

**Contextualizing Shared Leadership:**  
**A Social Network Approach**

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**Contextualizing Shared Leadership in the Public Sector:  
A Social Network Approach**

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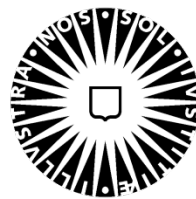
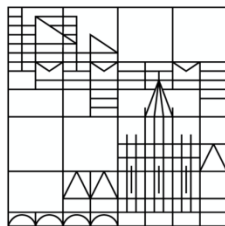
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## LIST OF ABBREVIATIONS

PSM	Public Service Motivation
ORT	Organizational Red Tape
HRM	Human Resource Management
APP	Attraction to Public Policy
CPV	Commitment to Public Values
CP	Compassion
SS	Self-Sacrifice
ERGM	Exponential Random Graph Model
CFA	Confirmatory Factor Analysis
ITE	Internal Team Environment
COA	Coaching

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## **Abstract**

Despite its 30-year history in HRM literature and rising demands by practitioners, the concept of shared leadership has so far sparsely been quantitatively studied in a public context. To address this gap in the pertinent literature, this thesis investigates the association between notable conditions of the public sector, namely public service motivation (PSM) and perceived organizational red tape (ORT), and the emergence of shared leadership in teams. For this purpose, a novel social network approach using temporal exponential random graph modeling is applied to a sample of 4 teams of employees in public universities ( $n = 25$ ). It was found that the sub-dimensions of PSM display relevant differences in their effects on shared leadership behavior. Furthermore, perceptions ORT were found to suppress the emergence of shared leadership directly. Lastly, the data showed that value-based homogeneity of teams, based on a shared commitment to public values and public service in general, positively affects the emergence of shared leadership. These findings have important implications for the contextualization of shared leadership research as well as the practical implementation of shared leadership in public organizations.

## 1. Introduction

The requirements for public servants are changing: Society is becoming ever more pluralistic, with social groups displaying increasing differences in aspirations, values and perspectives (Head & Alford, 2015). With this change, the demands for public service are growing increasingly dynamic and complex: While the often conflicting desires of ever more stakeholders need to be balanced, the political pressure for cost effectiveness, equality and quality of service is rising (Zeier et al., 2021). In short, the time of traditional, calculating public service has passed while the need for flexibility, innovation and compromise is growing in public organizations. In response to these developments, the merits of classical top-down leadership in the public sector are increasingly questioned (Howieson & Hodges, 2014; Ospina, 2017). The individual, hierarchical leadership approaches that have traditionally characterized public organizations are ill suited to face the abovementioned challenges adequately, mainly due to their lacking adaptability and innovation (Howieson & Hodges, 2014). As Head and Alford (2015) suggested: modern society is “not amenable to top-down, general solutions”(Head & Alford, 2015, p.713). Because of this, practitioners and researchers alike are calling for greater attention to shared leadership as a means to address the changing demands of the public sector.

Shared leadership, here defined as “[...]an emergent team property that results from the distribution of leadership influence across multiple team members” (Carson et al., 2007, p.1218), is a form of collective leadership, wherein the different members of a team equally and informally share leadership responsibility, as opposed to relying on one formally appointed leader. As such, members of shared leadership teams display mutual, horizontal leadership among their team, even without necessarily having formal power over each other (Pearce, 2004). As the term shared leadership is used interchangeably with similar concepts such a distributed leadership or team leadership, empirical studies on the concept are sometimes hard to identify (Fitzsimons et al., 2011). Those reliable studies on shared leadership that do exist consistently show positive effects on work-related outcomes such as team performance, team cognition, team creativity, team proactivity, and information sharing (D’Innocenzo et al., 2016; Wu et al., 2020). The potential benefits of applying shared leadership in the public sector are extensive: Shared leadership’s decentralized approach to teamwork offers the flexibility and adaptability needed to deal with the dynamic requirements of modern public service. Furthermore, its open approach to internal communication enables the free discussion of new ideas, which in turn facilitates innovation (Wang et al., 2014). Based on these characteristics and shared leadership’s empirically demonstrated effects, it may be a fitting tool for public organizations to tackle the changing demands mentioned above. As Merkens and Spencer



(1998) said referring to the value of shared leadership in public organizations: “Twenty years ago or even ten, the sharing of leadership and responsibility would have been advantageous to an organization. Today it is critical to survival. Without it, the whole organization is headed for failure” (Merkens & Spencer, 1998, p.1) However, while a number of important antecedents to shared leadership such as transformational/ empowering leadership and team environment have been identified (see Wu et al., 2020), little is known about the applicability of shared leadership in the public sector. This is problematic, as public sector organizations differ markedly from their private sector counterparts in ways that might affect the emergence of shared leadership (Leisink et al., 2021). In particular, two concepts have consistently been found to present important differences between the public and the private sector: Public employees’ public service motivation (PSM) and their perceptions of organizational red tape (ORT) (Boyne, 2002; Buelens & Van den Broeck, 2007)

PSM, here defined as “[...]the belief, values and attitudes that go beyond self-interest and organizational interest, that concern the interest of a larger political entity and that motivate individuals to act accordingly whenever appropriate” (Vandenabeele, 2007, p.547) is a unique form of other-regarding motivation mainly found in employees of the public sector, driving them to work towards the benefit of society at large (Ritz et al., 2020). It not only affects extra role behavior and job satisfaction, but also an employee’s organizational commitment, perceptions of leadership and their desire for autonomy (Ritz et al., 2016). Driven by the wish to expand their autonomy and provide the highest possible quality of public service, public service motivated employees may seek to broaden their perceptions of leadership, claiming and granting leadership responsibility outside of formal hierarchies to improve the performance of their team. However, this relationship is likely affected by the composition of the team surrounding these employees: According to research on leader-prototypicality (e.g. Steffens et al., 2015), public service motivated employees should be more prone to sharing leadership responsibility in a team that shares their values and desire for high quality public service. Consequently, the display of shared leadership behavior by public service motivated employees may depend on the overall levels of PSM in their team.

ORT, here defined as “[rules], regulations, and procedures that remain in force and entail a compliance burden for the organization but have no efficacy for the rules' functional object” (Bozeman, 1993, p.283), has been a staple of research in public administration since the New Public Management movement (George et al., 2021). The majority of studies on the subject have found ORT to have negative effects on organizational performance, mainly through its direct effects on employee behavior (Brewer & Walker, 2010; George et al., 2021). As

breaching ORT entails negative consequences (e.g. reprimand by superiors), employees become increasingly hesitant to step outside organizational guidelines, even if doing so would benefit their work. Accordingly, perceptions of ORT by employees, here defined as “the perception that rules and procedures (formalization) in an organization are detrimental to organizational performance” (Jacobsen & Jakobsen, 2018, p.26), were found to negatively affect public employee’s commitment, motivation and proactivity (George et al., 2021; Hattke et al., 2020; Jacobsen & Jakobsen, 2018). This impeding effect on employees’ proactivity potentially extends to displays of shared leadership behavior. Considering the public sector’s historical reliance on classic, hierarchical leadership structures, one can expect little space for the liberal perceptions of leadership required by shared leadership. Subsequently, if employees have strong perceptions of red tape in their organization, they may feel hesitant to claim or grant leadership outside of formal hierarchies for fear of breaching organizational regulations and earning punishment.

Both PSM and ORT represent unique characteristics of the public sector that could potentially affect the emergence of shared leadership in public organizations. Consequently, this thesis aims to contextualize the concept of shared leadership, adding a public sector perspective to the literature and providing data in response to practitioners’ rising demands for shared leadership. Using adaptive leadership theory (DeRue, 2011) and social network analysis, the effect PSM and perceptions of ORT have on the emergence of shared leadership will be investigated. For this purpose, the following research question is posed:

*Do the public sector context and its specific characteristics support or suppress the emergence of shared leadership?*

In order to further specify the underlying research goals of this thesis, the following sub-questions are formulated:

*To what extent does PSM have a positive relationship with shared leadership?*

*Which role do employees’ perceptions of organizational red tape and the composition of the team play in this relationship?*

To answer these questions, a cross-sectional survey study will be conducted in 4 teams of employees in public universities. Within this study, a social network approach will be applied

to measure both the emergence of shared leadership in a select sample of teams and how it is affected by team members' PSM, value-based team composition and perceptions of ORT.

From a practical perspective, this thesis mainly responds to the rising calls for shared leadership in the public sector. Professionals in both healthcare (e.g. Beirne, 2017; Brún et al., 2019; West et al., 2015) and higher education (e.g. Pearce, 2004; Pearce et al., 2018) have called for greater attention to collective forms of leadership as a possible response to the rising demands and increasing complexity of public service. Insights from this study may provide a game plan for practitioners to achieve such a transition successfully. Specifically, this study may inform practitioners of changes in public sector recruiting and bureaucratic structures that could facilitate the successful implementation of shared leadership. Organizations seeking to build shared leadership teams may be motivated to shift efforts in both recruiting and personnel development towards the strengthening of PSM to create a workforce that is open to sharing leadership responsibility. As Pearce et al. (2018) suggested: "Selecting the people with the proper orientations for leadership positions is essential. Nothing is more important when it comes to the future of public [...] leadership" (Pearce et al., 2018, p.643). For the latter, public organizations aiming to establish shared leadership may be driven to redouble the ongoing efforts to cut down on ORT (George et al., 2021; Giauque et al., 2012). As such, reducing structural and mental barriers preventing employees from engaging in shared leadership may be the first step for practitioners on their way to reform leadership in public organizations. Overall, this paper serves to provide empirical underpinnings for the rising demand for shared leadership in the public sector, potentially tempering the initial optimism of practitioners or spurring deliberate changes in organizational practices.

This thesis contributes to the literature in three ways. First, it adds to the literature on shared leadership by empirically investigating the concept in a public context. Recently, a growing body of research has investigated the importance of organizational context in how human resource management (HRM) practices affect organizational outcomes (e.g. O'Toole & Meier, 2015). Within this discussion, the differences between the private and the public context have received particular attention (e.g. Knies et al., 2018; Leisink et al., 2021). While some findings from the private sector offer valuable insights in a public context, Knies et al. (2018) state that merely applying the results of studies in the private sector to public organizations is too simplistic to encompass their underlying differences. In empirical terms, O'Toole et al. (2015) state that lacking contextualization of research can harm the validity of results, further suggesting that a diversification of research context could reveal conceptual inconsistencies and varying results in established HRM theories (O'Toole & Meier, 2015). In the case of shared

leadership theory, this contextualization of findings and research has not yet occurred, due to a lack of both conceptual clarity and deliberate empirical studies in a public context: Regarding the former, inconsistent use of terminology in the literature on collective forms of leadership has led shared leadership to become synonymous with any act of dispersing leadership responsibility (Fitzsimons et al., 2011). This lack of conceptual clarity, while not preventing empirical work outright, has stifled any focused efforts to take research on shared leadership outside of the private sector (Bolden, 2011; Fitzsimons et al., 2011). Subsequently, while shared leadership has been the focus of a growing body of empirical work over the last 30 years (Dinh et al., 2014; Wu et al., 2020; Zhu et al., 2018), the concept has only received scarce attention in a public sector context (see Brún et al., 2019). Only recently, some quantitative studies on the outcomes of shared leadership in the public sector have been conducted (e.g. Umans et al., 2020). However, the antecedents of shared leadership in the public sector have only been studied qualitatively, leading to a lack of unbiased and replicable data on which future research and managerial practice can be based (e.g. Currie et al., 2009; Zeier et al., 2021). In an effort to contextualize the study of shared leadership, this thesis will first clarify the conceptual outlines of shared leadership before investigating the concept quantitatively in a public sector context.

Secondly, this thesis aims to provide a methodological contribution to the study of shared leadership by conducting a novel social network analysis. Most previous studies have so far made use of an aggregation approach to measuring shared leadership and its antecedents, rephrasing classic leadership questionnaires to reflect the emergence of shared leadership and utilizing these in large N survey studies (Wu et al., 2020; Zhu et al., 2018). While this approach simplifies data collection (as it doesn't require subjects of the study to know one another) and the inclusion of shared leadership in more expansive studies, it was found to be inadequate for measuring shared leadership accurately in a number of meta-analyses (D'Innocenzo et al., 2016; Wang et al., 2014; Wu et al., 2020). Social network analyses measure shared leadership based on individual leadership connections between the members of a team, creating an accurate reflection of the leadership culture in that team while also allowing for the investigation individual differences and their effects on shared leadership development (Mayo et al., 2003). Numerous meta-studies have shown that the social network approach provides the most reliable data on shared leadership and its antecedents, at the cost of arduous data collection (D'Innocenzo et al., 2016; Wu et al., 2020). By utilizing social network analysis, this thesis adds to the novel, but reliable data on shared leadership collected using this method, creating a stable basis for future research.

Lastly, this paper adds to the developing research on shared leadership antecedents, specifically team composition, which remains understudied in the current literature (Siangchokyoo & Klinger, 2022; Zhu et al., 2018). Previous research has mostly focused on the role of different leadership styles (e.g. empowering leadership) and task characteristics (e.g. task complexity) in creating shared leadership (e.g. Seibert et al., 2011; Serban & Roberts, 2016; Wang et al., 2017). While team composition has received some attention regarding its role in creating shared leadership in recent years (Siangchokyoo & Klinger, 2022; Zhou, 2016), research has largely remained conceptual (Hoch & Dulebohn, 2017; Pearce et al., 2018). Empirical studies have so far only approximated the effect of team composition through measurements of socio-demographic and functional diversity (Cox et al., 2003; Hoch, 2014; Muethel et al., 2012). Within this body of research, results have remained conflicting: For instance, while Cox et al. (2003) found team heterogeneity to hinder the development of shared leadership, Hoch (2014) found diverse teams to develop shared leadership more easily. In an effort to bring clarity to the existing literature, this thesis will investigate the impact of team composition on shared leadership development through the dispersion of public service motivation in the teams.

This thesis will continue as follows: In chapter 2, shared leadership will first be differentiated from other forms of collective leadership, specifically distributed leadership, in order to provide conceptual clarity. Secondly, an overview of previous work on shared leadership in the public sector will be presented, outlining existing gaps in the literature and providing some initial evidence for a potential relationship between shared leadership and the conditions of the public sector. Thirdly, the potential mechanisms behind this relationship are explored, providing the theoretical basis for seven hypotheses introduced in the last part of this chapter. In chapter 3, the methodological approach of this study will be introduced. Here, a quick overview of the research design, including sample selection, research procedure, measurement instruments, analytical approach, and validity/ reliability of the design, will be given. In chapter 5, the results of this study will be displayed including descriptive, the model statistics used to test the hypotheses and tests on data quality. In chapter 6, the findings of this thesis will be discussed, including its limitations, implications for theory and practice, and potential impact on future research.

## 2. Theoretical Framework

### 2.1 Collective Leadership: An Ongoing Debate

Over the past decades, public administration research has shown rising interest in collective forms of leadership as an alternative to the more traditional, top down approaches to public management (Crosby & Bryson, 2018; Jakobsen et al., 2021; Vogel & Masal, 2015). This “meteoric rise of collaborative leadership” (Van Wart, 2013, p.559) is part of a stream of research hoping to widen perceptions of leadership in public organizations and increasingly consider the role that employees without formal influence play in public leadership (Vogel & Masal, 2015). Within this body of literature, a number of terms for collective forms of leadership have been introduced, such as dispersed, devolved, democratic, distributive, collaborative, collective, co-operative, concurrent, coordinated, relational and co-leadership (Fitzsimons et al., 2011). However, the terms shared leadership and distributed leadership are by far the most common and have consequently received the most academic attention in terms of publications (Bolden, 2011; Ospina, 2017; Vogel & Werkmeister, 2021). Historically, both terms have been used interchangeably, obscuring theoretical and conceptual differences between the two approaches and making it hard to separate both from one another (Chapman et al., 2016).

This lack of conceptual clarity can in large parts be attributed to the similarity of both concepts: Both shared leadership and distributed leadership accept that perceiving leadership to only originate from formally appointed leaders is a far too simplistic approach to understanding leadership fully (Pearce & Conger, 2003; Spillane, 2005). Consequently, both concepts deviate from traditional top-down leadership models, suggesting that leadership influence can be held by multiple people in a team or organizations, even if they do not hold any formal power (Harris, 2002). Furthermore, both shared leadership and distributed leadership see leadership as an emergent phenomenon of the group and organization respectively, as opposed to a simple matter of formal rank (Günzel-Jensen et al., 2018; Zhu et al., 2018). These conceptual similarities were also recognized by Bolden (2011), who in his review of literature on distributed leadership noted that “both sets of literature draw attention to the need to recognize informal, emergent and collective acts of influence as well as those instigated by people in formal positions of authority” (Bolden 2011, p. 257). In spite of these similarities, shared and distributed leadership differ in three important aspects: Level of analysis, degree of formality in which leadership is distributed and the context in which leadership occurs.

Regarding the analytical level, shared leadership is perceived as an emergent phenomenon at the team level exclusively (Avolio et al., 1996), while distributed leadership considers the organization as a whole (Spillane et al., 2004). This difference in the level of analysis is reflected in the empirical work on both concepts: While samples in shared leadership studies consist of several teams from different organizations (Wu et al., 2020), studies on distributed leadership are mainly conducted across entire organizations (Bolden, 2011). Beyond the analytical level, both concepts further differ in the degree of formality with which leadership is shared/ distributed (Fitzsimons et al., 2011): Members of a shared leadership team have the ability to claim leadership responsibility freely whenever they believe necessary, while also being open to accept leadership from all of their peers in an informal leadership process (DeRue & Ashford, 2010; Katz & Kahn, 1978). However, this informal process is still subjected to formal team leadership, which shapes a team culture where such an open perception of leadership is possible (Harris, 2002). Shared leadership is thus not considered an alternative to formal, vertical leadership, but rather an equally important aspect of team leadership (Zhu et al., 2018). Distributed leadership, often considered to be an “analytical framework” (Bolden, 2011, p. 256) used to measure the degree to which leadership is distributed, takes a much more formalized approach. Therein leadership is only considered to be distributed if formal leadership influence is granted to multiple members of an organization (Günzel-Jensen et al., 2018). Lastly, both concepts differ in the factors that are considered relevant in the leadership process (Fitzsimons et al., 2011): While shared leadership is only focused on the interaction between prospective leaders and followers (Zhu et al., 2018), distributed leadership further includes organizational contexts such as industry or market development as significant influences on how leadership is distributed (Fitzsimons et al., 2011; Bolden, 2011).

At this point, it has to be mentioned that the conceptual differentiation between shared leadership and distributed leadership is an ongoing debate that is far removed from empirical research on both approaches (Bolden, 2011; Fitzsimons et al., 2011). Some authors even believe the differentiation between the terms to be unnecessary as they are too closely related and essentially describe the same concept, only at different levels of the organization (Bolden, 2011; Leithwood & Mascall, 2008). As most published papers tend to use both terms interchangeably, the only notable differences in empirical research are based on the studies’ field and the country where they originate: The term shared leadership is mostly used in a medical and organizational context, while distributed leadership seems to be the favored term of researchers in the field of education (Bolden, 2011). Similarly, US studies seem to favor the term shared leadership while studies from the UK mainly refer to the concept of distributed leadership (Bolden, 2011). Historically, shared leadership seems to be the more popular term, which is why data on the

antecedents and effects of shared leadership is more widely available (Zhu et al., 2018). However, the existing research on consequences and antecedents of distributed leadership mirrors this conceptual overlap: Positive associations with performance and job satisfaction have been found for both shared leadership (e.g. Carson et al., 2007; Drescher et al., 2014; Muethel et al., 2012; Serban & Roberts, 2016) and distributed leadership (e.g. Hulpia & Devos, 2009; Leithwood & Mascal, 2008). Both concepts further share a number of key antecedents such as trust among peers (Drescher et al., 2014; Jönsson et al., 2020) and empowerment of employees (Günzel-Jensen et al., 2018; Margolis & Ziegert, 2016).

In summary, while shared and distributed leadership have important conceptual differences, both concepts are close to indistinguishable when it comes to empirical research. This review of the debate surrounding both concepts serves to illustrate the chaotic state of research in collective leadership. After this point, this thesis will exclusively use the term “shared leadership”. This choice was made for two reasons: Firstly, shared leadership is easier to implement in a public sector context. Fully and formally distributing leadership across entire organizations in the public sector is simply not realistic considering public organizations’ historic reliance on traditional leadership models (Chapman et al., 2016; Vogel & Masal, 2015). In order to introduce collective leadership into public organizations, an incremental approach may be more prudent (Zeier et al., 2021). Shared leadership offers such an incremental approach due to its continued consideration of formal leader influence and its smaller scale focus on the team level (Zeier et al., 2021). Secondly, the concept of shared leadership was chosen due to its reliable empirical track record. While positive connections between distributed leadership and organizational outcomes have been found in the past, the large diversity of measurement tools and the lacking clarity of the concept itself have led to some inconsistent findings (Bolden, 2011). The literature on shared leadership, in contrast, clearly outlines its conceptual boundaries and a small number of accepted measurement tools (Zhu et al., 2018). Consequently, shared leadership offers a reliable base of data on which the theoretical framework of this thesis can be based, while providing a measurement tool in social network analysis that, while rare, has been repeatedly tested and verified (Wang et al., 2014; Wu et al., 2020; Zhu et al., 2018)

In the following section, an overview of the work on how the specific conditions of the public sector may affect the emergence of shared leadership behavior will be given, before the theoretical framework and hypotheses of this thesis will be introduced.



