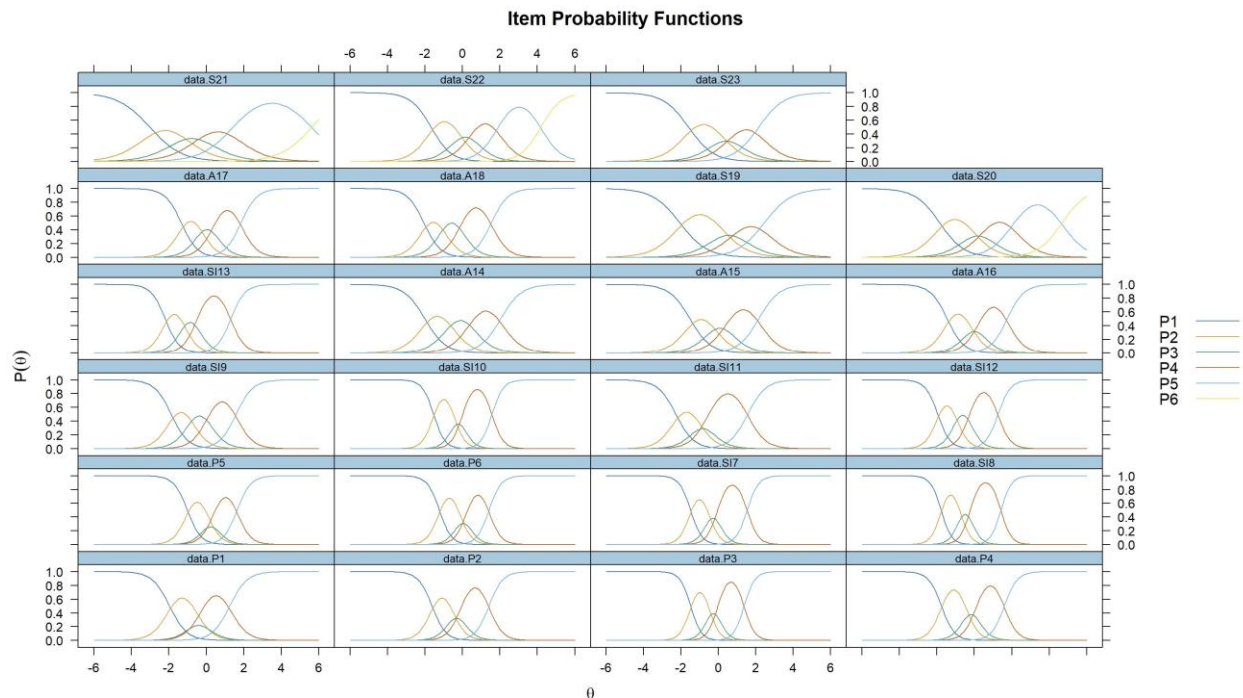
The IRT-based ME testing results showed there were no items with DIF for the organizational transparency scale between the public and private sectors. These results indicate the functioning of the scale's items did not differ seriously across the two different sectors so the measurement structure and items of the organizational transparency scale hold consistent meaning. The overall test information curve can be seen in Figure 6.1 and the item probability functions can be seen in Figure 6.2 for the organizational transparency scale.

Figure 6.1. Test Information Curve for Organizational Transparency Scale



Note. Theta = organizational transparency.

Figure 6.2. Item Probability Functions for all 23 Items of the Organizational Transparency Scale



Note. Theta = organizational transparency.

RQ2: ME Testing for Agency One vs. Agency Two

CFA-based ME Testing

In order to determine if the organizational transparency scale between agency one versus agency two within the public sector has measurement equivalence on not (RQ2), ME was first tested using a multigroup CFA approach. The four-factor model of the organizational transparency scale showed adequate fit, CFI = .90, RMSEA = .09 [90% CI: .09 - .10] and SRMR = .06 (Hu & Bentler, 1999). ME was supported for all levels for the scale (Table 6.6).

The configural invariance test (step 1) indicated marginal fit. Moving onto to step 2 where the constraint of equivalent factor loadings was added did not yield in significant ME deterioration. The addition of equal intercept constraints (step 3) did lead to a $\Delta\text{CFI} > .002$ (Meade et al., 2008), but there still was overlap for the RMSEA 90% confidence intervals so ME

was supported for step 3. For step 4, where the residuals are constrained to be equivalent, it was once again found to have $\Delta CFI > .002$, but there still was overlap for the RMSEA 90% confidence intervals so ME was supported for this step. The factor invariance test (step 5) was supported as there was no significant ME deterioration seen at this step. For the final step, where equal factor covariance is imposed (step 6) there was no significant ME deterioration seen and ME was supported for step 6. These findings are in support overall of good ME for the organizational transparency scale for the agency one and agency two within the public sector.

Table 6.6. Measurement Equivalence Testing Results for Agency 1 vs. Agency 2

Model	χ^2	df	$\Delta \chi^2$	Δ df	CFI	Δ CFI	RMSEA	RMSEA 90% CI
Step 1	1028.36	448	-	-	.8249	-	.13	.12-.14
Step 2	1043.96	467	15.59	19	.8259	.001	.13	.12-.14
Step 3	1085.63	486	41.67	19	.8191	.0068	.13	.12-.14
Step 4	1140.22	509	54.59	23	.8095	.0096	.13	.12-.14
Step 5	1146.21	513	5.99	4	.8089	.0006	.13	.12-.14
Step 6	1154.40	519	8.20	6	.8083	.0006	.13	.12-.14

Notes. CFI = comparative fit index; Δ CFI = change in comparative fit index; RMSEA = root mean square error of approximation; CI = confidence interval. A Δ CFI in bold and italics indicates that the item intercepts are identified to be significantly different between groups using the Δ CFI threshold of 0.002 (Meade et al., 2008). Step 1: A test for configural invariance (equal factor structure); Step 2: A test for metric invariance (equal factor structure + equal factor loadings); Step 3: A test for scalar invariance (equal factor structure + equal factor loadings + equal intercepts); Step 4: A test for invariant uniqueness (equal factor structure + equal factor loadings + equal intercepts + equal residual uniqueness); Step 5: A test for invariant factor variance (equal factor structure + equal factor loadings + equal intercepts + equal residual uniqueness + equal factor variance); Step 6: A test for invariant factor covariance (equal factor structure + equal factor loadings + equal intercepts + equal residual uniqueness + equal factor variance + equal factor covariance).

A deeper investigation was conducted into steps 3 and 4 to see the difference on the item level as the constraints were increased in these steps because they did fail the threshold for a $\Delta CFI > .002$ (Meade et al., 2008), but ultimately passed ME due to there not also being a lack of overlap for the 90% RMSEA confidence intervals. These results can be seen in Tables 6.7 and 6.8. However, as ME was supported overall for the organizational transparency scale, the

findings indicate that fair and meaningful comparisons across agency one and agency two can be made.

