The Configurational Perspective in Organizational Psychology: Fuzzy Sets for Novel Insights

Dissertation

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Abstract

This dissertation aims to apply the configurational perspective to organizational surveys. The studies included in this dissertation demonstrate that an increasingly popular configurational method can be applied to large dataset sizes similar to organizational surveys. This method is called fuzzy set qualitative comparative analysis (fsQCA). Additionally, the incremental insights of fsQCA are illustrated by taking traditional methods into comparison. At the same time, the presented research addresses current methodological challenges to fsQCA in order to shed light on its application in the context of organizational surveys and to reduce reasons inhibiting researchers to use this method. The first study conceptualized and empirically investigated differently complex interplays of core manageable factors predicting and influencing high levels of affective commitment. Specifically, the results indicate that job design, organizational treatment, leadership, and recognition were consistently found to be essential in terms of incremental, relative, and configurational importance for the management of affective commitment. The second study aims to deepen the understanding of the formation of change-supportive intentions by adopting a configurational perspective. Investigating the theory of planned behavior in a longitudinal setting, the results suggest the combination of high change-related attitude and high change-related perceived behavioral control as the most consistent and reliable solution for fostering high change-supportive intentions. Both the first and second study addressed methodological challenges by adopting robustness tests for large-N fsQCA to increase trustworthiness and reduce sensitivity of the results. Additionally, as required for fsQCA data preparation, recommendations for thresholds were made and different calibration techniques investigated. The third study connects these two studies by performing a simulation on artificial small-N and large-N datasets comparing regression analysis, fsQCA, and its different calibration techniques. In particular, new insights on the joint use of both methods and methodological recommendations on the calibration of fsQCA could be given. In sum, the presented research highlights the applicability of fsQCA to organizational surveys and that a configurational approach can further enrich the understanding of organizations and organizational life.

Keywords: organizational survey, fsQCA, configuration, fuzzy set, large-N, affective commitment, change-supportive intentions, organizational change, simulation

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1. Introduction

In the dynamic world of the current Information Age, the increase of complexity in organizations and organizational life has become indisputable. For example, in terms of scale alone, the worldwide largest organization in 1955 and 2011 rose from 624,000 employees in a single country to 2.1 million employees working in over 15 countries, respectively (Suddaby, Hardy, & Huy, 2011). Over the last years, organizational researchers have increasingly acknowledged and attempted to account for this complexity, specifically the configurational nature of organizational phenomena (e.g., Desarbo, Di Benedetto, Song, & Sinha, 2005; Marlin, Ketchen, & Lamonst, 2007; Siggelkow 2001, 2002; Suddaby et al., 2011). A configurational perspective is particularly apt to cope with complexity by placing the focus on "understanding how distinct characteristics jointly cause an outcome" (Cambré, Fiss, & Marx, 2013, p. 312). Some researchers even argued that the concept of configurations probably is "…one of the central ideas of organization studies, stemming back to the writings of founding fathers such as Max Weber (1922[1978])." (Fiss, Marx, & Cambré, 2013, p. 2).

One reason for this concept's appeal is that social and organizational phenomena seem unlikely to be explained by single and isolated factors (e.g., Kent, 2009; Siggelkow, 2002). Instead, they are likely to interact and create configurations with complex interdependencies relating to a certain criterion (Fiss, 2011), such as turnover intention. Hence, the configurational perspective offers considerable potential for organizational research (e.g., Short, Payne, & Ketchen, 2008), for understanding people, groups, and organizations (Meyer, Tsui, & Hinings, 1993), and thus for organizational psychology.

Despite the importance of configurations and the new insights they may allow, configurational theory seems to be one of the least understood facets in organizational research (Fiss et al., 2013). Although configurational thinking is not entirely new and often addressed by applying variable-centered methods such as regression analysis with interaction terms, there is a recent trend to turn to case-centered methods for studying configurations (e.g., Berger, 2016; Fiss, 2007). Over the last years, numerous studies examining configurations with case-centered methods have been conducted, for example in the field of business and management research (e.g., Campbell, Sirmon, & Schijven, 2016; Fiss, 2011; Misangyi & Acharya, 2014). However, such studies are still scarce in the area of organizational psychology.

In this field, research is mostly conducted with organizational surveys (Kraut, 1996; Rogelberg, 2002) that are often analyzed by linear, additive methods, such as regression

analysis. Yet, methods beyond linear analyses are considered a better fit for examining complex interdependencies (Ragin, 1987, 2000, 2008). Moreover, studying complex relationships in the context of organizational surveys was demanded in a number of studies, on topics such as change readiness (Oreg, Vakola, & Armenakis, 2011), organizational behavior (Short et al., 2008), or organizational performance (Fiss, 2011). Although a few non-organizational surveys were previously investigated by configurational approaches (e.g., Cooper, 2005; Ragin, 2006), the configurational perspective on typical organizational surveys using Likert scales is still missing. In fact, Likert scales are very well-suited for organizational surveys due to their affective measurement and thus commonly used in organizational research and psychology (Rogelberg, 2002). Therefore, examining organizational surveys by configurational methods seems to have a high potential to provide new insights into organizations that could help grasping the complex nature of organizations and organizational life.

Over the last decades, a few configurational methods were introduced that hold promise for their application to surveys. For example, latent profile analysis (LPA; Lazarsfeld & Henry, 1968) has increasingly received attention in marketing and psychological research (Tein, Coxe, & Cham, 2013). By defining subgroups or profiles of data, LPA has configurational properties, but may fall short in analyzing organizational surveys when the relation to a specific outcome is required. A slightly more promising approach, called qualitative comparative analysis (QCA), was developed and revised by Ragin (1987, 2000, 2008). In contrast to LPA, QCA is able to, for example, explicitly analyze asymmetric effects and determine the relative importance of variables. However, the unique properties of QCA will be explained in more detail in the next chapter.

The family of configurational approaches has gained popularity in several research areas for investigating complex interdependencies (Rihoux, Álamos-Concha, Bol, Marx, & Rezsöhazy, 2013). In particular, the subform fuzzy set QCA (fsQCA) is an approach that is even finer-grained than QCA. Instead of resting on an additive, linear attribute, it identifies the relationships and interdependencies of multiple factors relating to a certain criterion (Fiss, 2011). In contrast to correlational methods, fsQCA enables the exploration of more complex interdependent constellations, equifinality (i.e., multiple pathways to similar outcome), and asymmetric effects. Moreover, this approach is still able to maintain interpretability and transparency, which would not be guaranteed by, for example, machine learning approaches such as neural networks. One problem with these is that algorithms such as deep neural networks compute information across multiple hidden layers of artificial neurons that quickly

reach the point where the computational process becomes untraceable for researchers. Hence, it is rather unsurprising that the configurational approach is often preferred by many research areas. FsQCA has been applied in a broad range of research areas such as environmental research (e.g., Pahl-Wostl & Knieper, 2014), healthcare (e.g., Eng & Woodside, 2012; Longest & Thoits, 2012), education (e.g., Cooper, 2005; Olufadi, 2015), social and political sciences (e.g., Ragin, 2008; Rihoux & Marx, 2013; Vis, 2012), marketing (e.g., Feurer, Baumbach, & Woodside, 2016; Kent & Argouslidis, 2005), and in particular in management and organizational research (e.g., Aversa, Furnari, & Haefliger, 2015; Bell, Filatotchev, & Aguilera, 2014; Campbell, Sirmon, & Schijven, 2016; Crilly, 2011; Crilly, Zollo, & Hansen, 2012; Garcia-Castro & Francoeur, 2014; Grandori & Furnari, 2008; Greckhamer, 2011, 2016; Meuer, 2014; Misangyi & Acharya, 2014; Pajunen, 2008). On top of these, fsQCA has recently found application in psychological research (Su, Chiang, Lee, & Chang, 2016; Xie & Jia, 2016) and on Likert-type survey data (Emmenegger, Schraff, & Walter, 2014; Whittington, McKee, Goodwin, & Bell, 2013). In summary, fsQCA seems to be a well-suited tool for configurational analyses in an organizational context, but still appears not fully established for the application on organizational surveys.

One possible reason for the rather reserved application of fsQCA to survey data may be the original design of QCA. Its initial purpose was to solely analyze small-N to medium-N data, i.e. 12-50 cases (Greckhamer, Misangyi, & Fiss, 2013), in order to maintain in-depth knowledge about each case. This method was then further improved and extended (e.g., Ragin, 2000, 2008; Schneider & Wagemann, 2010, 2012; Fiss, 2011) enabling the application to large-N data (e.g., Bell et al., 2014; Campbell et al., 2016; Garcia-Castro & Francoeur, 2014; Misangyi & Acharya, 2014; Ordanini, Parasuraman, & Rubera, 2014). However, this transition results in the loss of in-depth knowledge in large-N settings similar to other quantitative methods such as regression analysis or LPA.

Despite this tradeoff, fsQCA's unique properties could still offer new insights into large datasets. In this respect, an extensive guide on the transition from small-N to large-N settings was published by Greckhamer et al. (2013). Thus, over the last years, fsQCA has been refined to cope with and successfully shown to analyze dataset sizes that are typical for organizational surveys (e.g., Rihoux & Marx, 2013; Schneider & Wagemann, 2012). Surveys often share the common aim to assess a variety of variables, analyze sample characteristics, and most often to examine relationships between these survey variables. In particular, identifying these relationships in the form of configurations and reflecting complex interdependencies may allow analyzing survey data from a new perspective.