## 2.2 Shared Leadership in a Public Sector Context

In spite of the conceptual inconsistencies in the field of collective leadership, studies on what can be considered shared leadership behavior in the public sector have been rising in popularity (Bolden, 2011; Zhu et al., 2018). Studies in these areas have been mostly focused on the fields of education and healthcare, where practitioners have been the most vocal in their demands for shared leadership (Brún et al., 2019; Hartley, 2010; Zhu et al., 2018). Within those studies, the impact of the conditions of the public sector (such as PSM or ORT) on the emergence of shared leadership are almost exclusively considered theoretically. For instance, Chreim et al. (2010) suggest that even though the implementation of shared leadership in a healthcare setting may seem natural due to the fields interdisciplinary and interdepartmental work processes, its implementation might be inhibited by the traditionally hierarchical structures of the healthcare sector and constant pressures from both funding bodies and regulatory agencies. This view is supported by Currie and Lockett (2011), who theorize that the historically top-down leadership structures of public hospitals may inhibit the development of shared leadership behavior, even though the interdisciplinary nature of patient care may necessitate it. One of the few qualitative studies on this topic was conducted by Jackson (2000), who found medical staff's prevailing mental models of top-down hierarchies and leadership to be a significant barrier in the implementation of shared leadership practices. This indicates that while practitioners desire to engage in shared leadership in order to fulfill their tasks, the historical conditions of their sector make them reluctant to do so. Günzel-Jensen et al. (2018) later conducted an empirical study based on these assumptions, finding empowering leadership in a healthcare setting to be positively related to employee engagement in distributed leadership practices and stating that this effect is "especially strong in health care settings as empowering leaders can provide autonomy and freedom in a very hierarchical, complex and predefined setting" (Günzel-Jensen et al., 2018, p. 124). This indicates, that if given the opportunity and freedom to do so, practitioners will engage in shared leadership behavior.

In the field of education, the situation seems to be quite similar. In their qualitative study of shared leadership in UK schools, Currie et al. (2009) found that while practitioners' demands for collective forms of leadership are supported by the school's institutional environment, a multitude of both internal and external institutional pressures inhibit both teachers and principals from implementing shared leadership successfully. One such pressure was found to be the UK education sector's continued emphasis on principals' individual accountability for school performance, which in turn excludes teaching staff from taking part in school leadership (Storey, 2004). More recently, Zeier et al. (2021) conducted a lab experiment, wherein a government-funded research group was subjected to a leadership-development program designed to aid the emergence of shared leadership. Their following interviews with

participants showed that while shared leadership behavior became slightly more frequent, the groups previously hierarchical leadership structures still created tensions and resistance from participants (Zeier et al., 2021).

Even though quantitative studies on the impact of public sector conditions on the emergence of shared leadership are rare, insights can be taken from other studies. In a recent study conducted with 4800 employees in Danish municipalities, Kjeldsen and Andersen (2021) found that while different kinds of leadership training reduced the perceived leader-employee gap in distributed leadership behavior (i.e. a shared perception of what leadership style a leader is applying), employees still considered leadership to be mainly hierarchical. This may further indicate some historical path dependencies in how employees in the public sector view leadership.

In summary, the literature indicates that the underlying conditions of the public sector may affect the willingness and ability of public sector employees to display shared leadership behavior freely, even though the nature of their tasks might demand it. As quantitative studies of this exact dynamic are lacking, practical insights are limited, however. In the following section, the potential mechanisms behind this process are explored.

### **2.3 How Employees Differ in Shared Leadership Behavior: Adaptive Leadership Theory**

Within the shared leadership literature, leadership is conceptualized as a dyadic relationship between a leader that claims a leadership role and a follower who grants it in turn (DeRue & Ashford, 2010; Katz & Kahn, 1978), as opposed to the more traditional, one-directional conceptualizations of leadership (e.g. Bryman, 2013; Mechanic, 1962; Schilit & Locke, 1982). More specifically, the acts of claiming and granting leadership responsibility are seen as separate, but equally important acts forming leadership relationships in teams (DeRue & Ashford, 2010). This conceptualization of leadership is used because it relates well to the informal influence processes of shared leadership: As previously stated, shared leadership occurs as a horizontal influence process among peers who do not necessarily have formal power over one another (Pearce, 2004). Consequently, acts of claiming leadership within this team have to be willingly granted by prospective followers as they do not always have a formal obligation (i.e. considerations of rank) to do so (DeRue & Ashford, 2010). If it is not granted by prospective followers in the team, the act of claiming leadership alone is meaningless and will likely be ignored or even criticized by peers, who may perceive it as an act of vainglory (DeRue & Ashford, 2010). As one-directional conceptualizations of leadership do not consider the necessity of followers accepting leadership, they may identify leadership in shared

leadership teams where none exists, consequently not capturing the concept of shared leadership accurately and thus making them ill-suited for this analysis (DeRue, 2011). Both the use of this two-way conceptualization of leadership and its empirical measurement through social network analysis are substantiated by some of the most recognized studies on shared leadership (e.g. Carson et al., 2007; DeRue et al., 2015)

Based on these conceptual foundations, the main model used for this paper's theoretical framework is adaptive leadership theory. Adaptive leadership theory suggests that the acts of claiming and granting leadership responsibility needed for shared leadership to emerge are heavily influenced by the individual characteristics and experiences of employees (DeRue, 2011; DeRue & Ashford, 2010). Formulating the theory, DeRue (2011) himself suggested that “[...] individuals’ unique experiences, personality, motivations, beliefs, and values will create differences in how people engage in leading–following interactions, what they see as leadership or followership in those interactions, and how they process information about the nature of their leading–following interactions” (DeRue, 2011, p.142). A number of studies have tested this relationship and its connection to shared leadership empirically (e.g. Carson et al., 2007; DeRue et al., 2015). For example, Chiu et al. (2016) demonstrated that perceptions of leader humility positively affected acts of both claiming and granting leadership. Similarly, Margolis & Ziegert (2016) showed that a sense of empowerment and self-efficacy positively affected the claiming of leadership responsibility by employees, which in turn positively affected the emergence of shared leadership. Using adaptive leadership theory, this study argues that levels of PSM and perceptions of ORT affect the degree to which individuals claim and grant leadership roles, which in turn affects the emergence of shared leadership. Figure 1 (p. 25) shows a preliminary visualization of the conceptual model.

## **2.4 Shared Leadership and PSM**

There is a growing consensus in the PSM literature suggesting the construct to be multi-dimensional (Perry & Wise, 1990; Wright, 2008). According to Perry and Wise’ (1990) original typology, three kinds of motives form the basis for the dimensions PSM: rational, norm-based and affective motives. Rational motives represent an individual’s self-serving motivation for public service, for instance through direct participation in public policy and the resulting feelings of responsibility (Perry & Wise, 1990). Norm-based motives are based on commitment and adherence to public values and norms such as equity, duty or accountability, which in turn drive the motivation for public service (Perry & Wise, 1990). Lastly, affective motives represent an individual’s motivation for public service based on feelings of compassion and identification towards society itself, particularly towards the disadvantaged (Perry & Wise,

1990). Starting with Perry's (1996) own, four-dimensional measurements scale based on this typology, several researchers have applied similar, multidimensional conceptualizations of PSM in order to measure these underlying dimensions of PSM in varied national contexts (e.g. Giauque et al., 2011; Knies et al., 2018; Leisink & Steijn, 2009). In an effort to create an internationally applicable measurement instrument, Kim et al (2013) overhauled Perry's (1996) original typology, leading to the formulation of the following 4 dimensions of PSM: Attraction to public participation (APP) (relating to rational motives of PSM), Commitment to public values (CPV) (relating to norm-based motives of PSM), compassion (COM) (relating to affective-motives of PSM) and self-sacrifice (SS), which serves as the altruistic foundation of the PSM construct.

Previous empirical research has suggested that different dimensions of the PSM construct motivate different behaviors (Wright & Grant, 2010): For instance, Jensen and Vestergaard (2017) demonstrated, that higher levels of self-sacrifice and compassion positively affect the amount of home-visits undertaken by GPs. Olsen, Hjorth, Harmon & Barfort (2019) also made use of a multi-dimensional PSM construct, finding the dimensions of self-sacrifice and commitment to public interest (as CPV has been conceptualized in previous studies) to be more negatively related to subjects' cheat-rate in a dice game than both COM and attraction to public value (As APP has been conceptualized in some papers). Lastly, Neumann and Schott (2021) found that while commitment to public interest was positively related to the intensity with which citizens of Zurich made use of a digital co-production platform, COM demonstrated a negative relationship with this civil-engagement. Based on these findings, there is reason to believe that the different dimensions of PSM potentially affect the display of shared leadership behavior differently. Consequently, Kim et al.'s (2013) dimensions of PSM will be used to build the theoretical framework of this study.

Starting with the first dimension of APP, public service motivated employees want to participate in the creation of public value directly (Perry & Wise, 1990). In an effort to provide meaningful public service to as many people as possible, such individuals have a desire to directly engage in any activity that creates public value such as community service, policy processes or social development (Kim & Vandenabeele, 2010). The public sector offers the best opportunity to do so, which is why PSM was found positively related to employment in public organizations (Vandenabeele, 2011). In the confines of public organizations, attraction to public participation leads such employees to strive for individual autonomy and more direct and personal influence (Battaglio & French, 2016). As opposed to the other dimensions of PSM, attraction to public participation is strictly instrumental (Andersen et al., 2014): Taking charge

and expanding their influence are merely the means for public service motivated employees to gain greater control over the provision of public service, enabling them to benefit a larger part of society and work towards the public good more directly (Wright & Grant, 2010). This is especially true for employees in the education sector, who seek to provide the best possible education to their students (Bellibaş et al., 2021; Katz & Shahar, 2015). Shared leadership allows individual members of a team to take charge more freely, without having to gain a formal position of power first (Pearce, 2004). Previous studies on shared leadership have shown it to promote individual influence and personal autonomy (O'Toole et al., 2002; Pearce & Conger, 2002), while also strengthening organizational citizenship behavior (Wang et al., 2017). Consequently, in an effort to enhance their individual influence and direct impact on the creation of public value, employees with an attraction to public participation may seek to claim leadership roles more frequently if given the chance.

*H1: With rising attraction to public participation, individuals will claim leadership responsibility more frequently.*

Turning to the second dimension of the PSM construct, public service motivated employees are strongly committed to public values (Parola et al., 2019; Perry, 1996). Integrated in these public values are both a sense of civic duty towards the government and one's own position as a public servant (Wright & Pandey, 2008), as well as a commitment to the values held by society such as accountability, democracy, equity or social responsibility (Jørgensen & Bozeman, 2007). Realizing these public values through their actions is likely to lead to personal satisfaction for such employees, motivating their efforts to do so whenever possible (Kim & Vandenabeele, 2010). Shared leadership, at its core, is a democratic process wherein the diverse values of society are represented more strongly than they are in hierarchical teams (Pearce & Conger, 2002; Zhou, 2016). Its open approach to leadership allows public service motivated employees to actively encourage their peers to take part in leadership and thus include the opinions of individuals normally excluded from the decision-making process. As such, engaging in shared leadership behavior would make the provision of public service more democratic, which in turn aligns with public service motivated employee's desire to realize the societal values of democracy and equity (Kim & Vandenabeele, 2010). Beyond its positive effects on equal exchange of opinions, shared leadership distributes influence and responsibility equally among the team (Pearce, 2004). Now that influence is no longer limited to team members with formal power, every member of the team is responsible for providing input whenever they deem necessary. Shared leadership thus allows public servants to actively participate in the creation of public value whenever they believe prudent, enabling them to

fulfill both their civic duty towards the government and their responsibility as civil servants towards the public. Consequently, in order to realize public values more fully, employees who are committed to these values may seek to engage in shared leadership behavior more frequently if given the chance:

*H2a: With rising commitment to public values, individuals will claim leadership responsibility more frequently.*

*H2b: With rising commitment to public values, individuals will grant leadership responsibility more frequently.*

The third dimension of public service motivation focusses on the compassion that public servants have for the subjects of their efforts: the public (Perry & Wise, 1990). Frederickson and Hart (1985) suggested that public servants should have a “special relationship” with the people they serve, noting genuine care for the wellbeing of society to be a central aspect of public service. This is especially true for vulnerable or disadvantaged members of society, with which public servants are likely to identify themselves (Vandenabeele, 2007). Public servants have been known to show greater efforts when dealing with these groups directly, even violating procedural rules to provide the best possible service (Wright & Grant, 2010). For instance, Jensen and Vestergaard (2017) showed that GPs with high levels of compassion prioritize the provision of care to weak or elderly patients, even if this violates existing guidelines. Similarly, Vuorinen and colleagues (2021) showed that compassionate teachers showed more other-oriented behavior towards students than those with lower levels of compassion. If given the opportunity, public university employees with high levels of compassion are likely to take charge in order to help disadvantaged students as best as they can. As mentioned above, shared leadership strengthens the direct influence of individual team members, while also increasing their autonomy to act by their own accord (O’Toole et al., 2002; Pearce & Conger, 2002). As such, shared leadership allows public servants to provide personal care to the citizens that they identify with, without having to break existing procedures and risk reprimand. Consequently, employees who are show high levels of compassion may seek to claim leadership responsibility more frequently if given the chance. These efforts are likely to be accepted by peers, as studies on the importance of compassion in both the private and the education sector found that employees favor compassionate leaders (Quinn et al., 2021) and that compassion positively affects performance on the individual, team and relational level (Wei et al., 2016):

*H3: With rising compassion, individuals will claim leadership responsibility more frequently.*

The last dimension in Kim et al.'s (2013) typology is the willingness of public service motivated employees to forego personal rewards in favor of delivering public service, effectively placing the achievement of public value above personal ambitions and desires. While such individuals may seek to claim leadership roles to advance their perception of public value, this doesn't always guarantee that services are provided in the best possible fashion, especially if a problem requires specific expertise. One of the reasons why shared leadership has consistently been shown to positively affect team performance is because it allows information to be shared freely and for the most capable individuals in any given situation to take charge if needed (Manz et al., 2015; Meuser et al., 2016). As public service motivated employees prioritize the best possible delivery of public service above any personal ambitions, they may be more likely to defer to their peers for leadership if the situation demands it. While empirical data on such behavior is lacking, a qualitative study conducted by Zeier et al. (2021) on a public research team supported this notion. The authors stated that "...collective aspects of leadership identity would correspond well with this public service motivation" (Zeier et al., 2021, p.568), finding PSM to be a unifying theme in their efforts to broaden perceptions of leadership among their subjects.

*H4: With rising self-sacrifice, individuals will grant leadership responsibility more frequently.*

## **2.6 Shared Leadership and Perceptions of Organizational Red Tape**

While public service motivated employees may be willing to both claim and grant leadership responsibility outside formal hierarchies, the binding structure and bureaucracy of the public sector may not allow such behavior as freely as private organizations. Traditionally, public organizations are very hierarchical and tied to internal processes (Leisink et al., 2021; Weber, 1956). Leadership is traditionally top-down oriented, leaving employees little agency to take charge freely (Zeier et al., 2021). Additionally, the necessity for accountability is very high, which is why flexible/ collective leadership structures aren't easy to implement (Dubnick & Frederickson, 2014). Indicative of these structural bindings is the concept of ORT (Leisink et al., 2021). ORT emerged into the research on public administration as part of the New Public Management movement during the 1980s (Hood, 1991), where it was used as an overarching term for the overly strict and standardized rules, regulations, and procedures that created an overly bureaucratic public sector (Hughes, 2012). Since then, the concept has been a staple of public administration research, as organizational red tape remains a significant obstacle in many public organizations (Feeney, 2012; Giauque et al., 2012). Here it is important to separate the

concept of ORT from its sister-concept of administrative burden: While administrative burden, here defined as “the costs that individuals experience in their interaction with the state” (Moynihan et al., 2015, p. 45), is focused on the perspective of the *citizens* on the overly bureaucratic processes of public organizations, ORT instead refers to the perspective of *public servants* on the same bureaucratic processes that they are a part of.

Previous studies on the effects of ORT have yielded mostly negative results: Red tape’s negative effect on organizational performance remain one of the most well documented relationships in public administration research (Brewer & Walker, 2010; Pandey et al., 2007), with most studies naming reduced efficiency and communication as underlying sources (George et al., 2021). More recently, ORT’s effect on employee outcomes have come under scholarly investigation: As measures such as close supervision and reduction of individual autonomy take hold, employees have to fear reprimand for even slight deviations from existing processes (Brewer & Walker, 2010; Giaque et al., 2012). Not surprisingly, red tape was found to negatively affect autonomy, job-satisfaction and organizational commitment, creating feelings of powerlessness against bureaucratic constraints (George et al., 2021; Hattke et al., 2020; Quratulain & Khan, 2015). Seeing as shared leadership requires a somewhat liberal approach to hierarchical leadership, perceptions of ORT are expected to negatively affect its emergence. Furthermore, adaptive leadership theory suggests that employees will only claim or grant leadership if they expect the act not to have negative consequences for them (DeRue & Ashford, 2010). As claiming or granting leadership outside of formal hierarchies potentially breaches ORT, employees who do so have to fear negative consequences such as official reprimand. Consequently, employees may be hesitant to engage in shared leadership, even if they desire to do so. Based on this, this study proposes the following moderating hypothesis:

*H5: Perceptions of organizational red tape moderate the relationship between of all PSM sub-dimensions on displays of shared leadership behavior, in that the relationship is weaker if perceptions of organizational red tape are strong*

## **2.5 Shared Leadership and Value-Based Team Composition**

Beyond their own predispositions for public service and organizational surroundings, the individual’s tendency to both claim and grant leadership responsibility is also affected by the composition of the team that surrounds them. Regarding the former, adaptive leadership theory suggests greater identification with one’s peers increases the willingness of individuals to claim leadership responsibility, as they expect support from likeminded colleagues (DeRue et al., 2015; DeRue & Ashford, 2010). For public service motivated employees, this suggests

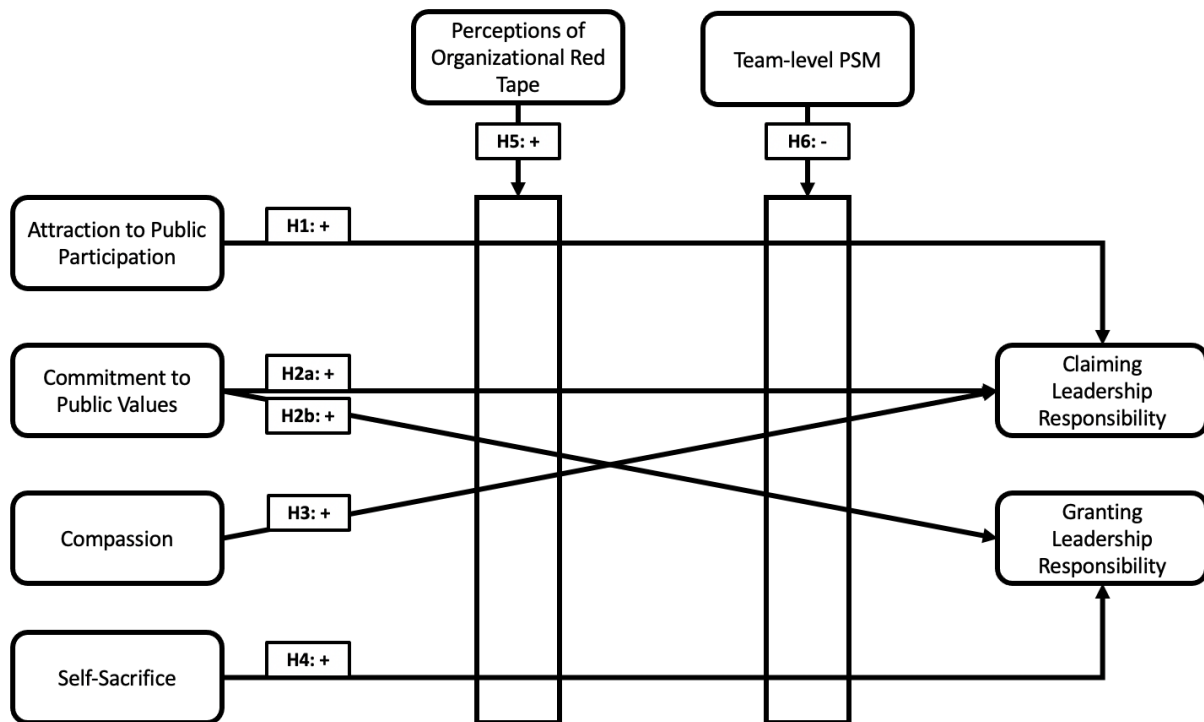


that their willingness to claim leadership responsibility will increase if their peers are likewise public service motivated. This effect has been substantiated by numerous studies showing that potential leaders claim leadership more frequently, if they perceive the team to share their values (Hogg & Van Knippenberg, 2003), demonstrate a shared purpose (Carson et al., 2007) or display a collective identity (Hiller et al., 2006). High levels of PSM on the team level are an indicator of such shared values (Bellé, 2013). Consequently, public service motivated employees will claim leadership responsibility more frequently, if their team is similarly public service motivated. Similar to the act of claiming leadership, the degree to which leadership is granted is affected by the character of one's peers (DeRue & Ashford, 2010). Adaptive leadership theory suggests that individuals are more likely to grant leadership roles if the prospective leader shares their underlying values and convictions (DeRue et al., 2015). This perspective is supported by the empirical work on leader prototypicality, which suggests that individuals are more likely to accept leadership from managers that fit their idea of a leader, including their ambitions, values and behavior (e.g. Steffens et al., 2013, 2015; van Knippenberg, 2011). Based on these approaches, it seems likely that the propensity of public service motivated employees to display shared leadership behavior will increase with the perceived value congruence of the team surrounding them. Past research on PSM and person-organization fit has shown, that the job satisfaction of public service motivated employees is positively related to the degree to which organizational values (and through that the team's values) are aligned with their own (Liu et al., 2015; Wright & Pandey, 2008). Consequently, public service motivated individuals are expected to both claim and grant leadership responsibility more frequently, if their team is similarly public service motivated.

