

# Assessment of Conventional and Advanced Methodologies: Application of Configurational Approach and Fuzzy Set Theory in Emotional Labor Research

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**Abstract:** Application of configurational approach and fuzzy set theory on social and behavioral science variable models needs more attention. Few social science researchers have employed configurational methods of research to empirically investigate a research question. On the front of exploring unique and innovative ways of investigation, this paper discusses the application of fuzzy set theory in social sciences. The study primarily takes a model of emotional labor and employee well-being as a case example to depict how configurational models are developed. The study examines emotional labor and well-being, not as predictor or criterion variables, but rather as conditions and outcome. The study also distinguishes between correlational and configurational method of research and adopts a descriptive approach by taking five research papers that examine social and behavioral science constructs from a configurational approach. Scarcity of literature in the crossover between the mathematical models and social sciences, particularly for the respective variables, call for a study that can clarify the initial queries surrounding fuzzy set models and pave the way for future empirical studies. The research concludes that utilizing mathematical models like fuzzy set theory, configuration and qualitative comparative analysis in social sciences can break monotony and bring newness in approaching as well as addressing a research query. This paper draws attention towards exploring new avenues in research methodologies. Application of newer methods would not only increase the rigor and precision of research findings but also assist in approaching a research area from multiple angles thereby enhancing the research quality.

**Keywords:** Configuration, Fuzzy Sets, Qualitative Comparative Analysis, Emotional Labor, Employee Well-Being

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## 1. Introduction

Social scientists often propose, and test theories based on correlational phenomenon where a verbal statement about a social construct is converted into nominal scale and tested through statistical analysis to establish whether the numbers say the same. While this is a neat system for getting straightforward conclusion about a research model, the underlying assumption that all social constructs can be interpreted using conventional statistical techniques, is somewhat flawed. To understand this argument, it must be kept in mind that statistical techniques are equipped to handle crisp sets where there are mutually exclusive sets like sex or age. On the other hand, social constructs are not crisp but fuzzy, thereby making their categorization and calibration for empirical analysis, a tedious process (Ragin, 2008). For instance, it is hypothesized that stress can be the consequence of low EQ. However, not all people who have low EQ may experience stress, not the same level of it anyway. This points to the fact, that social constructs are often fuzzy with lack of a clear membership in one group. Ragin (2008) calls for the study of such groups through set theoretic methods rather than statistical or correlational methods.

Major aim of this study is to discuss the theory of fuzzy sets and set theoretic methods in detail to understand how they can be used in social and behavioral sciences and why they might bear better and more reliable empirical results. The paper aims to make the case for application of configurational research approach in social and behavioral sciences and illustrating its potential by showing how it might be applied to a case example of emotional labor and well-being.

The paper is comprised of four major sections. Section 1 is introduction. Section 2 introduces the basic concepts and principles associated with configurational approach and fuzzy set theory. Section 3 discusses the importance of integrating the configurational approach with the social science variables. It provides a contrast between configurational and correlational approaches and highlight the challenges of employing the former against latter. Section 4 includes a discussion on recent studies that have employed configurational approach to empirically test behavioral sciences constructs. This provides a better outlook of ongoing work and how configurational methods are used in social science studies. Section 5 demonstrates how various techniques of configurational research methods can be applied on a behavioral science model. For the said purpose, a

hypothetical case of emotional labor strategies and their relation to employee well-being is discussed in healthcare context. Historical literature on emotional labor strategies and well-being is included to understand the nature of these variables. An empirically testable configurational model of emotional labor and well-being is built to exemplify the use of configurational theory in behavioral science.

The study would assist social science researchers to familiarize with configurational theory and help in integrating and triangulating qualitative and quantitative studies given the holistic nature of configurational models.

### 1.1 Objectives of Research

The study aims towards achieving the following objectives.

- To explore and understand key concepts of fuzzy sets, configurational approach and qualitative comparative analysis.
- To use the constructs of emotional labor and employee well-being as a case example to highlight various tools and techniques of configurational approach.
- To present an empirically testable configurational model of emotional labor and well-being.
- To highlight and discuss the benefits and pitfalls of employing configurational approach in social science research.

### 1.2 Research Questions

Our study strives to answer the following research questions.

- What are fuzzy sets and qualitative comparative analysis?
- How is configurational approach relevant to social and behavioral science research?
- How is configurational research method applicable on a research model comprised of behavioral variables?
- What are the merits and demerits of employing configurational approach?

## 2. Literature Review

### 2.1 Qualitative Comparative Analysis with Fuzzy Sets

Qualitative comparative analysis is a commonly used method in set theory. It differs from other methodologies in multiple ways. Firstly, it is based on causation rather than correlation. This causation is established and supported through knowledge and theory. Secondly, it assumes the principle of equifinality i.e. one outcome can have several antecedents or pathways rather than one. This attribute of QCA is a clear distinction from correlational approach. Thirdly, it utilizes truth tables for hypothesizing configurations or combinations of causal conditions. Here, a set theoretic relation might turn out to be stronger even if correlation for the same model is found to be weak (Ragin, 2008; Schneider and Wagemann, 2012). To further understand the essence of set theoretic relations, let us discuss some of the basic concepts of configurational approach, fuzzy sets and set theoretic relations.

#### 2.1.1 Distinction between Crisp and Fuzzy Sets

Ragin (2008) discusses crisp sets by stating that any phenomenon of interest can be categorized in crisp sets if they are mutually exclusive. For instance, gender or age groups. Furthermore, membership in a crisp set can easily be determined by defining the conditions required to be part of the outcome set. Ragin (2008) exemplifies how dogs are a subset of mammals, with the former's set entire area residing inside the superset of latter. Similarly, when it comes to membership calibration, crisp sets are simple to grasp. Only two qualitative anchors of 1 and 0 are used to denote a case's membership in crisp sets. Either a case is either fully part of a set (1) or not at all (0) (Schneider and Wagemann, 2012). This need for dichotomization of sets while studying social phenomenon, is incredibly difficult. Any mistake in determining the membership or non-membership of a case might jeopardize the results (Ragin, 2008; Schneider and Wagemann, 2012). For instance, deciding whether a person is a liberal or a conservative would require examining all the combinations of causal conditions that lead to both outcomes. Since, there are people who are neither fully liberal nor fully conservative. Deciding their membership in either sets would be based upon knowledge and theory-based calibration of set membership. Here, fuzzy sets allow partial membership in sets with cases either *more in than out* of a set or *more out than in* a set (Ragin, 2008). Hence, more than two qualitative anchors of 1 and 0 are used in fuzzy sets. A case having membership of 0.6 in a set denotes that it is more in the set than out.

