

Master Thesis Strategic Management

Anne-Fleur Mulder

S1019678

Supervisor

Dr. Koen van den Oever

Second reader

Dr. Ir. Gerrit Willem Ziggers

Radboud University



Master Thesis Strategic Management
School of Management
Radboud University Nijmegen

Supervisor

Dr. Koen van den Oever

Second reader

Dr. Ir. Gerrit Willem Ziggers

Date

16-06-2020

Content

Chapter 1: Introduction	4
Chapter 2: Theoretical background	7
<i>Boards</i>	<i>7</i>
<i>Characteristics</i>	<i>8</i>
<i>Affect</i>	<i>9</i>
<i>Group affect</i>	<i>10</i>
Chapter 3: Literature and Hypotheses.....	12
<i>Affect and board performance.....</i>	<i>12</i>
<i>Moderating effect of tenure</i>	<i>14</i>
Chapter 4: Methodology.....	16
<i>Research object</i>	<i>16</i>
<i>Sample and data sources.....</i>	<i>16</i>
<i>Dependent variable</i>	<i>17</i>
<i>Independent variable.....</i>	<i>17</i>
<i>Moderating and control variables.....</i>	<i>20</i>
<i>Analysis</i>	<i>21</i>
<i>Ethics.....</i>	<i>21</i>
Chapter 5: Results.....	23
<i>Robustness checks</i>	<i>28</i>
Chapter 6: Discussion	31
<i>Practical implications</i>	<i>32</i>
<i>Limitations and recommendations for future research</i>	<i>32</i>
<i>Conclusion.....</i>	<i>35</i>
References.....	36
Appendices.....	42
<i>Appendix 1 - Circumplex model of affect</i>	<i>42</i>
<i>Appendix 2 - Decisions list (besluitenlijst) board meeting</i>	<i>43</i>
<i>Appendix 3 – Python face script.....</i>	<i>46</i>
<i>Appendix 4 – Python CSV script</i>	<i>47</i>
<i>Appendix 5 - Output API</i>	<i>48</i>
<i>Appendix 6- Assumptions</i>	<i>49</i>
<i>Appendix 7 - Reasons to winsorize.....</i>	<i>53</i>
<i>Appendix 8- U-shape check.....</i>	<i>55</i>

Chapter 1: Introduction

Within organisations, groups and teams are appointed to deal with complex assignments because groups are assumed to have more various capabilities compared to individuals in terms of information, knowledge, and expertise (van Knippenberg, Kooij-de Bode, & van Ginkel, 2010). A special type of group resides at the top of organisations, namely the board of directors. The board of directors can be seen as a decision-making group within an organisation that has the responsibility to process strategic issues (Forbes & Milliken, 1999). The board of directors has a critical function within an organisation as they influence strategy and performance by carrying out three different kinds of tasks (Boivie, Bednar, Aguilera, & Andrus, 2016). The main functions of the board are to monitor and have an oversight of the company, distribute resources and provide advice to the top management team (J. L. Johnson, Daily, & Ellstrand, 1996). To effectively execute their roles, the board of directors needs to receive, process and distribute information (Boivie et al., 2016), implying that information processing is an essential mechanism within boards.

The mainstream within the board literature assumes processes within boards to be rational, cognitive and formal. The emphasis within research has long been on cognition and rationality perspectives (Cacioppo & Gardner, 1999). However, the notion of bounded rationality has allowed other streams within business literature to have a more nuanced perspective and to take social and political influences into account (Wooldridge & Cowden, 2020). The inclusion of social processes has not been seen within board literature as the main emphasis lies on researching the composition and demographics in boards in order to investigate performance (Pettigrew, 1992). As Daily, Dalton and Cannella (2003) pointed out, there is still a lot unknown about what happens inside boardrooms and which operations, activities and processes influence the performance of boards. To enhance our knowledge regarding the effectiveness of boards, researchers encounter barriers that prove challenging to overcome. Research is needed that asks for specific data involving the cooperation of a board that would be willing to let researchers study deliberations and dynamics within the boardroom (Daily, Dalton, & Cannella, 2003). Data that is necessary to understand and gain knowledge of what happens inside boardrooms, but extremely difficult to obtain. To extend our understanding of boards and to reveal more complex relationships, research needs to be conducted in new contexts, using mechanism-based research questions and delving into new sources of information (S. G. Johnson, Schnatterly, & Hill, 2013).

Powell, Lovaglio and Fox (2011) suggested that introducing behavioural strategy including human cognition, affect, and social behaviour to the strategic management of organisations, can enrich theory, inspire new ideas and generate new research methods. Additionally, Ashkanasy, Humphrey, and Huy (2017) debate that to be able to understand organisations, one needs to understand how cognition and affect drive human behaviour and decision-making, as humans drive organisations. Affect is used as a broad term to capture a variety of feelings and therefore encompasses both specific and short-lived

emotions and general long-lasting moods (Barsade & Gibson, 2007; Bartel & Saavedra, 2000; Menges & Kilduff, 2015). Affect gets more research attention within organisation, business and management literature. Ashkanasy, Hartel & Daus (2002) indicated that affect plays a role in shaping behaviour in organisations as it influences creativity, workout comes, and decision-making. Affect matters in organisations because “affect is inherent to the human experience, and thus inherent to any situation in which humans interact with each other and their environment” (Barsade & Gibson, 2007, p. 51). Therefore, it can be argued that affect provides a unique angle to capture the psychological- and social processes in boards. However, to the best of my knowledge, no research has been aimed at the effect that affect plays within boards of directors and the influence on their performance. The research that exists takes a narrow approach (Maitlis & Ozcelik, 2004), and often investigates affect on an individual level and not from a board of directors point of view. Therefore, it can be concluded that affect is a new perspective and a new theoretical angle to investigate boards of directors. It is essential to understand the role that affect plays within boards as it can improve our understanding of and change our view of board processes, dynamics and performance.

Affect will be seen as a group level concept as this thesis focusses on expanding our knowledge of boards of directors and their performance. Group affect can be defined as “feelings that emerge from or in groups” (Menges & Kilduff, 2015, p. 851). Literature about contagion teaches us that affect on group-level is a result of members that share and diffuse affect within the group (Forgas & George, 2001). The contagion of affect in groups occurs as people copy each other's facial expressions and nonverbal behaviour automatically and unconsciously (Barsade, 2002). Tenure is expected to influence emotional contagion and as a result, influence the information processing within a board. Tenure, in other words, the time someone has a particular position or job, is expected to have a moderating effect on the relationship between affect and performance. When boards score higher on tenure, board members coordinate more closely and are more cohesive (Cohen & Bailey, 1997). It can be argued that boards that have a higher average tenure will be more emotionally homogeneous because emotional contagion increases due to cohesiveness and coordination. Additionally, when members spend more time with each other, interactions become richer and more information is shared (Harrison, Price, & Bell, 1998).