*H6: Team-level PSM moderates the effect of all PSM sub-dimensions on displays of shared leadership behavior, in that the relationship is significantly stronger if team-level PSM is high rather than low.*

**Figure 1.**

*Visualization of Conceptual Model*



*Notes: Own visualization*

## 2. Methodology

### 3.1 Research Design

The testing of the abovementioned hypotheses will be conducted using a cross-sectional survey study and a subsequent analysis using temporal Exponential Random Graph Models (temporal ERGMs). A quantitative design was chosen for several reasons: Firstly, it serves to expand the study of shared leadership in the public sector, which has thus far relied primarily on qualitative measurements and conceptual work (e.g. Zeier et al., 2021). Furthermore, a quantitative design allows for the study of moderating effects, enabling the testing of both Hypothesis 5 and 6 respectively.

The measurement of shared leadership itself lies at the core of this study. Traditionally, shared leadership is measured through the so-called aggregation approach (Avolio et al., 1996; Pearce & Sims Jr., 2002). In this method, traditional leadership scales (e.g. multifactor leadership questionnaire) are reworded to measure the expression of leadership by the whole team as opposed to a single formal leader (Wang et al., 2014). However, the aggregation approach merely measures shared leadership as a team level metric without investigating the role that individual characteristics and the behavior of team members play in its emergence (Zhu et al., 2018). Due to the nature of the hypotheses in this thesis (i.e. measuring the effect that individual motivation and perceptions have on the emergence of shared leadership), the

aggregation approach is unsuited for their testing and was thus disregarded. Instead, a novel social network approach will be applied to test the abovementioned hypotheses.

Social network analysis is based on the idea that shared leadership is a team process as opposed to a team property, meaning that it develops within a team through the individual actions of its members (Mayo et al., 2003; Zhu et al., 2018). As mentioned previously, leadership is therein perceived as a dyadic relationship between a leader who takes leadership responsibility and a follower who grants it in turn (Katz & Kahn, 1978). The main method of social network analysis is based on the measurement of these leadership relationships in a team, specifically if they exist, what team members they are centered around and to what degree they are reciprocated (Mayo et al., 2003). This measurement is conducted according to the following steps: First, a single item question asks each member of the team to evaluate their leadership-relationship with each of their fellow team members (see Section 3.4.1). In the second step, these evaluations, originally based on a 7-point Likert-scale ranging from 1 (Not at all) to 7 (To a very great extent), are dichotomized to indicate leadership relationships (i.e. leadership ties) between individual team members. In the third step, a leadership network is created based on these evaluations, wherein all members of the team are contained as so-called nodes. In the final step, the created network is analyzed based on each node's position in the network and the number and nature of ties they share with others. A visualization of the process can be found in Table 1.

In a directed network such as the one in this study, nodes can display two kinds of leadership relationships with others: *Incoming leadership ties*, indicating that the node is perceived as a source of leadership by others and *outgoing leadership ties*, indicating that the node perceives others as sources of leadership. Individuals who grant leadership responsibility more freely will display more outgoing leadership ties, while individuals who claim leadership responsibility show more incoming leadership ties in turn (Mayo et al., 2003). Through the analysis of patterns in the way these leadership ties form in a team, the social-network approach allows for identification of antecedent conditions for the development of shared leadership on an individual level and a team level (Zhu et al., 2018). On the team level, propensity for shared leadership is assessed through the calculation of the team's leadership density - the actual leadership ties in a sample in proportion to the total amount of possible ties (Knoke & Yang, 2008). The propensity for shared leadership in a team is increased with the amount of leadership ties that are realized, which is why a higher density value suggests a higher propensity for shared leadership (Knoke & Yang, 2008). On the individual level, the social network approach investigates the position of individual nodes in the network (Zhu et al. 2018). Seeing as nodes

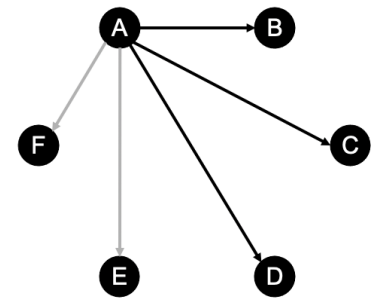
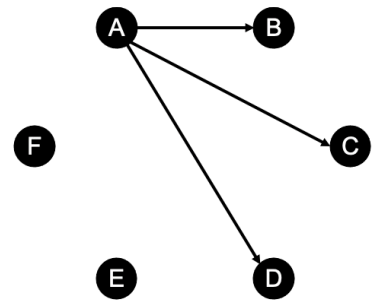
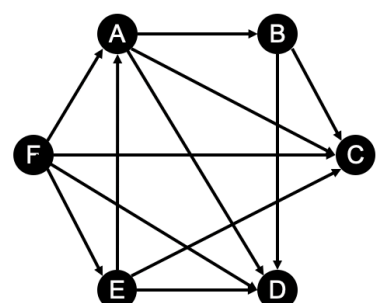
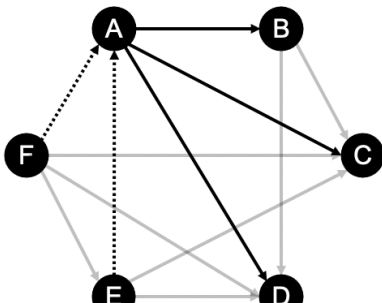
vary in the amount and nature of leadership ties they display, their unique impact and position in the network can be analyzed with regards to their specific characteristics (e.g., PSM and perceptions of organizational red tape). Specifically, it can be tested whether certain individual characteristics (e.g. individual levels of PSM) significantly affect the formation of incoming or outgoing leadership ties. Consequently, social network analysis allows for the analysis of shared leadership on both the team level (through density) and the individual level (importance of individual characteristics in creating leadership ties). While leadership density will be calculated as part of the descriptive statistics of this study, the testing of the hypotheses will be conducted solely on the individual level (through the analysis of tie-formation). This approach was chosen due to both the limited sample size and the resulting lack of comparable teams in this study and the nature of the proposed hypotheses, which are focused mainly on the individual level. For the purpose of later publication, this research design has been pre-registered on OSF (<https://osf.io/vyjgx/>).

### **3.2 Sample**

The empirical analysis of this study draws on a sample of 25 participants in 4 teams, including the coordinators of an undergraduate lecture (N=4) in the Netherlands, two teams of post-doctoral researchers in Germany (N=5 and N=10) and the coordinators of a student-help program in the Netherlands (N=6). The sample was chosen from among employees of public universities who consider themselves as a team. Participating teams had to collaborate on a daily basis in order to be eligible for participation in this study. Public universities were chosen as the sample population for two reasons: Firstly, professionals in the public education sector have been very vocal in their demand for shared leadership structures in their organizations (e.g. Pearce, 2004; Pearce et al., 2018), creating a demand for quantitative data on the subject. Secondly, teams in public universities are not as closely tied to formalized leadership structures as other public organizations, creating potentially favorable conditions for shared leadership behavior to emerge. Study participation was voluntary, and respondents were assured that their responses are kept confidential and used for research purpose only.

**Table 1**

*Visualization and Explanation of Necessary Steps in Social Network Analysis of Shared Leadership in Teams.*

	<b>Explanation</b>	<b>Visualization</b>
<b>Step 1</b>	Team members (e.g. A) are asked to <i>evaluate</i> the degree to which they rely on each of their peers for leadership on a 7-point Likert scale ranging from 1 (Not at all) to 7 (To a very great extent).	
<b>Step 2</b>	These evaluations are then <i>dichotomized</i> to indicate whether a leadership tie exists between the nodes. Only evaluations of sufficient strength (i.e. 5 and above) are considered as ties. (e.g. between A and B, C or D)	
<b>Step 3</b>	A leadership network of the team is created based on all realized leadership ties in the team. At this stage, leadership density can be calculated as an indication of the team's propensity for shared leadership.	
<b>Step 4</b>	The network is analyzed based on each node's (e.g. A) <i>incoming leadership ties</i> (full arrows) and <i>outgoing leadership ties</i> (dotted arrows), forming the individual-level analysis.	

*Note: The descriptions of the steps always refer to fully black aspects of the visualizations on the right side of the table, including the dotted arrows in Step .*

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**Table 2.**

*Sample Demographics*

	<b>mean</b>	<b>sd</b>	<b>median</b>	<b>min</b>	<b>max</b>
Tenure	2.121	1.943	1	0	9
Position	1.762	0.831	2	1	3
Male	0.441	0.507	0	0	1
Female	0.563	0.507	1	0	1
German	0.600	0.500	1	0	1

*Note: values rounded to three decimals, own computation*

### **3.3 Procedure**

Participants were invited to take part in this study between June and July 2022. First contact was established through email exclusively with formal team-leaders/ representatives of the team. These were then asked to provide a list containing the names and e-mail addresses of all team members. The names were used to complete the single-item shared leadership measure (see Section 3.4.1), while the addresses were used to provide each participant with a personalized link to the online survey on the platform SoSciSurvey and the agreement of confidentiality for this study. Links to the survey included a personalized serial number for each participant ensuring anonymity in data collection, analysis and interpretation from this point forward. Upon completion of the survey and the provision of the personalized links, the abovementioned list of names and e-mail addresses was deleted in compliance with GDPR regulations. The survey was conducted in English.

### **3.4 Measures**

All variables were measured at the individual level. All measures used in the survey have shown high internal consistency in past research (Cronbach's  $\alpha \geq 0.70$ ) and have been well established and tested in a public sector context. Participants were asked to evaluate the items on a 7-point Likert scale ranging from 1 ("Strongly disagree") to 7 ("Strongly agree") unless instructed otherwise.

#### ***3.4.1 Shared leadership***

To measure the existence of leadership ties between the subjects, Marsden's (1990) roster method will be applied. All participants are presented with a list of all of their fellow team-members and asked to evaluate them based on the following item using a Likert-scale ranging from 1 (Not at all) to 7 (To a very great extent): "To what degree do you rely on this individual for leadership?"(Carson et al., 2007; Tillmann et al., 2018). Results are then dichotomized to indicate whether a leadership tie exists (values of 5 and above) or not (values of 4 and below) (Chrobot-Mason et al., 2014). Based on these measurements, the abovementioned leadership networks are created, which in turn allows for the calculation of leadership density and centrality, as well as the testing of the hypothesis through the analysis of tie-formation. The full questionnaire can be found in the appendix (Appendix 1)

### 3.4.2 Public Service Motivation

Public service motivation and its subdimensions will be measured using Kim et al.'s (2013) four-dimensional PSM scale. This scale was chosen over Perry's (1996) original scale and its myriad derivatives (e.g. Giauque et al., 2011; Leisink & Steijn, 2009; Vandenabeele, 2008) to provide greater validity of results. Perry's original (1996) scale has been found to lack validity outside the United States due to some country specific values (namely a specific understanding of self-sacrifice) being represented. Alternative scales based on Perry's (1996) measurements instrument are similarly limited to their respective national contexts. Kim et al.'s (2013) measurements scale on the other hand has been constructed to be applicable in an international context providing greater validity and generalizability to this study. Its international applicability has been substantiated by an original survey of 23,000 public servants, which demonstrated the scale's validity across ten countries and four world regions (Mikkelsen et al., 2021). Kim et al.'s (2013) scale consists of four items for each of the four dimensions of PSM, namely "attraction to public participation" (APP), "commitment to public values" (CPV), "compassion" (CP) and "self-sacrifice" (SS). Items are evaluated based on a Likert scale ranging from 1 (totally disagree) to 7 (totally agree) to provide greater variance. An example item from the scale is "Meaningful public service is very important to me" (Kim et al., 2013). To test the validity of the hypothesized four-factor model of PSM based on Kim et al.'s (2013) PSM sub-dimensions, a confirmatory factor analysis (CFA) was conducted (results of all forthcoming CFAs can be found in Table 3.)

**Table 3.**

*Results of the Confirmatory Factor Analysis (Discriminant Validity)*

Model	$\chi^2$	Df	CFI	TLI	RMSEA	SRMR
4-factors PSM	164.859***	100	0.828	0.793	0.161	0.101
1-factor PSM	213.118***	104	0.710	0.665	0.205	0.103
2-factor ORT	13.225*	7	0.901	0.850	0.189	0.029
1-factor ORT	21.199**	9	0.934	0.889	0.233	0.055

*Note.*  $N = 25$ . Values rounded to 3 decimals.  $\chi^2 = \chi^2$ -test statistics,  $Df =$  degrees of freedom,  $CFI =$  Comparative Fit Index,  $TLI =$  Tucker-Lewis Index,  $RMSEA =$  root mean squared error of approximation,  $SRMR =$  standardized root mean squared residual. Own computation. \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .



While neither of the tested models make the cutoff values, likely due to the small sample size (Jackson et al., 2009), the four-factor model is closest and thus displays the best fit (Hu & Bentler, 1999). The convergent validity assessment shows that all items correlate with their respective scales, except for one item in the APP sub-dimension (see Table 4). The Cronbach's alpha of both the overall scale (Cronbach's  $\alpha = 0,95$ ) and the different sub-dimensions (Cronbach's  $\alpha$ : APP = 0,85, CPV = 0,92, COM = 0,89, SS = 0,89) are more than satisfactory, indicating very good reliability (Streiner, 2003). Due to the exceptionally high Cronbach's alpha of the APP scale, item PS01\_04 was retained in spite of its diverging factor loading (Jackson et al., 2009).

**Table 4.**

*Convergent Validity for Hypothesized 4-Factor Model of PSM, Cronbach's Alpha*

Item	Scale	Scale 1	Scale 2	Scale 3	Scale 4	Cronbach's $\alpha$
<i>Attraction to Public Participation</i>						0.85
PS01_01	1	<b>0.561</b>	0.364	0.458	0.385	
PS01_02	1	<b>0.793</b>	0.505	0.723	0.526	
PS01_03		<b>0.692</b>	0.590	0.656	0.442	
PS01_04		0.804	0.776	<b>0.813</b>	0.572	
<i>Commitment to Public Values</i>						0.92
PS01_05	2	0.611	<b>0.844</b>	0.713	0.639	
PS01_06	2	0.544	<b>0.820</b>	0.704	0.595	
PS01_07	2	0.605	<b>0.876</b>	0.747	0.651	
PS01_08	2	0.628	<b>0.775</b>	0.620	0.593	
<i>Compassion</i>						0.89
PS01_09	3	0.635	0.599	<b>0.732</b>	0.472	
PS01_10	3	0.753	0.717	<b>0.883</b>	0.577	
PS01_11	3	0.686	0.691	<b>0.734</b>	0.665	
PS01_12	3	0.707	0.667	<b>0.818</b>	0.573	
<i>Self-Sacrifice</i>						0.89
PS01_13	4	0.511	0.697	0.773	<b>0.813</b>	
PS01_14	4	0.336	0.343	0.352	<b>0.746</b>	
PS01_15	4	0.583	0.578	0.569	<b>0.825</b>	
PS01_16	4	0.589	0.654	0.688	<b>0.799</b>	
<i>Public Service Motivation</i>						0.95

*Note: Values rounded to 3 decimals. Highest factor loadings are in bold. ORT = Organizational Red Tape. Own computation*

### ***3.4.3 Perceptions of Organizational Red Tape***

Previous research has traditionally measured perceptions of ORT using single-item scales, merely asking whether respondents believe red tape to exist in their organization or not (Bozeman & Feeney, 1993). However, as these single-item scales were found to lack validity (Feeney, 2012), this thesis will apply van Loon et. al.'s (2016) well established, two-dimensional measure for organizational red tape. This measure was chosen for two reasons: Firstly, it has been successfully applied in a public context in the past, setting a precedent for the use in this study (Van Loon, 2017). Secondly, this scale measures both formal and informal rules as possible sources of red tape, encapsulating the concept more fully than other measures (van Loon et al., 2016). For each of the two dimensions, “lack of functionality” and “compliance burden”, respondents will evaluate four items on a Likert scale ranging from 1 (totally disagree) to 7 (totally agree) to provide greater variance. An example item from the scale is “the rules with which I have to comply in my job have a clear function for my job activities” (van Loon et al., 2016). A CFA is conducted to verify the hypothesized two-dimensional model and the measurement scale (see Table 2.). Results show that while both the CFI and TLI suggest superior fit for the one-factor model,  $\chi^2$ -tests, SRMR and RMSEA suggest superior fit for a two-factor model (Hu & Bentler, 1999; Jackson et al., 2009). The convergent validity assessment of the two-factor model shows that all items correlate highly with their respective factors, except for one item in the Compliance burden sub-dimension (see Table 5.). The Cronbach's alpha for both the overall scale (Cronbach's  $\alpha = 0,95$ ) and the two sub-dimensions (Cronbach's  $\alpha$ : Lack of functionality = 0,97, Compliance burden = 0,88) were exceptionally high, suggesting very good reliability (Streiner, 2003). Due to the nature of the hypotheses and the exceptionally high Cronbach's alpha of the overall scale, the two-factor model was disregarded in favor of a simplified one-factor model.

**Table 5.***Convergent Validity for Original 2-Factor Model of Perceived ORT, Cronbach's Alpha*

Item	Scale	Scale 1	Scale 2	Cronbach's $\alpha$
<i>Lack of functionality</i>				0.97
OR01_01 (reversed)	1	<b>0.961</b>	0.799	
OR01_02 (reversed)	1	<b>0.926</b>	0.836	
OR01_03 (reversed)	1	<b>0.950</b>	0.826	
<i>Compliance burden</i>				0.88
OR01_04	2	0.648	<b>0.737</b>	
OR01_05	2	0.746	<b>0.74</b>	
OR01_06	2	<b>0.866</b>	0.810	
Perceived ORT				0.95

*Note: Values rounded to 3 decimals. Highest factor loadings are in bold. ORT = Organizational Red Tape. Reversed items were accounted for during the CFA. Own computation*

### **3.4.4 Control Variables**

To isolate the effects of PSM and perceptions of ORT, several exogenous control variables are added. These were chosen based on the current literature on the antecedents of shared leadership (Wang et al., 2014; Wu et al., 2020; Zhu et al., 2018): Firstly, the socio-demographic measures of age and gender were added based on the previous literature on leader perceptions and the effects of prospective leader seniority (Ayman & Korabik, 2010; Muethel et al., 2012). Secondly, measures for formal position of employees and organizational tenure are added to control for both formal and informal positions of power in the teams that may affect leadership ties (Kim et al., 2015; Ng & Feldman, 2010). Age was later excluded as a potential control variable due to its high correlation with tenure and the subsequent risk of multicollinearity. Lastly, measures on Internal Team Environment (ITE) and Coaching (COA) by Carson et al. (2007) are added to control for two of the most notable antecedents of shared leadership in teams.

Beyond these exogenous controls, the social dynamics of social networks need to be accounted for similarly. Previous research on social networks has identified a number of common local patterns of relationships in networks, so called “network configurations”, that endogenously affect the development of social networks (Lusher et al., 2013, p. 17; Snijders et al., 2006). These preexisting patterns to network development need to be accounted for if the emergence of relationships in the network is to be accurately predicted by the descriptive model (Chrobot-Mason et al., 2016). For this purpose, the following network controls will be applied:

To account for dyadic dependencies in the network, we control for both arc (edges) and reciprocity (mutual) of leadership connections. We further include controls for “simple connectivity” (twopath) (Lusher et al., 2013, p.174), or the tendency of nodes which send ties to also receive them by a third node. Finally, we account for the clustering of groups in a network by including “cyclic triplets” (ctriple) (Lusher et al., 2013, p.174), or the tendency of twopath connections to be closed off by returning to the original node. This choice of network controls is substantiated by prior research utilizing social network analysis to measure the emergence of shared leadership (Chrobot-Mason et al., 2016; Tillmann et al., 2018)

### **3.5 Data Analysis**

Following Chrobot-Mason et al.’s (2016) and White et al.’s (2014) recent approach to measuring leadership relationships in social network analysis, the analysis of the sample networks and the resulting testing of the hypotheses will be conducted using temporal ERGMs (Snijders et al., 2006). ERGMs are statistical probability models that analyze the formation of social networks based on the patterns of individual ties between the nodes in the network (Harris, 2013). This analysis considers not only patterns of endogenous network self-organization (through the abovementioned network controls) but also the individual attributes of actors and contextual factors as possible exogenous predictors of network formation (Robins et al., 2007). That way, ERGMs enable the testing of hypothesized patterns in network formation, inferring the social processes that have built a network and whether certain configurations of the network occur at a higher frequency than might be expected by chance (Robins et al., 2007). In practice, individual variables are tested for the effect that they have on the formation of leadership ties in the sample. If a variable demonstrates a significant positive (negative) effect, it indicates that the variable increases (decreases) the nodes’ propensity to form leadership connections. Therein, terms can be specified to test each variable’s effects on both kinds of leadership ties, either together or individually, allowing an in-depth analysis of network patterns. Past research has utilized ERGMs mainly on individual networks. However, this study utilizes 4 separate networks with the intention of analyzing the formation of networks across multiple teams in a fixed effects model. Because of this, temporal ERGMs are utilized for this analysis. While usually used to analyze the longitudinal development of individual networks, temporal ERGMs can be used to analyze several different networks at once, increasing the size of the sample and enabling the use of fixed effects models (Leifeld et al., 2018). The data analysis was conducted in R-Studio version (4.0.2) using the software suite *statnet* (Handcock et al., 2003) and the package *btergm* (Leifeld et al., 2018).