Conversely, a case with membership of 0.4 denotes that it more out than in the set (Schneider and Wagemann, 2012). Membership score of 0.5 in a set is problematic. Ragin (2008) calls the qualitative anchor of 0.5 the crossover point. If a case has 0.5 membership in a set, it is recommended to establish whether it's *In* or *Out* based on theory or observation of similar cases. Such cases might have to be removed from the analysis altogether if their membership remains undecided.

### 2.1.2 *Asymmetry*

Set theoretic asymmetry implies that two seemingly contradictory statements or claims can be equally valid (Ragin, 2008). For instance, the claim that people who exercise emotional labor experience low well-being can be termed as emotional labor as a subset of well-being. Conversely, people not practicing emotional labor might also experience low well-being. The two set theoretic claims do not contradict each other, rather each will have its own configurations or pathways, based upon relevant theory. Most of the quantitative tools like correlation, regression, analysis of variance (ANOVA) and structural equation modeling (SEM) are appropriate for testing symmetrical data. However, in social sciences, we deal mostly with asymmetrical data where for any social phenomenon, membership of conditions and outcome is not confined to exclusive crisp sets rather reside in several sets simultaneously, thereby creating asymmetric relations (Ragin, 2008).

### 2.1.3 *Equifinality*

*Equifinality* principle allows multiple paths or combinations of different conditions to cause the same outcome. For determining any outcome, configurations leading up to it are developed, after carefully studying a social phenomenon and assessing the conditions that are causing the outcome to occur. Employing configurational approach not only allows for establishing multiple paths to the same outcome, but also enlightens us about whether those conditions are sufficient or necessary for the instance of outcome (Hsiao et al, 2013; Ragin, 2008).

### 2.1.4 *Causal Complexity*

Causal complexity results from equifinality and asymmetry. I.e. an outcome is caused by numerous combinations of causal conditions and those combinations albeit seemingly conflicting, yet are equally valid (Ragin, 2008). The complexity principle gets us beyond testing the social science variables as independent, intervening or moderating variables and aims to examine them in the form of complex permutations of causal conditions, leading up to the same outcome. It allows understanding a certain social phenomenon by theory and strengthening its measurement by scale calibration which again is contingent upon substantive knowledge (Grant, Morales and Sallaz, 2009).

### 2.1.5 *Configurations or "Recipes"*

Dealing with fuzzy sets allows the researcher to establish various configurations for the outcome variable. Also called as "recipes" by Ragin (2008), these configurations must be supported by strong theoretical base (Ragin, 2008; Grant, Morales and Sallaz, 2009). For instance, there would be several combinations of causal conditions leading to the outcome of low well-being. Each configuration or recipe points to a pathway to the outcome. Refinement of causal conditions is done by excluding all the irrelevant conditions that do not lead to the outcome due to contextual reasons. Such measures ensure parsimony in qualitative comparative analysis and enable the researchers to closely reexamine the causal conditions (Grant, O'Neil and Stephens, 2009). Later for empirical analysis through QCA, these recipes are organized in the form of truth tables.

### 2.1.6 *Consistency Versus Coverage*

In configurational theory, Consistency refers to how consistently a causal condition leads to an outcome across a number of cases (Ragin, 2008). For instance, ample number of cases have found that emotional labor results in low well-being, thus the former might be considered a consistent cause or condition to produce the latter as outcome. However, establishing mere consistency is not enough. A causal condition must have considerable coverage in determining the outcome. Coverage entails how strongly a causal condition predicts the outcome (Ragin, 2008). For example, emotional labor might be a consistent condition for low well-being across most cases, but if its impact as an individual determinant is weak, then it will be said to have low coverage. Both consistency and coverage range from 0 to 1.

### 2.1.7 *Sufficient and Necessary Conditions*

Concerns of consistency and coverage are closely tied to whether the conditions in question are sufficient or necessary to produce the outcome. A sufficient condition refers to the factors sufficient to cause the outcome

but might not be necessary for it (Ragin, 2008; Schneider and Wagemann, 2012). For instance, combination of emotional labor and high emotional job demands is a sufficient condition for low well-being. However, this condition might not be necessary since there are instances when people do not experience low well-being despite presence of both conditions. For establishing sufficiency, all values of combinations of causal conditions must be less than corresponding outcome values. Necessary conditions point to indispensable causal conditions without which outcome cannot possibly occur. For establishing necessity, all values of outcome must be less than corresponding values of combinations of causal conditions (Ragin, 2008; Schneider and Wagemann, 2012). If we add in the above configuration, the condition of exhaustion, the configuration can become necessary to cause the outcome of low well-being. Here, it should also be noted that membership scores of causal conditions and outcome are not consistently sufficient or necessary across all cases. This simply implies equifinality and asymmetry, where an outcome can have numerous determinants or causal conditions, where one set theoretic claim does not contradict or undermine the other (Ragin, 2008).

### 2.1.8 Truth Tables and Scale Calibration

Truth tables list down all possible configurations for any given outcome. Each truth table configuration is itself a statement of sufficiency (Schneider and Wagemann, 2012). The formula for calculating all possible configurations in a truth table is  $2^k$  ( $k$ = number of causal conditions). While this is quite straightforward in crisp set analysis, precise calibration is needed when analyzing fuzzy sets (Ragin, 2008). For instance, if emotional labor is given a score of 0.6 to cause well-being of 0.8, there will have to be sufficient theoretical support towards choosing these scores. One might argue, why not choose below or above 0.6. Simple nominal scales or even interval scale like Likert do not calibrate the social construct based on theory. The following points need to be kept in mind while constructing truth tables (Grant, Morales and Sallaz, 2009; Hsiao et al, 2013; Schneider and Wagemann, 2012).