Table 6.7. Step 3: Scalar Measurement Equivalence Testing Item Intercepts Information for Agency 1 vs. Agency 2

Scale item		Intercepts					
		Step 2		Step 3		Δ Intercepts	
		Testing Model		Testing Model		Testing Model	
		Agency 1	Agency 2	Agency 1	Agency 2	Agency 1	Agency 2
Factor 1							
	Item 1	3.42	3.58	3.38	3.38	0.04	0.20
	Item 2	3.24	3.35	3.15	3.15	0.09	0.20
	Item 3	3.14	3.35	3.11	3.11	0.03	0.24
	Item 4	3.01	3.25	2.99	2.99	0.02	0.26
	Item 5	2.45	3.03	2.56	2.56	0.11	0.47
	Item 6	2.74	3.38	2.88	2.88	0.14	0.50
Factor 2							
	Item 7	3.13	3.20	3.06	3.06	0.07	0.14
	Item 8	3.31	3.53	3.27	3.27	0.04	0.26
	Item 9	3.07	3.58	3.15	3.15	0.08	0.43
	Item 10	3.12	3.35	3.09	3.09	0.03	0.26
	Item 11	3.38	3.83	3.45	3.45	0.07	0.38
	Item 12	3.31	3.70	3.32	3.32	0.01	0.38
	Item 13	3.59	3.83	3.58	3.58	0.01	0.25
Factor 3							
	Item 14	3.04	3.35	3.04	3.04	0.00	0.31
	Item 15	2.90	3.23	2.89	2.89	0.01	0.34
	Item 16	3.06	3.35	3.03	3.03	0.03	0.32
	Item 17	2.79	3.15	2.78	2.78	0.01	0.37
	Item 18	3.15	3.65	3.22	3.22	0.07	0.43
Factor 4							
	Item 19	2.57	2.70	2.59	2.59	0.02	0.11
	Item 20	2.78	2.83	2.77	2.77	0.01	0.06
	Item 21	3.60	3.43	3.52	3.52	0.08	0.09
	Item 22	2.79	2.95	2.82	2.82	0.03	0.13
	Item 23	2.74	2.78	2.73	2.73	0.01	0.05

Notes. Items with comparatively ‘larger’ value for Δ intercept are bolded and italicized. Step 2 Testing model references the 2nd step (metric invariance) in multigroup confirmatory factor analyses-based measurement equivalence testing and Step 3 testing model refers to the 3rd step (scalar invariance) in this process. For organizational transparency factor 1= participation, factor 2 = substantial information, factor 3 = accountability, factor 4 = secrecy.

Items 5 and 6 will be used as an example of looking deeper into the intercept changes that have been bolded due to being comparatively ‘larger’. For example, item 5 ($M_{step\ 2} = 3.03$, $SE_{step\ 2} = 0.21$; $M_{step\ 3} = 2.56$, $SE_{step\ 3} = 0.11$) and item 6 ($M_{step\ 2} = 3.38$, $SE_{step\ 2} = 0.21$; $M_{step\ 3} = 2.88$, $SE_{step\ 3} = 0.11$) for agency 2 have the biggest intercept change at .47 and .50 respectively. When this information is taken in the context of the response scale (1-5 Likert scale) and the standard errors being 0.21 and 0.11, this deeper look reveals that these differences from step 2 to step 3 are not concerning and still support the overall conclusion that ME is supported.

Table 6.8. Step 4: *Invariant Residuals Measurement Equivalence Testing Residuals Information for Agency 1 vs. Agency 2*

Scale item	Residuals (ϵ)					
	Step 3		Step 4		$\Delta \epsilon$	
	Agency 1	Agency 2	Agency 1	Agency 2	Agency 1	Agency 2
Factor 1						
Item 1	0.65	0.49	0.60	0.60	0.05	0.11
Item 2	0.51	0.27	0.43	0.43	0.08	0.16
Item 3	0.21	0.34	0.26	0.27	0.05	0.07
Item 4	0.35	0.39	0.38	0.38	0.03	0.01
Item 5	0.64	0.23	0.50	0.50	0.14	0.27
Item 6	0.60	0.20	0.47	0.47	0.13	0.27
Factor 2						
Item 7	0.38	0.43	0.38	0.38	0.00	0.05
Item 8	0.32	0.19	0.27	0.27	0.05	0.08
Item 9	0.41	0.21	0.35	0.35	0.06	0.14
Item 10	0.45	0.33	0.41	0.41	0.04	0.08
Item 11	0.58	0.36	0.53	0.53	0.05	0.17
Item 12	0.25	0.38	0.30	0.30	0.05	0.08
Item 13	0.41	0.20	0.36	0.36	0.05	0.16
Factor 3						
Item 14	0.39	0.32	0.37	0.37	0.02	0.05
Item 15	0.46	0.45	0.45	0.45	0.01	0.00
Item 16	0.46	0.33	0.41	0.41	0.05	0.08
Item 17	0.35	0.38	0.36	0.40	0.01	0.02
Item 18	0.49	0.32	0.44	0.44	0.05	0.12
Factor 4						
Item 19	0.29	0.25	0.28	0.28	0.01	0.03
Item 20	0.22	0.12	0.20	0.20	0.02	0.08
Item 21	0.78	0.60	0.73	0.73	0.05	0.13
Item 22	0.45	0.32	0.42	0.42	0.03	0.10
Item 23	0.57	0.39	0.52	0.52	0.05	0.13

Notes. Items with comparatively ‘larger’ value for Δ intercept are bolded and italicized. Step 3 Testing model references the 3rd step (scalar invariance) in multigroup confirmatory factor analyses-based measurement equivalence testing and Step 4 testing model refers to the 4th step (invariant residuals) in this process. Items 5 and 6 for agency 2 will be used as an example of looking deeper into the residual changes that have been bolded due to being comparatively ‘larger’. For the residuals, the R^2 will be referenced which have an inverse relationship with residuals. For R^2 good convergence is seen at $> .05$ (Fornell & Larcker, 1981). Item 5 ($\epsilon_{step\ 3} = 0.23$, $R^2_{step\ 3} = 0.87$; $\epsilon_{step\ 4} = 0.50$, $R^2_{step\ 4} = 0.75$) and item 6 ($\epsilon_{step\ 3} = 0.20$, $R^2_{step\ 3} = 0.89$; $\epsilon_{step\ 4} = 0.47$, $R^2_{step\ 4} = 0.77$) for the agency 2 have the biggest residual change with both at 0.27. When this information is taken in the context of the R^2 and the residuals do not exceed these values, this deeper look reveals that these differences from step 3 to step 4 are not concerning and still support the overall conclusion that ME is supported.

IRT-based ME Testing

Once the multigroup CFA-based ME testing was conducted, IRT methods were used to investigate ME using differential item functioning (DIF) to see if there were any items that the function inconsistently across agency one and agency two. First, the unidimensionality of the model was tested to see if uni- or multi-dimensional IRT needed to be used for the analyses. As can be seen in Table 6.9, the unidimensional model had better fit and was used for the IRT analyses.

Table 6.9. Model Results for Determination of Model Dimensionality for IRT Analyses for Agency 1 vs. Agency 2

Model	AIC	BIC
Unidimensional	7757.69	8108.13
Multidimensional	7781.21	8131.64

Notes. AIC stand for Akaike Information Criterion, and BIC stands for Bayesian Information Criterion; The multidimensional model consisted of the four subfactors (participation, substantial information, accountability, and secrecy) for the organizational transparency scale (Rawlins, 2008).