### **3.6 Model Specification**

This thesis follows Chrobot-Mason et al.'s (2016) approach to model specification in directed networks, which is in turn based on Lusher et al.'s (2013) prior work. Consequently, five models were specified in total. First, a base model including only the endogenous and exogenous control variables was specified (Model 0). In the first real model, the main effects of the PSM sub-dimensions are added, allowing the testing of Hypotheses 1-4 (Model 1). In the second model, the direct effects of the hypothesized moderators (perceived ORT and team-level PSM) are added to test for any potential direct influence on tie-formation (Model 2). In the final two models, the interactions of the sub-dimensions of PSM with employee perception of ORT (Model 3) and team-level PSM (Model 4) are added respectively.

### **3.7 Validity and Reliability**

Before the results of the analysis are displayed, the validity and reliability of both data and measurement instruments must be considered. To ensure external validity and generalizability of results, the sample for this study was carefully chosen from among teams of employees in public universities. Due to the cross-sectional design of the study, internal validity, or the ability to make claims of causality for results, remains a problem (Bryman, 2012). To account for the effects of external factors, several control variables were included in the analysis. Additionally, the analysis of the collected data was conducted using temporal ERGMs, enabling the analysis of multiple teams in a fixed effects model, thus further accounting for external factors. Lastly, the validity of measurement instruments, or the degree to which these instruments actually measure the intended concepts, was considered (Bryman, 2012). A confirmatory factor analysis was conducted for all multi-dimensional scales (i.e. PSM, ORT) to ensure discriminant and convergent validity. To ensure the validity of the estimated models both a goodness-of-fit test and Markov Chain Monte Carlo (MCMC) diagnostics were used, testing for both model fit and model degeneracy (Morris et al., 2014). Furthermore, the Bayesian Information Criterion (BIC) Akaike Information Criterion (AIC) were calculated for each model to check the relative model fit of the 5 estimated models when compared to one another. The consistency of the measurements, or their reliability, was also accounted for in multiple ways (Bryman, 2012). For the analysis, well-known measurement scales have been chosen which have been well established and tested in a public sector context. To ensure internal reliability, Cronbach's  $\alpha$  was calculated for all measurement scales as displayed in section 3.4.

## 4. Results

### 4.1 Descriptive Statistics

Table 6. shows the means, standard deviations, medians and minimum/maximum values for all measured variables in the sample. The sample shows high base levels of PSM across all sub-dimensions, averaging evaluations of 5.615 on the overall PSM scale and between 5.245 (SS) and 5.991 (CPV) on the 4 sub-dimensions. Interestingly, SS is the sub-dimension with the lowest scores among participants, being the only dimension with minimum evaluation of lower than 3. The standard deviations of the PSM sub-dimensions are relatively small, ranging from 0.964 for the overall scale to 1.180 for SS. This indicates that the evaluations of all nodes tend to cluster around the sample mean. Perceptions of ORT are moderately low at 3.853, speaking to the functionality of work-processes in the participating organizations. Participants further perceived both their internal team environment (ITE mean = 5.924) and their external managers (COA mean = 5.213) to be moderately supportive (mean = 5.924). The standard-deviation of COA at 1.621 was the highest of all latent constructs in the sample, indicating that evaluations of external management did not cluster around the sample mean. Conversely, ITE demonstrated the lowest standard deviation of all latent constructs (sd = 0.495), indicating relatively low variance around the high sample mean of 5.924.

**Table 6.**

*Descriptive Statistics for Main Variables*

	<b>mean</b>	<b>sd</b>	<b>median</b>	<b>min</b>	<b>max</b>
PSM	5.621	0.964	5.687	2.937	6.812
APP	5.576	1.090	5.751	3.255	7
CPV	5.991	1.083	6.256	3	7
COM	5.664	1.043	5.753	3	7
SS	5.245	1.180	5.544	2.545	7
ORT	3.853	1.589	3.572	1.523	5.833
ITE	5.924	0.495	5.811	4.814	6.754
COA	5.213	1.621	5.667	1.333	7

*Note: values rounded to three decimals, PSM = Public Service Motivation, APP = Attraction to Public Participation, CPV = Commitment to Public Value, COM = Compassion, SS = Self-Sacrifice, ORT = perceived Organizational Red Tape, ITE = Internal Team Environment, COA = Coaching, own computation*

Table 7. shows Pearson's correlation coefficients for all main constructs as well as control variables (Bryman, 2012). Altogether, there are several significant and high correlations among the main constructs, as well as the control variables. Present significant coefficients can

be attributed to theoretically expected relations between variables, the construction of the measurement instruments or the nature of the sample. For example, all sub-dimensions of the PSM construct are highly correlated with one another and with the overall PSM construct due to their shared conceptual basis. Similarly, the negative correlations of ORT with the overall PSM construct ( $r = -0.48, p < 0.05$ ) can be attributed to previously identified negative effects of ORT on PSM (Giauque et al., 2012; Quratulain & Khan, 2015). However, beyond such expected correlations, there are several which warrant closer investigation (see Table 7):

**Table 7.**

*Pearsons's Correlations of Variables*

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. PSM												
2. APP	<b>0.86***</b>											
3. CPV	<b>0.88***</b>	<b>0.66***</b>										
4. COM	<b>0.92***</b>	<b>0.80***</b>	<b>0.77***</b>									
5. SS	<b>0.85***</b>	<b>0.57**</b>	<b>0.68***</b>	<b>0.68***</b>								
6. ORT	<b>-0.48*</b>	-0.24	<b>-0.70***</b>	<b>-0.41*</b>	-0.33							
7. ITE	-0.03	-0.01	-0.03	-0.09	0.01	0.17						
8. COA	-0.29	-0.22	-0.35	-0.36	-0.10	0.29	0.16					
9. Tenure	<b>0.45*</b>	0.28	<b>0.42*</b>	<b>0.42*</b>	<b>0.45*</b>	-0.39	0.01	0.06				
10. Position	<b>-0.43*</b>	-0.25	<b>-0.57**</b>	-0.39	-0.30	<b>0.58**</b>	0.18	<b>0.48*</b>	-0.32			
11. male	0.08	0.11	0.29	0.04	-0.13	-0.30	0.21	-0.09	-0.23	-0.04		
12. female	-0.08	-0.11	-0.29	-0.04	0.13	0.30	-0.21	0.09	0.23	0.04	<b>-1.00***</b>	
13. german	<b>-0.52**</b>	<b>-0.44**</b>	<b>-0.49*</b>	<b>-0.55**</b>	-0.34	<b>0.53**</b>	0,21	0,33	-0,29	<b>0,46*</b>	0,23	-0,23

Note:  $N=25$ ,  $*p<0,05$ ,  $**p<0,01$ ,  $***p<0,001$ , PSM = Public Service Motivation, APP = Attraction to Public Participation, CPV = Commitment to Public Value, COM = Compassion, SS = Self-Sacrifice, ORT = perceived Organizational Red Tape, ITE = Internal Team Environment, COA = Coaching, own computation

Notably, tenure was found to be significantly and positively correlated with PSM ( $r = 0.45, p < 0.05$ ) and all of its sub-dimension (CPV:  $r = 0.42, p < 0.05$ ; COM:  $r = 0.42, p < 0.05$ ; SS:  $r = 0.45, p < 0.05$ ) with the exception of APP, suggesting a potential relationship between an employee's tenure in a team and their levels of PSM. Also noteworthy is the negative correlation between the participants formal management positions and aspects of PSM, two of

which are significantly negative (PSM:  $r = -0.43$ ,  $p < 0.05$ ; CPV:  $r = -0.57$ ,  $p < 0.01$ ). Employees' levels of managerial responsibility further showed a significant positive correlation with both perceptions of ORT ( $r = 0.58$ ,  $p < 0.01$ ) and COA ( $r = 0.48$ ,  $p < 0.05$ ), both of which warrant further investigation. Lastly, the geographic location of the team in Germany showed a significantly negative correlation with PSM ( $r = -0.52$ ,  $p < 0.01$ ) and all of its sub-dimensions (APP:  $r = -0.44$ ,  $p < 0.01$ ; CPV:  $r = -0.49$ ,  $p < 0.05$ ; COM:  $r = -0.55$ ,  $p < 0.01$ ), as well as a significantly positive correlation with ORT ( $r = 0.53$ ,  $p < 0.01$ ).

Table 8. shows the descriptive statistics for all leadership networks. Out of the 152 possible leadership ties, 89 were realized leading to an overall leadership density of 0,58 in all four leadership networks. According to the pertinent literature on shared leadership, which measured the average leadership density of private-sector teams at 0.22, this value denotes a high propensity for shared leadership behavior (D'Innocenzo et al., 2016). However, the teams in this study, while all above the average density of 0.22, show a significant variety in leadership density, ranging from 0.33 for Network 1 to 0.86 for Network 3. On average, each node realized 3,56 leadership connections with other nodes.

**Table 8.**

*Descriptive Statistics for Shared Leadership Networks*

	<b>N 1</b>	<b>N 2</b>	<b>N 3</b>	<b>N 4</b>	<b>Overall</b>
Number of Nodes N	4	5	6	10	25
Number of possible Edges n [N x (N-1)]	12	20	30	90	152
Realized Edges	4	16	26	43	89
Average Edges per Node	1	3,2	4,3	4,3	3,56
Density	0,33	0,8	0,86	0,48	0,58

*Notes: N1-4 = Networks 1 to 4.*

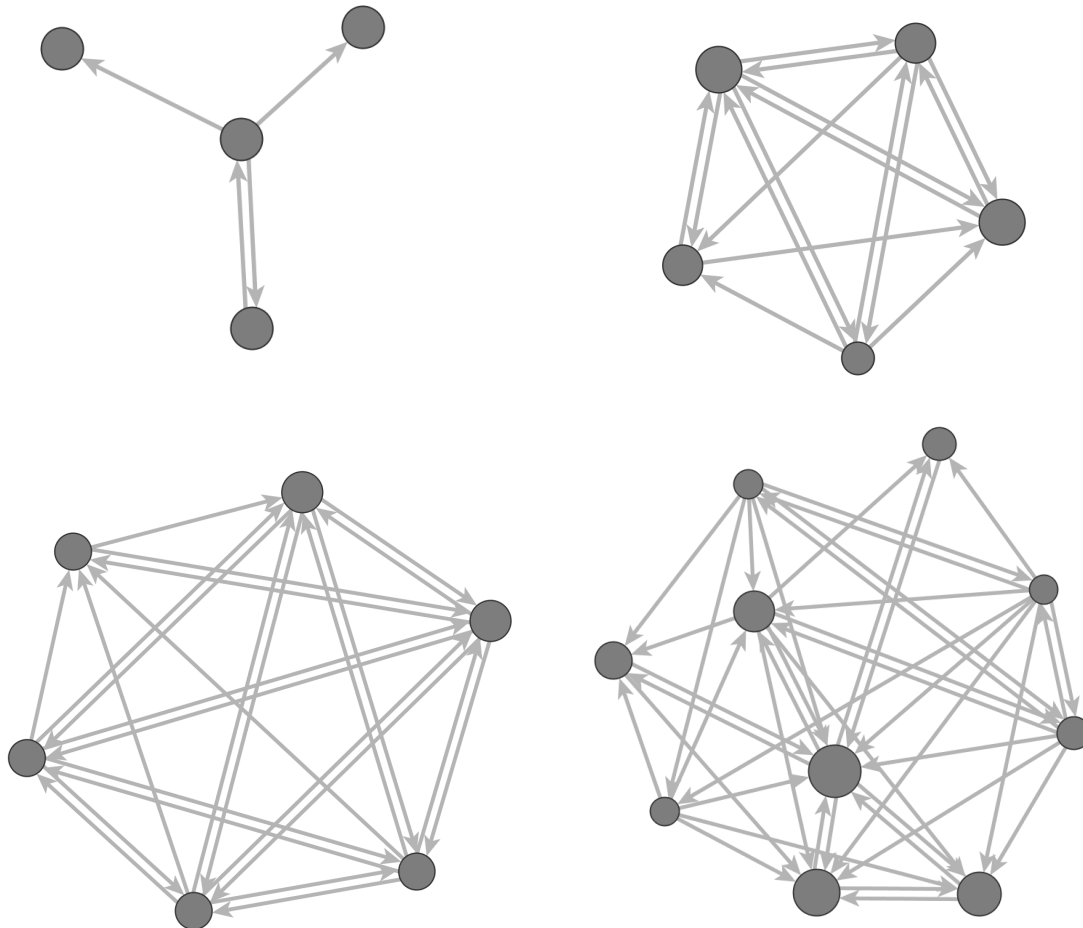
Figure 2. shows graphical representations of the four leadership networks in this study. Nodes (i.e., team members) are represented by the grey circles. The size of the circles mirrors their indegree-centrality – their position in the network's leadership hierarchy. The more incoming ties a team member receives, the bigger their circle. Arrows represent the leadership ties (i.e. edges) between the nodes, pointing from the sender of a leadership tie (the prospective follower) to the recipient of the respective tie (the perceived leader). The networks show their relative leadership densities: Network visualizations which demonstrate a larger number of



arrows relative to the number of nodes they contain (such as Network 3) have a higher leadership density than those with a relatively small number of arrows (such as Network 1).

**Figure 2.**

*Visualization of Leadership Networks*



*Notes: Top-left = Network 1, top-right = Network 2, bottom-left = Network 3, bottom-right = Network 4, own visualization*

## 4.2 Estimation Results

The results of the 5 estimated models are presented in Table 9, with each model building on the previous one by adding more variables. The interpretation of TERGMs is similar to that of any binary logistic regression model (Harris, 2013). An effect is thus regarded as significant if the estimated coefficient is greater than two times (in absolute terms) its standard error (White et al., 2014). In the following, the estimation results are discussed in detail.

Results for model 0 (only including control variables) show a negative effect of edges ( $\beta = -0.60$ ). While very small and insignificant, this indicates that the formation of leadership

ties is not entirely random, but rather based on the selected variables. Among the remaining network controls only *ctriple* ( $\beta = -0.81, p < 0.05$ ) shows a significant, negative effect, indicating that nodes in the sample have a significant tendency not to close twopaths by returning to the initial node ( $A \rightarrow B \rightarrow C \rightarrow A$ ). Regarding the exogenous, non-network controls, only the positive effect *gender* ( $\beta = 0.79, p < 0.05$ ) achieves significance above the 5%-level, indicating that men in the sample are more likely to form leadership ties than women. The negative effect *COA* ( $\beta = -0.26, p < 0.1$ ) only achieves significance at the 10%-level, indicating that perceptions of supportive coaching by external managers has a slightly negative effect on the development of leadership ties. The negative effect of *team-nationality* ( $\beta = -0.65, p < 0.1$ ) is similarly significant at the 10%-level alone, suggesting that members of German teams are slightly less inclined to form leadership ties than their Dutch counterparts. All remaining effects among the exogenous controls (*ITE*, *Tenure* and *Position*) remain insignificant, indicating no impact on the formation of leadership ties, beyond the effect of chance. The two model fit values, Akaike's An Information Criterion (AIC) and Bayes Information Criterion (BIC) for Model 0 displayed values of 552.81 and 596.78 respectively. Here it is important to note that AIC and BIC merely indicate relative model fit of the estimated models. They only demonstrate which of the estimated models best fits the collected data when compared to one another without showing whether any of the models actually fit the data well. To assess overall model fit, a goodness-of-fit analysis is conducted in section 4.2.

Model 1 displays the results of the control variables, as well as the newly added main effects of the PSM sub-dimensions. H1 to H4 are tested based on the effects of the PSM sub-dimensions on the formation of leadership ties. *APP* ( $\beta = -0.49$ ) shows an insignificant negative effect on the formation of incoming leadership ties, indicating no impact on tie-formation beyond the effect of chance and thus failing to support H1. The effects of *CPV* on the formation of both incoming ( $\beta = 1.07, p < 0.05$ ) and outgoing ( $\beta = 1.38, p < 0.01$ ) leadership ties are both significantly positive, indicating that nodes with higher levels of *CPV* show a greater propensity to form leadership ties and providing support for both H2a and H2b. *COM* ( $\beta = 0.01$ ) shows an insignificant positive effect on the formation of incoming leadership ties, suggesting no impact on the formation of ties beyond the effect of chance and thus failing to provide support for H3.

**Table 9.***Model Statistics*

	<b>Model 0</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>
<i>Network Controls</i>					
edges	-0.60 (3.90)	<b>-14.08</b> (5.65)*	<b>-110.60</b> (31.88)***	<b>-200.55</b> (44.37)***	<b>-191.44</b> (1.56)***
mutual	0.04 (0.52)	-0.22 (0.57)	-0.36 (0.65)	-0.14 (0.69)	-0.19 (0.73)
twopath	0.32 (0.22)	0.40 (0.26)	0.10 (0.28)	0.16 (0.27)	0.13 (0.27)
ctriple	<b>-0.81</b> (0.40)*	<b>-1.06</b> (0.43)*	-0.80 (0.45)	<b>-1.21</b> (0.48)*	<b>-0.90</b> (0.45)*
<i>Exogenous Controls</i>					
ITE	0.21 (0.36)	0.44 (0.39)	0.03 (0.49)	-0.21 (0.60)	0.07 (0.61)
COA	-0.26 (0.14)	-0.18 (0.16)	<b>-0.66</b> (0.23)**	<b>-0.63</b> (0.28)*	<b>-0.85</b> (0.21)***
Tenure	0.09 (0.12)	-0.14 (0.14)	-0.02 (0.17)	0.02 (0.20)	0.11 (0.19)
Gender (male)	<b>0.79</b> (0.31)*	-0.04 (0.40)	0.58 (0.50)	0.87 (0.61)	<b>1.32</b> (0.52)*
Position	0.20 (0.21)	<b>0.58</b> (0.27)*	<b>0.61</b> (0.30)*	<b>0.65</b> (0.32)*	<b>0.71</b> (0.34)*
Country(German)	-0.65 (0.35)	-0.27 (0.46)	<b>3.41</b> (1.23)**	<b>7.17</b> (1.68)***	3.53 (2.74)
<i>Main Effects PSM Sub-Dimensions</i>					
APP Incoming		-0.49 (0.40)	-0.48 (0.49)	-0.38 (0.50)	0.24 (0.72)
CPV Incoming		<b>1.07</b> (0.48)*	<b>1.72</b> (0.77)*	1.48 (0.75)	0.11 (1.07)
CPV Outgoing		<b>1.38</b> (0.45)**	<b>2.22</b> (0.63)***	<b>2.70</b> (0.74)***	<b>2.75</b> (0.97)**
COM Incoming		0.01 (0.44)	-0.58 (0.57)	-0.54 (0.61)	0.01 (0.99)
SS Outgoing		-0.37 (0.33)	<b>-1.14</b> (0.53)*	<b>-1.70</b> (0.60)**	-2.89 (4.78)

	<b>Model 0</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>
<i>Moderators Direct Effects</i>					
ORT			<b>-1.00</b> (0.35) **	<b>-2.87</b> (0.72) ***	<b>-0.87</b> (0.42) *
Team-lvl PSM			<b>8.82</b> (2.76) **	<b>17.29</b> (3.92) ***	<b>15.16</b> (0.74) ***
<i>Moderation ORT</i>					
APP x ORT Incoming				-0.74 (0.93)	
CPV x ORT Incoming				0.51 (0.95)	
CPV x ORT Outgoing				-1.50 (0.92)	
COM x ORT Incoming				0.68 (1.40)	
SS x ORT Outgoing				2.15 (1.11)	
<i>Moderation Team-lvl PSM</i>					
APP x PSM Incoming					<b>-0.48</b> (0.20) *
CPV x PSM Incoming					<b>1.06</b> (0.32) **
CPV x PSM Outgoing					0.22 (0.33)
COM x PSM Incoming					<b>-0.56</b> (0.27) *
SS x PSM Outgoing					0.05 (1.05)
Num. obs.	152	152	152	152	152
AIC	552.81	817.24	806.23	793.75	792.19
BIC	596.78	883.20	880.98	870.49	867.93
Joint p-value (GOF)	0.959	0.422	0.633	0.766	0.538

\*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$ ;  $p < 0.1$

Lastly, SS shows a similarly insignificant and negative effect ( $\beta = -0.37$ ) on the formation of outgoing leadership ties, thus failing to support H4. The effect of edges remains negative, however becoming significant, which indicates that the formation of leadership ties is explained by the variables included in the model ( $\beta = -14.08$ ,  $p < 0.05$ ). The effects of the network control variables remain largely unchanged, only slightly increasing in strength and changing direction in the case of mutual ( $\beta = -0.22$ ). The effects of the exogenous control variables remain similarly unchanged with a few exceptions: The negative effects of both COA ( $\beta = -0.18$ ) and team-nationality ( $\beta = -0.27$ ) become insignificant once the effects of the PSM sub-dimensions are added to the model. The formerly significant effect of gender ( $\beta = -0.04$ ) similarly becomes insignificant and even negative. Conversely, the effect of the nodes' managerial position becomes significantly positive ( $\beta = 0.58$ ,  $p < 0.05$ ) once the effects of the PSM sub-dimensions are added, suggesting that nodes with formalized managerial responsibilities have a stronger tendency to form leadership ties than those without. Both the AIC (817.24) and BIC values (883.20) are increased in model 1, suggesting lower relative model fit when compared to model 0.