In order to investigate the relationship between affect, performance and the moderating role of tenure, the following research question is proposed:

“What is the influence of affect of board members of Dutch water authorities on their performance, and how does tenure moderate this relationship?”

This research is conducted in the setting of Dutch water authorities. Water authorities are decentral organised administrations responsible for regional water management. Twenty-one water authorities in the Netherlands make sure that there is enough clean drinking water as well as ensuring the inhabitants

are safe and keep dry feet (Unie van waterschappen, n.d.-a). Videos of board meetings form the sample for the research. These videos were analyzed and scored on emotions with the help of the Microsoft Face application programming interface.

This thesis contributes to the literature by proposing affect as a perspective to study and broaden our knowledge of boards of directors and their performance. The addition of affect in the study of boards criticizes the assumption of rationality and allows for a reevaluation of how we see boards, their processes and performance. As a consequence, boundaries of the existing research and literature on boards of directors and affect are indicated. This thesis also contributes methodologically by using analysis techniques based on machine learning, which is a relatively novel research method that provides access to sources of data such as videos, images, and audio that have been hard to analyse before (Choudhury, Wang, Carlson, & Khanna, 2019). Moreover, these new techniques make it possible to overcome barriers to study affect in organisational settings as this is mainly difficult because people are not always conscious about their feelings or do not judge them honestly (Ashkanasy, Humphrey, & Huy, 2017). Applying application programming interfaces and machine learning within the research area of boards of directors creates new possibilities to do research and to enlarge our knowledge in this particular field.

The next chapter describes the theoretical background for this thesis, which makes it possible to develop hypotheses regarding the influence of affect of the board members on the board performance of Dutch water authorities in chapter three. The fourth chapter outlines the research objective, sample, data sources, and measures. Furthermore, the analysis and research ethics are included in the chapter. In the fifth chapter, the results of the analysis and robustness checks are discussed. The last chapter covers the discussion including practical implications, limitations and recommendations for future research and finally the discussion.

Chapter 2: Theoretical background

Boards

Boards of directors can be seen as decision-making groups that have the responsibility to process strategic issues (Forbes & Milliken, 1999). Strategic decisions distinguish from other decisions by the fact that they are interdependent with other contemporary decisions, decisions made by actors such as suppliers, buyers or consumers, and over time (Leiblein, Reuer, & Zenger, 2018). In the business context, strategic decision-making is crucial as it involves fundamental choices that impact the performance and future direction of a firm (Eisenhardt & Zbaracki, 1992). Similarly, boards of directors can be seen as information processing groups that have to acquire, transform and then distribute information both among themselves and in the organisation (Hinsz, Tindale, & Vollrath, 1997). The added value of the board lies in effectively processing the right information based on their various skills, knowledge and capabilities before handing it over to all concerned parties (Boivie et al., 2016).

The board of directors has as main tasks to control, to advise, and to facilitate obtaining and distributing resources (J. L. Johnson et al., 1996). Likewise, Boivie et al. (2016) define three roles comparable to those defined by J. L. Johnson, Daily, & Ellstrand (1996) namely, monitoring, resource provision and punctual events that together influence strategy and financial performance. The first role covers continuous control of the company, the second role concerns offering resources in the form of guidance, recommendations or experience and finally the last role is needed in irregular situations and turbulent times (Boivie et al., 2016). Even though the board has multiple roles, they are not opposing yet they are supplementary and interdependent (Hambrick, Misangyi, & Park, 2015)

In assessing the effectiveness of the board in performing these roles and determining board performance, Zahra & Pearce (1989) describe four attributes of the board of directors that are related to the board roles: composition, characteristics, structure and process (Zahra & Pearce, 1989). Each board role asks for some specific characteristics consisting of background, age, education, and experience, and personality (Zahra & Pearce, 1989). Forbes and Milliken (1999) develop two criteria that determine board effectiveness: board task performance and cohesiveness. They define the latter as the ability to work together as a group and the former as the ability to execute the monitor and resource provision roles adequately. Additionally, they argue that social-psychological factors such as interaction, exchange of information and discussions, influence board task performance. Research often use firm performance to measure the effectiveness of top management teams (Cohen & Bailey, 1997). Although Cohen and Bailey (1997) also provide a broader aspect of team effectiveness, namely the quality and quantity of outputs, member attitudes and behavioural outcomes.

Summarising, the board of directors can be seen as a decision-making group that execute the roles of service, strategy and control. The execution of these roles, determining the effectiveness of boards, is influenced by different attributes of board members. Which characteristics and how these characteristics effect decisions and the effectiveness of boards is explained with the upper echelons theory of Hambrick and Mason (1984) and the quad model of Hambrick, Misangyi and Park (2015).

Characteristics

The upper echelons theory of Hambrick and Mason (1984) outlines a model in which top managers react to situations based on their cognitions, values, and perceptions hence influencing strategic choices (Hambrick & Mason, 1984). Therefore, one of the core elements of their theory is that decision-makers incorporate specific characteristics such as cognition, experience, personality and values to form a perception of the situation, that form the base from where a decision can be made. The quad model of Hambrick, Misangyi and Park (2015), make the necessary qualities even more specific. According to these researchers, a board is more likely to be an efficient monitor when at least one but preferably more directors possess four qualities: independence, expertise, bandwidth and motivation. When these qualities are scattered among members of the board, they do not contribute to improved monitoring (Hambrick et al., 2015).

In the update of the echelons theory, Hambrick (2007) argues that it is necessary to recognise the tendencies and personalities of the top management to understand how organisations act and perform. Also, focusing on groups rather than individuals provides a better explanation of outcomes as the government of an organisation is a complex task, and thus, a shared responsibility (Hambrick, 2007). As a result, the interactions, interpretations and perceptions of the whole group influence strategies and decisions (Hambrick, 2007) Up until now, demographic characteristics have been used as proxies to capture psychological and social processes that drive top management behaviour, due to the difficulty of obtaining such data (Hambrick, 2007). However, demographics have its limits and are not the key driver of strategies and decisions (Carpenter, Geletkanycz, & Sanders, 2004).

To capture these psychological and social processes, affect can be used as a concept. It can be seen as a critical shaper of decision-making, as it forms our preferences and perceptions (Forgas, 1995; Maitlis & Ozcelik, 2004), that in turn influence strategic choices (Hambrick & Mason, 1984). Affect is essential within organisations as it is deep-rooted and fundamental to human interactions (Barsade & Gibson, 2007). Additionally, as humans drive organisations, it is essential to understand how affect drives behaviour and decision-making, to understand organisations (Ashkanasy et al., 2017). Moreover, due to new developments in technologies, it is possible to measure psychological and social processes such as affect.