Based on set-theoretic assumptions, fsQCA takes on the configurational perspective that allows analyzing interdependencies between multiple variables. Specifically, fsQCA has three unique characteristics. First, it allows the prediction of a certain criterion based on a complex configurational pattern of other survey variables. Hence, fsQCA goes beyond simple interactions and assumes that the value of an outcome is related to different, identifiable patterns of variables. Second, as a consequence, an outcome of interest can be explained through different and separate pathways, called equifinality (Katz & Kahn, 1978). That is, high levels of a criterion could be related to more than one pattern of variables, which could potentially relate to, for example, different demographic subsets. This has high practical relevance, as it helps to identify design choices for specialized interventions. Third, the set-theoretic understanding of the relationship of configurations and their corresponding outcomes enables the identification of possible asymmetric effects (Ragin, 2008). That is, factors contributing to high levels of an outcome might be different from those connected to lacking high levels of that outcome. Hence, fsQCA could provide supplemental insights into organizational phenomena in addition to, for instance, correlational analyses. For example, Fiss (2011) obtained configurations of eight variables associated with very high performance of organizations. Whereas regression with interaction terms quickly reaches its limits above three variables (e.g., Grofman & Schneider, 2009; Kam & Franzese, 2007), fsQCA offers a complementary understanding of the more complex interdependencies related to very high performance.

In spite of the complementary properties of fsQCA, a few challenges to its application remain. First, although fsQCA was successfully applied to large-N data, it is still a contested issue due to its original development for small-N data. However, the presented studies show that fsQCA can reliably and successfully be employed to large-N data by, for example, dividing the data into subsamples or relating the results to other methods. Second, the robustness of the method has not been completely clarified, yet. That is, fsQCA may be sensitive to slight changes to, for example, thresholds or other parameters, that weaken the trustworthiness of the results. A first promising attempt was proposed by Emmenegger et al. (2014). Their robustness test was implemented in two of the presented studies in order to ensure trustworthiness. Third, fsQCA requires the calibration of data into fuzzy sets by substantive and theoretical knowledge. Fuzzy sets are continuous values between 1 and 0 that are assigned according to anchor points. These anchor points could be based on specific Likert points (e.g., 1, 4, and 7), i.e. absolute calibration, or percentiles of data (e.g., 25th, 50th, and 75th), i.e. relative calibration. Specifically in the case of Likert scales, most studies

used an absolute calibration approach (e.g., Meuer, 2014; Mikalef, Pappas, & Giannakos, 2016; Ordanini et al., 2014), whereas some studies utilized a relative calibration instead (e.g., Palacios-Marques, Roig-Dobón, & Comeig, 2017; Veríssimo, 2016; Whittington et al., 2013). Even though it can be argued that Likert scales are tied to psychometric theory and that the points can represent meaningful thresholds, a relative calibration seems to be an alternative due to, for example, known tendencies towards positive values on Likert scales in survey research (e.g., Braunscheidel, Suresh, & Boisnier, 2010; McCarty & Shrum, 2000). Even for the absolute calibration of Likert scales, studies adjusted the thresholds according to such tendencies (Emmenegger et al., 2014; Ordanini et al., 2014) or means (Cheng, Cai, & Jin, 2016). Additionally, the relative calibration of Likert scales has only recently been applied in the context of business research (Veríssimo, 2016). Given these different approaches and missing clear calibration guidelines, researchers could be easily confused when calibrating organizational survey data. Therefore, the presented research sheds light on the different calibration techniques and makes suggestions specifically in regard to Likert scales.

Taken together, the general purpose of this dissertation is to take on the configurational perspective and demonstrate the applicability of fsQCA to large datasets of organizational surveys. The incremental insights gained by this approach are illustrated by taking traditional methods into comparison. These methods include regression analysis, relative importance, and LPA. In this context, current methodological challenges are addressed and solutions suggested, such as for the calibration manner and fsQCA robustness. Hence, this dissertation intends to deepen the methodological understanding of fsQCA and simultaneously foster its application in the field of organizational psychology and survey research. Future studies can build on this research to further refine fsQCA in the context of organizational surveys and analyze the complex interdependencies salient in organizational life.

The next section of this dissertation will introduce the theoretical background of the configurational perspective and is followed by demonstrating the unique features of fsQCA. In the section that follows, the current challenges of fsQCA will be addressed with a particular focus on its calibration procedures. Building on this knowledge, this dissertation will present three studies. The first study is concerned with how relevant factors in managing affective commitment interplay in their relation to affective commitment. For this purpose, it applies the methods multiple regression analysis, relative importance analysis, and fsQCA

using a relative calibration approach. The second study addresses the question of whether employees' change-related attitudes, perceived behavioral control (PBC), and subjective norms – either individually or in specific configurations – are involved in the formation of employees' change-supportive intentions. In this case, multiple regression analysis and LPA are compared to fsQCA using an absolute calibration approach at two time points in an organizational change process. Finally, the third study picks up on the insights of the first two studies by addressing remaining challenges. In a simulation with artificially created datasets in the form of organizational surveys, multiple regression analysis, fsQCA, as well as two different calibration approaches of fsQCA are compared. Subsequently, a comprehensive discussion and a summary of the most important insights of the presented studies will be given. These are followed by a discussion of general implications for research and practice, general limitations, and conclude with several ideas for future research.

1.1. Theoretical Background of the Configurational Perspective

As discussed above, the configurational approach has a lot of potential in organizational research by helping to grasp complex interdependencies and offering a fresh perspective on organizations and organizational life (e.g., Fiss et al., 2013; Meyer et al., 1993). Although the concept of configurations was determined as one of the least understood facets in organization theory (Fiss et al., 2013), recent developments encourage a change for the better. In fact, configurational approaches increasingly drew attention in various research areas (Rihoux et al., 2013) and specifically in the field of management and organizations over the last years (e.g., Aversa et al., 2015; Bell et al., 2014; Campbell et al., 2016; Garcia-Castro & Francoeur, 2014; Greckhamer, 2016). Moreover, existing configurational methods have been improved and advanced lately (e.g., Emmenegger et al., 2014; Rihoux & Marx, 2013; Schneider & Wagemann, 2012), whereas additionally novel tools for the analysis of configurations were introduced (e.g., Baumgartner, 2009; Baumgartner & Epple, 2014). QCA even entered the phase of mainstreaming in a few disciplines (Rihoux et al., 2013) that promises a further refinement of this configurational method in the next years. Thus, configurations are still a current and perhaps even flourishing topic that has the potential to become more and more popular in research and practice.

From a methodological perspective, various tools for the analysis of configurations exist. Although just briefly addressed in this dissertation, LPA and CNA are possible alternatives for analyzing configurations beside QCA. On the one hand, LPA is a

probabilistic variant of typical clustering methods that aims to identify hidden subgroups of cases (Lazarsfeld & Henry, 1968). These groups are differentiated by patterns of interrelated variables that do not overlap and are discrete as well as exhaustive (Tein et al., 2013). However, beside the advantages of QCA explained in the following, LPA misses an explicit outcome-orientation. On the other hand, CNA is based on QCA utilizing a different optimization algorithm that is supposed to ease the analysis of data in contrast to QCA (Baumgartner, 2009). Additionally, chain-like causal dependencies among the conditions of an ultimate outcome are a supplementary feature. However, CNA has not found its path to organizational research, yet. One reason might be the easier application of QCA due to available tools and skepticism against the promoted causality property of CNA. In contrast, the rapidly increasing number of publications (Rihoux et al., 2013) and the wide variety of studies over the last years (e.g., Campbell et al., 2016; Dul, 2016; Veríssimo, 2016; Woodside, Prentice, & Larsen, 2015) suggest that methods of the QCA family are currently a more promising tool to analyze configurations. Therefore, the presented research mainly focuses on the application of QCA, whereas Study 2 took LPA into the comparison as well.

Originally designed by Ragin (1987), QCA is a systematic, case-centered, and set-theoretic method that has the potential to detect complex relationships in data. In particular, QCA aims to identify all possible case types that need to be investigated for the hypothesis. Contrary to classical statistical methods, the data is understood as sets with conditions and qualitative outcomes instead of independent and dependent variables, respectively (Ragin, 2008). With the help of this set-theoretic tool, it is possible to study multiple solution pathways and interdependencies between conditions and outcomes. One challenge posed by applying QCA is to convince researchers to shift away from "net effects" thinking of such variables and focus on how configurations of variables associate with an outcome (Ragin, 2008). In this context, QCA minimizes the inferences to so called "prime implicants" by the Quine-McCluskey algorithm. That is, the configuration of conditions cannot be further combined with another configuration to eliminate a condition. For this reason, set-theoretic methods like QCA are remarkably fitting for testing configurational theory. In addition, such methods also become interesting to organizational and strategy research, because configurations are viewed as different types of cases instead of considering cases as independent aspects.