In model 2, the direct effects of the moderating variables perceptions of ORT and team-level PSM are added to all preceding variables. Both newly added effects are significant: The significant negative effect of perceptions of ORT ( $\beta = -1.00$ ,  $p < 0.01$ ) on tie-formation suggests that nodes who perceive levels of ORT in their organization to be high are less likely to form leadership ties with other nodes than those who perceive low levels of ORT. Conversely, the significant positive effect of team-level PSM ( $\beta = 8.82$ ,  $p < 0.01$ ), suggests that members of teams with high levels of PSM are more likely to form leadership ties than those in teams with low levels of PSM. The effect of edges sharply increases in both strength and significance ( $\beta = -110.60$ ,  $p < 0.001$ ), which suggests that the addition of the direct effects of the moderating variables significantly improved the explanatory value of the estimated model. The effects of all remaining network controls remain unchanged, with the exception of *ctriple* ( $\beta = -0.80$ ,  $p < 0.1$ ) suffering a decrease strength and significance. The effects of the exogenous control variables remain similarly unchanged compared to the preceding model with two notable exceptions: Firstly, the negative effect of COA ( $\beta = -0.66$ ,  $p < 0.01$ ) increases in both strength and significance, again indicating that perceptions of a supportive coaching environment have a surprisingly negative effect on the formation of leadership ties. Secondly, the effect of German team-nationality ( $\beta = 3.41$ ,  $p < 0.01$ ) turns sharply positive and significant, indicating that the members of German teams are significantly more likely to form leadership ties. The effects of the PSM sub-dimensions also remain largely unchanged, only demonstrating an increase in significance for the effects of both CPV ( $\beta = 2.22$ ,  $p < 0.001$ ) and SS ( $\beta = -1.14$ ,  $p$

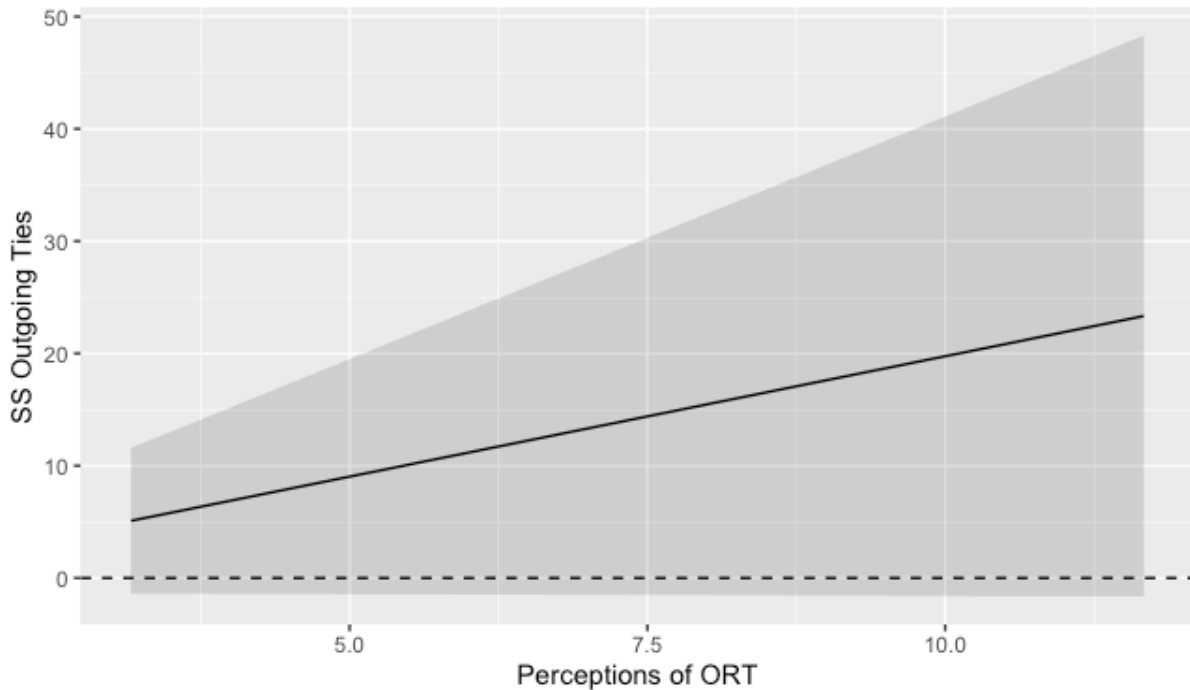
< 0.05) on the formation of outgoing leadership ties. The latter of these relationships now not only fails to support H4, but also contradicts it, suggesting that high levels of SS lead nodes to form less outgoing leadership ties. The AIC (806.23) and BIC (880.98) values for model are both slightly reduced, suggesting a minimal improvement in relative model fit.

In model 3, the moderating effects of perceptions of ORT on the relationship between the PSM sub-dimensions and the formation of leadership ties are added to the preceding variables. Here, no significant effects are found with the exception of the positive moderating effect of perceived ORT on the relationship between SS and the formation of outgoing leadership ties ( $\beta = 2.15$ ,  $p < 0.1$ ), which only achieves significance at the 10%-level. This effect indicates that nodes with high levels of SS become more likely to display outgoing leadership ties if they perceive high levels of ORT. In total, the results of model 3 fail to support H5. The negative effect of edges in ( $\beta = -200.55$ ,  $p < 0.001$ ) again increases in strength, suggesting a further increase in explanatory power for model 3. The effects of the network controls also remain largely unchanged compared to the preceding model, with the exception of the negative effect of ctripple ( $\beta = -1.21$ ,  $p < 0.05$ ) again becoming significant. The effects of the exogenous control variables remain unchanged compared to the preceding model as well, merely indicating some changes in significance for the effects of COA ( $\beta = -0.63$ ,  $p < 0.05$ ) and team-nationality ( $\beta = 7.71$ ,  $p < 0.001$ ). The effects of the PSM sub-dimensions similarly only display minor changes in significance for the effect of CPV on the formation of incoming leadership ties ( $\beta = 1.48$ ,  $p < 0.1$ ) and the effect of SS on the formation of outgoing leadership ties ( $\beta = -1.70$ ,  $p < 0.01$ ). The direct effects of the two moderating variables of perceived ORT ( $\beta = -2.87$ ,  $p < 0.001$ ) and Team-level PSM ( $\beta = 17.29$ ,  $p < 0.001$ ) remain robust and both increase their significance. The AIC (793,75) and BIC (870.49) of model 3 indicate a slight improvement in model-fit when compared to the preceding models

Figure 3. represents a graphical representation of the moderating effect of perceived ORT on the relationship between SS and the display of outgoing leadership ties. Both the effect graph (represented by the black line) and the 95% confidence interval (represented by the grey cone surrounding the black line) exclusively demonstrate a very slight positive moderation (as indicated by the slight incline of both the graph and the surrounding cone), which indicates the significance of the effect. The graphical representations of all remaining moderating effects of perceptions of ORT can be found in the Appendix (Appendix 2).

**Figure 3.**

*Illustration of the Moderating Effect of Perceived ORT on the Relationship between SS and the Development of Outgoing Leadership Ties*



*Notes: black line = effect graph, grey cone = 95% confidence interval, own computation*

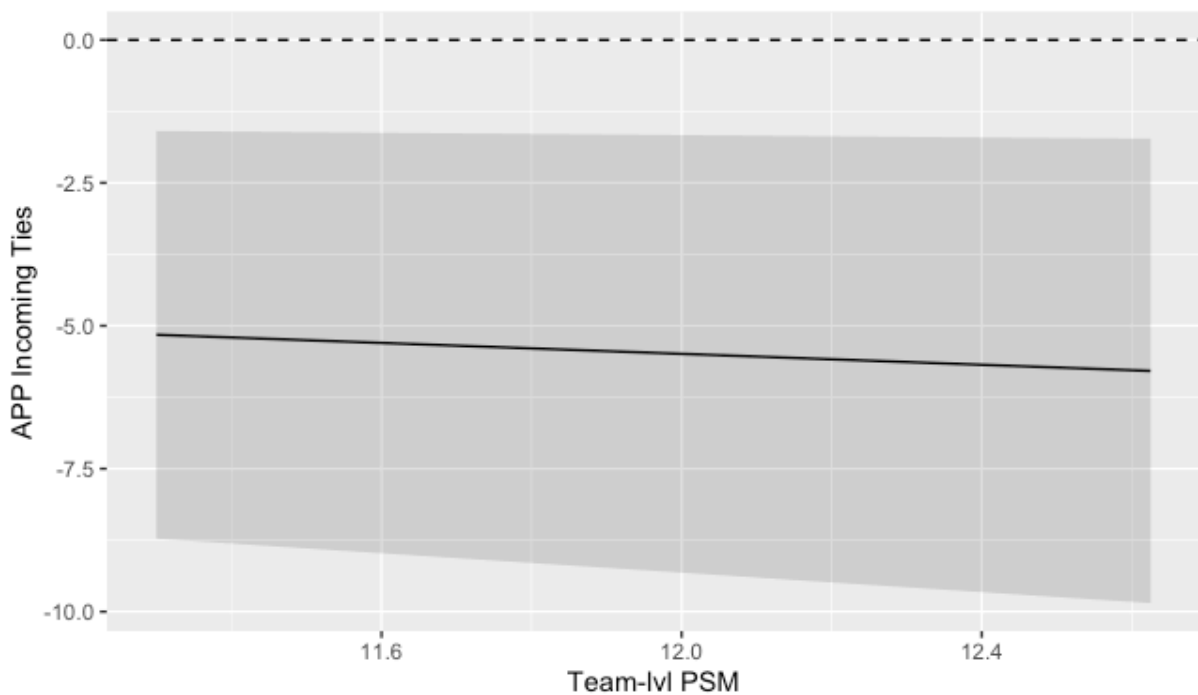
In model 4, the moderating effect of team-level PSM on the relationships between the PSM sub-dimensions and the formation of incoming- and outgoing leadership ties are added in favor of the moderating effects in model 3. Here, several significant effects can be observed: Team-level PSM negatively moderates the relationship between APP and the display of incoming leadership ties ( $\beta = -0.48, p < 0.05$ ) in that the already negative effect becomes even stronger with increasing team-level PSM. Furthermore, the effect of CPV on the display of incoming leadership ties is significantly positively moderated by team-level PSM ( $\beta = 1.06, p < 0.01$ ), in that the effect becomes more positive with increasing team-level PSM. Combined with its now insignificant direct effect, this indicates that the positive effect of CPV on the formation of incoming leadership ties seems to be entirely dependent on team-level PSM. Lastly, the relationship between COM and the formation of incoming leadership ties is significantly negatively moderated by team-level PSM ( $\beta = -0.56, p < 0.05$ ), in that the effect of COM becomes increasingly negative as team-level PSM increases. In total, these results partially confirm H6. The effect of edges ( $\beta = -191,44, p < 0.01$ ) remains mostly unchanged when compared to model 3, as do the effects of the remaining network controls. The effects of the exogenous control variables are similarly robust, with a few exceptions. The negative effect

of COA ( $\beta = -0.85, p < 0.001$ ) increases in significance to the 0.1%-level. Similarly, the effect of gender ( $\beta = 1.32, p < 0.05$ ) again becomes significant while the formerly significant effect of team-nationality ( $\beta = 3.53$ ) becomes insignificant. The main effects of the PSM sub-dimensions of the formation of leadership ties similarly remain robust when compared to the preceding model, with two exceptions: Both the effect of SS on the formation of outgoing leadership ties ( $\beta = -2.89$ ) and the effect of CPV on the formation of incoming leadership ties ( $\beta = 0.11$ ) become insignificant. The direct effects of the two moderating variables remain largely unchanged, as only the direct effect of perceived ORT ( $\beta = -0.87, p < 0.05$ ) suffers a loss in significance to the 5%-level. The AIC (792.19) and BIC (867.93) values of model 4 indicate a slight improvement of relative model fit when compared to the preceding model.

Figure 4 shows an illustration of the moderating effect of team-level PSM on the relationship between APP and the display of incoming leadership ties. Again, both the effect graph and the 95% confidence interval display exclusively negative moderating effects, indicating significance. All remaining illustrations of the moderating effects of team-level PSM can be found in the Appendix (Appendix 3).

**Figure 4.**

*Illustration of the Moderating Effect of Team-level PSM on the Relationship between APP and the Development of Incoming Leadership Ties.*

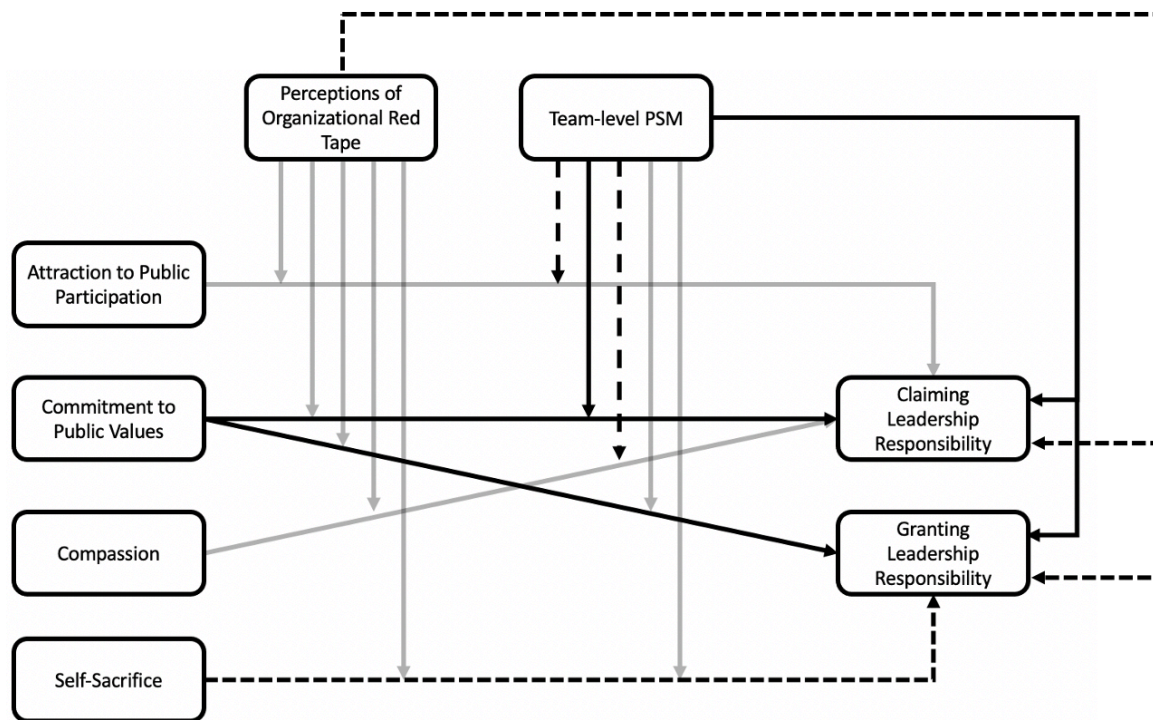


*Notes: black line = effect graph, grey cone = 95% confidence interval, own computation*



In summary, the analysis of the collected data yielded mixed results with regards to the conceptual model: Firstly, the effect of PSM on displays of shared leadership behavior varies considerably across the four PSM sub-dimensions. Contrary to the proposed framework, both APP and COM demonstrated no significant effect on displays of incoming leadership ties, failing to support both Hypothesis 1 and 3. Surprisingly, SS showed a negative and even partially significant effect on displays of outgoing leadership ties, partially contradicting Hypothesis 4. Only CPV demonstrated the hypothesized relationships, showing significant and positive effects on both sets of shared leadership behavior, thus providing support for Hypotheses 2a and 2b. Regarding the moderating hypotheses, results are similarly mixed: While no significant moderating effects in support of Hypothesis 5 were found for perceived ORT, it demonstrated a direct, negative and strongly significant effect on shared leadership behavior across all models, warranting further discussion in section 5.1. Regarding the moderating effect of team-level PSM, results again vary considerably across the four sub-dimensions of PSM: Team-levels PSM was found to negatively enforce the main effects of both APP and COM on displays of incoming leadership ties, partially contradicting Hypothesis 6. Furthermore, both the relationships between CPV and displays of incoming leadership ties on the one hand and SS and displays of outgoing leadership ties on the other hands were not significantly affected by team-level PSM. Only the relationship between CPV and displays of incoming leadership ties was significantly and positively moderated by team-level PSM, providing partial support for Hypothesis 6. Beyond its moderating effect, team-level PSM showed a direct and significantly positive effect on displays of shared leadership behavior, warranting further discussion in section 5.1. A visual summary of the estimation results can be found in Figure 5.

**Figure 5.**  
*Visualization of Estimation Results*



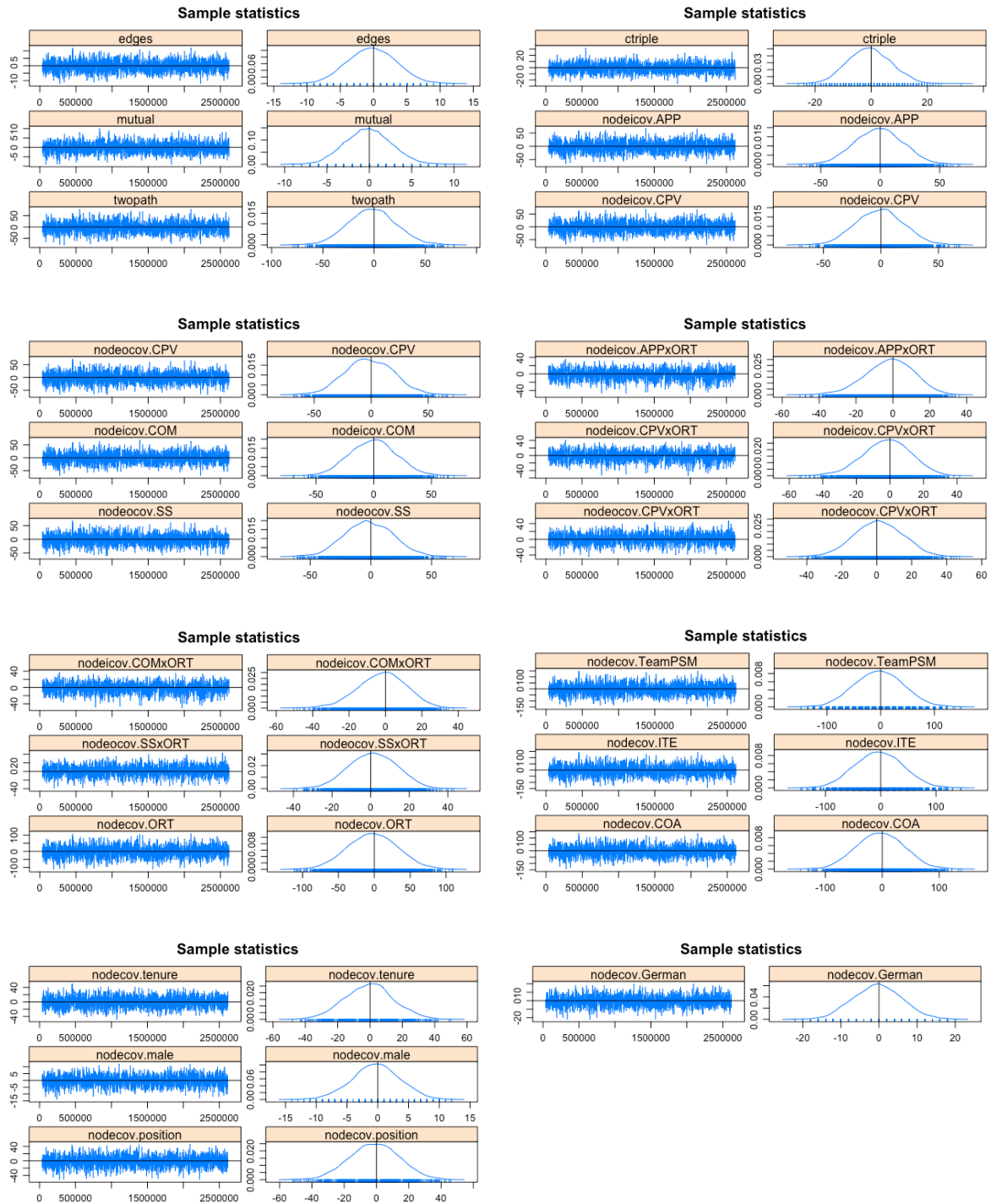
*Notes: Grey arrows = no sufficiently significant effect, full black arrows = significant positive effect, dotted black arrows = significant negative effect, own visualization*

#### 4.2 Goodness-of-fit (GOF) and MCMC Diagnostics

To assess how well the estimated models reflect the collected data, the two-stage goodness-of-fit assessment method described in (Harris, 2013) is used. In the first step, MCMC diagnostics are used to check for model degeneracy. Degenerate models may be estimated due to poor specification or estimation, potentially resulting in unrealistic or uninterpretable models (Lusher et al., 2013). The statnet package in R-Studio provides both a graphical and a numerical indication of model degeneracy (Handcock et al., 2003). For the latter, model degeneracy is present if the overall p-value of an estimated model approaches significance. As none of the estimated models show significant p-values (see Table 9), we can assume that none suffer from degeneracy. Regarding the graphical representation of model degeneracy, Figure 6 shows the individual MCMC diagnostics for each of the variables in Model 3.

For each variable, the graph on the right side should resemble a normal distribution. As this is roughly the case for all included variables, we can rule out individual degeneracy for each of the included variables in the model. The same graphical output for Model 4 demonstrating similar results can be found in the Appendix (Appendix 4).