Affect

The literature covering the topic of affect uses a variety of constructs and definitions (Delgado-Garcia & De la Fuente-Sabate, 2010; Menges & Kilduff, 2015). Terms such as affect, emotions and mood overlap partially, and they are sometimes used interchangeably within the literature. As a consequence, it is difficult to find general definitions, partly as the conceptualisations can differ; however, some agreement can be found. Affect can be defined as an umbrella term covering both moods and emotions (Bartel & Saavedra, 2000; Menges & Kilduff, 2015). Emotions are targeted on or caused by a specific event or situation and tend to be intense for a shorter period (Barsade & Gibson, 2007; Bartel & Saavedra, 2000). Whereas moods cannot be linked to a cause or target and are enduring (Barsade & Gibson, 2007; Bartel & Saavedra, 2000). For example, happiness is a positive emotion which can give someone a good mood. In this research, the term affect will be used to cover both emotions and moods.

Research by Ekman (1992) states that there are six basic emotions, universally recognised across cultures. Those basic emotions can be seen as groups or families of emotions, namely anger, disgust, fear, happiness, sadness, and surprise (Ekman, 1992). According to the circumplex model (see appendix 1), emotions can be displayed on two axes: valence and arousal (Russell, 1980). Where valence indicates whether emotions are pleasant or unpleasant, arousal indicates whether they are active or passive (Hakansson et al., 2016). The relationship between valence and arousal shows variation when measured by self-report on an individual level due to differences between persons and situations (Feldman, 1995; Kuppens, Tuerlinckx, Russell, & Barrett, 2013). In this research, emotions will be classified in terms of valence as most researches within the area of judgement and decisions have focused on this “most universal and ubiquitous feature of affect” (Forgas, 1995, p. 39).¹ Happiness is classified as a pleasant or positive emotion, and anger, disgust, fear and sadness are classified as unpleasant or negative emotions.

The general understanding is that positive affect is most useful in organisations in terms of stimulating creativity (Amabile, Barsade, Mueller, & Staw, 2005). Positive affect also leads to favourable outcomes such as work achievement, enrichment and support of supervisors and co-workers (Staw, Sutton, & Pelled, 1994). Positive affect stimulates creativity because it stimulates alternating cognitive processes and new associations to develop new ideas (Amabile et al., 2005). Moreover, favourable job outcomes are influenced by positive affect through three intermediating processes: effect on the employee, the response of others and response to others (Staw et al., 1994). The researchers imply that employees with more positive affect perform more tasks, with more endurance and with better cognitive processing. Finally, the researchers suggest that positive affect enhances helping behaviour to others.

¹ The focus on valence was also a consequence of agreement within the thesis circle as another student working with the same data focused on the arousal construct of affect.

Furthermore, affect influences decision-making in anticipating possible results and consequences of decisions in terms of delight and regret. For example, anticipated negative affect can lead to delays, and negative affect experienced as a consequence of decisions increases the reluctance of making similar decisions in the future (Maitlis & Ozcelik, 2004). Therefore, affect can be seen as a critical shaper of decision-making, as it forms our preferences and assumptions (Forgas, 1995; Maitlis & Ozcelik, 2004). Affect does not only occur individually but also in groups such as the board of directors.

Group affect

The emergence of affect in groups is a result of social interaction between members of the group (Menges & Kilduff, 2015). Two mechanisms play a role in the emergence of group affect: contagion and sensemaking. Through contagion, group emotions can develop, a pattern or homogeneous affective response (Forgas & George, 2001). Affect has a ripple effect on team member's affect, perceptions, and actions (Barsade, 2002). Research of George (1990) shows that these group emotions exist and additionally have an effect on work outcomes. More specifically, a group's positive affect has a negative relationship with employee absenteeism, and negative group affect has a negative effect on social behaviour in the group (George, 1990).

Moreover, some research indicates that what kind of influence affect has on performance and decision-making does not depend on whether affect is negative or positive but on whether affect in a decision-making group is homogeneous or heterogeneous (Barsade, Ward, Turner, & Sonnenfeld, 2000). More diversity in trait effect, a person's tendency to experience feelings and moods, has a negative impact on decision-making and performance due to the experience of more conflict and less collaboration (Barsade et al., 2000). Therefore, better performance is achieved in groups displaying homogeneous affect. When contagion increases, the board becomes more homogeneous regarding affect (Barsade, 2002). The more homogeneous groups are regarding affect, the better decisions they make, and the better they perform, as collaboration increases and conflict decreases (Barsade et al., 2000).

The second mechanism that plays a role in the emergence of group affect is sensemaking. Sensemaking is the ongoing process of people interpreting and explaining the world around themselves (Maitlis, 2005; Weick, Sutcliffe, & Obstfeld, 2005). Within groups, this process happens collectively, and members tend to help each other in making sense of situations (Menges & Kilduff, 2015). Sensemaking occurs especially when situations are new, and people feel uncertain about what to do (Maitlis, 2005). The construction of reality as a group as a result of interactions creates an opportunity for affect to be felt and shared among members (Menges & Kilduff, 2015).

In summary, boards can be seen as decision-making groups and have various roles in which information processing plays an important role. Additionally, based on the upper echelons theory and the quad model of Hambrick, Misangyi and Park (2015), it can be argued that decision-makers use specific characteristics such as cognition, experience, personality and values to process excessive information to form a perception of the situation. Those perceptions can, in turn, be used to form decisions. Affect, and especially group affect can grasp these psychological and social processes within boards.

Chapter 3: Literature and Hypotheses

Affect and board performance

Firstly, it is essential to make two assumptions explicit. Based on the previous chapters, it is assumed that a board can be seen as decision-making groups. The literature lacks specific research that investigates affect within boards or strategic decision-making, although research focusing on affect within broader decision-making literature can be found. Consequently, the second assumption is made that general decision-making is comparable to strategic decision-making, the type board of directors concern themselves with. Therefore, research from the general decision-making literature stream will be used to form the hypotheses.

The affect infusion model of Forgas (1995) will be used to link affect with board performance. The affect infusion model of Forgas (1995) incorporates affect and information processing. Affect influences two aspects of information processing: how people transform information (the process) and which information they remember and use (attention). The affect infusing model stresses that affect mainly plays a role in substantive information processing when dealing with complex tasks, precisely the type of tasks boards deal with daily. Such tasks require the activation, combination and transformation of information in order to create an interpretation and response (Forgas & George, 2001), such as strategic decision-making within boards. Based on bounded rationality, Hambrick and Mason (1984) also concluded that situations faced by decision-makers are complex and exceed the plausible amount of information that one can process. The echelons theory describes how the characteristics mentioned before help directors to digest the enormous amount of information in a three-step process by steering (1) where to pay attention to, (2) how to perceive what they see and hear and (3) how they translate that into a meaningful interpretation.

Combining the upper echelon theory and the affect infusion model, affect influences information processing, especially when dealing with complex tasks. Two mechanisms demonstrate how information processing is aided by affect, it forms how people deal with information, and it steers attention.

Whether positive or negative affect has a positive influence on decision-making and performance, literature shows two opposing perspectives. On the one hand, there is literature that supports positive affect leads to better decisions, although there is also literature that states negative affect drives better decision-making. Research of Seo and Barrett (2007) combines both perspectives. It shows that individuals experiencing more intense feelings, both positive and negative emotions, leads to higher decision-making performance, supporting the standpoint that both types of emotions can be beneficial in decision-making processes.