Based on the procedure of minimizing inferences, QCA can produce complex, intermediate, and parsimonious solutions. The difference between the complex and parsimonious solution lies in the treatment of the remainders. Remainders are combinations

of conditions that do not have enough empirical evidence, i.e. they do not reach the frequency threshold. In other words, not enough cases apply to a combination to make a meaningful statement about their outcome. Concerning the complex solution, the remainders are set to "false", i.e. they are completely excluded from the analysis. Considering the parsimonious solution, the remainders are set to "don't care", i.e. they are included for minimizing inferences of non-remainders if necessary. The intermediate solution represents the complex solution potentially reduced post hoc by substantive and theoretical knowledge of the researcher. Even though Ragin (2008) recommended to present intermediate solutions, the in-depth knowledge of each case would usually not be trustworthy enough in large-N studies to decide about the relevance of individual conditions. In recent years, it was argued that the complex solution may be misleading (Cooper & Glaesser, 2016) or even be false for analyzing causal relationships (Baumgartner, 2015). Hence, the transparent presentation and interpretation of both complex and parsimonious solutions becomes imperative for evaluating the results.

Essentially, QCA can be divided into three types: crisp set QCA, multi-valued QCA, and fsQCA. They mainly differ in how values are assigned to an interval between one and zero, i.e. the calibration process. Whereas crisp sets can only take dichotomous values, fuzzy sets can take any value in the interval from 0 to 1, thus being the most fine-grained approach. This is specifically useful in the context of organizational surveys in order to reflect the diversity of survey responses. Multi-valued QCA ranks between these two and is often rejected for fsQCA. For completeness and at least worth mentioning, two rarely applied subforms exist, called temporal QCA (tQCA; Caren & Panofsky, 2005) and two-step QCA (Schneider & Wagemann, 2003), but they could not establish themselves in, for example, organizational and management research. Moreover, the Theory-Guided/Enhanced Standard Analysis proposed by Schneider and Wagemann (2012, 2013) was supposed to replace QCA and seemed to ascend as the new state-of-the-art procedure by applied researches (e.g., Thomann, 2015), but was heavily criticized (Thiem, 2016). In contrast, fsQCA has still received increasing attention and has been applied in numerous studies, as mentioned before. Furthermore, fsQCA has been extended for the analysis of large-N data (Ragin, 2000, 2008; Schneider & Wagemann, 2010; Greckhamer et al., 2013) and since been progressively applied due to its advantages to study complex configurations. Therefore, considering the complexity of organizational life, fsQCA promises to be the currently best fitting configurational method for analyzing large-N organizational surveys.

1.2. Unique Features of FsQCA

As a set-theoretic method, fsQCA basically possesses five unique properties that are supplementary to correlational methods beside studying configurational patterns. First, an outcome of interest can be associated with different and separate combinations of conditions and various pathways, i.e. equifinality (Katz & Kahn, 1978). In other words, more than one pattern of conditions could constitute high levels of a certain criterion. These patterns could consist of different subgroups, such as managers and employees. For example, in the context of organizational commitment, the combination of coworker satisfaction and transformational leadership could similarly contribute to high levels of organizational commitment as the combination of coworker satisfaction and job satisfaction. The identification of equifinal pathways has high practical relevance by helping to identify design or strategy choices for interventions or implementations, for example in organizational change (Weiner, 2009).

Second, based on the logic of set-theory, fsQCA conditions can be differentiated and understood in terms of necessity and sufficiency regarding an outcome of interest. For example, if high levels of change-supportive intentions only occur when a positive attitude is present, then positive attitude is likely a necessary condition and hence a superset of intentions. However, positive attitude is thought to be sufficient for intentions, if positive attitude is directly related to and thus a subset of high levels of intentions. Hence, sufficient conditions or configurations can deliver different strategies that foster intentions, whereas necessary conditions indicate the groundwork to build on for amplifying intentions.

Third, understanding the relationship of configurations and its outcome in terms of necessity and sufficiency entails the possibility of identifying asymmetric effects (Ragin, 2008). Specifically, the presence and the absence of an outcome are treated in separate analyses. The idea behind asymmetric effects is that the factors contributing to high levels of an outcome might be different from factors related to a particular lack of high levels of that outcome. For example, in the context of organizational commitment, this would imply that factors contributing to high levels of commitment might differ from factors inhibiting high commitment. This is contrary to the symmetric nature of correlations. For example, modeling the inverse of commitment in a correlational analysis only changes the sign of the coefficients, but does not reveal differential patterns of factors that relate to high or lack of high levels of commitment. Therefore, if such asymmetric effects exist, interventions for fostering commitment might be different from interventions avoiding a lack of commitment.

Fourth, fsQCA is able to incorporate the concept of core and periphery (Fiss, 2011). To some degree, the core-periphery model can determine the relative importance of conditions. In particular, the evidence for core conditions suggests a strong relationship with the outcome of interest, whereas the relationship between peripheral conditions and the outcome of interest is weaker (Fiss, 2011). Apparently, the cognitive ability to categorize is better understood in relation to a conceptual structure comprised of core and peripheral classifications (e.g., Hunn, 1982; Rosch, 1983). Moreover, the core-periphery model was already used in a number of studies (e.g., Pfeffer, 1976; Lyles & Schwenk, 1992; Borgatti & Everett, 2000). From a methodological perspective, core conditions can be identified by analyzing the data according to the complex as well as the parsimonious solution. Configurations or single conditions can be labeled core conditions, if they similarly result in both complex and parsimonious solutions. Every other configuration or single condition is considered as peripheral. Thus, the core-periphery model is suitable for determining the most important conditions in the resulting configurations.

Finally, the perhaps biggest advantage of fsQCA particularly compared to other QCA methods lies in the fine-grained calibration. However, the calibration can simultaneously be viewed as its biggest challenge. If guidelines or an appropriate rationale behind the calibration is missing, an improper calibration can compromise the analysis right from the beginning. Still, the calibration to fuzzy sets enables the researcher to influence the analysis based on well-founded theoretical knowledge. The researcher can thus cope with data that have very low variance or strong positive tendencies on Likert scales resulting from, for example, cultural differences of respondents. Additionally, the diversity of survey responses can be properly reflected in contrast to, for instance, crisp set QCA. Beside different calibration techniques specifically aiming at Likert scales, a few challenges remain. In the next chapter, the most important challenges to fsQCA are addressed and discussed.

1.3. Current Challenges to FsQCA

As previously stated, QCA methods were originally designed to analyze small to medium sized datasets (Ragin, 1987, 2000), i.e. about 12-50 cases (Greckhamer et al., 2013). However, in the context of organizational research, analyses of large-N data are far more reasonable to potentially make well-grounded statements about a specific outcome. In recent years, fsQCA has been progressively extended and applied to larger dataset sizes ranging from 50-100 cases (e.g., Crilly, 2011; Meuer, 2014; Vis, 2012; Woodside, 2013), a few

hundred cases (e.g., Bell et al., 2014; Fiss, 2011; Ordanini et al., 2014), up to over thousand cases (e.g., Campbell et al., 2016; Cooper & Glaesser, 2010, 2016; Cooper, Glaesser, Gomm, & Hammersley, 2012; Garcia-Castro & Francoeur, 2014; Misangyi & Acharya, 2014). The research presented in this dissertation analyzed 947 cases (Study 1), 1,589 and 1,524 cases (Study 2), as well as a comparison of 50 and 500 cases (Study 3) to support the applicability of fsQCA to large datasets and thus to surveys. The transition from small-N to large-N fsQCA entails a few differences that are extensively discussed by Greckhamer et al. (2013). Most importantly, the frequency threshold needs to be adjusted accordingly and a higher number of conditions could be included in the analysis. Of course, researchers lack specific case-knowledge that can hinder the interpretation and meaning of solution pathways (Ragin, 2008). For this reason, some researchers may mistrust results of large-N fsQCA. However, Cooper and Glaesser (2016) developed a test adopted in Study 2 that can verify if small-N pieces of a large-N dataset produce similar results. In sum, the application of fsQCA to large dataset sizes seems to be increasingly accepted and published.

Against this backdrop, another challenge of fsQCA is the robustness and validity of the results. A few researchers have criticized the sensitivity of fsQCA to slight parametric changes compromising results of studies applying fsQCA (e.g., Lucas & Szatrowski, 2014; Krogslund, Choi, & Poertner, 2015; Skaaning, 2011). Although a great part of this criticism could be disproved (e.g., Rohlfing, 2016; Thiem, Baumgartner, & Bol, 2016; Thiem & Baumgartner, 2016), it becomes obvious that robustness tests are urgently required to reduce sensitivity and increase the trustworthiness of fsQCA results. However, only two noteworthy robustness tests currently exist. On the one hand, Cooper and Glaesser (2016) started to address the issue of the transition from small-N to large-N fsQCA. Adopted in Study 2 of the presented research, this subsampling robustness test aims to address concerns about fsQCA application in large-N settings and to help increase confidence in its results. After drawing thousands of small random subsamples (e.g., 50 cases) from the complete large dataset, a percentage determines the degree of robustness by counting the occurrences of these configurations divided by the number of subsamples analyzed. As an example, Study 2 demonstrates that the results of subsamples agree with the results of the complete dataset providing further information on the validity and robustness of large-N fsQCA.