- All conditions are arranged in the form of recipes, configurations or combinations of causal conditions towards an outcome.
- Study must define based on theory, qualitative anchors of *full non-membership* (0.0), *full membership* (1.0), *crossover point* (0.5), *more in than out* and *more out than in*; for any social construct.
- Calibration should incorporate the precision of quantitative method and knowledge of qualitative method.
- Scoring of both conditions and outcomes should be either above or below the *qualitative anchor* of 0.5. Scores below 0.5 would show low membership scores and vice versa. Conversion of fuzzy set into crisp set scores depend upon the membership scores of causal conditions.

## 3. Relevance of configurational approach/fuzzy set theory in behavioral science

Most of the previous studies have used statistical measures like correlation, regression and structural equation modeling for data analysis. Similarly, for deeper understanding of certain areas, qualitative methods of research are used. While these methods offer detailed analysis and in-depth comprehension of the variables of interest, replication of the same research techniques has created monotony and has stifled the growth of new ideas concerning the exploration of miscellaneous research tools. Here, configurational approach to research can fill the gaps. It offers the precision and exactitude of quantitative study while also acknowledging the detail and depth of a qualitative study.

### 3.1 Configurational versus Correlational Approach to Research

Majority of social science research has employed correlational research methods that are better suited for crisp or mutually exclusive sets. Unlike pure sciences, the variables or sets social scientists deal with are hardly mutually exclusive rather highly intertwined. Thus, establishing causality between them based on conventional correlational techniques undermines all the other factors that play their role in predicting the same outcome (Grant, Morales and Sallaz, 2009).

Ragin (2008) points out how correlational approach focuses the researcher's attention on digging up maximum number of cases where presence of a causal condition leads to the presence of a corresponding outcome: as well as cases where of absence of a causal condition leads to absence of its subsequent outcome, thereby supporting researcher's stance of causality. This bias does not encapsulate the true essence of any set theoretic relation. Set theoretic researcher is not motivated to merely establish a strong association between condition and outcome rather is concerned with studying specific cases only. Choice of those respective cases is contingent upon the set theoretic strategy in question. For instance, the researcher might want to

determine whether cases with the same outcome share same causal conditions: or whether cases sharing similar causal conditions lead to one common outcome. Ragin (2008) further argues that correlational approach uses predetermined formulas to establish causality. Such formulas “*rely on the bivariate correlation as the cornerstone of empirical analysis, these sophisticated quantitative techniques eschew the study of explicit connections. This underlying fundamental shortcoming of the correlation is at the root of the rejection of correlational methods by many scholars who conduct qualitative and case-oriented research.*” (Ragin, p. 22). The advantage of translating social phenomenon into fuzzy sets is that the latter is simultaneously quantitative as well as qualitative in nature. While assessing social science theory in these sets, one not only has to rely on rich theoretical foundation to justify the relevant set theoretic connections (qualitative) but also makes use of fuzzy set calibration technique to quantify those connections (quantitative). Thus, fuzzy sets allow the researcher to establish causal relationships based on both extensive theoretical knowledge, as well as precise quantitative calibration.

### **3.2 Challenges and Pitfalls of Configurational Approach**

One of the pitfalls of configurational approach include resting on the premises that certain combinations of causal conditions lead to an outcome (Ragin, 2008). However, the number of these conditions may be too big to handle while empirically testing the model (Sehring, Korhonen-Kurki and Brockhaus, 2013). Ragin' (2008) suggests using  $2^k$  to determine the number of all logically possible configurations. In reality, k or number of conditions are too many, resulting in complications. Then there is the problem of number of cases. A study may examine ten cases, whereas the eleventh case might hold considerable significance to set theoretic relations and therefore would be ignored in the study. All possible combinations of causal conditions and their subsequent outcomes in the context of any social phenomenon, cannot possibly be studied and inferred across all existing cases. On one hand, social theorizing calls for including maximum cases and conditions in the configurational analysis. On the other hand, doing so would compromise the parsimony of research (Sehring, Korhonen-Kurki and Brockhaus, 2013).

Moreover, determining which conditions to include or exclude depend on rigorous assessment of all available cases to avoid missing any important and relevant conditions. Examining limited number of cases might lead to inclusion of some irrelevant conditions, resulting in inaccurate results. Similar problems may arise while establishing sufficiency and necessity of conditions (Roig-Tierno, Gonzalez-Cruz and Llopis-Martinez, 2017). Looking at the technical aspects of QCA, there is problem of missing data, which QCA cannot deal with unless that case is removed from the analysis. This may result in overlooking significant factors crucial for the set theoretic claim (Schatz and Welle, 2016). In both csQCA and fsQCA, handling inconsistent truth table configurations across significant number of cases also calls for revising theory or the underlying assumptions surrounding the set theoretic claims (Roig-Tierno, Gonzalez-Cruz and Llopis-Martinez, 2017). Scoring process and assigning membership scores based on theory and knowledge sometimes may lead to subjective scoring. Lastly, configurational studies need a lot of time and resources at researcher's disposal (Simister and Scholz, 2017).

## **4. Review of configurational studies**

This section discusses five recent configurational studies investigating social science variables, particularly those that are relevant to emotions or well-being. Doing so would not only help us understand emotions from a new lens but would also open doors for social scientists to explore newer research methodologies.