**Figure 6.**  
*MCMC Diagnostics for Model 3*



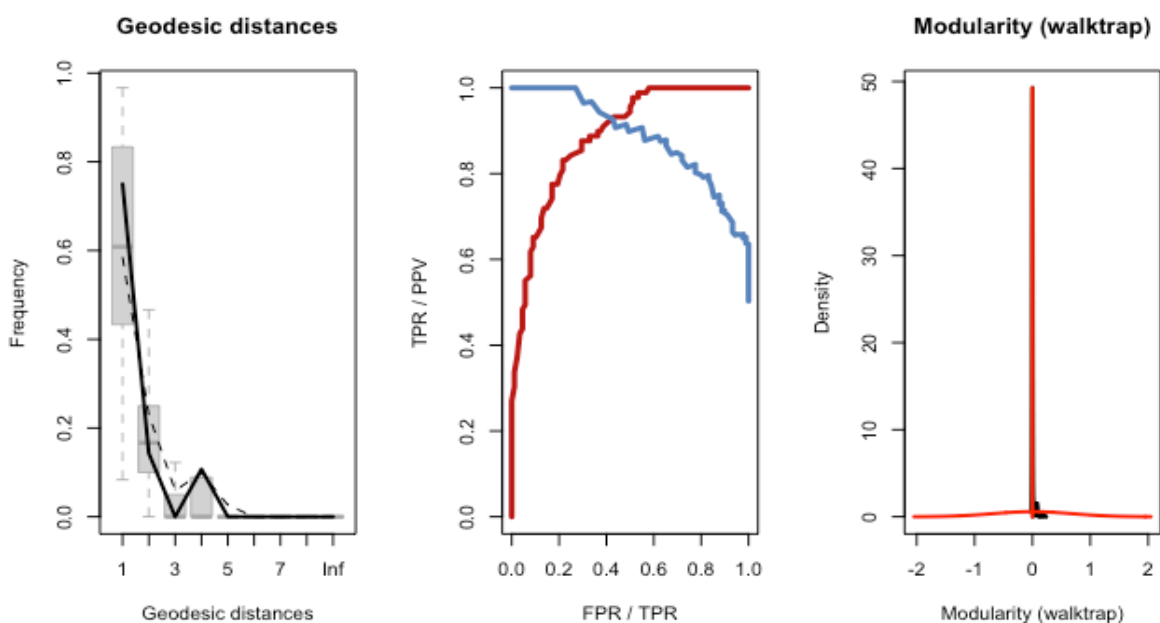
*Note: Diagnostics are conducted for each effect-term in the model, order mirrors the order of effect terms in Model 3, Visualized using statnet suite in R studio*

In the second step, we assess the goodness-of-fit for each of the five estimated models, in order to rule out any miss-specification. For this purpose, several networks are simulated and compared against the estimated model specification. The statnet package in R-Studio provides

graphical representations of the goodness-of-fit analysis for interpretation. The provided confidence intervals can be used to determine whether the observed and simulated measures come from the same distribution (Harris, 2013). Generally, the black line, indicating the observed value, should be at least within the grey boxes, indicating the 95% confidence intervals for the represented network characteristics (Harris, 2013). Ideally however, the black solid line moves from the center of each of the grey boxes to the next (Harris, 2013). Figure 7, a visual analysis of the goodness-of-fit diagnostics of Model 3, reveals that, while not ideal, model fit is generally satisfactory for Model 3. This indicates that the estimated models don't deviate too far from a range of models simulated from the same data, therefor capturing the data in a satisfactory way. The same applies to all remaining models. The relevant visualizations for Models 0, 1, 2 and 4 can be found in the Appendix (Appendix 5). According to the AIC and BIC values calculated for each model, Model 0 shows the greatest model fit among the estimated models, closely followed by Model 4. Both values account for the “overestimation” of models caused by the inclusion of a large number of variables (Morris et al., 2014), which is why the values worsen with rising model complexity. As overestimation is ruled out by the traditional goodness-of-fit measure, Model 4 can be considered the best fitting model.

**Figure 7.**

*Goodness-of-Fit Analysis for Model 3 and Model 4.*



*Notes: Visualized using statnet suite in R-studio*

### 3. Discussion

#### 5.1 Summary

The purpose of this thesis was to investigate whether the conditions of public sector organizations support or suppress the emergence of shared leadership behavior in teams. Specifically, its purpose was to investigate the extent to which PSM has a positive relationship with shared leadership and which role employees' perceptions of ORT and the composition of the team play therein. To this end, a theoretical model based on adaptive leadership theory and a large body of contemporary literature was presented, culminating in the formulation of 6 Hypotheses. These were then tested using a novel social network approach, based on survey data collected in both German and Dutch public universities.

To answer the question of whether PSM has a positive effect on shared leadership, Kim et al.'s (2013) four-dimensional conceptualization of PSM was applied and 4 Hypotheses were formulated accordingly. The resulting analysis showed that the effect of PSM on displays of shared leadership behavior significantly varies across its sub-dimensions. Hypothesis 1, stating that APP positively affects the formation of incoming leadership ties, was rejected as the effect was insignificant and even slightly negative across all estimated models. This indicates that an employee's APP has no effect on their tendency to claim leadership responsibility or their team's tendency to perceive them as a leader. These results are likely a product of the context in which this study was conducted: Previous studies have shown that individuals with high levels of APP are attracted to very service-oriented positions, such as the medical service or non-profits, which allow them to observe the added value of their efforts directly (Ballart & Rico, 2018; Kim & Vandenabeele, 2010). In research-teams, which make up the bulk of the sample in this study, this service-orientation is not as strong as it would be in street-level bureaucracy (Hupe & Hill, 2007). Consequently, individuals with high levels of APP may not see a reason for direct participation or personal leadership in a process where the impact of this participation is not entirely visible (Ballart & Rico, 2018).

Conversely, Hypotheses 2a and 2b, stating that CPV positively affects displays of incoming- and outgoing leadership ties respectively, were confirmed as the effects were positive and significant across all models except for model 4. This suggests that individuals with high levels of CPV have a higher tendency to both claim and grant leadership responsibility, supporting the theoretical framework outlined in Section 2.4 and suggesting CPV as a notable predictor of shared leadership behavior.

Hypothesis 3, stating that COM positively affects displays of incoming leadership ties, was rejected as the effects of COM were insignificant and even negative across all models. This

suggests that COM does not affect an employee's tendency to claim/ be perceived as a source of leadership. Two potential explanations for these results offer themselves: Firstly, the nature of the sample may again have affected results: Prior research has shown that individuals with higher levels of COM tend to favor service-oriented organizations and teams, where they are able to directly interact with the beneficiaries of their efforts (Ballart & Rico, 2018; Kjeldsen & Jacobsen, 2013). As the sample of this study mainly consists of research groups and a group of coordinators of a lecture yet to be held, this direct contact with the beneficiaries of one's work is fairly limited. As such, individuals with high levels of COM may not see a reason to claim leadership responsibility for a task that does not provide any immediately observable benefits to the people they are compassionate towards. Secondly, based on the nature of the sample the relationship between COM and shared leadership may have been mischaracterized in the theoretical framework. Individuals with high levels of COM, who cannot directly observe the effects their work has on its beneficiaries, may redirect their compassion towards their team members. As such they may be more likely to grant leadership responsibility to their peers out of respect for their viewpoints. Future research should reinvestigate the relationship between COM and shared leadership behavior more broadly, testing for both incoming and outgoing leadership ties using a sample of teams from more service-oriented public organizations, such as child-protective services or the medical sector.

Lastly, hypothesis 4, stating that SS positively affects displays of outgoing leadership ties, was rejected as the effect of SS was negative and in model 2 and 3, even significantly so. This indicates that SS negatively affects the degree to which members of a team form outgoing leadership ties, contradicting the theoretical framework of this study. While these results are surprising, a potential explanation for this negative effect exist: As the observed results indicate a lower likelihood for external perceptions of leadership with increasing levels of SS, the proposed theoretical framework may again have mischaracterized the relationship between SS and shared leadership behavior. Past research on the dimensions of PSM has shown that SS is associated with the individual's willingness to take on additional responsibilities without compensation, in an effort to facilitate and improve the provision of public service (Kim et al., 2013; Wright & Grant, 2010). For example, general physicians with high levels of SS were shown to undertake more home-visits to patients than those with lower levels of SS (Jensen & Vestergaard, 2017). In traditional public organizations, leadership responsibility is associated with an increase in bureaucratic burdens and perceptions of ORT (Kaufmann et al., 2019). Accordingly, the descriptive statistics of this study show that a team-member's managerial responsibility and perceived ORT are significantly and positively correlated ( $r = 0.58, p < 0.01$ ), hinting at a potential relationship between the two. The teams in this sample all demonstrate a

high propensity for shared leadership, leaving those team members with formal managerial influence with mainly administrative responsibilities. Consequently, instead of granting leadership responsibility more frequently, individuals with high levels of SS may be more likely to claim leadership responsibility in hopes of providing higher quality public service. They may do so at the cost of enduring greater bureaucratic burdens and personal responsibility if their influence is formalized, “taking the fall” for their team by dealing with the negative aspects of team management, while the team as a whole works towards the creation of public value. Future research should again examine the relationship between SS and shared leadership more broadly, investigating the impact of SS on the formation of both incoming and outgoing leadership ties.

To answer the second sub-question of how perceived ORT and team composition affect the relationship between the PSM sub-dimensions and shared leadership behavior, two moderating hypotheses (Hypotheses 5 & 6) were formulated. Hypothesis 5, stating that perceived ORT negatively moderates the relationship between the PSM sub-dimensions and displays of shared leadership behavior, was rejected as none of the moderating effects were significant at the 5%-level. The surprising positive moderating effect of perceived ORT on the relationship between SS and the display of outgoing leadership ties only barely achieved significance at the 10%-level, which most likely makes it attributable to the small sample. However, perceived ORT was found to have a direct and significantly negative effect on the formation of leadership ties across all models. These results indicate that the proposed theoretical framework may have mischaracterized the effect of perceived ORT, which was shown to generally inhibit the emergence of shared leadership in the sample regardless of the individual’s levels of PSM. This general effect of perceived ORT is supported by past research, which demonstrated that perceived ORT negatively affects individual’s agency, commitment and tendency for organizational citizenship behavior (Pandey et al., 2007; Quratulain & Khan, 2015; Van Loon, 2017). As overall levels of perceived ORT in the sample were relatively low (median = 3,5), the observed effects can be considered particularly strong, suggesting perceived ORT as a major inhibitor of shared leadership behavior. Future research should investigate the direct effect of perceived ORT more closely, by analyzing its separate effects on both types of shared leadership behavior in a sample with higher variance in perceived ORT.

Hypothesis 6, stating that team-level PSM positively moderates the relationship between the PSM sub-dimensions and displays of shared leadership behavior, was partially rejected: As both the relationship between APP and Incoming leadership ties as well as the relationship between COM and Incoming leadership ties were significantly and negatively moderated by the overall level of PSM in the team, results suggest that both direct effects grow

increasingly negative as team-level PSM rises. Conversely, team-level PSM had a significantly positive moderating effect on the relationship between CPV and the formation of incoming leadership ties, indicating that individuals with high levels of CPV are more likely to claim leadership responsibility if their team is likewise public service motivated and providing some support for Hypothesis 6. These results confirm prior conceptions of PSM as a multi-dimensional concept (Wright & Grant, 2010), as the relationships of all PSM sub-dimensions are varyingly affected by overall PSM.

The negative moderation of the effects of both APP and COM on the display of incoming leadership ties may again be tied to the nature of the sample as well as the nature of the effects that the PSM sub-dimensions have on shared leadership behavior: As the sample was drawn from teams with low levels of service-orientation in their tasks, individuals with high levels of APP and COM looking for immediately observable impacts to their actions are already unlikely to perceive any advantage to claiming leadership responsibility (e.g. Ballart & Rico, 2018; Clerkin & Cogburn, 2012; Kjeldsen & Jacobsen, 2013). The results of this study demonstrated this fact through the insignificance of all effects on incoming leadership ties associated with either sub-dimension (see Table 9). With increasing team-level PSM, levels of APP and COM in the team similarly increase, making it hard for any individuals with these attributes to stand out from their peers and be perceived as a leader thereafter. However, the relationship between CPV and the display of incoming leadership ties seems to be dependent on exactly this homogeneity: Theories on leader prototypicality suggest that an individual is more likely to be perceived as a leader if they are “of the group and for the group” (Steffens et al., 2015, p.180), sharing the values of their team. With rising team-level PSM, levels of CPV among the team members similarly rise, creating shared values in the team and facilitating the emergence of individual with high levels of CPV as leaders. Interestingly, the effect of CPV on outgoing leadership ties is consistently positive and significant across all models, without being significantly moderated by the composition of the team. This suggests that individuals with high levels of CPV are prone to grant leadership responsibility more willingly regardless of the team they are in, while they are only seen as sources of leadership themselves if the team shares their motivation for public service.

Beyond the testing of the proposed hypotheses, several other interesting effects are revealed in the analysis. The consistently significant and positive effect of team-level PSM on the formation of leadership ties indicates, that members of teams with high average levels of PSM are significantly more likely to engage in shared leadership behavior than those in teams with low average levels of PSM. Combined with the results of Hypotheses 2 and 6, this indicates that value-based team composition plays an important role in the shared leadership process.



Additionally, it shows that CPV takes a preeminent position among the PSM sub-dimensions when it comes to shared leadership: As overall PSM increases, so do average values of all its sub-dimensions, including those that negatively affect the shared leadership process. SS was shown to negatively affect displays of outgoing leadership ties and rising team-level PSM was shown to negatively moderate the effects of APP and COM on displays of incoming leadership ties. Yet despite this, rising levels of team-level PSM show a consistently strong and significantly positive effect on shared leadership behavior. This indicates that the positive effects of CPV outweigh the effects of all other sub-dimensions as team-level PSM increases, suggesting CPV as a driving factor in the relationship between PSM and shared leadership.

Lastly, the results of this study contradict existing research on shared leadership regarding its organizational antecedents of ITE and COA. For the former, no significant effect on the formation of leadership ties was found, even though several studies have previously identified ITE as an important predictor of shared leadership (e.g. Carson et al., 2007). A possible explanation for the effect's insignificance could be the lacking variance of ITE in the sample, which at just 0.24 may have been insufficient to account for any effects. Regarding the effect of COA, results showed a significant negative effect across the last three models, suggesting that supportive leadership behavior by external managers negatively affects the formation of leadership ties and contradicting the prevailing consensus in the shared leadership literature (e.g. Carson et al., 2007; Jackson, 2000). These results are potentially explained through the public context of this study: Previous research has shown that employees in the historically hierarchical public sector tend to retain mental models of traditional top-down leadership (Currie et al., 2011), meaning that individuals in the public sector are used to receiving leadership from one source alone, even if shared leadership is officially encouraged. While COA was shown to be positively associated with shared leadership, its associated measurement instrument only measures the supportiveness of the relationship between a leader and their team, without being directly tied to sharing leadership responsibility (Carson et al., 2007). Consequently, if mental models of top-down leadership still prevail in the public sector, an employee's positive perceptions of external coaching may simply indicate that they perceive their external manager as a strong source of leadership and guidance, which in turn stifles their perceptions of leadership within the team. To test this assumption, future research on shared leadership in a public context should control for these prevailing mental models of hierarchical leadership. Additionally, future research should apply alternative measures to account for the impact of external management of the shared leadership process in public organizations. One possible alternative is the concept of empowering leadership, which specifically measures a leader's support for the increased agency and leadership of their followers (Amundsen &

Martinsen, 2015; Arnold et al., 2000). The concept has been shown to positively affect the emergence of shared leadership (e.g. Fausing et al., 2015) and it has been successfully applied in a public sector context with regards to distributed leadership (Günzel-Jensen et al., 2018)

## **5.2 Scientific Contribution**

This thesis adds to the contemporary literature in several ways. Firstly, it contributes to the ongoing contextualization of HRM research in public organizations (Knies et al., 2018; O'Toole & Meier, 2015), by being the one of the first to empirically investigate the established concept of shared leadership in a public sector context. The resulting study showed that the specific conditions of the public sector, namely PSM and perceived ORT (Boyne, 2002; Buelens & Van den Broeck, 2007) have a significant and thus far uninvestigated impact on the emergence of shared leadership. Confirming prior conceptions of PSM as a multi-dimensional construct (Perry & Wise, 1990; Wright, 2008; Wright & Grant, 2010), results indicate that the sub-dimensions of PSM affect the display of shared leadership separately. Therein, CPV seems to be a particularly strong predictor of both leadership ambitions and preferences in public sector teams. These findings align with prior research suggesting that a shared purpose (Carson et al., 2007) shared identity (Hiller et al., 2006) and shared values (Hogg & Van Knippenberg, 2003) form a strong basis for a team to develop shared leadership.

In contrast to the proposed theoretical framework, the remaining sub-dimensions of PSM (APP, COM, SS) seemed to have partially significant negative effects on the display of shared leadership behavior. These results may indicate aspects of PSM as a hindrance to the emergence of shared leadership, adding to the literature on the dark side of PSM and its potential negative effects (e.g. Giauque et al., 2012). More likely however, they may be explained through the lack of service-orientation in the teams included in this study's sample. Prior research has shown that individuals with high levels of the affected PSM sub-dimensions prefer work in service-oriented and non-profit organizations with close connections to their beneficiaries and more altruistic emotional connotations (Clerkin & Cogburn, 2012; Kjeldsen & Jacobsen, 2013). Consequently, the specific nature of the sample may have affected results. To account for this effect, future studies on the connection between PSM and shared leadership should both expand and diversify the sample, including a wider range of more service-oriented public organizations such as hospitals or primary/ secondary education.

Aside from the effects of PSM, perceived ORT was shown to have a significantly negative and direct effect on displays of shared leadership behavior in the investigated sample. While these results failed to confirm the proposed moderating effect, they add to the

understanding of shared leadership in a public context by proposing ORT as a significant impediment to the shared leadership process. As such this thesis adds to both the growing list of negative outcomes associated with perceptions of ORT (Brewer & Walker, 2010; Van Loon, 2017) and the literature on the antecedents and obstacles to shared leadership (Fausing et al., 2015; Serban & Roberts, 2016).

Beyond the contextualization of HRM research, this thesis also adds to the understanding of how team composition affects the shared leadership process in teams (Hoch & Dulebohn, 2017), by investigating the concept using a novel social network approach. Teams with higher levels of PSM were shown to have a significantly higher propensity to display shared leadership than those with lower levels. While previous research has been debating whether homogeneity strengthens or weakens the emergence of shared leadership (Cox et al., 2003; Hoch, 2014), these results suggest that value-based homogeneity positively affects the display of shared leadership behavior. Further support for this interpretation can be found in the positive and significant moderating effect of team-level PSM on the relationship between CPV and the display of incoming leadership ties, which suggests that individuals are more likely to emerge as leaders in teams which share their values. However, this is only the case for value-based homogeneity, as the remaining moderating effects of team-level PSM showed mixed and even negative results. When it comes to shared leadership or leader emergence in the public sector in general, commitment to the values of public service seems to be a significant predictor, even more so than two of the most established predictors of shared leadership in ITE and COA. Future research should attempt to verify this assumption through more expansive, longitudinal studies

Lastly, this thesis provides a methodological contribution to the research on shared leadership by applying a novel social network approach. Specifically, it expands on this reliable methodology by being one of the first to apply it in a public sector context (Wu et al., 2020) and collecting initial data on the emergence of shared leadership in public organizations using this reliable methodology. However, the use of this approach and the difficulties in collecting a sufficiently large sample associated with it were in part to blame for the small sample size of this study. Future research should expand the use of this methodology in a public context by increasing the size of the used samples and thus adding to the reliable data on shared leadership collected using social network analysis.

### 5.3 Practical implications

The results found in this study yield several implications for practice. Firstly, the level of shared leadership found in the sample of this study far exceed the average of those found in private sector teams. Even though some variance in leadership density was observed across the teams, all exceeded the average level of 0.22 identified in private organizations by D’Innocenzo et al. (2016) in their meta-analysis. This indicates that the teams in this sample, on average, are very open to the concept of sharing leadership responsibility outside formal hierarchies and that teams in the public education sector seem less tied to traditional conceptions of leadership than previously assumed. Consequently, employees are likely to respond positively to more widespread encouragement of shared leadership behavior across organizations in public education, especially considering the previously mentioned rise in employee’s demands to do so (Pearce, 2004; Pearce et al., 2018). In practice, this encouragement of shared leadership could be achieved through a switch in the organizational management of public universities towards empowering leadership (Fausing et al., 2015). This includes placing a greater focus on the self-efficacy of employees, sharing crucial information freely with them and strengthening their individual agency (Amundsen & Martinsen, 2015).

The collected data further indicates that perceived ORT negatively affects the tendency of employees to engage in shared leadership behavior. As such, organizations seeking to establish shared leadership teams are encouraged to reduce unnecessary bureaucratic burdens and dismantle obsolete administrative processes through continuous procedural audits (George et al., 2021; Giaque et al., 2012). This will further demonstrate the organization’s support for the wishes of their staff, while freeing employees to engage in shared leadership behavior with the approval of their superiors and without the fear of sanctions. To compliment these organizational efforts, work must also be done within the team itself: Previous research has shown that prevailing mental models of traditional hierarchies and leadership through seniority still represent obstacles to shared leadership on the team-level. Consequently, efforts must be undertaken to flatten perceptions hierarchies within the teams by, for example, deformatizing their work environment and dress code.

Lastly, this thesis suggests a number of changes in both recruitment and team management, which could increase the propensity for shared leadership in organizations: Results indicate that the emergence of shared leadership behavior is positively affected by the individual team member’s commitment to the public values of equity, democracy, accountability and duty. Consequently, if organizational leaders hope to establish teams with a high propensity for shared leadership, recruiting prospects with CPV is just as important as

reinforcing these values in existing staff (Pearce et al., 2018). Additionally, emergence of shared leadership behavior in public sector teams seems to be strongly connected to their value-based homogeneity: Individuals with high levels of CPV are more likely to emerge as leaders if their peers share their motivation for public service, while teams with high average levels of PSM show a greater propensity for shared leadership overall. Public organizations seeking to establish shared leadership teams should subsequently be mindful of the composition of their teams and seek to establish and strengthen shared values within them. One way to achieve this could be reconnecting teams to the subject and societal consequences of their work through field trips or face-to-face meetings with the beneficiaries of their work (e.g. Liu et al., 2015).