On the other hand, Emmenegger et al. (2014) proposed a robustness test for large-N fsQCA that has been extended and adopted in Study 1 and Study 2 of the presented research. This robustness test aims at demonstrating that the results are insensitive to small changes in data, i.e. robust and reliable. In particular, the data is analyzed for about 1,000 runs while

randomly deleting 10% of the data each run. Then, the occurrences of the emerging configurations are counted. The most robust solution is subsequently identified by its high frequency combined with a low count of other newly emerging combinations. This test has been extended to perform the robustness analyses on a wide variety of thresholds to address potential sensitivity to parametric changes (Study 1 and 2). Therefore, beside the evaluation of robustness of a specific threshold, the threshold leading to the most robust and reliable results can be determined. This generally reduces arbitrariness in choosing thresholds and simultaneously builds trust in fsQCA results.

Regarding the thresholds related to the analysis process of fsQCA, basically two cut-offs are required to be chosen by the researcher. However, researchers partially miss a clear rationale in their choice specifically for large-N fsQCA, because the literature gives only mixed recommendations. Both cut-offs determine which combinations of conditions are included in proceeding analyses. First, the frequency threshold determines the minimum number of cases that is necessary for a combination of conditions to be considered for the analysis. Basically, the frequency threshold balances a trade-off between the potential for deductive analysis and the inclusion of rare configurations. Whereas small-N fsQCA studies should always include all combinations with at least one case, more than two cases are recommended for large-N approaches (Greckhamer et al., 2013). Ragin (2008) even mentioned a frequency threshold of 10 for large-N fsQCA. Although no further recommendations on the exact cut-off value exist specifically in relation to the size of the dataset, it was suggested that 80% of the cases should be included in the analysis (Greckhamer et al. 2013; Ragin & Fiss, 2008). However, this can lead to, for example, a frequency threshold of two cases (as in Study 1) contradicting the recommendation of Greckhamer et al. (2013). Additionally, the 80% rule can quickly lead to the inclusion of rare configurations (e.g., with a frequency threshold of 1). Configurations with very few empirical incidences can negatively affect the analysis, as they are likely to have a low informative value and might be the result of, for example, measurement errors (Ragin, 2008). Especially when conducting organizational surveys, configurations covering less than 1% of all cases would offer only limited practical implications. Therefore, clear recommendations and their consistent application are required in order to avoid the chance of fishing for results and maintain comparability across studies.

The presented research showed two strategies to determine the frequency threshold. On the one hand, as applied in Study 1, at least 1% of the cases are included to provide a minimum basis for practical implications depending on the number of cases. However, no

less than three cases should be included at any time, if the total number of cases is above 50 (Greckhamer et al., 2013). On the other hand, the previously mentioned robustness test based on Emmenegger et al. (2014) has been extended in Study 2 to include a variety of frequency thresholds above three cases. Thus, a frequency threshold was determined that yielded the most robust solution. Apart from both strategies, Study 3 only applies the minimum frequency thresholds recommended by Greckhamer et al. (2013) to stay in the scope of computational feasibility in the simulation. However, Study 1 and especially Study 2 aim to build a consistent rationale for determining the frequency threshold of large-N fsQCA.

Second, the consistency threshold determines to what degree cases are consistent with a specific combination of conditions. Although the convention for small-N and large-N fsQCA is a minimum of 0.8 (i.e., "almost always sufficient"; Greckhamer et al., 2013; Ragin, 2008), consistency thresholds of only 0.75 were used as well (e.g., Garcia-Castro & Francoeur, 2014; Whittington et al., 2013). Additionally, the results may differ, if a consistency threshold of, for example, 0.9 instead of 0.8 is applied, although both are in the scope of recommendations. Deviating from a 0.8 threshold could lead to the suspicion that the threshold was altered to obtain specific results, for example to support hypotheses of the study. Again, a clear rationale or more specific recommendations for large-N fsQCA are required to build trust in its results. The robustness test by Emmenegger et al. (2014) has been extended in Study 1 and 2 to incorporate a variety of possible consistency thresholds (e.g., from 0.75 to 0.85 in steps of 0.05). Hence, based on the most robust results, the consistency threshold could be determined specifically for the dataset at hand. In the presented research, consistency thresholds between 0.79 and 0.82 were determined according to the robustness test (Study 1 and 2), whereas Ragin's (2008) recommendation of 0.8 was chosen in Study 3 due to computational feasibility.

Another current challenge of fsQCA is the decision on how many conditions can be included in the analysis depending on the number of cases. Essentially, an increase of the number of cases should result into increasing the number of conditions. Additionally, researchers may quickly tend to analyze more than less conditions, because the design of the method suggests that redundant conditions are eliminated. However, this could be a pitfall due to limited diversity (Ragin, 2008). That is, the number of cases are sparsely scattered across the possible combinations. For example, 12 conditions included in an analysis lead to 4,096 possible combinations (2^k combinations, where k is the total number of conditions). Considering typical dataset sizes of organizational surveys with 500 or 1,000 cases, the issue of limited diversity could be very prominent. As a result, only very few simplifications could

be made leaving highly complex configurations that are difficult to interpret. This may hinder, for example, strategic decisions based on organizational surveys, because too many conditions would have to be taken into account.

Against this backdrop, the literature on the number of conditions to be used is not very clear for different dataset sizes and rather hints at integrating more than less conditions. On the one hand, Greckhamer et al. (2013) define four to eight conditions and six to 12 conditions typical for small-N and large-N fsQCA, respectively. On the other hand, Marx, Cambré, and Rihoux (2013) particularly determined the number of conditions in relation to the number of cases by creating a benchmark table for QCA. The benchmarks illustrate the chance of accepting a model which could similarly have been generated by random data. According to the most stringent benchmark of 1%, more than 180 cases should presumably justify the inclusion of 11 conditions into the analysis. However, limited diversity would be very prominent in this scenario with 2,048 possible combinations. To avoid limited diversity and highly complex solutions, the presented research of this dissertation included seven conditions for 947 cases (Study 1), three conditions for 1,589 and 1,524 cases (Study 2), and four conditions for 50 and 500 cases (Study 3). These studies demonstrate that limiting the number of conditions can be more fruitful for research and practical implications by providing interpretable results.

1.3.1. The Calibration Procedure of FsQCA

An essential factor of fsQCA is the calibration of conditions and outcomes. That is, before the analysis, their values have to be transformed into fuzzy values, i.e. fuzzy sets. In brief, fuzzy sets are continuous measures ranging from 0.0 to 1.0 that need to be calibrated using substantive and theoretical knowledge relevant to set membership (Ragin, 2008). For this purpose, three anchor points have to be chosen by the researcher. First, a membership of 0.05 and below represents conditions as fully out of a set. Second, a membership of 0.95 and above represents conditions fully in a set. Third, a membership of 0.5 acts as a crossover point determining maximum ambiguity. Ideally, the anchors reflect the researcher's conceptualization of the respective fuzzy sets and thus capture the variation of interest (Ragin, 2008; Schneider & Wagemann, 2010). Due to the effect on the solutions, this process should be well documented to enable a clear interpretation of the results (Schneider & Wagemann, 2010).

The most prominent and automated technique to transform conditions and outcomes into fuzzy set membership scores is the direct method (Ragin, 2008). That is, the researcher assigns values of an interval scale to the three anchor points. The specification of anchor points was approached differently in past studies, but can be basically divided into the relative and absolute calibration approach. On the one hand, the relative calibration is mostly performed by using percentiles as anchor points. Although the crossover point sometimes varies between the median (e.g., Beynon, Jones, & Pickernell, 2016; Woodside, 2013) and the mean (e.g., Fiss, 2011; Lucas & Szatrowski, 2014), studies mainly differ in the choice of percentiles for full membership and full nonmembership. In particular, studies applied 95th and 5th percentiles (e.g., Beynon et al., 2016; Lucas & Szatrowski, 2014; Verissimo, 2016; Woodside, 2016), 90th and 10th percentiles (e.g., Dul, 2016; Greckhamer, 2016; Palacios-Marques et al., 2017; Tho & Trang, 2015), or 75th and 25th percentiles (e.g., Fiss, 2011; Greckhamer, Misangyi, Elms, & Lacey, 2008; Misangyi & Acharya, 2014). However, no clear and generally applicable guidelines exist for the relative calibration, yet.

On the other hand, in the context of Likert scales, the choice of anchor points for absolute calibration seems more divers, but similarly lack decisive guidelines. Additionally, the anchor points vary for 5-point Likert scales (e.g., Emmenegger et al., 2014; Fiss, 2011; Cheng et al., 2016) and 7-point Likert scales (e.g., Chang & Cheng, 2014; Cheng, Chang, & Li, 2013; Leischnig & Kasper-Brauer, 2015; Palacios-Marques et al., 2017). For example, the anchor points could be set to 6, 4, and 2 on a 7-point Likert scale (from 1-strongly disagree to 7-strongly agree) for full membership, crossover point, and full nonmembership, respectively (e.g., Meuer, 2014; Ordanini et al., 2014; Whittington et al., 2013). Another promising approach in regard to Likert scales was proposed by Emmenegger et al. (2014). They suggested that "strongly agree" is fully in the set of membership, while "somewhat agree" is already expressing an ambiguity and is not fully in the set of membership. Moreover, "neither agree nor disagree" can be interpreted as rejecting to agree and should be considered below the point of maximum point of ambiguity.