The first study by Gimenez-Espert, Valero-Moreno and Prado-Gasco (2019) investigate the emotional skills of nursing staff. Both regression and QCA are used in this study. Authors take age, sex, contract and seniority as set-theoretic conditions, while emotional abilities as the set-theoretic outcome. While the correlational analysis suggests an association between sex and empathy, the qualitative comparative analysis conclude that contract and age are sufficient but not necessary for enabling nurses' emotional abilities. Though the study suggests utilizing both methods for future researches as they are complementary in nature, they favor configurational approach over regression. Configurational models allow for studying conditions that may go unnoticed in a regression model. This is because of equifinality principle that does not undermine multiple configurations or pathways for outcome occurrence. Additionally, a condition can be studied alone or alongside other conditions, in determining its role in causing the outcome; unlike regression method where individual input of variables is deemed superior to their holistic role in the model.

Hsiao et al (2015) study antecedents and outcomes of workplace happiness using configurational method. The study empirically examines a dyadic asymmetrical relation between high versus low happy managers and their assessment of high versus low happy employees. Research findings reaffirm the utility of configurational approach in behavioral sciences, while presenting different configurations or pathways to happiness, whilst establishing equifinality as well as complexity of set-theoretic relations. Note that this study is among the first ones to use a configurational method to build algorithms for a behavioral phenomenon like happiness, making it one of a kind. The authors reaffirm Ragin's stance by stating that configurational methods are best suited to test asymmetric relations. The method allows the researcher to dig deeper into theory in order to comprehend the respective conditions and outcomes, thus giving it more precision and accuracy compared to correlational methods.

A descriptive predecessor of the aforementioned paper was presented by Hsiao et al (2013), that presents configurations of causal conditions i.e. gender, age education and marital status, leading to the outcomes i.e. performance. Authors point out that correlational methods would only measure the magnitude of relationship between happiness and performance. However, configurations highlight which variables/conditions are sufficient or necessary in producing the outcome. The study determines three combinations of demographic variables that lead to high happiness that in return improves performance. The findings assisted the authors in determining the consistency of configurations in causing the outcome as well as the coverage each configuration carries. The study concludes that to fully understand what drives employee's happiness and performance, one must look at various combinations of causal conditions, combined with the effects of demographic variables leading to the outcome. Only by adopting a configurational framework of research, can one uncover the complexity of the respective social constructs.

Study by Grant, Morales and Sallaz (2009) examines the relationship between emotional labor and meaningfulness among nurses, along with the potential outcomes of emotional labor strategies including well-being. The study states that instead of looking at individual drivers of well-being, different combinations of these drivers/conditions leading up to the same outcome should be examined. The paper assesses three conditions i.e. nurses' vertical and horizontal relations, cognitive frames and involvement in outside institutions. Configurations made from these factors are then linked to nurses' sense of meaning and authenticity. Use of fuzzy sets in this study is very appropriate, since nurses' membership in groups defined by negotiated order perspective and organizational culture, can neither be full membership nor full non-membership. The results propose five configurations that lead the nurses to believe their job has spiritual meaning. The study argues that both configurational and regression methods are complimentary in studying the constructs, however the former is more suitable to employ when the social phenomenon in question entails causal complexity. By reexamining cases and redefining conditions, a configurational researcher arrives at the most precise and parsimonious results. This resonates both with qualitative as well as quantitative research approaches.

The study by Grant, O'Neil and Stephens (2009) discusses pluralistic ignorance, a concept referring to people forming inaccurate perceptions about peers' opinions. These perceptions stem out of factors like observation, physical proximity to the peers or surface acting. The study build configurations from three conditions causing the outcome of pluralistic ignorance i.e. prominence of an issue, interpersonal networks, and socio-technical conditions. Nurses are chosen as sample subjects to test how their surface acting causes them to engage in pluralistic ignorance about each other's spirituality. QCA results propose three combinations of causal conditions, leading to pluralistic ignorance. The study recommends integrating qualitative and quantitative methods by employing configurational approach to research. Use of different research approaches as complimentary rather against each other, can help arrive at more reliable results.

This section discussed the studies on social/behavioral science variables, where configurational methods of research are employed. Limited number of studies using this methodology points to the wide gap in historical studies with respect to utilizing various research methods. All the aforementioned research papers highlight the pros and advantages of examining and testing social constructs through configurational method of research including allowing for causal complexity, equifinality, theory based study of conditions and outcomes and exploring multiple stances and explanations of the same phenomenon. The studies also reaffirm that configurational models are inclusive of sound theoretical base that strengthens the hypothetical stance of the researcher.

## **5. Emotional labor strategies and employee well-being- a configurational model**

Coming towards the variables in this study, we are interested in exploring emotional labor and employee well-being. Instead of viewing both as independent and dependent variables, emotional labor is conceptualized as condition and well-being as the outcome. Ragin (2008) states that choosing a variable as a condition or outcome depends upon the nature of set-theoretic claim. If the goal is to establish emotional labor as a sufficient condition of well-being, then emotional labor would be taken as a subset of well-being. Conversely, if the goal is to establish emotional labor as a necessary condition of well-being, then well-being would become a subset of emotional labor. Both scenarios can be pursued given the literature provides strong foundation for the set theoretic relations. In this research, we would be examining the former, where emotional labor is merely a sufficiency and not a necessity. Simply put, there are other conditions besides emotional labor that constitute well-being.

### **5.1 Emotional Labor**

The notion of emotional display in personal or professional capacity is as commonplace as any other natural phenomenon (Ozturk et al, 2015). Thus, employees must understand and learn the mechanisms of emotional labor to meet emotional job demands at work. Specifically, personnel belonging to service jobs, including, sales, teaching, healthcare and other front-line tasks combat daily with emotional regulation challenges (Humphrey, Ashforth and Diefendorff, 2015).