The IRT-based ME testing results showed there was one item with DIF for the organizational transparency scale between agency one and agency two. The item was item 8, “The organization provides information that is relevant to people like me”. For this item, McFadden’s R^2 differences in uniform and total DIF testing models were $> .02$. and the β change was $\geq .1$ (see Table 6.10 and Table 6.11; Choi et al., 2011; Cohen, 1988). Results indicated that in agency one which has a higher score, that scores on this item were high, in general, and discrimination of low or high organizational transparency based on this item was not very meaningful. However, the McFadden’s R^2 differences were not $> .02$ for non-uniform DIF, indicating while there is bias for this singular item between the two agencies, the bias doesn’t

change based how on the performance for the overall test by agency in regards to organizational transparency.

The impact of the item 8 on the test characteristic curves is shown in Figure 6.3 and the theta distribution can be seen in Figure 6.4. The left panel of Figure 6.3 illustrates that when considering the full 23 items of the scale, both agencies follow nearly identical response patterns, pointing to the overall test functioning being consistent across the two agencies. The right panel shows the difference between the two agencies for item 8 which has been identified to have DIF. Specifically, it can be seen that agency two, the red-dashed line, is visually shown consistently above and more to the left compared agency one, the solid black line, at moderate (middle area of the image) levels of theta (the latent trait level of organizational transparency). This indicates for item 8, that is systematically favors agency one which could potentially lead to expected higher scores (although only slightly) for this agency despite the equivalent levels of organizational transparency perception. Although DIF was identified, based on the impact by weighted density (Figure 6.5) the DIF while clearly present, is relatively small and will not greatly compromise the fairness of the organizational transparency scale as a whole. Overall, these results indicate the functioning of the scale's items, with the exception of item 8 to a small degree, did not differ seriously across the two agencies so the measurement structure and items of the organizational transparency scale hold consistent meaning. The overall test information curve can be seen in Figure 6.6 and the item probability functions can be seen in Figure 6.7 for the organizational transparency scale.

Table 6.10. Test of DIF based on Pseudo McFadden's R^2 Change

Item	No. of Categories	Pseudo McFadden ΔR^2		
		Uniform DIF (M1-M2)	Total DIF (M1-M3)	Non-Uniform DIF (M2-M3)
P1	4	0.0015	0.0026	0.0011
P2	4	0.0038	0.0109	0.0071
P3	5	0.0015	0.0023	0.0007
P4	4	0.0013	0.0021	0.0008
P5	5	0.0038	0.0070	0.0031
P6	4	0.0094	0.0118	0.0024
SI7	5	0.0074	0.0074	0.0000
SI8	3	0.0316	0.0335	0.0019
SI9	3	0.0027	0.0027	0.0000
SI10	4	0.0022	0.0028	0.0006
SI11	3	0.0058	0.0058	0.0000
SI12	4	0.0005	0.0039	0.0034
SI13	3	0.0000	0.0042	0.0042
A14	3	0.0014	0.0040	0.0026
A15	3	0.0013	0.0063	0.0049
A16	4	0.0000	0.0036	0.0036
A17	5	0.0006	0.0008	0.0002
A18	3	0.0045	0.0049	0.0004
S19	4	0.0003	0.0020	0.0017
S20	4	0.0004	0.0018	0.0015
S21	4	0.0070	0.0104	0.0034
S22	4	0.0003	0.0011	0.0008
S23	4	0.0009	0.0013	0.0004

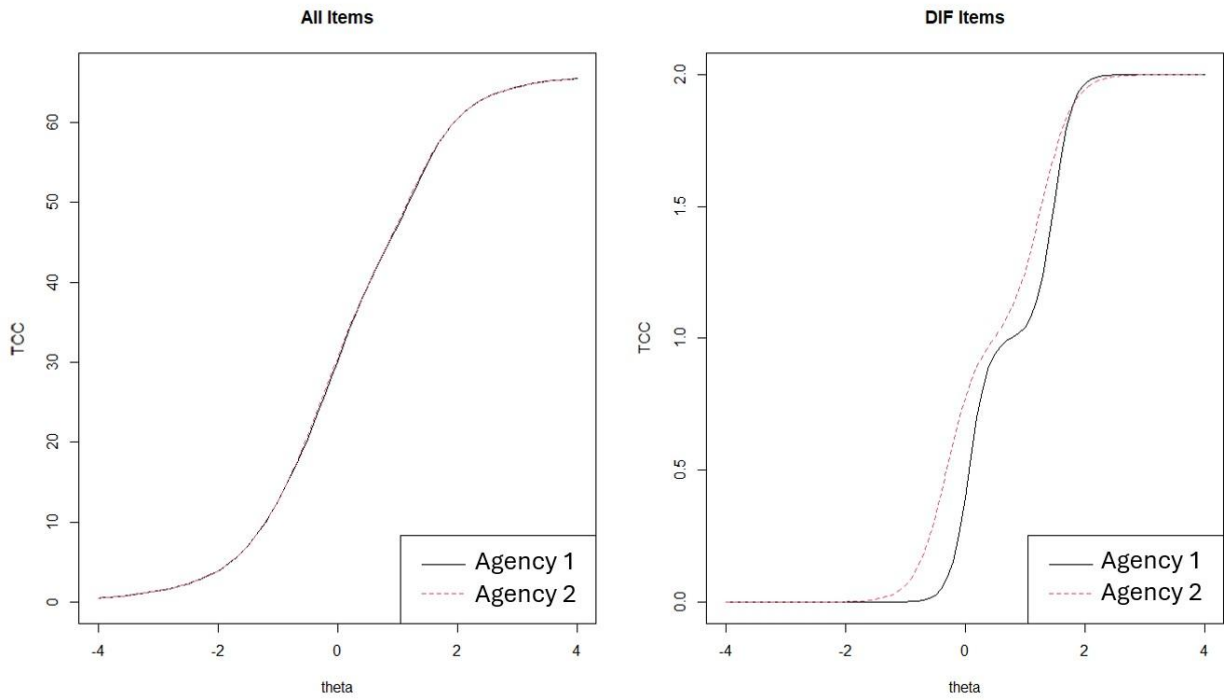
Notes. DIF = differential item functioning, the letters by the items represent the subdimension of organizational transparency the item belongs to, P = participation, SI = substantial information, A = accountability, and S = secrecy. M1 = Model 1, M2 = Model 2, M3 = Model 3. The following formulas are what make up the three logistic regression models that are compared to detect the presence of DIF. Model 1: $\text{logit } P(u_i \geq \kappa) = \alpha_\kappa + \beta_1 * \text{trait}$; Model 2: $\text{logit } P(u_i \geq \kappa) = \alpha_\kappa + \beta_1 * \text{trait} + \beta_2 * \text{group}$; Model 3: $\text{logit } P(u_i \geq \kappa) = \alpha_\kappa + \beta_1 * \text{trait} + \beta_2 * \text{group} + \beta_3 * \text{trait} * \text{group}$ (Choi et al., 2011). Significant $\Delta R^2 \geq 0.02$ (Cohen, 1988) and are bolded.