In the presented research, the divers and partially contradicting research regarding the calibration is addressed by applying the relative calibration with 75th, 50th, and 25th percentiles in Study 1 as well as the absolute calibration in Study 2 following Emmenegger et al. (2014). However, no clear guidelines on the calibration manner of typical organizational surveys using Likert scales exist, yet. This could lead to either confusion of researchers thus avoiding the application of fsQCA or even fishing for results. For this reason, Study 3 compares the absolute calibration (anchors: 6, 4, 2 on 7-point Likert scale) to the relative

calibration approach (anchors: 75th, 50th, 25th percentiles) in order to examine the general validity of both calibrations in the context of Likert-type surveys. This is the first step to bringing order into calibration techniques laying the groundwork for specific guidelines.

2.   The Presented Research

2.1. Overview

This dissertation is composed of three studies that make several contributions to the existing literature and practice on the application of the configurational approach fsQCA in the context of organizational surveys. The first study specifically examines and conceptualizes the interplay of important factors in the management of affective commitment, expanding its examination to a configurational perspective, and by providing practical implications for the complex management of affective commitment in organizations. To build trust in fsQCA and support the results, two linear, additive methods were taken into account, namely multiple regression and relative importance analysis. Thus, four relevant factors were consistently found to be essential in terms of incremental, relative, and configurational importance for managing high levels of affective commitment. Moreover, Study 1 makes a methodological contribution by expanding a recently suggested robustness test (Emmenegger et al., 2014) in order to increase trustworthiness of fsQCA results and derive appropriate consistency thresholds when applied to large-N organizational surveys.

The purpose of the second study is to understand the formation of change-supportive intentions due to its high relevance for achieving successful organizational changes. In particular, multiple regression analysis, LPA, and fsQCA are applied to longitudinal organizational surveys to provide deeper insights into the potentially complex interdependencies between TPB variables explaining the formation of intentions. Additionally, Study 2 contributes to previous research by applying recently suggested robustness tests. In particular, the robustness test similar to Study 1 is used in addition to a subsampling robustness test (Cooper & Glaesser, 2016) that confirms the successful transition of fsQCA from small-N to large-N organizational surveys.

The aim of the third study is to give helpful suggestions for the simultaneous application of multiple regression analysis and fsQCA in the context of organizational survey data. These suggestions are based on inherited scenarios of survey data in a simulation setting. In addition, the differently applied calibration approaches of fsQCA are compared to clarify the appropriate usage on Likert scales typical for organizational surveys. Whereas the

calibration procedure of fsQCA was conducted in a relative manner in Study 1, an absolute calibration was implemented in Study 2. Hence, Study 3 connects these two studies by giving new insights into the relation of fsQCA to regression analysis and into the fsQCA calibrations.

In summary, the presented studies contribute to the existing research by applying the configurational perspective to organizational surveys providing incremental insights into complex interdependencies of organizational phenomena by taking traditional methods into comparison. From a methodological perspective, the applicability of fsQCA to large datasets is demonstrated and current challenges addressed, such as the robustness of results and the calibration manner. Figure 1 depicts the relation and focus of the presented studies.
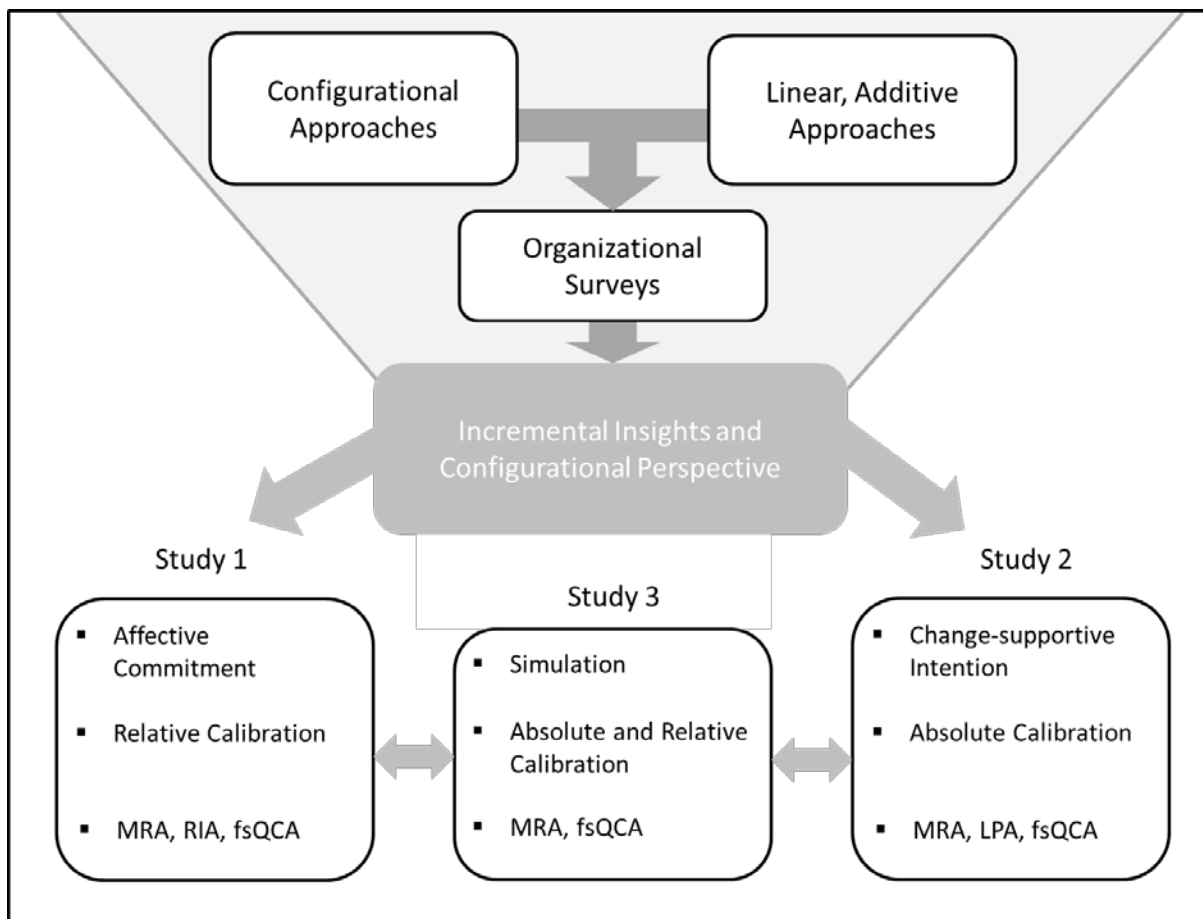

Figure 1: Summary of the studies included in the presented research. MRA = multiple regression analysis; RIA = relative importance analysis; LPA = latent profile analysis; fsQCA = fuzzy set qualitative comparative analysis

2.2. Study 1: Managing the Complexity of Organisational Commitment: A Fuzzy Set Approach

Meier, A.[1], & Mueller, K.[1] (2017). Managing the Complexity of Organisational Commitment: A Fuzzy Set Approach. *The International Journal of Management*, *6*(2), 18-32.

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Abstract

Previous meta-analyses identified several important factors relevant in the management of affective commitment of employees. Although we have extensive knowledge about these factors, yet little is known about their interplay in predicting high levels of commitment. As the complexity of organisational life increases, listing independent factors neglects the configurational nature and complex interplay of organisational phenomena like commitment. Therefore, this study aims to conceptualise and empirically investigate differently complex interplays of previously identified and important core manageable factors of commitment. A particular emphasis is put on the increasingly popular configurational methods in organisational research by incorporating fuzzy set qualitative comparative analysis into the comparison. Using panel data of 947 subjects, four configurations could be identified that determine high levels of affective commitment. In particular, the interdependence of job design and organisational treatment shows to be the core interplay and thus of highest relevance for specifically high levels of affective commitment. The study contributes to the literature by specifically examining the interplay of important factors in the management of affective commitment, expanding its examination to a configurational perspective, and by providing practical implications for the complex management of affective commitment in organisations.

Keywords:

affective commitment, relative importance, fsQCA, configurations

2.3. Study 2: A Configurational Perspective on the Theory of Planned Behaviour to Understand Employees' Change-Supportive Intentions

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A Configurational Perspective on the Theory of Planned Behavior to Understand Employees' Change-Supportive Intentions

Abstract

This study aims to deepen the understanding of the formation of change-supportive intentions by adopting a configurational perspective. To investigate potential configurations in relevant psychological processes suggested by the theory of planned behavior (Ajzen, 1991), classical linear analytic methods are supplemented by the application of two case-centered methods: latent profile analysis (LPA) and fuzzy set qualitative comparative analysis (fsQCA). The study uses data from two measurement times drawing on employees of a city council (*t*1: N = 1,589; *t*2: N= 1,524) undergoing complex and continuous organizational changes. While the case-centered results from LPA and fsQCA generally accord well with the results from regression analysis, they consistently highlight the relevance of configurational patterns. Specifically, LPA and fsQCA reveal that different combinations of change-related attitudes, subjective norms, and perceived behavioral control relate to the presence or absence of high supportive intentions. These results provide valuable insights for fostering employees' change-supportive intentions. Moreover, the present study demonstrates that case-centered analytical methods can essentially enrich research and theory-building in change management as well as in the field of behavioral intention formation in general.