Hochschild (1979) coined two types of emotional labor strategies, i.e. surface and deep acting. Former refers to superficially displaying emotions required of any service worker. Whereas, later entails internalizing the displayed emotions, thus making them felt emotions. Most studies show that surface acting is detrimental for organizations, leading to harmful effects like emotional exhaustion, depersonalization, burnout and affective resources' depletion (Newnham, 2017; Xu, Martinez and Lv, 2017). Conversely, deep acting reduces chances of turnover intentions and emotional exhaustion. It even elevates employee creativity (Xu, Martinez and Lv, 2017; Lee, An and Noh, 2015). Third type of emotional labor is genuine emotions, involving display of naturally felt emotions, rather than faking or having to internalize emotions, one simply displays what one feels like (Ashforth and Humphrey, 1993). This dimension can be considered an antithesis of surface acting. Displaying genuine emotions benefits the organizations by promoting positive affectivity (Lee and Chelladurai, 2016), employee well-being (Piccard, Cossette and Morin, 2018), affective commitment (Cossette and Hess, 2015) and reducing turnover intentions. (Xu, Martinez and Lv, 2017). An effective choice out of the three emotional labor strategies enhances customers' experiences with the firm (Wang et al, 2016). Lack of alignment between emotional job demands and emotional labor strategies may give way to superficial, insincere fulfillment of job demands (McCauley and Gardner, 2015).

### **5.2 Employee Well-Being**

Employee well-being has significant effects on performance, job satisfaction, employee engagement, absenteeism and turnover rates (Aboobaker, Edward and Zakkariya, 2018). Research indicates that emotional labor negatively affects employee well-being by compromising job satisfaction and inducing burnout (Cheung, Lun and Cheung, 2018). Emotional labor also leads to burnout, stress and worker alienation (Grandey and Sayre, 2019). Interestingly, some studies state that emotional labor might not be harmful for well-being at all. Bhawe and Lefter (2018) argue that since emotional labor entails healthy communication, it may even increase employee well-being. Choice of emotional labor strategy also determines its impact on well-being. Use of surface acting leads to low well-being given the factor of pretense. However, deep acting reduces dissonance and thus is beneficial for well-being as well (Cheung, Lun & Cheung, 2018). Similarly, Ashforth and Humphrey (1993) stated that having to practice emotional labor at work minimizes the chances of unpleasant conflicts and disagreements. Moreover, these people who practice emotional labor are more likely to understand and predict others' behavior which can subsequently reduce their stress and dissonance.

### **5.3 Fuzzy Set Truth Table**

The logic behind building a truth table is to define and refine the causal conditions whose combinations may or may not lead to the outcome. Hence, researchers strive to include as many cases in the analysis as possible. Occurrence of the causal conditions across these cases help identify the most critical conditions to produce the outcome. Moreover, logical AND combinations or configurations of truth table point to the most commonly occurring conditions across most cases. Refining the conditions time and again and selecting the most suitable cases, allow for excluding both irrelevant cases and redundant conditions. The resulting configurational model

is both accurate and parsimonious (Ragin, 2008; Schneider and Wagemann, 2012). Based on our case example of emotional labor strategies and well-being, this section demonstrates how fuzzy and crisp set truth tables are built and interpreted.

Theory on emotional labor points to its significant impact on employee well-being (Carballo-Penela, Varela and Bande, 2018; Wang, Hall and Taxer, 2019). This implies that former is the subset of the latter. Secondly, emotional labor has three dimensions namely surface acting (S), deep acting (D) and genuine emotions (G). All three differently affect the outcome of well-being (W). Thus, while striving to develop a configurational model of emotional labor strategies and employee well-being, hypothetical membership scores have been assigned to causal conditions and outcome based on mechanism proposed by Schneider and Wagemann (2012). For both the conditions and outcomes, membership scores are generated based on knowledge and theory. Emotional labor theory states that surface acting has the most detrimental impact on well-being, while deep acting may or may not affect well-being given the context (Wang, Hall and Taxer, 2019). Genuine emotions are most likely to improve well-being, given there is no pretense about displaying genuine emotions (Piccard, Cossette & Morin, 2018).

Additionally, the context we are going to presume is healthcare. The three hypothetical cases assumed for practice of emotional labor are of surgeon, nurse, and a psychologist. All three differ in their membership scores in causal conditions and outcome. Based on theory, it is assumed that surgeons are more likely to use genuine emotions and less likely to rely on surface acting and deep acting. This is because their job might not entail the social or interactive factor that drives one to engage in some sort of act or pretense. Based on this assumption, surgeon's score in S is 0.2. It is a low score since it is below the qualitative anchor of 0.5 which is also the crossover point for determining membership. For D, surgeon's score is 0.6. This is slightly higher than 0.5 showing an above average membership in usage of deep acting by surgeons. This score is chosen given how in certain instances; surgeons might have to truly empathize with the patients and may internalize feelings of concern for those under their care. For G, the membership score for surgeon is 0.9. This score denotes a very high membership score, approaching the full membership of 1, it shows high usage of genuine emotions by surgeons at work. For outcome, W, a hypothetical score of 0.7 is assigned to surgeons. This score is determined on the literary premise that use of genuine emotions leads to high well-being.

Since nurses exercise more empathy and consideration for their patients, they are likely to score high on surface and deep acting. Patients often have a closer contact with nurses as compared to doctors, since the former is directly under the care of nurses. On one hand, it elevates nurses' empathy for the patients, it may however lead to increased exhaustion and strain on nurses. Given this notion, nurses may rely heavily on surface acting or pretense to take the edge of. Thus, for S, nurses are assigned a higher score of 0.7. For D, a very high score of 0.9 is assigned given the closeness and rapport of nurses with their patients. For G, nurses are given a low score of 0.3. This is because of lack of margin for nurses to express their naturally felt or authentic emotions in front of the patients. A low W score of 0.4 is decided for nurses, based on EL theory that the more one engages in emotional acting, the more exhausting it becomes, thereby reducing well-being.

Third case assumed for our fuzzy set truth table is psychologist. It is presumed given the nature of their job, that psychologists may not get emotionally involved with patients, while relying mostly on faking emotions. Thus, for S (surface acting), a high score of 0.9 is assigned to psychologists. For D, low score of 0.2 is assigned given how emotionally neutral a psychologist must be. For G, a very low score of 0.1 is decided. This is because psychologists are not likely to display genuine emotions. For the outcome W, score of 0.6 is given to psychologists which is slightly above the crossover point of 0.5.