Affect can facilitate the decision-making processes by shifting attention to the most critical issues, driving attention and distribution working memory (Seo & Barrett, 2007). Isen (2001) concludes that positive affect contributes to more detailed and productive decision-making as it results in flexible, creative, systematic and extensive information processing. The research results by Staw and Barsade (1993) are in favour of the happier-and-smarter instead of the sadder-but-wiser hypothesis. This hypothesis was supported because the positive affect group identified more possibilities, requested more information when necessary and was more accurate than the negative affect group. Besides, people experiencing positive affect are more helpful, make more effort to understand each other's perspectives better, go beyond what is required and combine more various information when making a decision (Isen, 2001). Positive contagion in groups, the sharing and diffusing of affect among group members, leads to more collaboration, less conflict, and higher self-rating of task performance (Barsade, 2002). The contagion of moods in groups happens because as people copy each other's facial expressions and nonverbal behaviour automatically and unconsciously (Barsade, 2002). The positive influence of affective contagion can be explained because it is used within a group as a mechanism which provides feedback about how the group performs in terms of evaluation situations, how cohesive the group is and the safety of the continuation of the group (Hess & Kirouac, 2000).

The above-described research suggests that positive affect is beneficial for decision-making of boards based because it influences the two mechanisms of information processing, how people process information and steer attention, positively. Information processing is an essential competence for a board of directors because they are a decision-making group dealing with complex tasks and their decisions influence the performance and future direction of the firm through the execution of their roles. Therefore, the following hypothesis is suggested:

Hypothesis 1: The higher the positive affect of the board of directors, the higher their performance.

The research in the previous section outlines that positive affect is more beneficial for performance. In contrast, other research indicates that a more thorough, analytical elaboration of information and more considerable attention to new knowledge takes place by persons in a negative mood (Forgas, 1995; Forgas & George, 2001; Schwarz & Bless, 1991). More recent research also supports the fact that negative affect leads to better decisions. Groups in negative moods immerse themselves more in available information and, as a result, achieve higher decision quality than groups in positive moods (van Knippenberg et al., 2010). Furthermore, negative affect signals that a situation requires attention and potentially action, while positive mood signals that there is no such need (van Knippenberg et al., 2010). Consequently, from the perspective of signalling theory, affect can be seen as signals about where to steer attention and whether to take action or not. It can be concluded that evidence exists that negative

affect positively influences how people process information and how they distribute their attention, which creates a basis for better decisions, leading to a more effective execution of board roles and influencing their performance.

Hypothesis 2: The higher the negative affect of the board of directors, the higher their performance

Moderating effect of tenure

Tenure, in other words, the time someone has a particular position or job, has been well researched in organisations. When tenure increases, board members coordinate more closely and are more cohesive as a group, due to familiarity (Cohen & Bailey, 1997). Additionally, a group with high tenure develops shared knowledge, skills and perception (Forbes & Milliken, 1999). In fact, Forbes and Milliken (1999), define cohesion as one of two criteria that influence the effectiveness of boards as it will lead to more firm-specific information and understanding within groups. Longer organisation tenure is also associated with social cohesion due to shared experiences (Hambrick & Daveni, 1992).

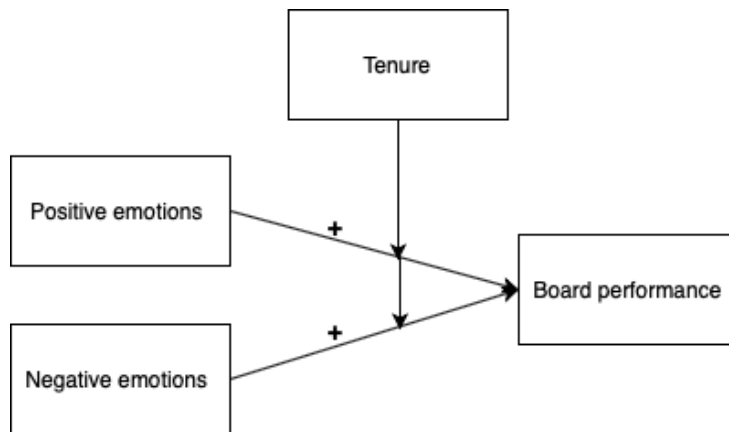
Tenure is known to influence a mechanism that explains how affect influences performance: namely information processing. Groups with a higher average tenure make better strategic decisions because more experience leads to more firm-specific knowledge (Schwenk, 1993), while short tenure groups are limited in organisation specific information and have poorer information exchange competencies, as they are less socially cohesive (Katz, 1982). Tenure influences information processing because when more time passes, more shared experiences can be created among group members, and more information can be acquired (Harrison et al., 1998). In other words, the longer a person is part of a team or group, the more information can be acquired. Familiar team members are better at pooling and integrating information that is scattered among the members of the group (Gruenfeld, Mannix, Williams, & Neale, 1996)

Because boards with higher tenure work more closely together and are more familiar, it can be suggested that the contagion of affect is higher in those boards. Thus, higher tenure boards are expected to have more emotional homogeneity. Moreover, research has indicated that homogenous emotional groups perform better (Barsade et al., 2000). Tenure positively influences the information processing mechanism that explains how affect influences performance. Hence, tenure is proposed to have a moderating effect on the relationship between emotions and board performance/effectiveness. The following hypotheses are formulated:

Hypothesis 3: The effect of positive affect on board performance is stronger for boards with higher tenure

Hypothesis 4: The effect of negative affect on board performance is stronger for boards with higher tenure

The four hypotheses are made visually in the conceptual model depicted below.



[Figure 1: conceptual model]

Chapter 4: Methodology

Research object

As mentioned in the introduction, the research setting is Dutch water authorities. Dutch water authorities consist of three administrative authorities: the general board, the daily board, and the chair. The general board is democratically chosen and consists of representatives of the residents, farmers, entrepreneurs, and nature and forest management of the region (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, n.d.). Their main tasks are to determine policy, rules, and regulations for the water authority. Additionally, the general board has the responsibility to control the actions of the daily board. The daily board concerns themselves with the preparation and implementation of policy (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, n.d.). The general board is similar to the board of directors when comparing the above-listed tasks to the roles of the board mentioned in chapter 2. Additionally, the daily board can be compared to top management team because top management teams in companies concern themselves with the day-to-day operations and the implementation of strategies (Luciano, Nahrgang, & Shropshire, in press).

Hereafter, the terms board of directors and top management team will be used to refer to the general and daily board. The terms daily and general board will not be used to avoid confusion as these are literally translated from Dutch to English. The function of the chair can be compared to a mayor and presides the meeting board of directors and top management team (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, n.d.). Dutch water authorities are almost entirely financially independent as their expenses are covered by taxes paid by inhabitants of the water authority. These water authority taxes are regional, and the amount differs per water authority, with an average of €327 per household (Unie van waterschappen, 2019). One of the advantages of using an organisation of the public sector is that they are obliged by law to give the public open access to information about their governance, performance, and finances (Rijksoverheid, n.d.). Consequently, they have an online database in which many data can be found. Among other things, video and audio recordings of meetings are available (Unie van waterschappen, n.d.-c).