Keywords: Change-supportive Intentions, Change reactions, Configurational Perspective, Fuzzy Set Qualitative Comparative Analysis, Latent Profile Analysis, Intention Formation, Theory of Planned Behavior, Organizational Behavior, Change Management, Germany

2.4. Study 3: Connecting the Dots of Fuzzy Sets and Regression: A Simulation Study for Survey Data

Meier, A. [1], Straatmann, T. [1], & Mueller, K. [1] (submitted). Connecting the Dots of Fuzzy Sets and Regression: A Simulation Study for Survey Data. *Survey Research Methods*.

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ABSTRACT

Introduced as a set-theoretic method for analyzing configurations and complex relationships in data, fuzzy set qualitative comparative analysis (fsQCA) has become an increasingly popular tool. Despite various comparisons, it is still unclear how and when fsQCA and multiple regression should be employed. The purpose of this study is to encourage and inform researchers, who wish to analyze survey data, to identify and draw from the strengths of both methods by embracing their unique properties. In total, 2000 datasets were created in the form of survey data for six induced scenarios, e.g. collinearity or asymmetry. Additionally, dataset sizes are defined for a small-N and large-N setting with 50 and 500 cases, respectively. These datasets were analyzed by multiple regression and fsQCA with an absolute and a relative calibration. The results show a high consistency for regression analysis, especially in large-N datasets detecting interaction effects. In the case of suspected asymmetric effects and combinatorial results, fsQCA shows additional insights. Moreover, fsQCA with an absolute calibration seems to outperform the relative calibration. Regarding different scenarios in survey data, both methods can give new insights into organizational life. In general, supplementing regression analysis by fsQCA with an absolute calibration is recommended. This study firstly provides guidelines for the application of multiple regression and fsQCA for different scenarios of survey data tested in a controlled environment.

Keywords: simulation, survey, configuration, fuzzy set, QCA, fsQCA, multiple regression

3.   General Discussion

The overall goal of the presented research was to apply the configurational perspective to organizational surveys. Each of the presented studies aimed to demonstrate the applicability of the increasingly popular fsQCA to large datasets typical to organizational surveys. Additionally, methods commonly used for analyzing surveys were taken into comparison to illustrate the incremental insights of the configurational perspective and specifically of fsQCA. These methods included multiple regression analysis, relative importance analysis, and LPA. Moreover, current methodological challenges of fsQCA were addressed to shed light on its application in the context of organizational surveys and to reduce reasons inhibiting researchers to use this method. The understanding of the transition from small to large datasets, the ratio between cases and conditions, frequency and consistency thresholds, robustness of the results, and the different calibration techniques for Likert scales could be deepened and mostly solved. From an applied perspective, first, fsQCA is generally a method fit to analyze large survey data. Second, robustness tests were developed that determine the most reliable results while simultaneously providing a consistent rationale for choosing frequency and consistency thresholds. Third, the absolute calibration was shown to be a better fit for Liktert scale data, at least when five or less conditions are included into the analysis. Whereas linear, additive approaches often fall short to analyze a higher complexity, the configurational approach could provide novel insights into the field of organizational psychology supplementing the traditional analysis tools. In sum, the presented studies intended to encourage researchers to examine complex interdependencies in organizational psychology by using fsQCA.

3.1. Summary of Results and Study-Specific Implications

The first study presented in this dissertation contributed to the literature on organizational commitment by providing an informed set of predictors of affective commitment and by conceptualizing and investigating three central forms of their interplay. Specifically, these predictors are core factors manageable by organizations that particularly influence high levels of affective commitment. Hence, organizations could increase the commitment of their employees by drawing from its benefits for both the organization (e.g., job performance) and the employee (e.g., well-being). This set of predictors included job scope, job involvement, perceived organizational support, justice, transformational

leadership, coworker satisfaction, pay satisfaction, promotion satisfaction, work-life balance, and job security. The different interplays of these core predictors were conceptualized as incremental contributions analyzed by multiple regression analysis, relative importance analyzed by relative importance analysis, and configurational patterns analyzed by fsQCA.

Using panel data of 947 subjects from various industries in Germany, the results showed major overlaps of the core conditions in fsQCA and the significant factors of the multiple regression as well as relative importance analysis. Across all three conceptualizations of the interplay of relevant factors, job design (job scope and involvement), organizational treatment (perceived organizational support and justice perceptions), leadership, and recognition (pay and promotion satisfaction) were consistently found to be essential in terms of incremental, relative, and configurational importance for the management of affective commitment. Focusing on the configurational approach, the combination of a good job design and positive organizational treatment was essential in relation to high affective commitment, whereas the single absence of positive organizational treatment associated with a lack of high affective commitment. Moreover, the robustness test by Emmenegger et al. (2014) could be extended to obtain more dependable and robust results of large-N fsQCA. This test additionally fortified the applicability of fsQCA to large datasets and thus organizational surveys.

This was the first study empirically examining a large variety of manageable factors relevant to affective commitment, while at the same time examining their interdependencies with a configurational approach. From an applied perspective, the management of particularly high levels of affective commitment can be expected in configurations where management creates a positive job design, fosters high transformational leadership skills, provides adequate pay and career opportunities, and is perceived as making an effort to support employees and treating them fairly. Concentrating on the core insights of fsQCA, the results suggest focusing on the combination of providing a positive job design as well as treating employees fairly and supporting them for achieving high commitment, while the central focus for avoiding its lack may be placed on fair and supportive treatment. From a methodological perspective, this study faced current challenges of fsQCA. In particular, a large number of cases typical to surveys could be analyzed, the trustworthiness of the results was increased by a robustness test, a better rationale for choosing the consistency threshold in large-N settings was developed, and Likert scales were successfully calibrated in a relative manner. At the same time, the study showed that the configurational perspective yields a high

potential for organizational surveys accounting for the complexity of organizational life when supplemented by traditional methods.

The second study included in this dissertation contributed to the literature on change management by deepening the understanding of the formation of employees' change-supportive intentions. Additionally, it highlights the practical importance of considering configurational patterns of psychological factors during change. Specifically, the potentially complex interdependencies between these change-related factors suggested by TPB were explored in relation to varying levels of change-supportive intentions. The TPB determinants include subjective norm, attitude, and PBC that were analyzed by drawing from the strengths of case-centered and variable-centered methods.

The longitudinal data (t1: N = 1,589; t2: N= 1,524) was drawn from a city council undergoing complex and continuous organizational changes. The results of regression analysis, LPA, and fsQCA indicate that the TPB determinants may generally influence each other's effects, or must even co-exist for high change-supportive intentions to occur. Although change-related attitude played both a crucial and nuanced role, it was emphasized that the determinants should not be studied in isolation. In particular, fsQCA revealed equifinal configurations consisting of two TPB determinants, except for the lack of high change-supportive intentions at t2 resulting in an asymmetric effect. Whereas interdependencies of TPB determinants were only found at t1 by regression analysis, LPA identified equifinal profiles of TPB determinants for high intentions at t2. The configurational methods determined that the combination of high change-related attitude and high change-related PBC was the most consistent and robust solution explaining the biggest variance for fostering high change-supportive intentions. Moreover, the study adopted the robustness test by Emmenegger et al. (2014) and the subsampling robustness test by Cooper and Glaesser (2016) supporting the reliability of fsQCA results and its applicability to large datasets, respectively.

This was the first study empirically examining the TPB variables in the context of a change management process from a predominantly configurational perspective. From an applied perspective and beside equifinal solution pathways, the asymmetric effect implied that interventions during change can be tailored to the status quo and the corresponding goals of the intervention: If the focus is to avoid the lack of high support, focusing on attitude may be a sufficient approach to improve matters. If the focus is on increasing change support, a

broader approach to interventions must be taken. In particular, a "socially supported, positive attitude" or a "control confident, positive attitude" are required for change support. Hence, interventions should aim at providing information about the vision and the benefits of changes, and convincing employees that their social environment approves of change-supportive behaviors and/or that their reactions to the change are within their own control.

From a methodological perspective, this study also faced current challenges of fsQCA. First, the applicability of fsQCA to large-N surveys was supported by additionally performing a subsampling robustness test. Second, a generally applicable robustness test to large-N fsQCA helped to increase trustworthiness of the results and simultaneously helped to find the most robust consistency threshold. Third, organizational survey data was similarly calibrated as suggested by Emmenegger et al. (2014) that supports using an absolute calibration approach. In sum, this study showed that configurational methods analyzing organizational surveys can enrich research and theory-building in change management and provide valuable information for fostering employees' change-supportive intentions.

The third study introduced in this dissertation contributed to the literature on the method of fsQCA by building on the challenges encountered in the other two studies. In particular, this simulation study addressed the comparability of regression analysis with fsQCA, their possible differences for small-N and large-N settings, and compared the two main calibration techniques of fsQCA. By making recommendations for the application of fsCQA, this study intended to resolve remaining challenges that might have inhibited researchers to look into organizational surveys with a configurational perspective.