Table 6.11. Test of DIF based on the β Change

Item	No. of Categories	$\Delta \beta$
P1	4	0.0124
P2	4	0.0172
P3	5	0.0054
P4	4	0.0083
P5	5	0.0025
P6	4	0.0033
SI7	5	0.0252
SI8	3	0.1503
SI9	3	0.0078
SI10	4	0.0099
SI11	3	0.0111
SI12	4	0.0013
SI13	3	0.0004
A14	3	0.0001
A15	3	0.0047
A16	4	0.0010
A17	5	0.0042
A18	3	0.0127
S19	4	0.0041
S20	4	0.0056
S21	4	0.0424
S22	4	0.0032
S23	4	0.0096

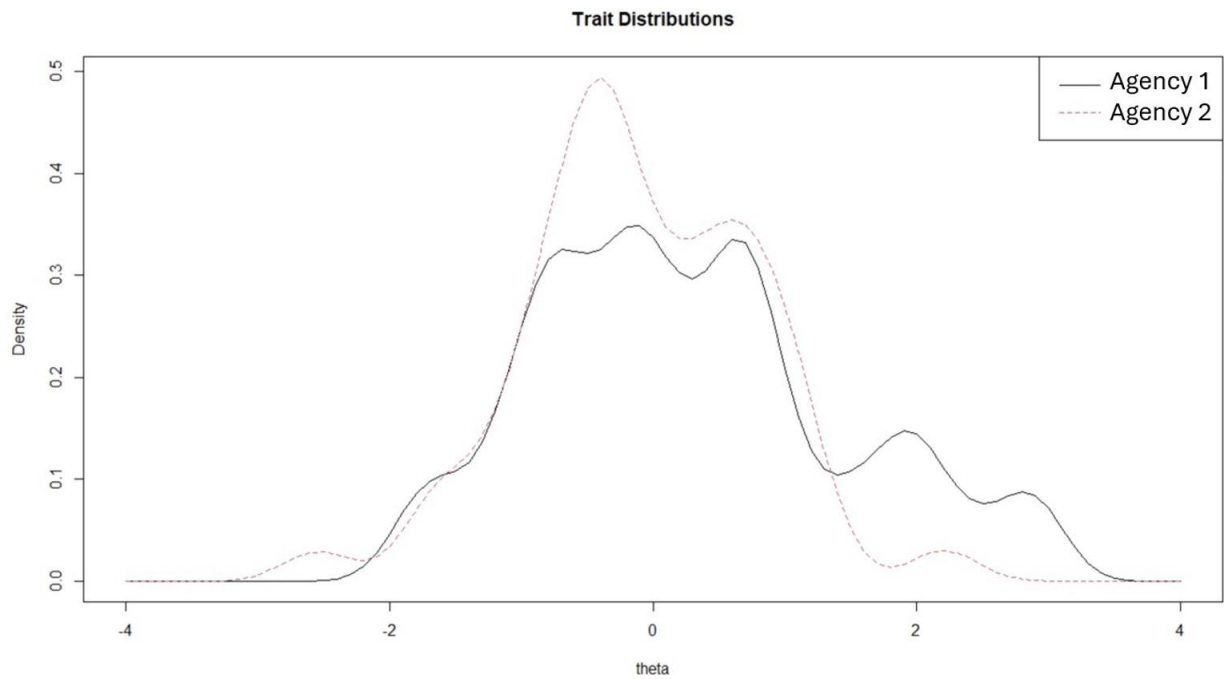
Notes. DIF = differential item functioning, the letters by the items represent the subdimension of organizational transparency the item belongs to, P = participation, SI = substantial information, A = accountability, and S = secrecy. β = beta. Items and values with significant DIF are bolded. $\alpha = .01$, $\Delta\beta \geq .1$ (Choi et al., 2011)

Figure 6.3. Test Characteristic Curves for All Items and Item 8



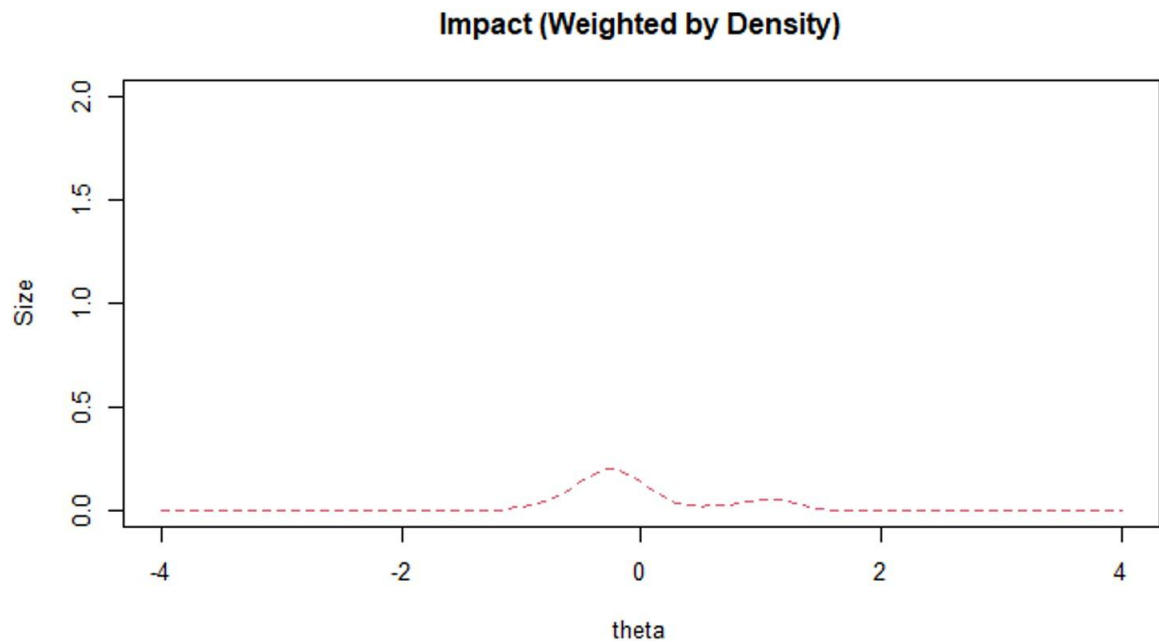
Notes. Theta = organizational transparency; TCC = test characteristic curve. The item with DIF from the organizational transparency scale is item 8.