Sample and data sources

Several data sources have been used to compose a dataset for the analysis. First, the videos of the board meeting can be found on the websites of the water authorities. The sample used in this research consists of the board meetings from Dutch water authorities from 2014 through 2019. Unfortunately, not all authorities have videos available of their board meetings. Ten of the twenty-one do videotape their board meetings; however, only a few started doing this in 2014. The remaining authorities either have only audio or only minutes available on their websites. The Dutch water authorities meet approximately once every month, between six and ten times a year, this varies among the different authorities. Eventually,

a selection was made based on availability, and 108 board meetings videos from the water authorities Amstel Gooi & Vecht, Friesland, Zuiderzee and Hoogheemraadschap de Stichtse Rijnlanden were collected. These 108 videos were divided among four students for the analyses, and the output was later combined to create a complete dataset. Eventually, 102 videos were used as observations for the analysis. Some videos were excluded due to a poor camera angle or were combined because the meetings took place on the same day.

Furthermore, the website of the Dutch government can be used to gain insight in demographics, composition and especially relevant for this research, the tenure of the board member of the Dutch water authorities (Overheid in Nederland, n.d.). Finally, the ‘water authority mirror’ is an overarching comparison of all water authorities and contributes to transparency and facilitates learning and improvement (Unie van waterschappen, n.d.-b). The mirror and the waves database of the union of water authorities give insight and access to data on board performance and control variables (Unie van waterschappen, n.d.-c). The data will be collected on the individual level and afterwards will be aggregated to board meeting level.

Dependent variable

The dependent variable in this study is board performance measured as the number of amendments and motions proposed per meeting. Usually, the performance of boards is measured on firm-level because this data is generally more accessible. However, in this case, the observations are on meeting level, and therefore the dependent variable should be on meeting level as well. There is not a lot known about what happens in boardrooms and what defines board meeting effectiveness. Nevertheless, team performance effectiveness can be defined as the quantity and quality of outputs (Cohen & Bailey, 1997). This data can be found in the draft decision lists of the meetings (see appendix 2 for an example). The final decision lists were not available; however, the draft version is usually accepted without adjustments the following meeting. Not all decisions were taken into account but specifically the amendments and motions made by the board of directors. It can be argued that amendments and motions are a purer way of measuring board performance as the number of decisions taken by the board is determined prior to the meeting when drawing up the agenda of the meeting. These amendments and motions are a sign of proactivity of the board, which can be linked to the monitoring role of the board.

Independent variable

Affect covers both moods and emotions, yet emotions are more measurable as they can be identified and studied through facial expressions (Ekman & Oster, 1979). Therefore, emotions will be used as the independent variable. The independent variables, negative and positive emotions of the board of directors, are measured with the help of the Microsoft Face application programming interface (API). A

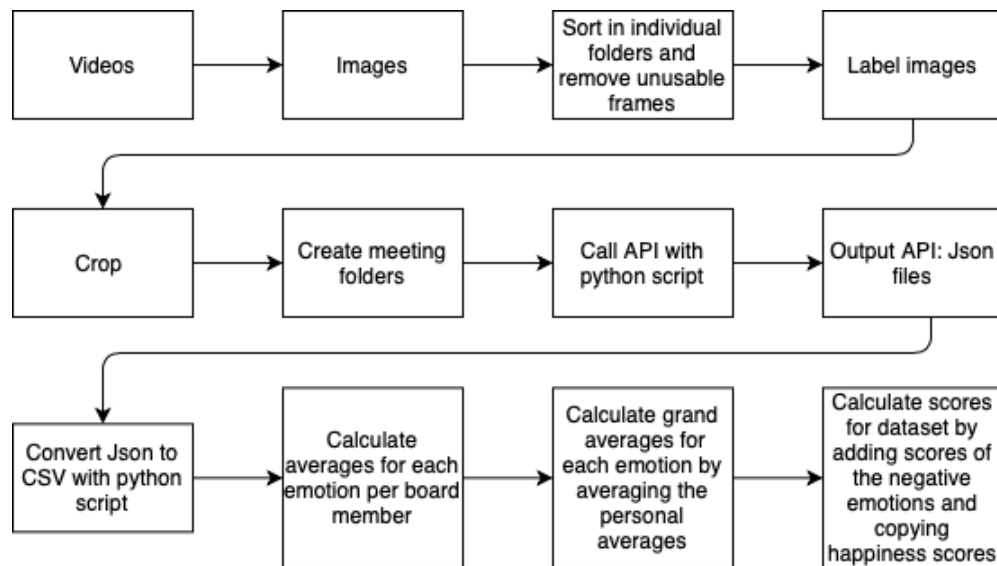
remark has to be made that one can only measure displayed emotions. However, these may not necessarily be the same as emotions themselves (Jarvis, 2017) as people can be very happy or angry but not show it. The Microsoft Face API can measure happiness, sadness, anger, contempt, surprise, fear, disgust, and neutral. The score on positive emotions will be based on happiness, and the score on negative emotions will be a combined score of anger, contempt, fear, sadness and disgust. The API is not immediately applicable to analyse video material as the API can only analyse images. Choudhury et al. (2018) describe how this particular API can be used to analyse video material. Based on their methodological steps, the following steps were completed to prepare the videos of the Dutch water authorities for the analysis with the Face API.

First static images were extracted from the videos at a rate of one image per second. In total, 102 meeting videos were selected with an average duration of 103 minutes, resulting in an average of 6180 frames per meeting. Afterwards, the images were sorted per individual to calculate scores individually. To be able to sort the images per board member, the images were labelled in the following way: `namewaterauthority-yearmonthdate-lastnameboardmember-scenenumber`. Labelling the images in this way proved to be helpful as well in sorting the scores in a later stage. Unusable frames that for example, showed the whole room, were placed in a sperate folder and excluded from the analysis by the API. As a next step, the images were cropped to make sure only one face was visible in each image, the face of the speaker. At this point, the images were prepared and ready to be analysed by the API to generate the emotion scores. The python script in appendix 3 was used to call the API. The output of the API is a JSON file per image. In appendix 4 was used to convert the JSON files into a CSV file per meeting which made it easier to transfer this output to the data set.

A key and endpoint are needed to run the face script and generate emotion scores. Therefore, a Microsoft Azure account had to be created. When such an account is created for the first time, a credit of €170 is offered to explore Azure for 30 days. Additionally, 30.000 transactions per month are free. Due to the division among the students of the thesis circle that worked with the same data and that all created an account with the free trial and offered credit, it was possible to complete the analysis of the images without additional costs. The Face API did not calculate scores for all images as sometimes a person looks down or the image was not clear enough. The API scores each image between 0 and 1 for every emotion, happiness, sadness, anger, surprise, fear, disgust, and neutral. The sum of these scores equals 1. See appendix 5 for an example of the API output, and the API output converted to a CSV file for 20 images.