It must be noted here that the above membership scores of conditions and outcomes are hypothetical and may change if one chooses a different situation or context. The purpose here is to demonstrate how a fuzzy set truth table is built and how it is converted into a crisp set for result interpretation.

Table 1 depicts the fuzzy membership scores assigned to three conditions (the three EL strategies) and outcome (well-being) across three hypothetical cases of surgeons, nurses, and psychologists.



**Table 1:** Hypothetical Fuzzy Set Membership Scores

Cases	Causal Conditions			Outcome
	S	D	G	W
Surgeon	0.2	0.6	0.9	0.7
Nurse	0.7	0.9	0.3	0.4
Psychologist	0.9	0.2	0.1	0.6

To build a truth table from above three conditions, Ragin’s formula of  $2^k$  (k represent number of causal conditions) is used to determine the possible number of configurations or combinations of causal conditions. Since there are three causal conditions in our example, k would be 3.  $2^3$  gives us 8. Thus, there are eight combinations of causal conditions leading to the outcome. These combinations include both presence and absence of the three conditions, ranging from SDG (presence of all three conditions in a case) to  $\sim S\sim D\sim G$  (absence or negation of all three conditions). The symbol  $\sim$  denotes absence or negation. For instance,  $\sim SDG$  entails absence of surface acting while presence of deep acting and genuine emotions.

For determining scores of each truth table configuration, Ragin’s (2008) two categories of set theoretic relations must be discussed first. First is when the set theoretic researcher is interested in studying an outcome and identifying the causal conditions that lead to it, making the condition, superset, and outcome, subset. This strategy is useful when identifying necessary conditions. Second is when the set theoretic researcher is interested in studying different combinations of causal conditions and determine if they produce the same outcome. Here, the conditions are subsets of the outcome. This strategy is suitable to use when examining sufficient conditions (Ragin, 2008). Our example belongs to the latter category. We are determining the sufficiency of the conditions in producing the outcome. Based on this, Schneider and Wagemann (2012) have proposed a neat method for determining the membership scores for each truth table configuration. They suggest choosing the lowest membership score out of three cases for determining the membership scores for each configuration. For instance, for SDG row, the smallest score is 0.2, for  $SD\sim G$  is 0.1 ( $G=0.9$ :  $\sim G=0.1$ ) and so on.

Table2 shows the membership scores calculated for eight combinations of three causal conditions.

**Table 2:** Fuzzy Set Truth Table Configurations

Cases	Causal Conditions			Truth Table Configurations								Outcome
	S	D	G	SDG	$SD\sim G$	$S\sim DG$	$S\sim D\sim G$	$\sim SDG$	$\sim SD\sim G$	$\sim S\sim DG$	$\sim S\sim D\sim G$	W
Surgeon	0.2	0.6	0.9	0.2	0.1	0.2	0.1	<b>0.6</b>	0.1	0.4	0.1	0.7
Nurse	0.7	0.9	0.3	0.3	<b>0.6</b>	0.1	0.1	0.3	0.3	0.1	0.1	0.4
Psychologist	0.9	0.2	0.1	0.1	0.2	0.1	<b>0.8</b>	0.1	0.1	0.1	0.1	0.6

According to Ragin (2008), no score for any of the above truth table configurations should be less than their corresponding outcome score. Such a configuration would be considered inconsistent and, in our case, *insufficient* to produce the outcome. In such a case, the outcome will be considered null or zero. Furthermore, there will be only one truth table configuration for each case where its membership would be maximum (Ragin, 2008). In table 2, maximum membership score for the case of surgeon lies in  $\sim SDG$  (0.6), maximum score for nurse lies in  $SD\sim G$  (0.6) and maximum score for psychologist lies in  $S\sim D\sim G$  (0.8).

**5.4 Conversion of Fuzzy Set Truth Table into Crisp Set Truth Table**

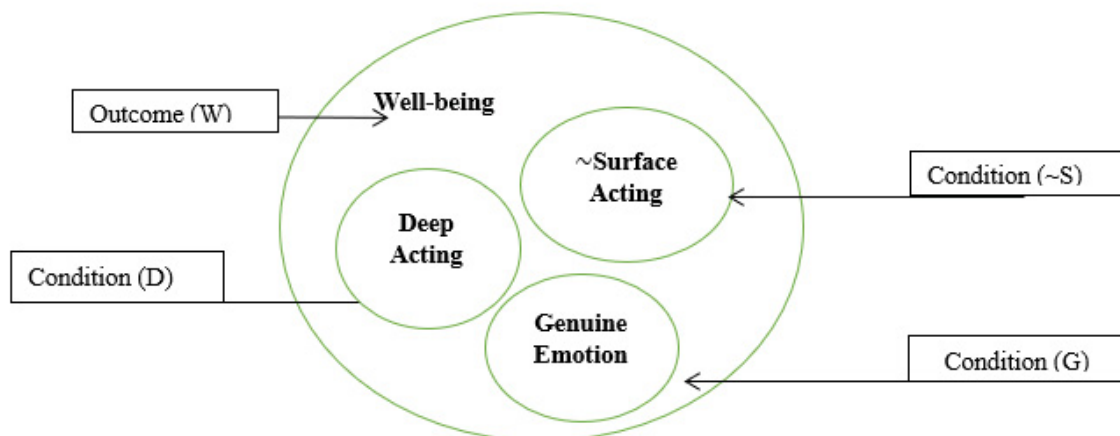
Fuzzy truth table scores can be easily be converted into crisp scores based on the principle of qualitative anchor 0.5, which denotes the crossover point (Schneider and Wagemann, 2012). All scores below this point show a low membership where condition is *more out than in* the outcome. Similarly, all scores above this point show high membership where condition is *more in than out* of outcome (Ragin, 2008). One would assume a score below 0.5 to be null or 0; and a score above 0.5 to be full membership or 1. For instance, for the case of surgeon, S has a fuzzy score of 0.2, which is below 0.5. in converting to crisp score, it will become 0. Similarly scores of D=0.6 and G=0.9, both being greater than crossover point of 0.5, will be converted to 1 in the crisp set truth table. The same process is repeated for cases of nurse and psychologist. Table 3 depicts the crisp scores for three causal conditions.