Figure 6.4. Theta Distribution Across Agency 1 and Agency 2



Note. Theta = organizational transparency

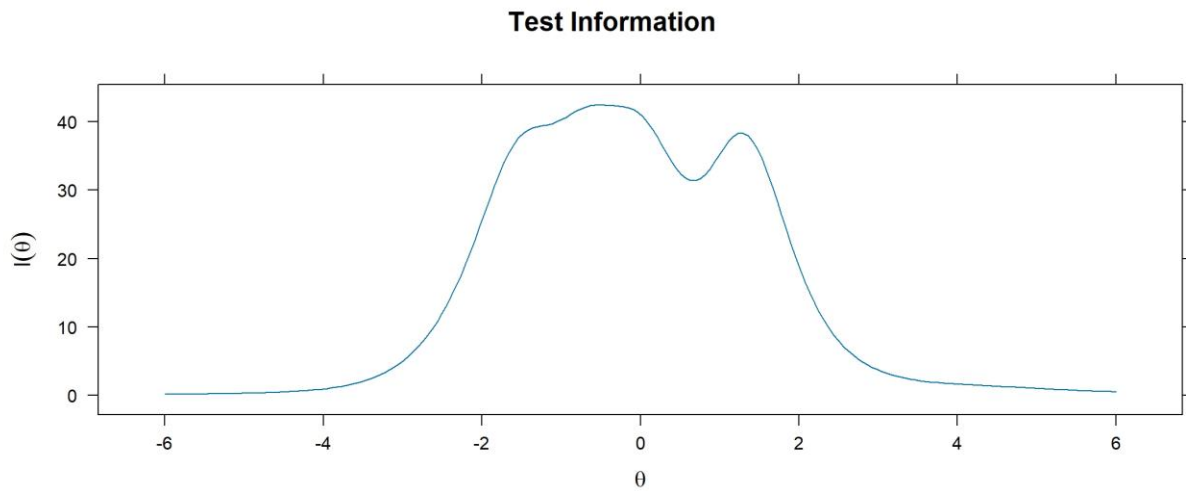
Figure 6.5. Item 8 DIF Impact (Weighted by Density)



Note.

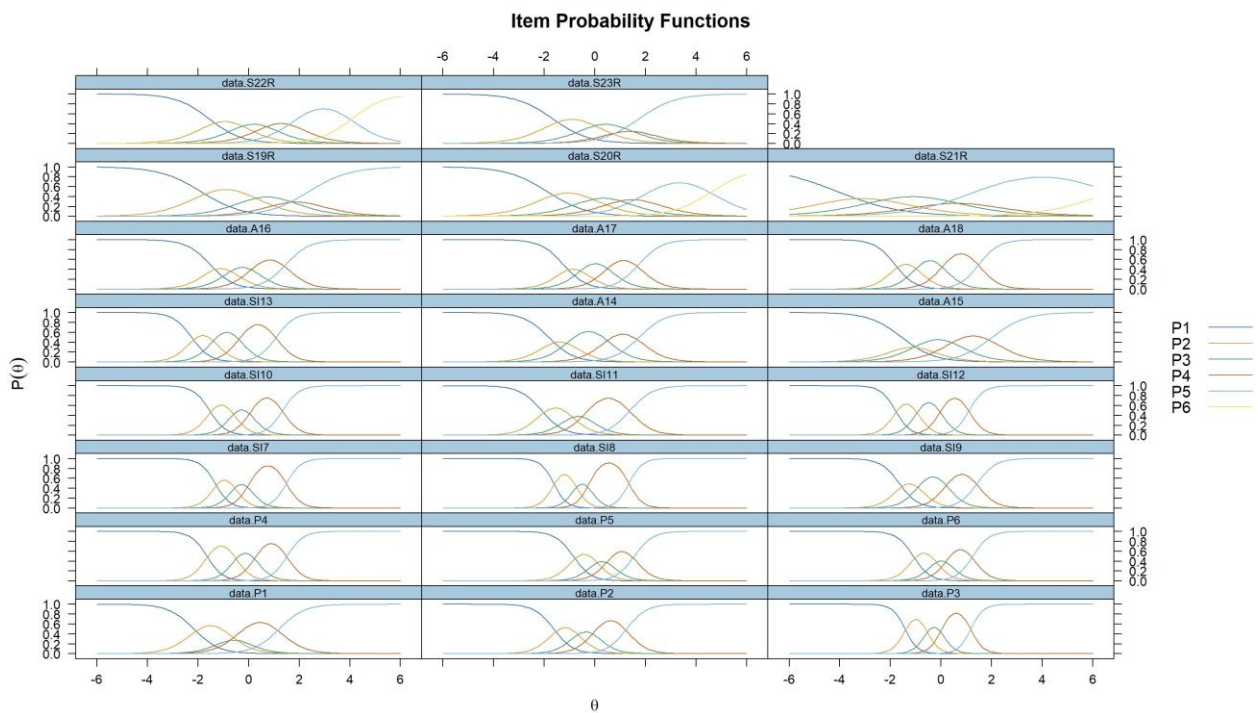
Theta = organizational transparency

Figure 6.6. Test Information Curve for Organizational Transparency



Note. Theta = organizational transparency.

Figure 6.7. Item Probability Functions for all 23 Items of the Organizational Transparency Scale



Note. Theta = organizational transparency.

Development of a Shorter Organizational Transparency Scale

The final aim of this study was to develop a more concise, organizational transparency scale that maintains excellent reliability and convergent validity. From the ME testing previously done on the scale, one item, item 8 from the private sector only sample to compare the two agencies, was identified to have small DIF and was chosen to be removed to ensure the highest levels of generalizability. As only one item was identified to have DIF, the scale is still quite lengthy being now at 22 items and the scale will be shortened using item information criteria.

Scale Shortening via item information criteria

As previously covered in the methods, for the 23-item organizational transparency scale, if each item is assumed to differentiate the level of the construct by an equal amount, each item should provide 4.35% of the total test information (i.e., 100% divided by 23 items). Thus, ideally items will now be retained if they have better than average discriminating ability, which would be items that have more than 4.35% total test information, however in order to ensure content validity, the top two from each subdimension were retained from each subfactor and in some cases (mainly for the reverse-scored subdimension of secrecy) these items did not quite reach the 4.35% but were still the highest in that subdimension. Despite this exception, the total test information did reach and surpass the minimum requirement of 30% which is needed to ensure model identification in a CFA (Kenny, 2016) and have acceptable levels of reliability of the scale (Cortina, 1993). The results for each item's total test information are provided in Table 6.12 and the individual item information curves can be seen in Figure 6.8. Based on these results, a total of 8 items were kept with a total test information retained at 43.06%. Specifically, items 4,5,9,11,14,18,19, 23 from the original full-length scale were kept. Since the goal of reducing the original scale with all 4 subdimensions being represented was achieved, using the criteria of

keeping a minimum of 30% total test information for the scale to further cut items was not used, as cutting further would lead to not all the subdimensions being covered equally. The finalized shortened scale with their items in their entirety can be seen in Table 6.13.