The eventual data for emotions used in the analysis was calculated by first calculating individual scores and then averaging these for the board of directors. Consequently, each individual has its influence on the overall score of emotions for a meeting. As the images had been sorted per individual first, a score

for each emotion was calculated for each member of the board based on the images belonging to that specific person. So, for example, if board member Smith was visible in a 100 images of a particular meeting X, these images were used to calculate a score for anger, contempt, disgust, fear, happiness, neutral, sad and surprise by calculating an average for board member Smith. For each board member, these averages were calculated and afterwards, these scores were averaged again to obtain the grand average for anger, contempt, disgust, fear, happiness, neutral, sad and surprise for the particular meeting. The last step was adding the scores for anger, contempt, disgust, fear and sadness to retrieve the overall score of negative emotions of the board of directors that was entered in the dataset and used for the analysis. The score for positive emotions of the board of directors was based on the average happiness score. See the diagram below for a summary of the steps described above.



[Figure 2: Process of constructing the independent variables]

Moderating and control variables

Hypothesis 3 suggests a moderating role of tenure on the relationship between affect and board performance. The moderating variable tenure, the time a board member is on the board of the Dutch water authority, will be measured in months. Although tenure is usually measured on year level, the choice was made to measure it in months as both the independent and dependent variables are measured on meeting level. When tenure is measured in months, the scores for this variable are distinctive per meeting. On the website of the Dutch Government, information can be found about when a person became a member of the board and when a person left the board. This information was gathered per board member to calculate a tenure score per meeting by averaging the number of months the board members had been part of the board.

Additionally, some control variables were included in the analysis to capture other influences that might have an effect on board performance. The following control variables were taken into account: gender diversity, political diversity, age diversity, board size, meeting frequency, meeting duration organisation, emotions of the top management team and finally organisation and year dummies.

Diversity

The diversity of the board of directors influences the functioning of the board (Boivie et al., 2016). Men and woman within boards differ in their values and attitudes to risk influencing choices and preferences (Adams & Funk, 2012). In an extensive review of diversity, Milliken and Martins (1996) argue that diversity of composition, including age, gender and politics, impacts outcome and performance of groups through affective, communication and cognitive processes. Following the example of other researchers (Harrison & Klein, 2007; Pelled, Eisenhardt, & Xin, 1999), diversity scores for age, gender and politics will be calculated using Blau's Index (1977) to transform these categorical variables into metric variables. Blau's index can be calculated with the following formula:

$$\text{Blau's index} = 1 - \sum p_i^2$$

Where p stands for the proportion of members in category i (Blau, 1977). The maximum score for a variable with two categories is 0,5, meaning that all categories are evenly present in the board (Harrison & Klein, 2007). The minimum score of 0 would indicate that only one category is present within the board.

Board size

Additionally, research shows that either very large or very small boards are optimal in terms of performance (Coles, Daniel, & Naveen, 2008). The number of boards board members of the Dutch water

authorities is dependent on the size of the water authorities (Rijksoverheid, n.d.). The influence of board size on board dynamics and the processing of information is also recognised by Boivie et al. (2016).

Meeting duration and frequency

Concerning the meetings themselves, two control variables will be taken into account: duration and frequency. Logically, the longer a meeting takes, the more amendments and motions can be put forward and the less frequent meetings are organised, the more topics have to be covered, and therefore more amendments and motions can be proposed. Also, meeting frequency is an element likely to influence relations among group members (Boivie et al., 2016).

Emotions of top management team

Lastly, emotion scores for the top management team were included as a control variable as they are present during the meetings as well and could influence the dependent variable.

Year and organisational dummies

Lastly, year and organisation dummies were included to control for time-specific (Barkema & Shvyrkov, 2007) and organisation specific effects.

Analysis

The data will be analysed in SPSS using multiple regression analysis. This technique can be used to test the relationship between one dependent metrically scaled variable and two or more independent metrically scaled variables (Hair, Black, Babin, & Anderson, 2014). The moderator or interaction effect can be included in the multiple regression analysis as a compound variable by multiplying one of the independent variables with the moderator (Hair et al., 2014).

Ethics

Research ethics can be described as incorporating and following moral guidelines during the different research phases, namely the preparation, data collection and reporting of findings (Myers, 2013). The main moral principle is what Myers (2013) calls the golden rule: "you should do unto others as you would have them do unto you" (p.49). Several fundamentals of ethics in research should be taken into account. First of all, it is essential to mention properly and acknowledge the knowledge of others by taking good care of references. When doing interviews, surveys and fieldwork one should always be aware of how to treat people and to inform participants about what is going to happen with the results and that they are free to withdraw their participation at any time (Myers, 2013). As this research will not include any fieldwork, surveys or interviews, this will not be something that needs attention. What does need to be kept in mind is that the data will contain private details such as names, gender, function

and tenure. Most of the data worked with in this thesis is publicly available except the emotions scores as these are generated by the API analysis. Nevertheless, the data will be treated with caution and respect for privacy. Lastly, it is important to report findings honestly and not to lie, create data or make alterations because it would improve results or contributions (Myers, 2013).

Chapter 5: Results

The descriptive statistics of the dependent, independent, moderator and control variables are included in table 1, excluding year and organisation dummies. The sample size for multiple regression should be at least 50 and preferably 100 to ensure power (Hair et al., 2014). This case includes 102 observations, as a consequence, the sample size requirement is met, and power is ensured. There is no missing data, therefore a missing data analysis is not required. The dependent variable number of motions and amendments has a mean of 1,657, a standard deviation of 2,232 and varies between 0 and 13. On average, more positive than negative emotions were shown by the board of directors in the meetings. Also, positive emotions have a higher standard deviation which is also reflected in the minimum and maximum scores. The average tenure of 43,46 months or three and a half years is not surprising given the fact that every four years there are elections and some board members serve multiple terms. The assumptions for the multiple regression analysis are met. See appendix 6 for the extended descriptive statistics and plots.

Table 1: Descriptive statistics of the variables

Variable name	N	Mean	S.D.	Min	Max
1. #Motions and amendments	102	1,657	2,232	0	13
2. Emotions BOD positive	102	0,073	0,047	0,001	0,233
3. Emotions BOD negative	102	0,042	0,018	0,005	0,085
4. Tenure	102	43,461	13,737	20	67
5. Board size	102	31,618	1,203	27	33
6. Meeting frequency	102	10,490	3,168	4	14
7. Meeting duration	102	103,804	74,724	5	369
8. Gender diversity	102	0,342	0,047	0,257	0,430
9. Political diversity	102	0,888	0,006	0,877	0,901
10. Age diversity	102	0,673	0,052	0,584	0,776
11. Emotions TMT positive	102	0,073	0,057	0,001	0,345
12. Emotions TMT negative	102	0,029	0,020	0,005	0,092

Note: BOD= board of directors and TMT= top management team

Table 2 on the next page shows the correlations between the main and control variables, indicating the presence and strength of associations between variables (Hair et al., 2014). The table does not include year and organisation dummies. The negative emotions of the top management team (0,239, $p < 0,05$) and board of directors (0,327, $p < 0,01$) positively correlate with the dependent variable amount of motions and amendments. The independent variables have no significant correlations suggesting multicollinearity should not be a problem. Additionally, the control variables meeting duration and age diversity are positively correlated with the dependent variable and meeting frequency is negatively correlated.