In total, 2,000 datasets were artificially created in the form of survey data for seven induced scenarios that inherit certain properties. These scenarios included asymmetric effects, high and low multi-collinearity, a single predictor associated with the outcome, and a twofold and threefold conjunction or interaction of predictors. Additionally, dataset sizes were defined for a small-N and large-N setting with 50 and 500 cases, respectively. These datasets were analyzed by multiple regression, fsQCA with an absolute calibration, and fsQCA with a relative calibration. As a result, regression analysis was generally very sufficient in revealing the different scenarios, except for interactions in small datasets samples and asymmetric effects. This can be compensated by supplementing the analysis by fsQCA with an absolute calibration. If Likert scales are used, an absolute calibration should be preferred to a relative calibration. Moreover, it was highly recommended to control survey data for collinearity,

because fsQCA with an absolute calibration seems to be similarly affected as regression analysis.

This was the first study comparing multiple regression with fsQCA as well as different calibration techniques of fsQCA for various scenarios of survey data in a controlled environment. Although additional research on the comparison of both methods is needed, first suggestions were given for the joint use of multiple regression and fsQCA utilizing the unique properties of each method. From an applied perspective, the results indicate that multiple regression should be supplemented by fsQCA for a configurational perspective on survey data. In particular, survey data should be calibrated in an absolute manner for detecting asymmetric effect, if four or less conditions are used in a large-N setting. Moreover, fsQCA is similarly affected by multicollinearity as regression analysis and requires preliminary analysis for its prevention. From a methodological perspective, the applicability of fsQCA to large datasets similar to organizational surveys was confirmed. Additionally, this study shed light on the different calibration techniques of fsQCA suggesting the absolute calibration for Likert scales.

3.2. General Implications for Research and Practice

As previously discussed, the results of the presented research provided several implications fostering affective commitment and forming change-supportive intentions, as well as methodological and conceptual implications for the application of fsQCA. Besides validating the application of fsQCA to large-N surveys, incremental insights were demonstrated by additionally taking well-established and traditional approaches into account, such as regression analysis. The presented research addressed and partially solved current challenges that reveal several methodological implications advancing fsQCA in its robustness and applicability to survey data. Hence, this dissertation intends to pave the way for future research in the field of organizational psychology taking on a configurational perspective to better cope with complex interdependencies in survey data. In this section, general implications are presented that can be derived from the three studies presented.

Beside equifinal solutions entailing different levers for strategic interventions, fsQCA has two distinct conceptual implications for research in organizational psychology. First, this set-theoretic approach revealed which asymmetric effects underlie the solutions related to the presence and those connected to the absence of affective commitment (Study 1) as well as

change-supportive intentions (Study 2). In contrast, multiple regression and relative importance analysis fail to detect asymmetric effects due to their symmetric nature. Although LPA can cluster groups showing both low and high values in the outcome of interest, fsQCA analyzes both its presence and absence explicitly. Analyzing both sides can give additional insights into specific outcomes. From a practical perspective, the analysis of the absence of an outcome could be specifically helpful, for example if resources of the organization are limited to promote high commitment or change-supportive intentions. This way, interventions can be implemented that at least prevent a decay or decrease of commitment or intentions until resources for their promotion are available again.

Second, despite some skepticism towards large-N fsQCA, the presented research further contributed to recent literature by demonstrating its applicability to large-N settings. From a conceptual and empirical perspective, fsQCA has been proven to be fit to dependably analyze large datasets. Considering Study 1, fsQCA has been successfully applied to 947 cases. In the scope of their methodological capabilities, the regression and relative importance analyses greatly supported the results of fsQCA. Regarding Study 2, the fsQCA results of 1,589 and 1,524 cases could also mostly be backed up by regression and LPA. Additionally, the adjusted subsampling robustness test concerning the dataset size could significantly increase the trustworthiness of the large-N results. Building on both studies, Study 3 took the comparison of small-N and large-N fsQCA into account. Disregarding the calibration procedure, fsQCA even performed better in creating the expected results for large datasets than for small datasets. In accordance with recent research (e.g., Bell et al., 2014; Campbell et al., 2016; Garcia-Castro & Francoeur, 2014; Misangyi & Acharya, 2014), the presented studies thus imply the dependable application of fsQCA to large dataset sizes that are representative for organizational surveys in the field of organizational psychology.

From a methodological and applied perspective, the results of the presented research could improve the use of fsQCA generating several new insights. First, fsQCA shows to be a very suitable configurational approach to identify interdependencies in data. In contrast, the potential counterpart of regression analysis quickly shows limitations and may cause difficulties (Aguinis, 1995; Aguinis & Stone-Romero, 1997). In fact, interactions of over three variables are rare, because the interpretation of the coefficients becomes infeasible while statistical assumptions cannot be maintained (e.g., Grofman & Schneider, 2009; Kam & Franzese, 2007). In accordance with Study 3, small dataset sizes inhibit the number of interaction terms that could be integrated into a regression model (Epstein, Duerr,

Kenworthy, & Ragin, 2008). Additionally, Study 2 showed that interaction terms in regression analyses sometimes failed to achieve significance, although LPA and fsQCA pointed to relevant configurations. Hence, the analysis of complex interdependencies with, for example, regression analysis can be rather delicate and is currently more promising if performed by a configurational method like fsQCA, as demonstrated in all three studies of this dissertation.

Second, the presented research shed light on the calibration procedures of fsQCA introduced over the last years. In particular, the relative calibration (Study 1) as well as the absolute calibration (Study 2) could be successfully applied indicating advantages in both. On the one hand, the relative approach becomes particularly interesting to automatically cope with known tendencies towards positive values on Likert scales in survey research (e.g., Braunscheidel et al., 2010; McCarty & Shrum, 2000). Additionally, the relative calibration would be independent of, for example, the number of points on the Likert scale or insufficient variance in the data by still maintaining the complete fuzzy value spectrum. For example, values between 5 and 7 on a 7-pt Likert scale that are nearby could still result in three sufficient anchor points for the relative calibration procedure. On the other hand, an absolute calibration needs to be manually adjusted to cope with low variance. That is, values between 5 and 7 on a 7-pt Likert scale could not be properly calibrated with 6, 4, and 2 as anchor points. To cope with this issue, thresholds using an absolute calibration were previously adjusted according to tendencies (Emmenegger et al., 2014; Ordanini et al., 2014) or means (Cheng et al., 2016). Additionally, if sufficient variance could be guaranteed, an absolute calibration would assure comparability across survey studies. Moreover, as Study 3 suggested, the absolute approach seems to be better suited for detecting asymmetric effects in data than the relative approach. However, this contradicts the fsQCA results of Study 1 and requires additional research. Thus, the issue of the different calibration approaches and anchor points could not be completely solved by the presented research. Still, from an applied perspective, an absolute approach is recommended, if less than five conditions are included in the analysis as in Study 3 and asymmetric effects are of interest.

Third, concerning the robustness of fsQCA results, two of the presented studies contributed to previous research by applying and extending recently introduced robustness tests. On the one hand, the test for large-N settings suggested by Emmenegger et al. (2014) helped to determine the robustness of a solution by, for example, randomly deleting 10% of the data for 1,000 runs. Hence, the resulting configurations would be persistent against a

certain amount of variance in the data. By extending this test to various possible thresholds, the consistency threshold could be chosen in a recommended range according to the most robust solutions resulting from the tests. A range of consistency thresholds was recommended by the developer of the method himself (>=0.8; Ragin, 2000, 2008), but lower thresholds have been used as well (0.75; e.g., Whittington et al., 2013) that could quickly confuse researchers. However, the extended robustness test not only allows to determine the robustness of fsQCA, but simultaneously can help to choose the best consistency threshold. This becomes especially helpful for thresholds in the "grey" area between 0.8 and 1.0. For this reason, this robustness test is recommended as a mandatory tool for every fsQCA application to increase reliability and avoid "cherry-picking".

On the other hand, the subsampling robustness test suggested by Cooper and Glaesser (2016) helps to increase confidence in the results of large-N fsQCA. As applied in Study 2, small sample sizes (e.g., 40-50 cases) are randomly drawn from the complete dataset. The idea is to run the analysis on sample sizes that are suitable for the initial design of fsQCA. Despite the decent amount of papers applying fsQCA to large-N data and existing guidelines (e.g., Greckhamer et al., 2013), the exact implications from the transition of small-N to large-N fsQCA seem not entirely clear. However, this subsampling robustness test can ensure the congruence of results when analyzing a large dataset. Thus, until the application of large-N fsQCA further fortifies, this test can be a helpful supplement to strengthen the trustworthiness of fsQCA in large-N settings.

3.3. General Limitations and Future Directions

As in most research, the presented studies face a few limitations that need to be noted. First and most obvious, the use of the relative calibration approach in Study 1 seems to contradict the recommendations of Study 3. In particular, the results of the simulation study indicate that asymmetric effects can only be created if the Likert scales are calibrated in an absolute instead of relative manner. However, the obtained configurations for the absence as well as the presence of affective commitment (Study 1) differ in at least two conditions per solution pathway, i.e. they are asymmetric. Turning to other research applying a relative calibration to Likert scale, we are only left with a single study by Veríssimo (2016). However, no valid configurations for the presence of the outcome could be obtained, because the consistency thresholds were below 0.5. Although a couple configurations are per se

asymmetric compared to no configurations, this deficit could occur due to various reasons and needs further confirmation. In contrast to four conditions included in Study 3, Veríssimo (2016) included six and Study 1 even seven conditions into the analyses. A higher number of conditions could be a reasonable explanation for asymmetric effects in fsQCA using the relative calibration, because it simultaneously increases the chance of more divers configurations. Hence, future research is needed to compare the different calibration techniques with a higher number of conditions to examine the possibility of detecting asymmetric effects.