For determining the crisp score for outcome (W), Ragin’s assumption for establishing sufficiency, that all truth table configuration scores must be less than their respective outcome scores, is followed. A violation of this assumption indicates that the condition is insufficient to produce the outcome. Looking at table 2, we can see that in case of surgeon, all truth table configuration scores are less than the outcome i.e. 0.7. This satisfies the rule of sufficiency and thus crisp set outcome for case of surgeon would be assigned the score of 1. However, in case of nurse,  $SD\sim G$  has a score of 0.6, which is greater than the outcome score of 0.4. In case of psychologist,  $S\sim D\sim G$  has a score of 0.8, greater than the outcome score of 0.6. Thus, it is concluded that for cases of nurse and psychologist, causal conditions are insufficient to produce the outcome (W), and thus would be considered null and assigned the score of 0. Table 3 highlights the crisp set truth table derived from table 2.

**Table 3:** Conversion of Fuzzy Set Truth Table to Crisp Set Truth Table

Cases	S	D	G	W
Surgeon	0	1	1	1
Nurse	1	1	0	0
Psychologist	1	0	0	0

Table 3 can also be depicted in the form of Venn diagram. It must be remembered here that the set theoretic assumption in this example is studying sufficient conditions, where conditions are the subset of outcome (Ragin, 2008). Since cases of nurse and psychologist do not fulfill the sufficiency rule and has 0 outcome score, Venn diagram for only the case of surgeon is depicted here. Looking back at table 2, the highest or most dominant score of surgeon case lies in  $\sim SDG$  (0.6), showing that negation of surface acting ( $\sim S$ ), presence of deep acting (D) and genuine emotions (G) would lead to the outcome of well-being (W). Taking the configuration  $\sim SDG$  as an example, following Venn diagram depicts the respective set theoretic relation. All three causal conditions reside inside the outcome.



**Figure 5.4.1:**  $\sim SDG$  Venn Diagram

As Ragin (2008) discusses two strategies of set theoretic relationships, the above Venn diagram signifies the sufficiency condition strategy where condition or combination of causal conditions are represented as subsets while outcome is represented as the superset. In other words, deep acting subset, negated surface acting subset and genuine emotions subset is just one combination of causal conditions that leads to well-being.

## 6. Conclusion

The primary aims of this research included exploring configurational approach and application of qualitative comparative analysis in social science research. Our study reinforces the idea that configurational approach is a valuable tool to examine social and behavioral constructs. If not superior, it is equally at par with standard statistical techniques through which inferences are drawn from the data (Gimenez-Espert, Valero-Moreno and Prado-Gasco, 2019). Some of the major challenges of employing configurational methods are equifinality, causal asymmetry and conjunctural causation. These combinedly called causal complexity are why most correlational researchers may remain hesitant to use QCA. Exploring multiple, independent, and possibly conflicting predictive paths to the same outcome undermines the correlational paradigm (Ragin, 2008: Sehring, Korhonen-Kurki and Brockhaus, 2013). However, with social phenomenon already complex by nature,

it is arguable to examine a research area through this approach. Lack of triangulation in majority of research also bodes well in favor of configurational approach since it combines case by case analysis like done in qualitative studies; and quantitative data analysis through scale calibration and truth tables like performed in quantitative analysis (Ragin, 2008).

In pursuit of the study's objectives, our study discusses basic QCA tools and techniques, and points to the gap in literature with respect to using QCA approach in social science research. Through a case example of emotional labor and employee well-being, we have proposed a workable configurational model demonstrating the basics of QCA approach when applied on behavioral constructs. Our research addressed the common queries surrounding the nature of fuzzy sets, configurational models and qualitative comparative analysis. Their role, application, utility and pitfalls in social sciences (Ragin, 2008) as well as behavioral sciences (Gimenez-Espert, Valero-Moreno and Prado-Gasco, 2019: Grant, Morales and Sallaz, 2009: Grant, O'Neil and Stephens, 2009: Hsiao et al, 2013: Hsiao et al, 2015) are discussed at length which would have a paramount impact on how researchers in these fields may perceive and approach a research problem or question at hand.

## **7. Future avenues**

It is recommended for future studies to expand our model with the assistance of further rigorous literature review and theoretical know-how of the respective constructs. Due to the vastness of configurational theory, several facets have been overlooked in our study; future research should discuss the various types of set theoretic relations, issues of INUS and SUIN conditions, employing fsQCA on a dataset, mechanisms for determining necessary and sufficient conditions. Issue of scale calibration also needs attention. At last, this research focused on the relationship between two variables, namely emotional labor and well-being of employees. Future research should explore the configurational methodology by incorporating other social science variables.