Table 2: Correlations

Correlations	Motions and amendments	Board size	Meeting Frequency	Meeting Duration	Gender Diversity	Political Diversity	Age Diversity	Tenure	TMT positive emotions	TMT negative emotions	BOD positive emotions	BOD negative emotions
Motions and amendments	1											
Board size	-0,119	1										
Meeting frequency	-0,259***	0,237**	1									
Meeting duration	0,675***	-0,379***	-0,338***	1								
Gender diversity	0,043	-0,492***	0,165*	0,053	1							
Political diversity	-0,160	0,376***	0,126	-0,320***	-0,246**	1						
Age diversity	0,244**	-0,038	-0,459***	0,182*	0,363***	-0,455***	1					
Tenure	0,071	0,056	-0,211**	0,010	-0,546***	0,516***	-0,327***	1				
TMT positive emotions	0,008	-0,229**	-0,69	0,011	0,008	0,000	-0,108	0,193*	1			
TMT negative emotions	0,239**	0,107	-0,114	0,074	-0,097	0,027	0,159	0,108	0,119	1		
BOD positive emotions	0,043	0,103	-0,100	0,050	-0,206**	-0,008	0,161	0,080	-0,061	0,054	1	
BOD negative emotions	0,327***	-0,390***	-0,429***	0,474***	-0,014	-0,419***	0,281***	0,063	0,123	0,052	-0,014	1

Notes: N=102; * p < 0.1; ** p < 0.05; *** p < 0.01; BOD= board of directors; TMT= top management team.

Table 3 shows the results of the regression of the dependent variable on the independent variables. Again, the table excludes the year and organisation dummies. Model 1 includes only the control variables. The adjusted R^2 of the model 1 is 0,507, so this model explains 50,7% of the variation of the dependent variable the number of motions and amendments. The adjusted R^2 can be considered high as the R^2 ranges from 0 to 1, where 0 indicates no prediction and 1 indicates perfect prediction (Hair et al., 2014). Model 2 includes the variable positive emotions of the board of directors and accordingly tests hypothesis 1, predicting that the higher the positive emotions are, the higher the board performance is. The coefficient of the relationship of positive emotions of the board of directors is not significant ($p=0,802$); consequently, hypothesis 1 can be rejected. In model 3 the variable negative emotions of the board of directors is included in the model, thus testing hypothesis 2 that the higher the negative emotions of the board of directors are, the higher the performance is. Likewise, the coefficient of negative emotions of the board of directors is not significant ($p=0,703$) and hypothesis 2 can be rejected as well.

Model 4 includes the interaction effect of positive emotions and tenure. The corresponding hypothesis, hypothesis number 3, suggested that tenure positively moderates the relationship between positive emotions and performance. The interaction effect of tenure and the positive emotions of the board of directors is not significant ($p=0,441$), resulting in the rejection of hypothesis 3. In model 5, the interaction effect of negative emotions and tenure is included. Hypothesis 4 proposed that tenure positively moderates the relationship between negative emotions of the board of directors and performance. This hypothesis was rejected as well because the interaction effect of negative emotions and tenure on board performance is not significant ($p=0,286$). The last model includes all control and main variables and again confirms that the relationships suggested by hypothesis 1, 2, 3 and 4 are not significant and can be rejected. Furthermore, the adjusted R^2 only decreases compared to model 1 stressing that the addition of the main variables does not add to the explanation of the dependent variable.

It can be seen throughout all six models that two control variables are significant, namely meeting duration ($p<0,01$) and negative emotions of the top management team ($p<0,05$). The significance of meeting duration seems logical as when a meeting lasts longer more motions, and amendments can be introduced by the board of directors. The coefficient of 0,023 might seem small; however, meeting duration is measured in minutes. Therefore, each hour the amount of motions and amendments increased with approximately 1,38. When negative emotions of the top management team increase with 1, the number of motions and amendments increase with 19,26. However, the scores of emotions range between 0 and 1, so an increase of 1 is not realistic. Alternatively, the coefficient of the negative emotions of the top management team can be interpreted in the following way: an increase of 0,1 in negative emotions leads to an increase of 1,93 in the number of motions and amendments or an increase of 0,01 in negative emotions leads to an increase of 0,1926 in the number of motions and amendments.

Table 3: Results regression analysis model 1-6



Variables	Motions and Amendments											
	Model 1		Model 2, h1		Model 3, h2		Model 4, h3		Model 5, h4		Model 6	
	Coef.	Sign. level	Coef.	Sign. level	Coef.	Sign. level	Coef.	Sign. level	Coef.	Sign. level	Coef.	Sign. level
BOD pos (h1+)			0,962 (3,835)	0,802			1,167 (3,853)	0,763			1,092 (3,933)	0,782
BOD neg (h2+)					4,691 (12,256)	0,703			2,834 (12,366)	0,819	3,096 (12,659)	0,807
Inter. BOD pos x tenure (h3+)							0,191 (0,247)	0,441			0,161 (0,250)	0,523
Inter. BOD neg x tenure (h4+)									-0,878 (0,817)	0,286	-0,806 (0,832)	0,336
Board size	1,238 (0,937)	0,190	1,225 (0,944)	0,198	1,229 (0,943)	0,196	1,225 (0,946)	0,199	1,106 (0,949)	0,247	1,103 (0,959)	0,253
Meeting frequency	0,239 (0,179)	0,184	0,241 (0,180)	0,184	0,243 (0,180)	0,180	0,242 (0,180)	0,183	0,221 (0,181)	0,225	0,225 (0,183)	0,221
Meeting duration	0,023 (0,003)	0,000	0,023 (,003)	0,000	0,023 (0,003)	0,000	0,023 (0,003)	0,000	0,023 (0,003)	0,000	0,023 (0,003)	0,000
Gender diversity	17,661 (11,191)	0,118	18,184 (11,445)	0,116	17,394 (11,270)	0,127	17,357 (11,523)	0,136	14,143 (11,659)	0,229	14,210 (12,004)	0,240
Political diversity	-158,415 (99,589)	0,115	-159,634 (100,273)	0,115	-157,470 (100,135)	0,120	-161,024 (100,535)	0,113	-151,768 (100,181)	0,134	-154,548 (101,297)	0,131
Age diversity	-2,298 (11,815)	0,846	-2,489 (11,907)	0,835	-2,064 (11,892)	0,863	-3,442 (11,999)	0,775	1,825 (12,419)	0,884	0,527 (12,686)	0,967
Tenure	,006 (0,025)	0,824	0,006 (0,025)	0,814	0,005 (0,025)	0,837	0,002 (0,026)	0,944	0,002 (0,025)	0,922	0,000 (0,026)	0,987
Emotions TMT positive	-1,183 (2,997)	0,694	-1,158 (3,016)	0,702	-1,274 (3,022)	0,674	-0,847 (3,050)	0,782	-1,897 (3,074)	0,539	-1,562 (3,143)	0,620
Emotions TMT negative	19,172 (9,133)	0,039	19,339 (9,209)	0,039	19,237 (9,182)	0,039	19,692 (9,243)	0,036	18,766 (9,184)	0,044	19,262 (9,315)	0,042
Adjusted R ²	0,507		0,501		0,502		0,499		0,503		0,493	