#### **5.4 Limitations and Future Research**

In spite of its contributions to both theory and practice, this thesis has some limitations. Firstly, the sample utilized in this study was rather small. The limited timeframe of this project as well as the difficult process of acquiring willing teams of participants during the busy spring/summer period in academia resulted in a sufficient, but less than ideal final sample of 152 participants. While enough to compute the models deducted from the proposed theoretical framework, this small sample limited the possibility for more expansive models. For instance, the originally intended estimation of separate effects for each of the PSM sub-dimensions on both incoming and outgoing leadership ties became impossible as the increasingly complicated models became incomputable in R-studio. The small sample size further limited the inclusion of additional control variables, most notably a measure of leadership self-efficacy, one of the most important predictors of shared leadership behavior. Consequently, the small sample size limited model specification severely, reducing the validity of the estimated models as well as inhibiting the interpretation of results. In order to address these shortcomings, future research on shared leadership in the public sector should be conducted on larger samples, allowing for greater specification of models through additional network terms as well as control variables such as leadership self-efficacy or empowering leadership (Avolio et al., 1996; Fausing et al., 2015). That way, the results of this study can be verified while also allowing for the validity of previous assumptions on the antecedents of shared leadership to be tested in a public sector context.

Secondly, the sample used in this study represents a very specific set of public organizations in public universities, which limits the generalizability of results. As noted in section 5, the effects of the different PSM sub-dimensions are subject to change depending on the nature (e.g. degree of service-orientation) of the organization. Replicating this study in different organizations in the public sector such as the medical sector may thus yield different

results. Similarly, the sample only draws from organizations in two countries (i.e. Germany and the Netherlands), a difference which was shown to significantly affect the formation of leadership ties (see Section 4.2). This further limits the generalizability of results across national contexts. By diversifying samples with regards to the nature of the public organization as well as their national contexts, future research should account for organizational differences, such as level of service-orientation, while increasing the generalizability of results across different countries. The effects of the PSM sub-dimensions on the display of shared leadership behavior in particular may vary depending on the organization's level of service-orientation. By including, for example, public hospitals or organizations in primary/ secondary education, this imbalance in the sample could be addressed resulting in a more complete representation of the relationship between PSM and shared leadership.

Thirdly, some of the results of this study should be regarded with suspicion considering the high median values of some of the main variables in the sample: For instance, levels of PSM (median = 5.68) were extremely high across the sample. The positive effect of CPV on the display of incoming leadership ties seems to be fully dependent on the overall levels of PSM in the team which is why this high median value potentially created favorable conditions for the effect to emerge. Similarly, the median value of CPV in the sample was the highest of all PSM sub-dimensions at 6.25 on a scale of 7. While the variance of the variable was sufficiently high for the estimation of effects (Variance of CPV in the sample = 1.17), the sample barely contains any individuals with low levels of CPV against which those with high levels can be compared. This may have resulted in a skewing of results in favor of the estimated hypotheses. Even though the purpose of this study was to investigate the emergence of shared leadership in the public sector, where levels of PSM are on average higher than in other sectors, it is questionable whether its results can be replicated in a sample with a higher variance of overall PSM and its sub-dimensions. One way to address this low variance and validate the results of this study is through the use of comparative analyses between the public and the private sector. As levels of PSM in the private sector are generally lower than in the public sector, using teams from both sectors in a comparative analysis will increase the variance of PSM and allow for the results of this study to be verified.

In addition to the specific nature of the sample, the questionnaire used in this study may have had negative effects on its results. Conducting the survey through both an online-questionnaire and almost exclusively self-reported measures is connected to several biases (Diekmann, 2021). Kim et al.'s (2013) self-report PSM questionnaire in particular is subject to social-desirability bias due to the nature of the questions, potentially inflating PSM values in

the sample. Similarly, these methods of data-collection do not entail any guarantee that subjects answer the questions seriously or without any interference (Diekmann, 2021). However, as any alternative approach to the testing of the proposed hypotheses was not feasible, all questionnaires were chosen based on their validity and reliability in previous applications to reduce these biases.

Lastly, due to the cross-sectional nature of the conducted study, causal inference of the collected data is difficult (Diekmann, 2021). While some precautions were taken in the form of control variables and the use of a fixed-effects model, properly interpreting the causality of the results remains a challenge. Specifically, the estimated effects may indicate that the causality of the proposed relationships is reversed. For instance, greater levels of shared leadership in a team could potentially strengthen aspects of PSM due to the more direct engagement of employees. Similarly, engaging in shared leadership may increase perceptions of ORT as employees who engage in shared leadership may come in contact with ORT more frequently than those who do not. To clarify the causal direction of the discovered effects, longitudinal analyses of the development of shared leadership in the public sector are needed.

## **5.5 Conclusion**

The purpose of this paper, aside from the contextualization of the shared leadership concept, was to answer the research question of whether the conditions of the public sector strengthen or suppress the emergence of shared leadership. Specifically, it was tested whether PSM has a positive effect on displays of shared leadership behavior and to what degree this effect is moderated by perceived ORT and composition of the team with regards to overall PSM. Following a social network analysis on 4 teams of employees in Dutch and German public universities, it was found that ORT has a direct suppressive effect of displays of shared leadership, while the effect of PSM varies across its 4 sub-dimensions: CPV was found to be positively related to both sets of shared leadership behavior, while all remaining sub-dimensions of APP, COM and SS displayed insignificant or, in the case of the latter, negative effects. These effects are partially moderated by team-level PSM, which itself has a direct and positive effect on shared leadership behavior. These results indicate that a) perceived ORT impedes displays of shared leadership by employees, b) the effect of PSM on shared leadership differs for each of the concept's sub-dimensions, while being largely driven by CPV and c) value-based homogeneity of teams seems to be a predictor of shared leadership behavior in the public sector. In summary, it can be said that the conditions of the public sector both suppress and strengthen the emergence of shared leadership in teams.

Three important conclusions should be drawn from this thesis: 1) Employees in the public sector show no inherent predisposition against shared leadership practices which would prevent its implementation outright. On the contrary, many of the qualities that distinguish them from their private sector counterparts actually lead them to seek out more open leadership structures. Instead of an inherent obstacle, public sector employees should thus be considered both drivers and benefactors of any reforms towards shared leadership in public organizations. 2) The real obstacle for these reforms remains the public sector's rigid reliance on traditional hierarchies and overly bureaucratic processes. While the argument against ORT is far from novel, this study again demonstrated that even small-scale reforms on the team-level remain problematic until these structural issues are addressed. The fact that contemporary literature in the field of public administration still has to consider ORT a prevailing condition of public organizations is indicative of the lack of impactful reform over the last decades. 3) Lastly, the contextualization of research in the public sector is vital to any forthcoming reforms. This study showed that even concepts with a 30-year track-record in organizational research such as shared leadership may behave vastly different under public sector conditions. In order to inform organizational practice successfully, public administration research should focus on reevaluating established concepts and compiling best-practices with proven empirical track-records in public organizations.



# APPENDIX

## Appendix 1: Full Questionnaire

<b>Variable</b>	<b>Items</b>
<b>Gender</b>	What is your gender? 1. male 2. female 3. diverse
<b>Tenure</b>	Since when have you been a member of your team? Please answer using the following format (YYYY).
<b>Position</b>	Do you have a managerial position at this moment? 1. no 2. yes, it is a part of my job 3. yes, it is my main task
<b>Public Service Motivation</b>	Please evaluate the following statements with regards to your personal beliefs:
Original Scale by Kim et al. (2013)	<ol style="list-style-type: none"><li>1. I admire people who initiate or are involved in activities to aid my community</li><li>2. It is important to contribute to activities that tackle social problems</li><li>3. meaningful public service is very important to me</li><li>4. it is important for me to contribute to the common good</li><li>5. I think equal opportunities for citizens are very important</li><li>6. it is important that citizens can rely on the continuous provision of public service</li><li>7. it is fundamental that the interests of future generations are taken into account when developing public policies</li><li>8. to act ethically is essential for public servants</li><li>9. I feel sympathetic to the plight of the underprivileged</li><li>10. I emphasize with other people who face difficulties</li><li>11. I get very upset when I see other people being treated unfairly</li><li>12. considering the welfare of others is very important</li><li>13. I am prepared to make sacrifices for the good of society</li><li>14. I believe in putting civic duty before self</li><li>15. I am willing to risk personal loss to help society</li><li>16. I would agree to a good plan to make a better life for the poor, even if it costs me money</li></ol>

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**Organizational  
Red Tape**

Please evaluate the following statements with regards to your own work:

Original scale by  
Loon et al. (2016)

The rules with which I have to comply in my job...

1. ...have a clear function for my job activities (reversed)
2. ...contribute to the goal of my job activities (reversed)
3. ...help me do my job well (reversed)
4. ...cause much pressure at work
5. ...take a lot of time to comply with
6. ...cause much delay

**Shared  
Leadership**

To what extent do you rely on this individual for leadership?

Original scale by  
Carson et al. (2007)

1. [list of all team members included in one network]

**Internal Team  
Environment**

Please evaluate the following statements with regards to your team:

Original scale by  
Carson et al. (2007)

1. the members of my team spent time discussing our team's purpose, goals, and expectations for the project
2. the members of my team discuss our team's main tasks and objectives to ensure that we have a fair understanding
3. the members of my team devise action plans and time schedules that allow for meeting our team's goals
4. the members of my team talk enthusiastically about our team's progress
5. the members of my team recognize each other's accomplishments and hard work
6. the members of my team give encouragement to team members who seem frustrated
7. people in this team are encouraged to speak up to test assumptions about issues under discussion
8. as a member of this team, I have a real say in how this team carries out its work
9. everyone on this team has a chance to participate and provide input
10. my team supports everyone actively participating in decision making

**Coaching**

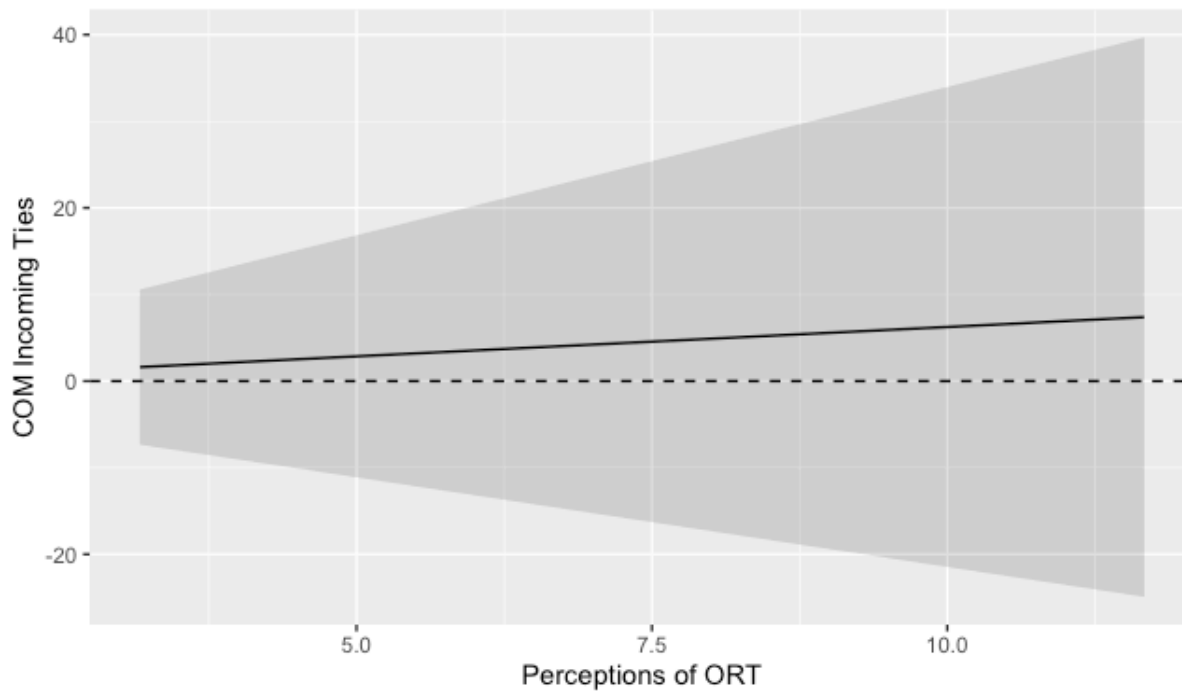
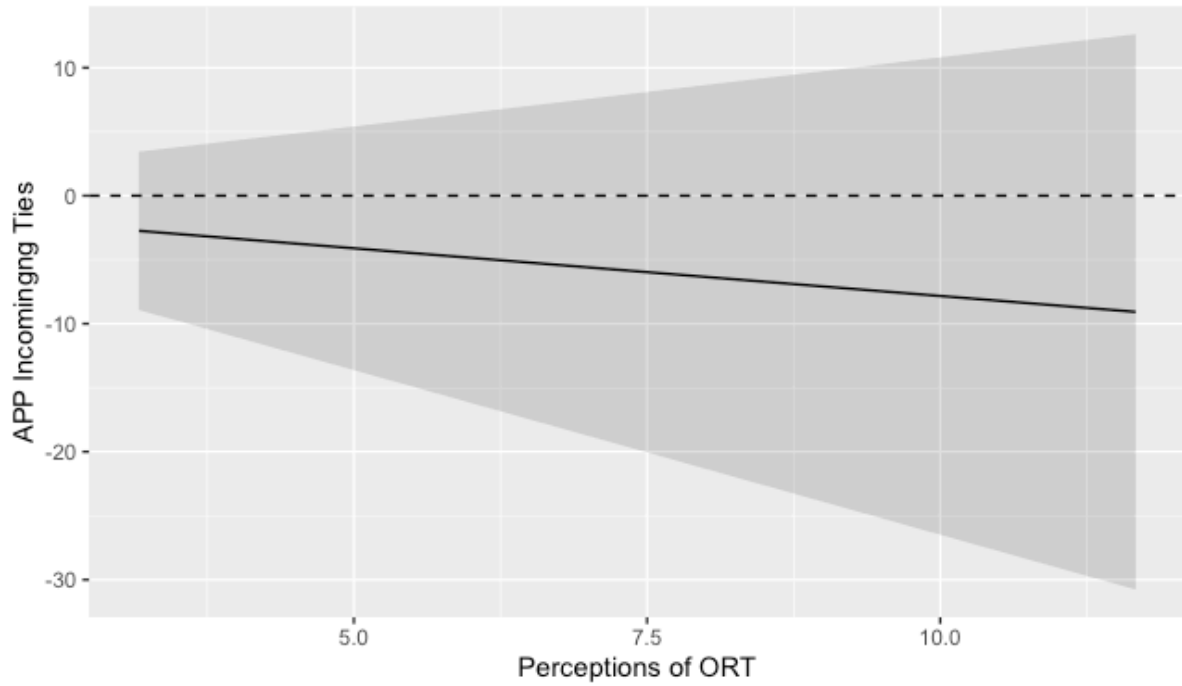
Please evaluate the following statements with regards to your team:

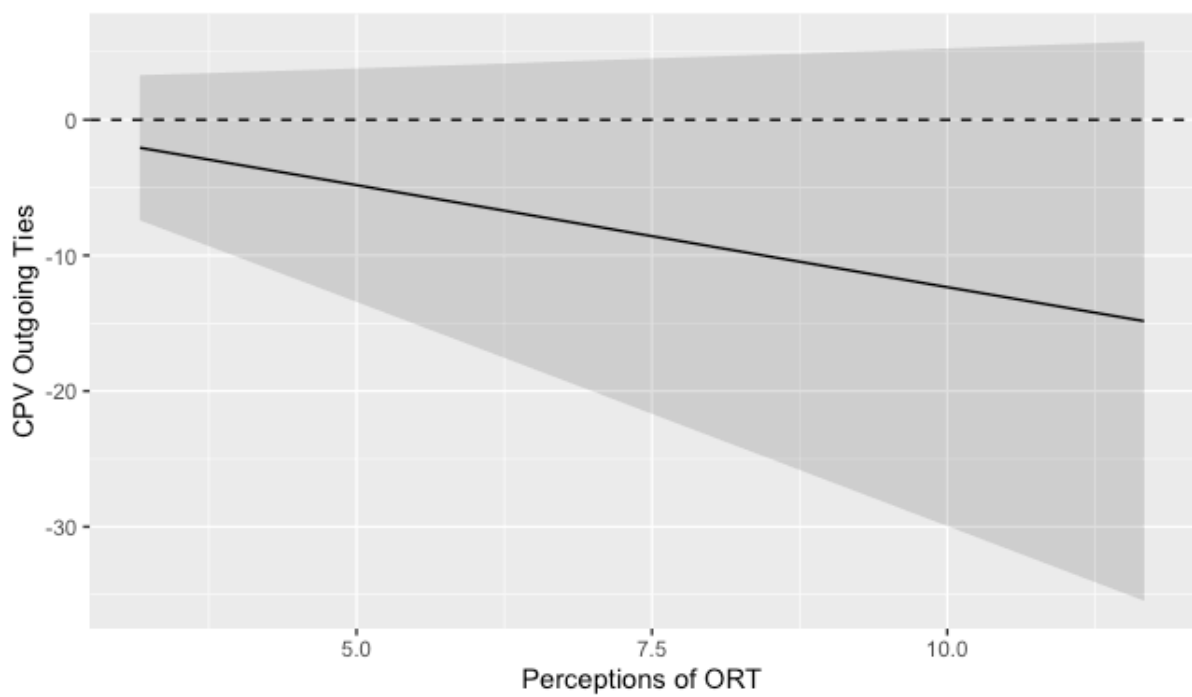
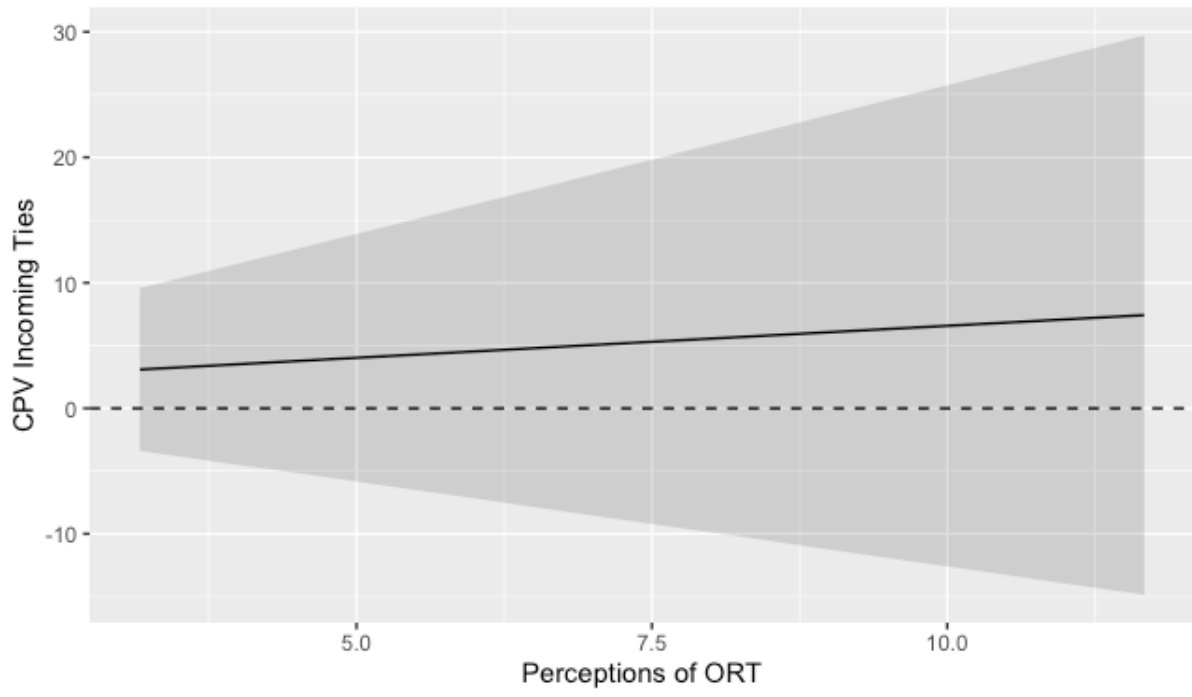
Original scale by  
Carson et al. (2007)

Our external manager...