Table 6.12. Results of Parameters & Information for Organizational Transparency Items Using Private & Public Sector Samples

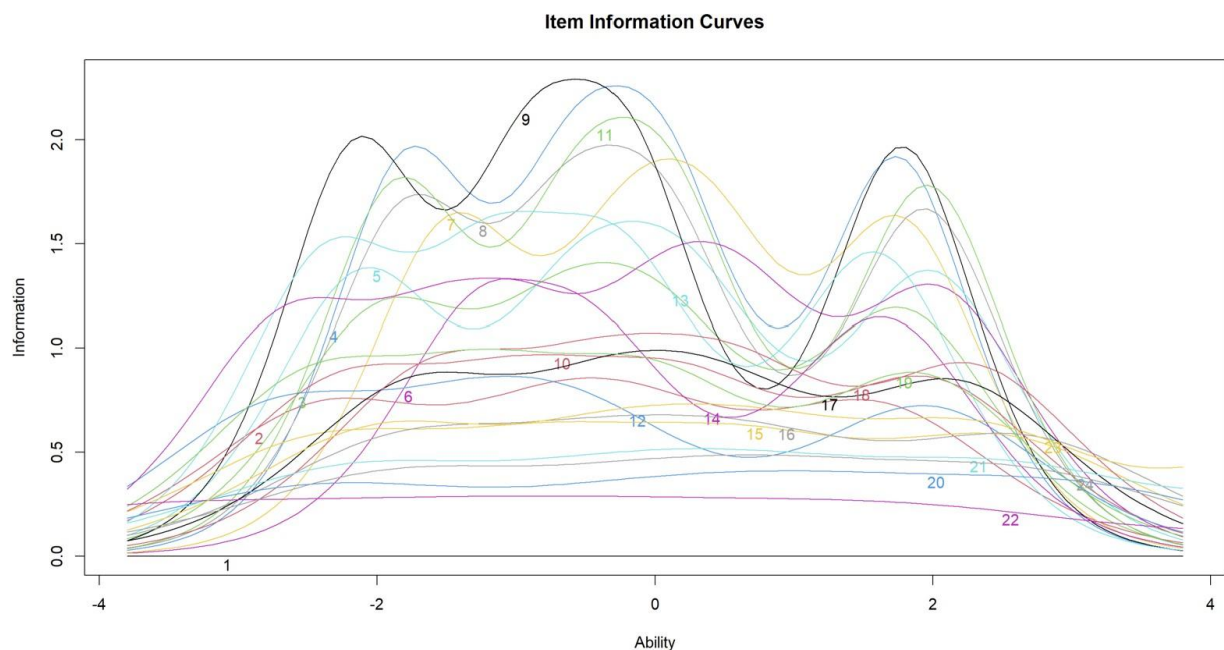
Item	Discrimination	Difficulty				Total Test Information	
		1	2	3	4	Value (Rank)	%
P1	1.69	-2.38	-0.70	-0.19	1.58	0.00 (23)	0.00%
P2	2.17	-1.96	-0.64	-0.03	1.78	4.75 (17)	3.48%
P3	2.76	-1.78	-0.55	0.03	1.74	6.6 (9)	4.83%
<i>P4</i>	2.33	-2.10	-0.50	0.18	1.99	8.96 (2)	6.56%
<i>P5</i>	2.24	-1.19	0.11	0.57	2.04	7.56 (7)	5.54%
P6	2.52	-1.47	-0.15	0.36	1.77	6.53 (10)	4.78%
SI7	2.57	-1.79	-0.59	0.01	1.95	7.73 (6)	5.66%
SI8	2.80	-2.15	-0.88	-0.22	1.78	8.26 (4)	6.05%
<i>SI9</i>	1.83	-2.24	-0.96	0.18	1.98	9.42 (1)	6.90%
SI10	2.66	-1.85	-0.50	0.07	1.96	5.63 (14)	4.12%
<i>SI11</i>	1.69	-2.71	-1.32	-0.60	1.95	8.68 (3)	6.36%
SI12	2.40	-2.35	-1.16	-0.27	1.59	5.00 (16)	3.66%
SI13	2.14	-2.63	-1.46	-0.55	1.64	7.91 (5)	5.79%
<i>A14</i>	1.49	-2.38	-0.77	0.61	2.51	6.83 (8)	5.00%
A15	1.50	-1.79	-0.34	0.67	2.65	4.51 (19)	3.30%
A16	1.81	-1.73	-0.30	0.41	2.18	4.29 (20)	3.14%
A17	1.89	-1.58	-0.35	0.55	2.29	5.28 (15)	3.87%
<i>A18</i>	1.86	-2.45	-1.23	-0.04	1.91	5.66 (13)	4.15%
<i>SI19</i>	1.16	-2.39	0.15	1.30	2.97	5.80 (12)	4.25%
S20	1.30	-2.15	-0.22	0.78	2.52	3.19 (22)	2.34%
S21	0.97	-3.61	-1.60	-0.16	1.74	4.72 (18)	3.46%
S22	1.56	-1.98	-0.25	0.71	2.30	3.35 (21)	2.45%
<i>S23</i>	1.26	-1.86	0.08	1.05	2.64	5.87 (11)	4.30%

Notes. Items that provide more than 4.35% of total test item information are bolded and italicized; Rank is from most informative (1) to least informative (23). The letters by the items represent the subdimension of organizational transparency the item belongs to, P = participation, SI = substantial information, A = accountability, and S = secrecy.

Table 6.13. Items for Newly Developed Shortened 8-item Organizational Transparency Scale

Item	Full Item
P1	The organization makes it easy to find the information people like me need.
P2	The organization asks the opinions of people like me before making decisions.
SI3	The organization provides information that can be compared to previous performance.
SI4	The organization provides information that is easy for people like me to understand.
A5	The organization presents more than one side of controversial issues.
A6	The organization provides information that can be compared to industry standards.
S7	The organization provides only part of the story to people like me.
S8	The organization only discloses information when it is required.

Notes. The letters by the items represent the subdimension of organizational transparency the item belongs to, P = participation, SI = substantial information, A = accountability, and S = secrecy. From the original full-length 23-item scale, in order, the items originally were: P4, P5, SI9, SI11, A14, A18, S19, and S23.

Figure 6.8. Item Information Curves for Organizational Transparency Scale Items (public/private sample)

Note. Each line represents an Item Information Curve of each organizational transparency scale item. Numbers indicate the item number in the original 23-item scale (Rawlins, 2008).

Reliability and Validity Analysis

Based on the methods above, the final developed shorter organizational transparency scale consists of 8 items. The scale was tested for good internal consistency using McDonald's ω and was determined to be acceptable as it was above the threshold of .70 at $\omega = .93$ (Hayes & Coutts, 2020).

Next the convergent validity was tested by calculating the mean scores of the shortened and original scales and investigating the correlation between the two scale's mean scores. a correlation between two variables greater than 0.80 (Brown, 2006) or 0.85 (Kenny, 1979) indicates the two variables are measuring the same construct. This threshold was met $r(344) = .97, p < .001$. Overall, the newly developed shortened scale for organizational transparency had excellent reliability and convergent validity.

Chapter 7 - Discussion

Overall, the current study aimed to further the psychometric knowledge and utility of an organizational transparency scale. To this end, this study was twofold – the first overall aim, to assess the measurement equivalence (ME) of the organizational transparency scale, included looking into 1) the ME in terms of those employed in the private sector to those employed in the public sector and 2) the ME within the public sector sample itself to see if there is a difference between two different U.S. federal government agencies that make up the utilized public sector sample. The second overall aim was to develop a shortened version of the organizational transparency scale while maintaining reliability and validity.

For the first aim, the results found evidence in support of ME for the organizational transparency scale in both cases: between the public and private sectors and between agency one and agency two within the public sector. These results provide important and robust empirical evidence regarding the generalizability of the organizational transparency scale as both multi-group CFA and IRT methods were utilized. The evidence found in support of ME points to the ability to be strengthened in one's confidence of cross-group comparisons in terms private vs. public sector or different agencies within the public sector when utilizing the organizational transparency scale. Interestingly, DIF was identified for one item between the two agencies although it was of small magnitude.