Second, other researches might arrive at different calibrations in each of the presented studies. As previously discussed in the introduction, different calibration techniques and various anchor points were previously applied on Likert scales. Additionally, the calibration process of fsQCA is an essential part of the current methodological debate (e.g., Krogslund et al., 2015; Thiem et al., 2016). In fact, setting the anchor values introduces some degree of subjectivity and may occasionally provide difficulties, for example if there is no sufficient knowledge or theoretical grounding in order to identify meaningful anchors. Even though the anchor points were set in an informed and justified manner in the presented research, clear and overarching guidelines on the calibration of Likert scales are still required for establishing a standard. Hence, future studies could perform extensive simulations for different calibrations of Likert scales or develop a calibration robustness test. With the calibration procedure being the most complex adjustment manually done by the researcher, this could diminish the barrier of using fsQCA in the field of organizational psychology. Furthermore, based on such newly established standards, theoretical and substantive knowledge could be individually applied to cope, for example, with cultural differences in responding to Likert scales.

Third, the relation and comparison of fsQCA to other methods is not exhaustive, but can give a few methodological insights. As a baseline, all three presented studies took regression analysis into account. Previous studies have already compared fsQCA with regression analysis (e.g., Grofman & Schneider, 2009; Seawright, 2005; Vis, 2012). However, debates about their exact relations are still in progress (e.g., Thiem et al., 2016). For this reason, as a third method, relative importance analysis and LPA were included in Study 1 and Study 2, respectively. Their inclusion was intended to provide a groundwork to build on and support the results of fsQCA, which is rather new to research in organizational psychology. Although a comparison of methods may suggest the superiority of a single

method, the presented studies argue for a supplementary use of each method fostering their unique properties. Furthermore, Meuer and Rupietta (2017) suggest that the integration of QCA and statistical analysis promises strong inferences for multilevel research on organizational configurations. Therefore, additional studies comparing classical analysis with fsQCA should be conducted to aggravate the acceptance of fsQCA in the field of organizational psychology.

Finally, only Study 2 of three studies was based on longitudinal data to possibly draw conclusions about causality. However, the two measurement times in Study 2 could not be matched over time due to data protection policies. Even though the literature on fsQCA often refers to contributing factors as "causal" conditions (e.g., Fiss, 2011; Ragin, 2000, 2008), causality is certainly not given per se. In fact, the causality is not bound to the methods of QCA as it is often illustrated. Instead, these "causal" conditions would be previously determined as predictors or factors that are already known to inherit a causal relationship to the outcome. Moreover, such causal relations are argued to only be identified by fsQCA if the parsimonious solution is used (Baumgartner, 2015). Hence, drawing causal inferences, particularly from organizational surveys, is not simply entailed by fsQCA and should be handled with caution.

3.4. Outlook

Based on the contributions of the presented research, a number of future studies can be derived or even become very salient that make methodological contributions to fsQCA or strengthen the applicability of a configurational approach to survey data. These studies worth pursuing are suggested in the following.

From a conceptual and methodological perspective, the presented research showed the importance of a configurational approach to psychological phenomena in organizations. As numerously proposed (e.g., Fiss et al., 2013; Meyer et al., 1993; Short et al., 2008), the configurational approach offers a high potential uncovering complex interdependencies in organizational life. Although a number of studies has been recently published in the field of business and management research (e.g., Campbell et al., 2016; Greckhamer, 2016; Fiss, 2011; Misangyi & Acharya, 2014), configurational methods still lack application in organizational psychology. In this context, fsQCA could particularly supplement research on psychological and organizational phenomena mostly relying on linear, additive methods.

Hence, the complementary application of fsQCA could give new insights into, for example, the prediction of turnover intention, perceived corporate social responsibility, work stress, or work engagement. Specifically, turnover intention could complement Study 1 by offering valuable clues on one of the opposing sides of organizational commitment.

Additionally, from a conceptual and methodological perspective, studying such phenomena by fsQCA could be expanded to longitudinal settings, for example for affective commitment. Although Study 2 examines two time points by configurational approaches, fsQCA was applied to each time point separately without a methodological integration. Beside the general value of multi-time studies in organizational psychology, fsQCA was not extended to specifically examine longitudinal data, yet. Even though tQCA considers the temporal order of conditions (Caren & Panofsky, 2005) in addition to the original QCA, this method needs to be expanded to fuzzy sets and the integration of data across several time points.

Considering the equifinality property, fsQCA appears to be particularly well suited to examine different patterns of relations for subgroups of employees. In the field of organizational psychology, it seems particularly interesting to have specific knowledge of the relevant configurational patterns for different employee populations in regard to age, tenure, family status, and others. For example, the manager sample was analyzed in Study 2 in an explorative manner showing the potential for subgroup-specific configurations. This way, interventions and strategies can be particularly customized to subgroups possibly enhancing their success. However, one significant challenge is that the unique coverages are partially very low across different solution pathways. This can result into the same employees yielding several identical configurations, especially in regard to core conditions. Hence, further research is needed on how to handle the methodological consequences that are entailed by such an approach.

From a methodological perspective, fsQCA for large datasets can typically incorporate six to 12 conditions (Greckhamer et al., 2013). A simulation showed that specifically QCA could integrate 11 conditions, if more than 180 cases are included in the analysis (Marx et al., 2013). However, as discussed earlier, too many conditions lead to the problem of limited diversity. That is, not all the combinations possible are occupied by empirical cases. Limited diversity was not an issue in the presented research, because the ratio of conditions and cases was acceptable or could be coped with by the number of runs in the simulation. However, the exact number of allowed conditions for fsQCA still requires

clarification. Therefore, a simulation study advancing the study of Marx et al. (2013) would be needed for fsQCA that suggests guidelines for the ratio of conditions and cases.

In regard to the robustness of fsQCA, robustness tests were adjusted and applied in Study 1 and Study 2. Although Study 3 created 2,000 datasets per scenario that already provided a certain amount of robustness, the simulation could be expanded by the robustness test based on Emmenegger et al. (2014) in a future study. This would be very computationally expensive, but could strengthen the results and suggestions tremendously. Additionally, future studies could build on the robustness test by developing meaningful thresholds for the robustness performance determining whether a solution can be considered or should be rejected. Moreover, a further expansion of robustness tests should be tested and applied in future studies that helps determining the optimal frequency thresholds similar to the consistency thresholds determined in Study 1 and 2. To enhance fsQCA, Rohlfing (2016) proposed that simulations are required and indeed a fitting tool for this matter. Hence, several simulation studies could be conducted that improve the robustness of fsQCA and offer reliable tests.

In order to further foster the application of configurational methods in organizational psychology, the relation to more classical and established methods typical to this field can additionally build trust in the results of fsQCA. Although the results of the different methods mostly differ by their individual properties alone, fsQCA could show additional aspects worth further investigating. As performed in the presented research, multi-method approaches should be in the spirit of researchers to reveal multiple perspectives. Still, no analytical assessment exists to determine a possible superiority of, for example, regression analysis over fsQCA. In this context, several debates have been published without providing a clear superior method (Clark, Gilligan, & Golder, 2006; Mahoney, 2008; Wagemann & Schneider, 2010). Hence, despite an admittedly difficulty or even impossibility, a reliable measure for the assessment of the validity of fsQCA results in comparison to traditional methods would be most desirable.

Concerning configurational approaches, fsQCA is not the only method analyzing configurations, as mentioned before. In spite of its popularity and progressing improvements, other configurational approaches might be worth exploring in research of organizational psychology. One established method to detect profiles is LPA, which was applied in Study 2 while demonstrating its limitations. Another method with a stronger focus on causality is CNA. Although CNA is not as well-established as fsQCA, yet, it could give new insights into

phenomena interesting to the field of organizational psychology. This approach focuses on causal chains and does not require the declaration of independent variables or outcomes. Thus, future studies could apply CNA, if a specific outcome could not be theoretically determined or several conditions could possibly come into question.

Based on the design of Study 3 and the recommendations by Rohlfing (2016), this study could be further extended to a more elaborate and comprehensive simulation or build on each other by smaller separate simulations. These additional simulations could include the core-periphery model proposed by Fiss (2011). The importance of individual conditions or their combinations could supplement the understanding of, for example, the relation between core conditions and significant variables of regression analysis. Alternatively, the simulation could build on the complex solution as determined in Study 3 and integrate the parsimonious solution. This differentiation could shed light on the debate between these two solutions (e.g., Baumgartner, 2015). Studying both solution strategies as well as the core-periphery model go mostly hand in hand. Hence, future simulation studies could further improve the understanding of fsQCA and foster its application, for example in survey research.

In sum, the presented research highlighted the applicability of fsQCA to organizational surveys and that a configurational approach can give new valuable insights into the field of organizational psychology and the analysis of organizational surveys. Although a few methodological challenges remain, the presented research hopes that the findings could resolve most of these challenges and thus encourage researchers to use fsQCA as a fruitful supplementary tool in future studies further enriching the understanding of organizations and organizational life.

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