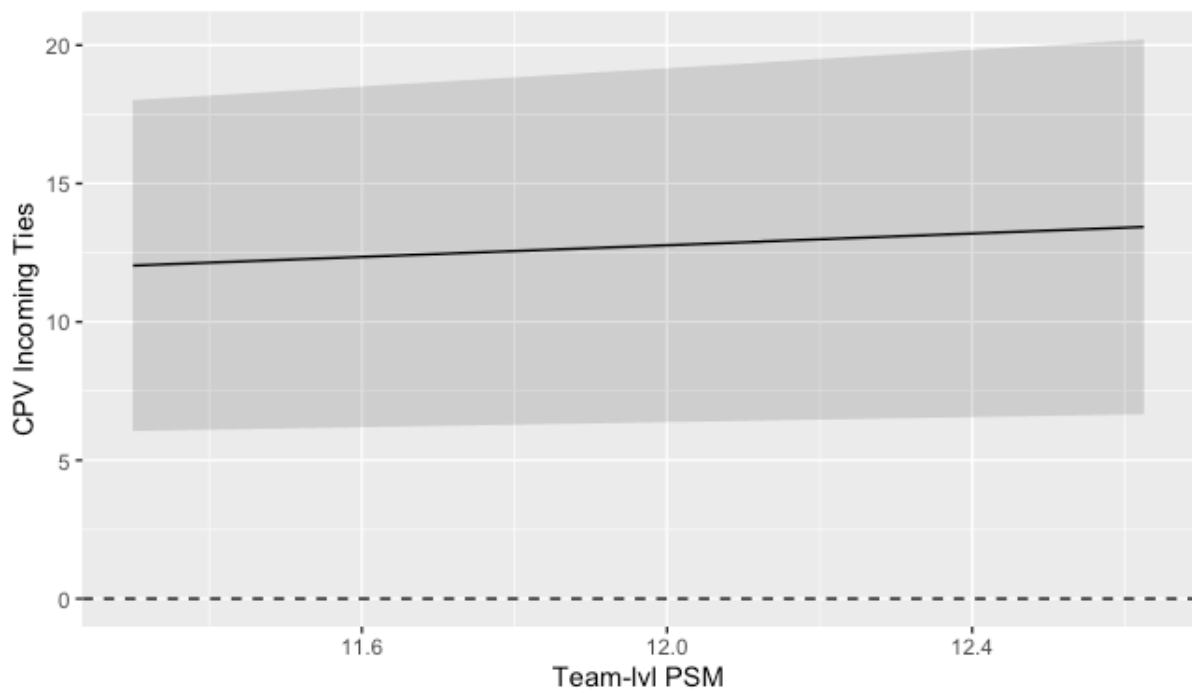
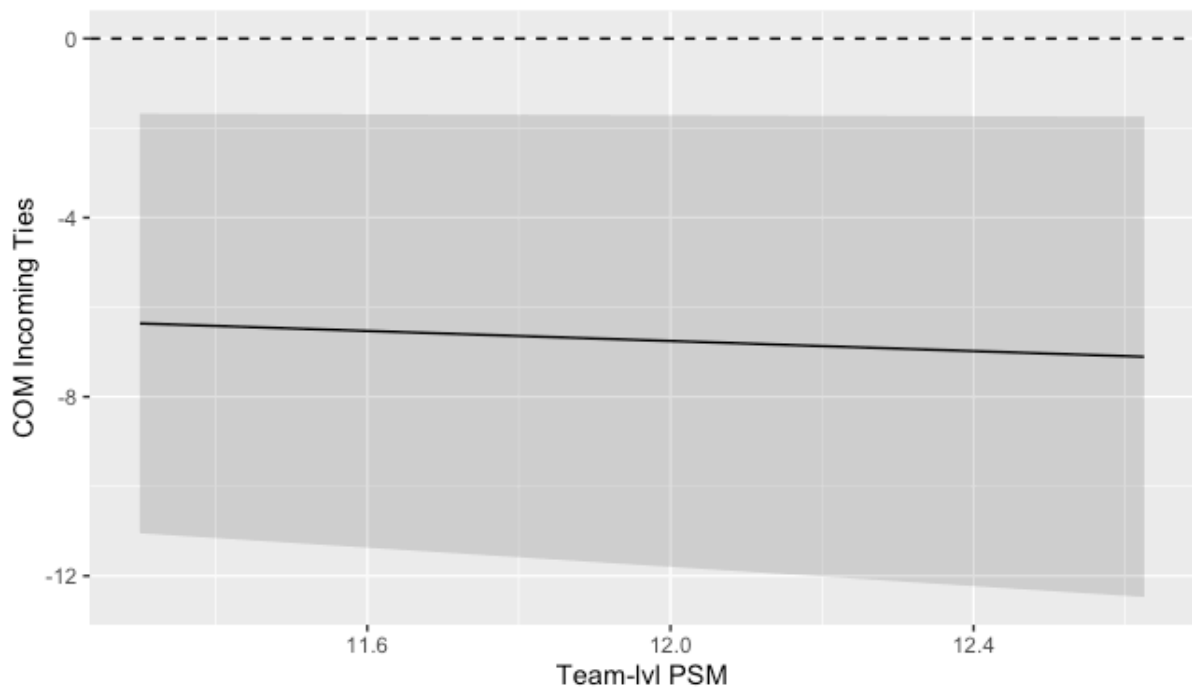
1. ...expresses his/her confidence in the capabilities of our team
  2. ...effectively motivates and guides our team towards accomplishing challenging goals for this project
  3. ...is sensitive to the needs of our team and tries to help us however he/ she can
-

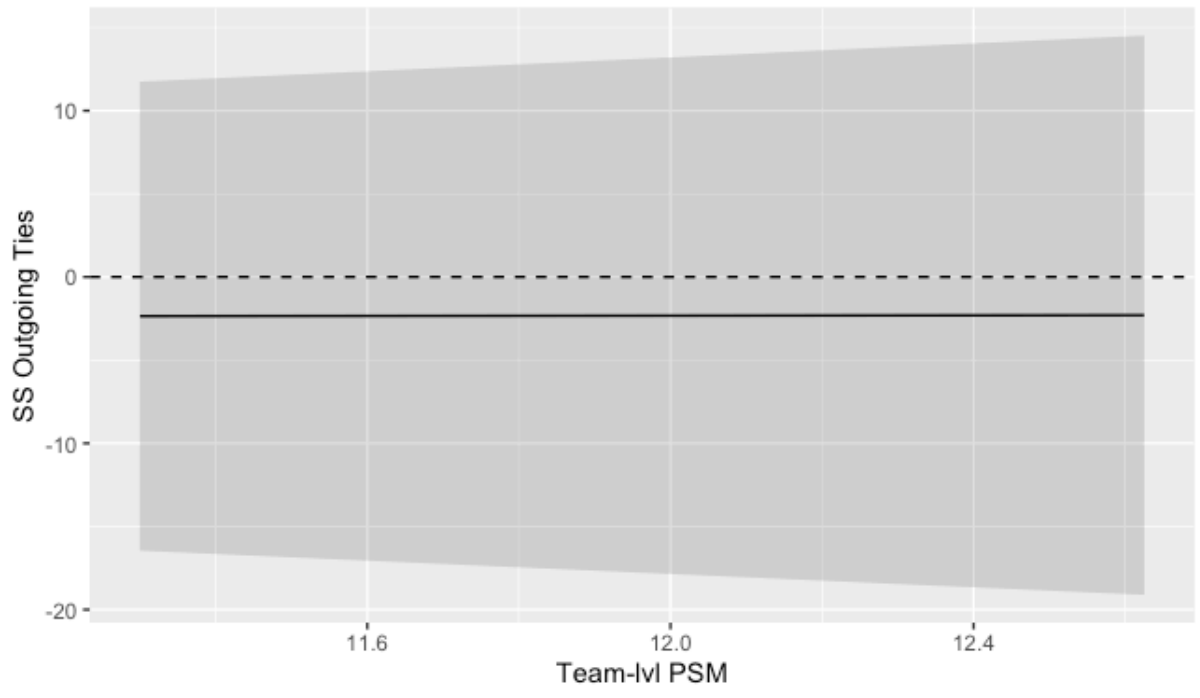
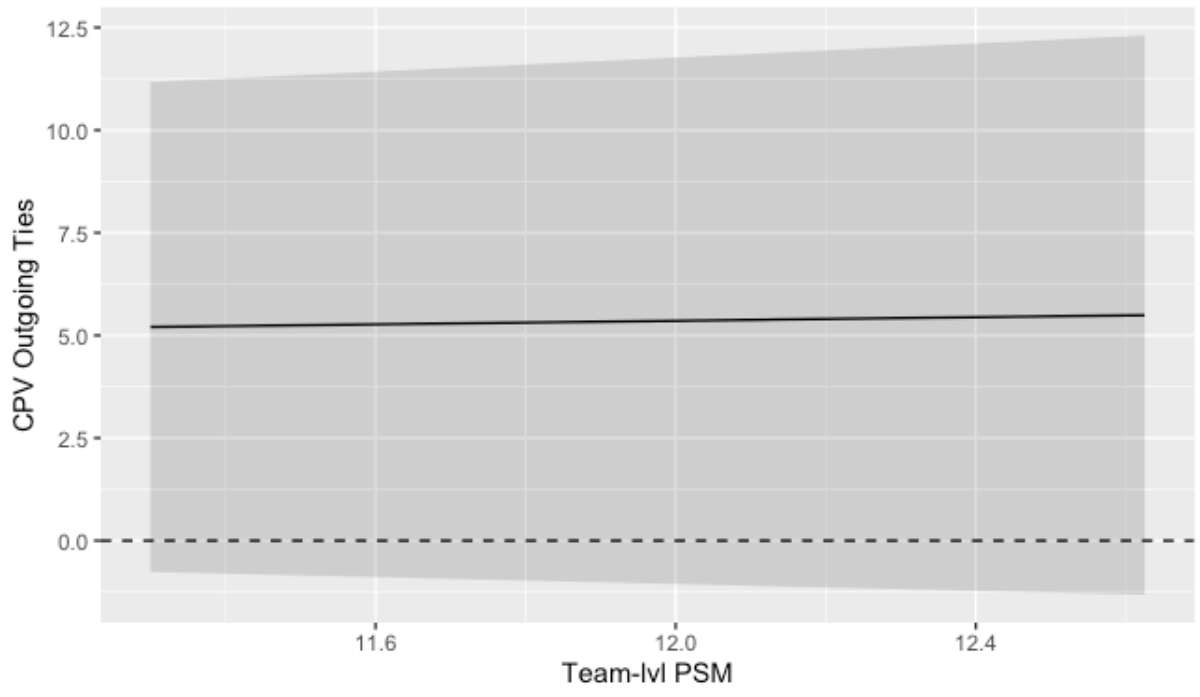
## Appendix 2: Visualization of Moderating Effects of ORT on PSM Sub-Dimensions



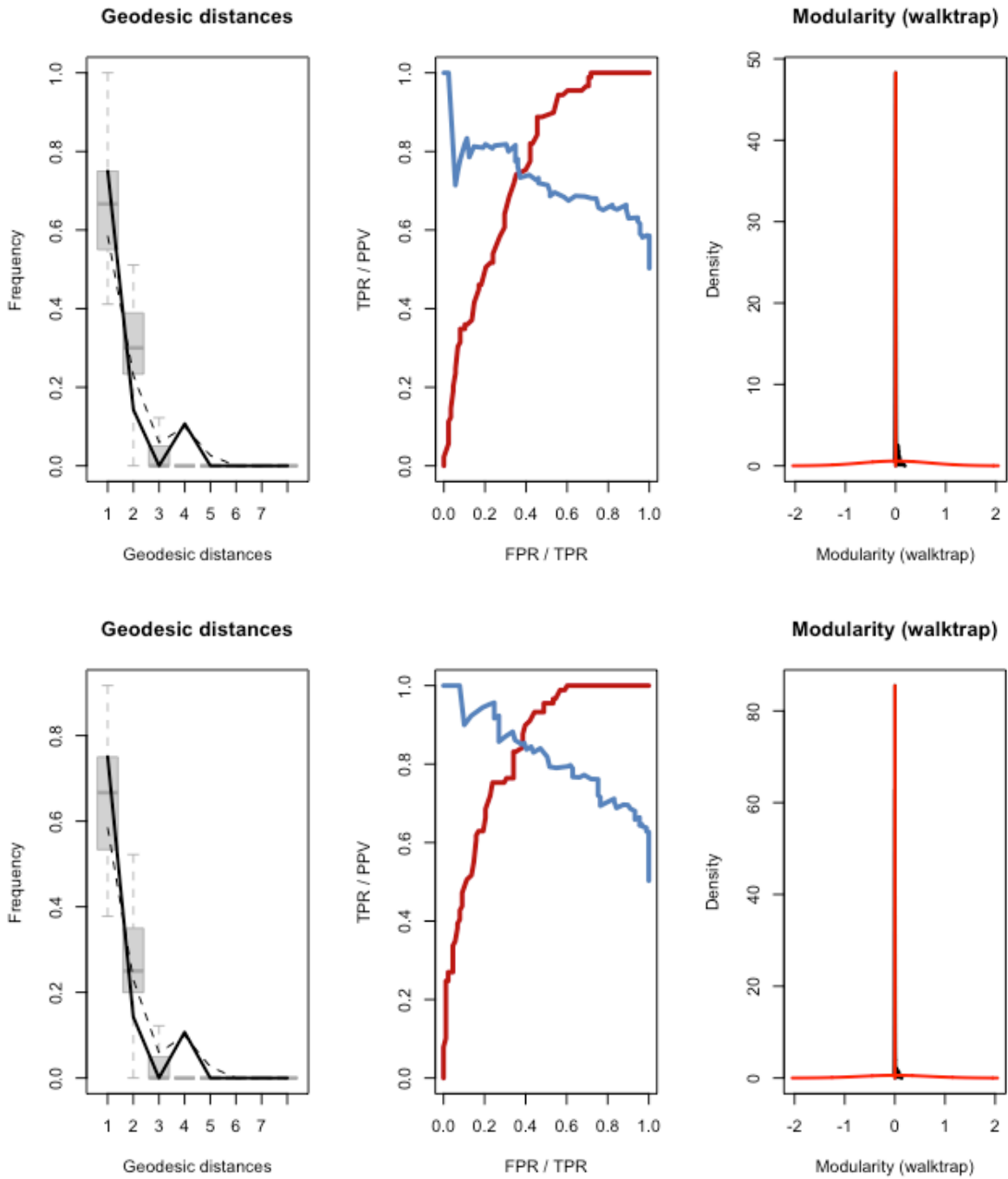


### Appendix 3: Visualization of Moderating Effects of Team-level PSM on PSM Sub-Dimensions

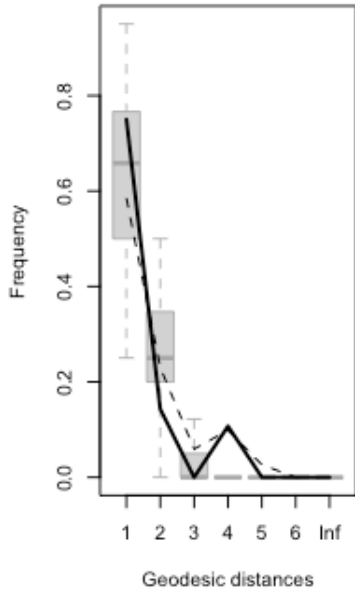




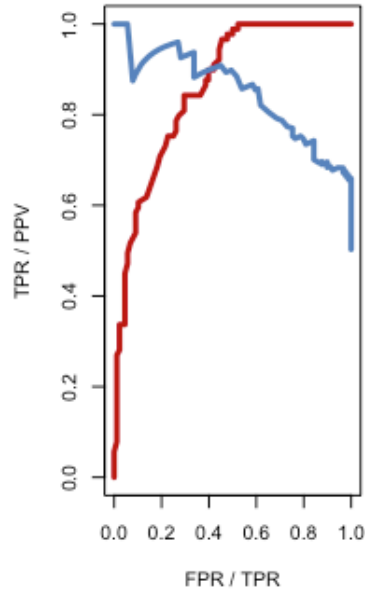
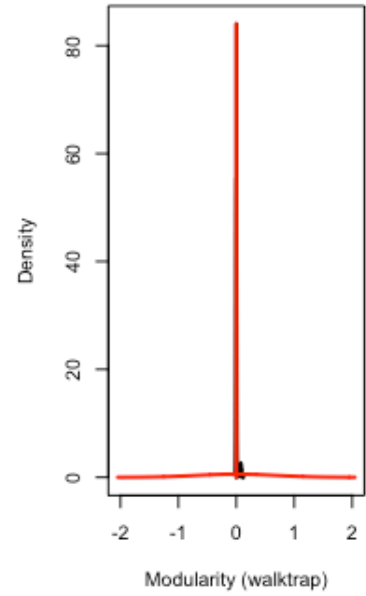
### Appendix 3: Visualization of Goodness-of-Fit Diagnostics (in Order Model 0, Model 1, Model 2 and Model 4)



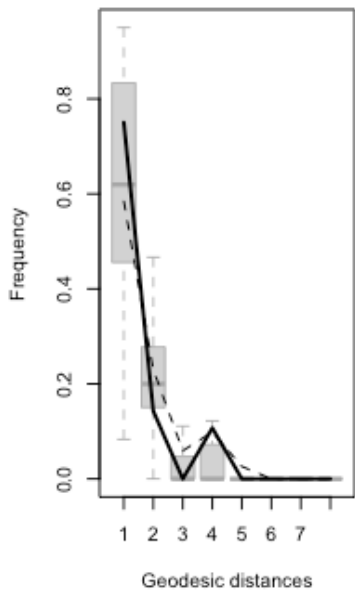
**Geodesic distances**



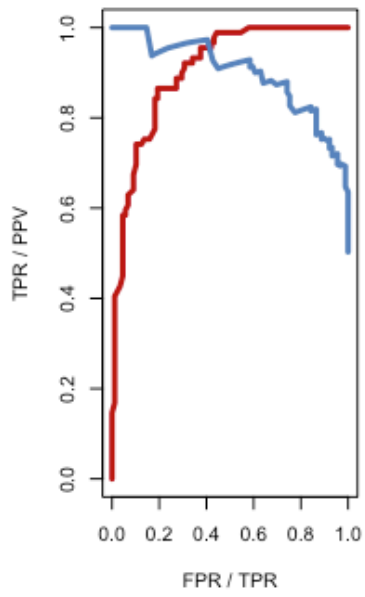
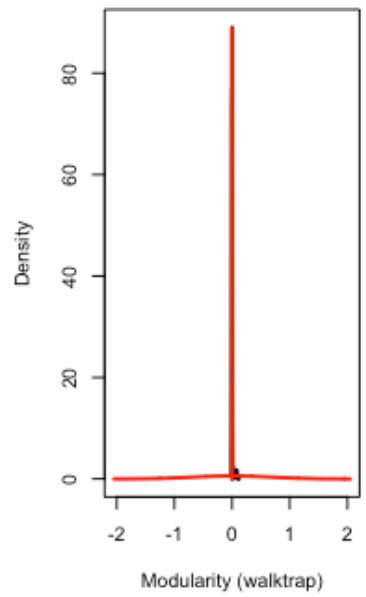
**Modularity (walktrap)**



**Geodesic distances**

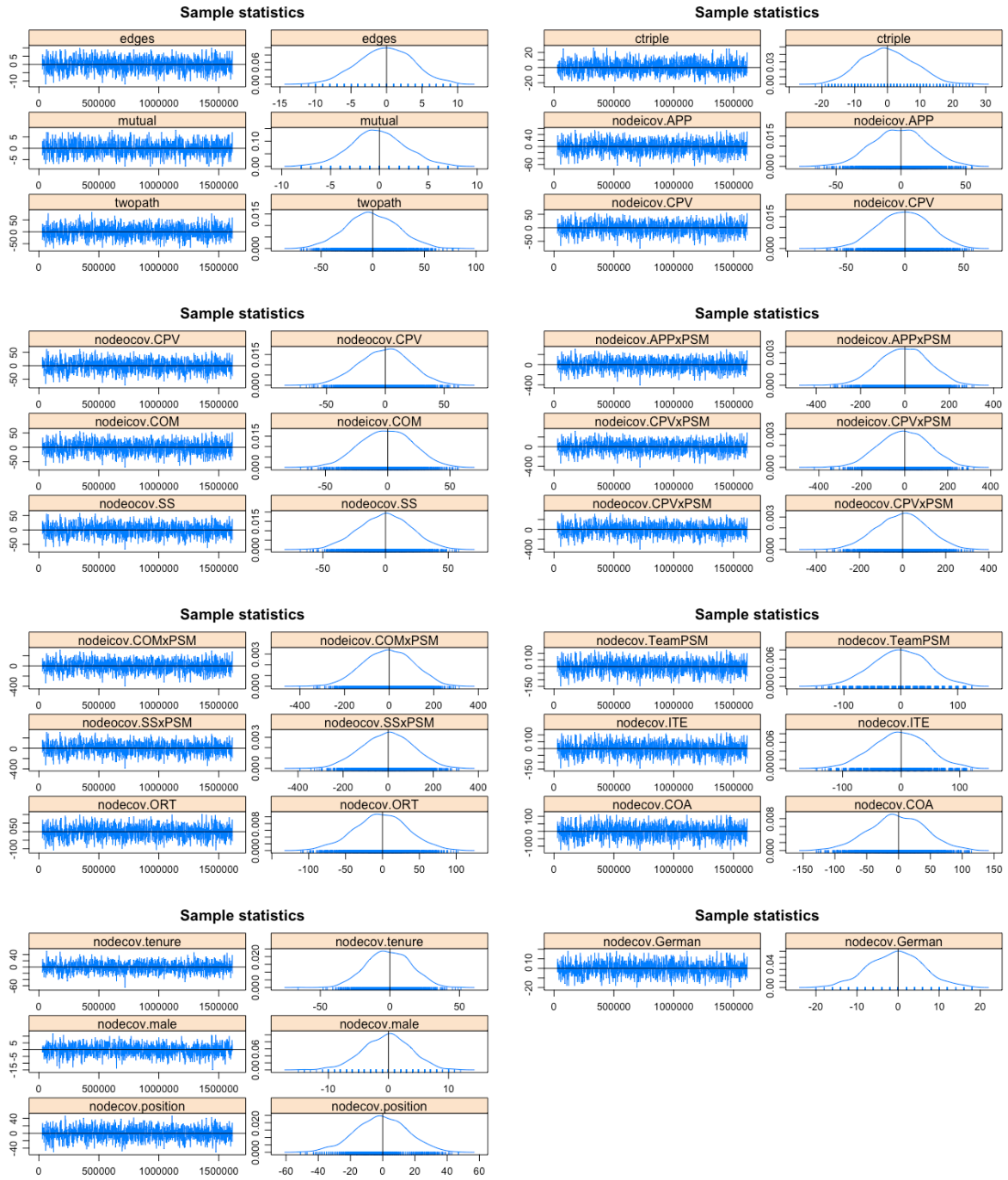


**Modularity (walktrap)**





## Appendix 4: Visualization of MCMC-Diagnostics (Model 4)



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