Delving into the DIF results, the one item identified with DIF was “The organization provides information that is relevant to people like me.” Agency one showed it scored systematically higher on this item compared to agency two. When considering this in relation to the functions and missions of each agency these results make some intuitive sense. Agency one's focus on research and innovation might lead them to being less extreme in their evaluations of

the information being provided to them as relevant or not and they are more likely to be satisfied with reaching their own conclusions given what information is provided, ultimately leading to a slightly more favorable transparency perception for this. While agency two's focus on regulations and diagnostics causes them to view this more stringently and have specific parameters in mind of what constitutes information relevance or not when it comes to transparency. Overall, while the DIF found wasn't to have large influence, it's discovered presence points to the fact there can be differences and more research is needed to further parse out these differences, their impact, and if this can occur in other cases such as between other agencies in the same or different government departments. Overall, these all these results from examining ME point to the importance of using a combination of methods to analyze ME in order to reveal nuances that can be present.

Looking at these ME results as a whole has important theoretical implications for the construct of organizational transparency. The findings of this study point to the idea of the generalizability, both across the public and private sector and between two agencies, of organizational transparency despite the possible differences in the workplace and employee experiences/perceptions such as values (Lyons et al., 2006; Van der Wal et al., 2008), place in society, policies, missions, etc. This points to the possibility of organizational transparency having some sort of universal value or perception by employees in the workforce today. For example, when thinking of sensemaking theory (Weick et al., 2005) in terms of the development of an employee's perception of organizational transparency, the results provide evidence for the idea that transparency-related cues in the workplace (e.g., open communication, access to information, accountability mechanisms in place) that inform the sensemaking process generate similar interpretations regardless of industry sector (private or public) or agency within the

public sector. More research and evidence is needed to investigate what specific mechanisms or unique organizational factors contribute to the development of organizational transparency, but this study helps provide evidence that findings from such lines of research are likely to be transferable from one context to another.

For the second aim, a more concise organizational transparency scale was developed, reducing the scale from 23 items to eight items. Even though the scale was significantly reduced, it maintained excellent reliability, convergent validity, and content validity. The development of this shortened version of the scale can potentially increase the usage and utility of the organizational transparency scale. Through making the scale more efficient and less burdensome, it can lead to benefits for the participants taking the scale, the researchers or practitioners wanting to use the scale/learn about the construct of organizational transparency theoretically or practically, and improve knowledge around organizational transparency itself.

Implications

Aim 1: Measurement Equivalence Testing of Organizational Transparency

This research has important potential theoretical contributions in the space of organizational transparency and ME testing. Researchers who are wanting to measure organizational transparency across different industry sectors can be more confident that this scale functions consistently across these groups and be more confident in any differences they find in group comparisons. This can open the door for them to move forward without such worries or needing to continually test for ME in similar instances and focus their attention on more research to investigate and develop the theoretical underpinnings of organizational transparency which is currently lacking as mentioned by Král & Schnackenberg (2024).

The results of this study also point to the importance of approaching such analyses with a wholistic approach. This study utilized both CFA and IRT methods. Without both methods being used, the DIF that was found for one item within the private sector (agency one vs. agency two) would not have been uncovered. The usage of both methods provides support that ME is not an all or nothing concept, such as in this case where a scale as a whole can be considered equivalent, but there still can be discrepancies at the individual item level functioning that are important to know in certain situations. For example, in the case of this study where the DIF was only found for one item only when comparing two agencies within the private sector, it could be important in the future for other agency comparisons in this space to check DIF of the organizational transparency scale before moving forward with the assumption they function the same. Specifically in the present study, as these two agencies did fall under the same overall government department, there may be differences that would become more pronounced between agencies that fall under different departments. As more research is done in this space, deeper understanding can lead to more theoretical development on why or how these differences develop and what aspects can have a more influential impact.

The ME findings of this study also have potential practical implications. As previously mentioned, with ME being supported for the organizational transparency scale, this can help with the streamlining of interpretations and confidence in the usage of the organizational transparency scale across the public and private sectors and/or different agencies within the public sector. Practically, those who are interested in organizational transparency in the workplace can feel confident using the same overarching scale and not having to adjust it to their specific circumstances, saving time and resources. When it comes to using it to make decisions in the workplace surrounding organizational transparency, the results support that they can make

relatively fair and unbiased decisions across groups. For example, if an organization is trying to adjust policies or practices to improve their organizational transparency based on their survey results and other interventions done by other organizations successfully (or unsuccessfully) that they have knowledge about, it can help with the confidence of adopting these in their potential to lead to the desired effect. However, as previously mentioned DIF was found for one item only when comparing the two agencies within the public sector. This does point to the need for a certain level of discernment if an organization has very different subdepartments or agencies present and that these may not be perceived the same by employees or work equally across the different groups and lead to DIF for different items of this scale depending on the nature of any existing differences. If differences are expected, these can help inform the chosen path or they should be accounted for when analyzing the impact of any decisions made or actions implemented in terms of organizational transparency.

Aim 2: Shorter Scale Development for Organizational Transparency

The second aim of the current study, to develop a more streamlined version of the current organizational transparency scale, ultimately culminated in an eight-item scale being developed, can also contribute to the theoretical knowledge regarding the construct. A more concise, yet still reliable and valid, version of the scale now being available can lead to more research in this area. Researchers and practitioners can feel confident in the shorter scale and are also given more space in their developed survey batteries to incorporate other constructs with the organizational transparency scale no longer taking up significant space like it was at its full length of 23 items compared to eight items now. This will allow for the nomological network of organizational transparency to expand as more research and relationships with other variables are explored. A more fully understood nomological network can help develop and refine the theoretical

background of organizational transparency, which is currently lacking (Král & Schnackenberg, 2024).

The practical implications of the developed eight item organizational transparency shortened scale go hand in hand with the covered theoretical contributions above. Additionally, the development of a shorter version of the scale reduces the time required by participants to take the survey, which is especially important for participants whose time might be limited, such as workers who sometimes are asked to take these surveys on the clock in addition to their normal job duties. Not to mention, it can potentially reduce costs when participants are being monetarily compensated for their time to take the scale, and make recruitment easier by being able to advertise a lower total survey item count or time needed to complete, and improving the participants experience when taking the survey, which ultimately can also increase the quality of data collected (Rogelberg & Stanton, 2007). A shorter scale can be helpful to reduce the total item load for researchers who are also piloting studies, are worried about reaching sufficient power to run their analyses, are interested in organizational transparency but it is not their focal variable of interest, and longitudinal data where participants have to take many items multiple times as reducing the survey length can help potentially with retention. This ultimately increases the effectiveness and efficiency of the organizational transparency scale if the newly developed eight item scale leads to better data quality, improved researcher and participants experiences as a whole, and more research on the construct of organizational transparency

Limitations

While the current study has important implications, it also has its limitations. An important limitation is that the current study does not have significantly large sample sizes. These could not be adjusted due to the use of already collected data, but larger sample sizes can

be sought out in future research. In fact, the current study can help ease the process of collecting larger samples with the use of the newly developed eight item organizational transparency scale. Also, due to the fact all the utilized data was already collected, we were unable to test for criterion-related validity as the two samples that were used to did not share any variables besides organizational transparency and future studies should test this regarding the newly developed shortened organizational transparency scale.