## **References**

- Aboobaker, N., Edward, M. and Zakkariya K.A., 2019. Workplace spirituality, employee wellbeing and intention to stay: A multi-group analysis of teachers' career choice. *International Journal of Educational Management*, 33(1), pp.28-44.
- Ashforth, B. and Humphrey, R., 1993. Emotional labor in service roles: the influence of identity. *Academy of Management Review*, 181, pp.88-115.
- Carballo-Penela, A., Varela, J. and Bande, B., 2018. The direct and indirect effects of self-efficacy on salespeople's emotional exhaustion and work- family conflict: a study using the job demands- resources model. *Canadian Journal of Administrative Sciences*. [e-journal]. <https://doi.org/10.1002/CJAS.1503>.
- Cheung, F., Lun, V.M.C. and Cheung, M.W-L., 2018. Emotional labor and occupational well-being: latent profile transition analysis approach. *Frontiers in Psychology*. [e-journal]. <https://doi.org/10.3389/fpsyg.2018.01084>.
- Cossette, M. and Hess, U., 2015. Service with style and smile. how and why employees are performing emotional labour? *Revue Européenne De Psychologie Appliquée*, 65, pp.71-82.
- Gimenez-Espert, M.C., Valero-Moreno, S. and Prado-Gasco, V.J., 2019. Evaluation of emotional skills in nursing using regression and QCA models: a transversal study. *Nurse Education Today*, [e-journal] 74, pp. 31-37. <https://doi.org/10.1016/j.nedt.2018.11.019>.
- Grandey, A.A. and Sayre, G. M., 2019. Emotional labor: regulating emotions for a wage. *Current Directions in Psychological Science*, 28(2), pp.131-137.
- Grant, D., Morales, A. and Sallaz, J., 2009. Pathways to meaning: a new approach to studying emotions at work. *American Journal of Sociology*, 115(2), pp.327-364.
- Grant, D., O'Neil, K. and Stephens, L., 2009. Pluralistic awareness among assembled peers. *Sociological Perspectives*, 52(1), pp.59-79.
- Hochschild, A., 1979. Emotion work, feeling rules, and social structure. *American Journal of Sociology*, 85(3), pp.551-575.
- Hsiao, J.P-H, Jaw, C., Huan, T-C. and Woodside, A.G., 2013. *How algorithms with happiness-at-work identify high (low) performing hospitality frontline-employees: transcending variable and cases-based analyses*. [Article] [s.n, s.l.]
- Hsiao, J.P-H., Jaw, C., Huan, T-C. and Woodside, A.G., 2015. Applying complexity theory to solve hospitality contrarian case conundrums: Illuminating happy-low and unhappy-high performing frontline service employees. *International Journal of Contemporary Hospitality Management*, [e-journal] 27(4), pp.608-647. <https://doi.org/10.1108/IJCHM-11-2013-0533>.
- Humphrey, R.H., Ashforth, B.E. and Diefendorff, J.M., 2015. The bright side of emotional labor. *Journal of Organizational Behavior*, [e-journal] 36(6), pp.749-769. <https://doi.org/10.1002/job.2019>.
- Lee, C., An, M. and Noh, Y., 2015. The effects of emotional display rules on flight attendants' emotional labor strategy, job burnout and performance. *Service Business*, 9, pp.409-425.
- Lee, Y.H. and Chelladurai, P., 2016. Affectivity, emotional labor, emotional exhaustion, and emotional intelligence in coaching, *Journal of Applied Sport Psychology*, 28(2), pp.170-184.

- McCauley, K.D. and Gardner, W.L., 2015. Separated from the self: a conceptual model of the emotional labor-dishonesty relationship. *Academy of Management Proceedings*, [e-journal] 2015(1).  
<https://doi.org/10.5465/ambpp.2015.17494abstract>.
- Newnham, M.P., 2017. A comparison of the enactment and consequences of emotional labor between frontline hotel workers in two contrasting societal cultures, *Journal of Human Resources in Hospitality and Tourism*, 16(2), pp.192-214.
- Ozturk, H., Bahcecik, N., Ozcelik, S. and Kemer, A., 2015. Emotional labor levels of nurse academicians. *Procedia - Social and Behavioral Sciences*, 190, pp.32-38.
- Picard, K., Cossette, M. and Morin, D., 2018. Service with a smile: a source of emotional exhaustion or performance incentive in call-centre employees. *Canadian Journal of Administrative Sciences*, 35(2), pp.214–227.  
<https://doi.org/10.1002/cjas.1413>.
- Ragin, C., 2008. *Redesigning social inquiry- fuzzy sets and beyond*. Chicago and London: University of Chicago Press.
- Roig-Tierno, N., Gonzalez-Cruz, T.F. and Llopis-Martinez, J., 2017. An overview of qualitative comparative analysis: a bibliometric analysis. *Journal of Innovation & Knowledge*, [e-journal] 2. pp.15–23.  
<http://dx.doi.org/10.1016/j.jik.2016.12.002>.
- Schatz, F. and Welle, K., 2016. *Qualitative Comparative Analysis: A valuable approach to add to the evaluator's toolbox? Lessons from recent applications*. CDI Practice Paper No. 13. Brighton: Institute of Development Studies. Available at: <[https://www.betterevaluation.org/sites/default/files/CDI\\_PP13.pdf](https://www.betterevaluation.org/sites/default/files/CDI_PP13.pdf)> [Accessed 8 June 2020].
- Schneider, C.Q. and Wagemann, C., 2012. *Set-theoretic methods for the social sciences- a guide to qualitative comparative analysis*. New York: Cambridge University Press.
- Sehring, J., Korhonen-Kurki, K. and Brockhaus, M., 2013. *Qualitative Comparative Analysis (QCA)- an application to compare national REDD+ policy processes*. Working Paper 121. Bogor: Center for International Forestry Research. Available at: <[http://www.cifor.org/publications/pdf\\_files/WPapers/WP121Sehring.pdf](http://www.cifor.org/publications/pdf_files/WPapers/WP121Sehring.pdf)> [Accessed 8 June 2020].
- Simister, N. And Scholz, V., 2017. *Qualitative comparative analysis (QCA)*. [s.l.] INTRAC For Civil Society. Available at: <<https://www.intrac.org/wpcms/wp-content/uploads/2017/01/Qualitative-comparative-analysis.pdf>> [Accessed 8 June 2020].
- Wang, E., Berthon, P., Pitt, L. and McCarthy, I., 2016. Service, emotional labor, and mindfulness. *Business Horizons*, [e-journal] 59(6), pp.655-661. 10.1016/j.bushor.2016.07.002.
- Wang, H., Hall, N.C. and Taxer, J.L., 2019. Antecedents and consequences of teachers' emotional labor: a systematic review and meta-analytic investigation. *Educational Psychology Review*. [e-journal]. <https://doi.org/10.1007/s10648-019-09475-3>.
- Xu, S., Martinez, L.R. and Lv, Q., 2017. Explaining the link between emotional labor and turnover intentions: the role of in-depth communication. *International Journal of Hospitality and Tourism Administration*, [e-journal]  
<https://doi.org/10.1080/15256480.2016.1276003>.