Additionally, there is the potential for biases to exist in the currently used samples. For example, the two federal agencies that make up the public sector were not randomly selected, and their unique situations being housed in the same federal government facility or both falling under the same federal government department may lead to biases that do not exist in other agencies or departments in the public sector or across the public sector. The private sector sample is made up of participants collected through snowball sampling and are not from specific sets of companies, so analyses to investigate the measurement equivalence across companies was not able to be analyzed. Furthermore, it could be argued that while evidence of DIF was found for only one item between the two agencies, more DIF might exist between agencies that do not fall under the same federal government department like the two used in the current study. Additionally, the two overall samples of public and private sectors were collected a little over a year apart, and it is possible if differences are seen it is due to time and not necessarily the industry sector, so future research will be needed to replicate these findings and parse out such nuances if time is an influence or not among other potential possible groupings such as culture differences since both private and public samples were collected within the United States.

Future Directions

Future research is still needed on organizational transparency as a whole. Continuing this research to see how generalizable organizational transparency is across individual companies, industry sectors, individuals, and cultures is vital to understand the nuances under which organizational transparency is operating. Based on the publicly accessible extant research, the current study is the only study investigating the measurement equivalence of organizational transparency and it has only begun to scratch the surface in this regard. More research in this space would provide vital information about the generalizability of the scale and the conclusions that can be drawn from it. For example, future studies checking the measurement equivalence across different government departments, types of government, and cultural differences, such as collectivist or individualist cultures, could be informative and especially helpful with the continually growing globalization seen today.

Additionally, the developed eight item shortened organizational transparency scale needs to be used in research and tested for criterion validity. The present study did not test its ability to predict variables and check that it is comparable to the already established 23-item organizational transparency scale. It also needs to be shown that the developed shorter scale was found to be helpful in this research space and actually has utility in terms of being used in lieu of the original scale. If the original scale is still being used over the shorter scale because it provides more information such as about the four subdimensions of organizational transparency more clearly, the utility of this developed scale needs to be revisited in future research.

Importantly, future research needs to focus on developing a theoretical framework for organizational transparency which can help guide the direction of this research space and refine the nomological network. For example, testing if the configural approach suggested by Král &

Schnackenberg (2024) is viable or if other directions need to be considered and developed. For example, regarding the configural theoretical approach, more research focusing on what forces (institutional, societal, and leadership) have more/less impact on organizational transparency and the interplay between them or their individual components would be incredibly important for researchers to know as well as practitioners who are looking for guidance on what aspects or elements to adjust to impact their organizational transparency.

Conclusion

In conclusion, the current study evaluated the measurement equivalence of the organizational transparency scale in two ways, 1) in terms of public vs. private sector employees and 2) in terms of agency employment in the private sector. Additionally, the present study developed a valid and reliable shortened eight-item organizational transparency scale. Both endeavors will benefit future research and understanding of organizational transparency. The establishment of measurement equivalence between the public and private sectors as well as within the public sector can increase the confidence in the generalizability of the scale between employees employed in the various sectors or if they belong to different agencies within the public sector. The finding of an item with DIF within the public sector sample when comparing two agencies also points to the importance of utilizing both CFA and IRT based analyses in this space to be fully informed about the nuances that can be occurring at the item level and may be important to know as it can point to potentially relevant cultural differences, norms, response styles, etc. even if ME overall is established at the factor level. This can inform future research which needs to investigate deeper what leads to these differences and how far reaching they are, such as if any other agencies or departments are not generalizable under the organizational transparency scale beyond private and public sectors and the two agencies investigated in the

current study. The created psychometrically sound, shortened eight-item scale can potentially increase the measurement of organizational transparency in research compared to the current lengthy, 23-item scale while still being able to be confident in the findings and the drawn conclusions. Overall, the aims of the current study ultimately helped understand ME in regards to organizational transparency, underscored the importance of approaching ME analyses with multiple perspectives, and can potentially help spur more research by allowing it to be more easily conducted and lead to a more thorough understanding of organizational transparency in the workplace today.

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Appendix A - Configural Theorizing Visual Example

Figure 1

Image of Table from Král & Schnackenberg (2024) to Illustrate Configural Theorizing in the Context of Organizational Transparency

	Transparency regime				
	Hollow transparency	Deceptive transparency	Paradoxical transparency	Pioneering transparency	Vanguard transparency
<i>Determining forces of transparency</i>					
Institutional forces	⊗	●		⊗	●
Societal forces			⊗	●	●
Leadership forces	⊗	⊗	●	●	●
<i>Transparency profiles</i>					
Disclosure	⊗	●	●	●	●
Accuracy		⊗	●	●	●
Clarity		⊗	⊗		●

Note(s): The table uses configurational convention. Black circles indicate the presence of a condition, and circles with “X” indicate its absence. Blank spaces indicate “does not matter.” Determining forces of transparency present the configurations of the core conditions for the transparency regimes. Transparency profiles explain the values of the three dimensions of transparency (disclosure, accuracy, and clarity) within the regimes

Source(s): Figure by authors

Table 1.
Typology of transparency regimes: their determining forces and the dimensions of transparency

Appendix B - Organizational Transparency Scale (Rawlins, 2009)

Directions: Listed below are statements that represent possible opinions that YOU may have about working at [your current company or XYZ Inc]. Please indicate the degree of your agreement or disagreement with each statement by selecting the option that best represents your point of view about [your current organization or XYZ Inc].

1. The organization asks for feedback from people like me about the quality of its information.
2. The organization involves people like me to help identify the information I need.
3. The organization provides detailed information to people like me.
4. The organization makes it easy to find the information people like me need.
5. The organization asks the opinions of people like me before making decisions.
6. The organization takes the time with people like me to understand who we are and what we need.
7. The organization provides information in a timely fashion to people like me.
8. The organization provides information that is relevant to people like me.
9. The organization provides information that can be compared to previous performance.
10. The organization provides information that is complete.
11. The organization provides information that is easy for people like me to understand.
12. The organization provides accurate information to people like me.
13. The organization provides information that is reliable.
14. The organization presents more than one side of controversial issues.
15. The organization is forthcoming with information that might be damaging to the organization.
16. The organization is open to criticism by people like me.
17. The organization freely admits when it has made mistakes.
18. Provides information that can be compared to industry standards.
19. The organization provides only part of the story to people like me. (reverse-coded item)
20. The organization often leaves out important details in the information it provides to people like me. (reverse-coded item)
21. The organization provides information that is intentionally written in a way to make it difficult to understand. (reverse-coded item)
22. The organization is slow to provide information to people like me. (reverse-coded item)
23. The organization only discloses information when it is required. (reverse-coded item)

Note. Items 1-6 measure the subdimension participation, 7-13 measure substantial information, 14-18 measure accountability, and 19-23 measure secrecy.