Notes: N=102; BOD = board of directors; TMT = top management team; Standard error is in parentheses

Robustness checks

Six robustness checks were performed in which variables are calculated in an alternative way or that excluded some cases. The final robustness check involves the analysis of data with an alternative analysis method: negative binomial regression. Table 4 includes the results of the robustness checks.

Number of cases

First of all, a check was done by excluding fifteen cases. Not every static image extracted from the videos could be analysed by the API. In some cases, 93% of the images were scored; in other cases, only 15%. As a result, the emotion score does not fully cover and represent the emotions present in a meeting. It is also possible that from some board members only a few images could be scored or even none at all. As a robustness check, only meetings for which the API scored at least 50% of the images, were included. As a result, fifteen meetings of the original 102 were excluded, and the model was analysed in SPSS with the remaining 87 observations, still meeting the requirement of at least 50 observations. The results of this robustness check did not lead to the acceptance of one or multiple of the four hypotheses. The adjusted R^2 does increase. This can be explained due to one extra control variable that is significant in this model, namely board size.

Winsorize

Secondly, taking into account the histogram, box and whisker plot, the (partial) scatterplots and cases with a standardised residual >3 , case 35 was winsorized (Tukey, 1962) by adjusting the dependent variable decisions from 13 to 9, the next case, to minimise the influence of the outlier. See appendix 7 for reasons to winsorize: histogram, box and whisker plot and the (partial) scatterplots of the dependent variable. In the second robustness check, the relationships suggested by the hypotheses remained insignificant as well.

Tenure

Moreover, some tenure data is missing for the meetings of the water authority Amstel, Gooi en Vecht. Especially data from 2013 and 2014 is missing, resulting in the average tenure calculated based on not all board members but based on the 17 board members of whom data was available. As a robustness check, the tenure of these meetings is treated as missing data, excluding cases listwise. Also, this robustness check did not show any significant results for the hypothesised relationships. Remarkably, the variable negative emotions of the top management team that was significant in each model so far is not significant in this model ($p=0,254$)

Measurement of the dependent variable

Additionally, a robustness check was performed regarding the dependent variable. To gather data for the dependent variable decisions, decision lists of the water authorities were analysed, and the number

of motions and amendments counted. However, not only amendments and motions are discussed and voted for during the board meetings, but also other types of decisions are made. As a robustness check, all the decisions were taken into account, including the motions and amendments. Including all decisions instead of only motions and amendments did not result in significant results.

Measurement of the independent variable

Also, concerning the independent variable emotions, a robustness check was done by calculating the averages differently. For the original model, the average score of emotion was calculated by first calculating individual scores and then averaging these. By doing this, the emotions of each board member are equally important in the average. However, for some board members, there are only a few scores, while for others, there are many scores. Therefore, another average was calculated as well in which every image weights equally heavy. Replacing the independent variable did not lead to significant results.

Negative binomial regression

Lastly, negative binomial regression is used as an alternative analysis. Reasons to use this particular analysis are count data and overdispersed data. Count-based dependent variables are variables that count the number of times an event occurred (Blevins, Tsang, & Spain, 2015), in the case of this research the number of motions and amendments was used. When dealing with count data, a more specialised regression can be performed based on the Poisson model (Blevins et al., 2015). When dealing with overdispersion, a special iteration of the Poisson model, named the negative binomial regression is recommended (Blevins et al., 2015). The current data shows overdispersion as the variance of the dependent variable is higher than the mean: $4,980 > 1,657$ (see appendix 6). Therefore, an extra robustness check was performed, analysing the data with negative binomial regression. As can be seen in table 4, in the negative binomial regression model none of the hypothesised relationships are significant.



Table 4: Robustness checks

Robustness checks	Model 6 Original		Robust 1 Cases 87		Robust 2 Winsorize		Robust 3 Tenure2		Robust 4 Decisions2		Robust 5 Emotions2		Robust 6 Negative Binomial	
	Coef.	Sign. level	Coef.	Sign. level	Coef.	Sign. level	Coef.	Sign. level	Coef.	Sign. level	Coef.	Sign. level	Coef.	Sign. level
BOD pos (h1+)	1,092 (3,933)	0,782	-1,692 (3,906)	0,666	1,145 (3,575)	0,750	0,417 (4,361)	0,924	-6,600 (6,444)	0,309	1,917 (5,030)	0,704	-1,023 (4,132)	0,804
BOD neg (h2+)	3,096 (12,659)	0,807	-0,475 (12,454)	0,970	2,530 (11,506)	0,827	7,271 (14,326)	0,613	-17,934 (20,664)	0,388	-2,962 (10,890)	0,786	0,774 (12,631)	0,951
Inter. BOD pos x tenure (h3+)	0,161 (0,250)	0,523	0,141 (0,231)	0,544	0,135 (0,228)	0,553	0,269 (0,326)	0,412	0,019 (0,410)	0,963	0,231 (0,315)	0,465	0,030 (0,230)	0,920
Inter. BOD neg x tenure (h4+)	-0,806 (0,832)	0,336	-0,797 (0,772)	0,306	-0,472 (0,756)	0,535	-0,880 (1,044)	0,402	0,508 (1,326)	0,702	-0,821 (0,717)	0,255	-0,927 (0,833)	0,266
Board size	1,103 (0,959)	0,253	2,341 (0,890)	0,011	1,132 (0,872)	0,198	1,128 (0,996)	0,261	1,001 (1,067)	0,351	-0,069 (0,678)	0,919	1,069 (0,842)	0,205
Meeting frequency	0,225 (0,183)	0,221	0,190 (0,185)	0,307	0,215 (0,166)	0,199	0,263 (0,192)	0,175	-0,322 (0,251)	0,202	-0,021 (0,166)	0,901	-0,043 (0,164)	0,795
Meeting duration	0,023 (0,003)	0,000	0,026 (0,003)	0,000	0,021 (0,002)	0,000	0,023 (0,003)	0,000	0,023 (0,004)	0,000	0,023 (0,003)	0,000	0,013 (0,003)	0,000
Gender diversity	14,210 (12,004)	0,240	20,673 (11,137)	0,068	13,927 (10,911)	0,206	11,482 (12,637)	0,367	19,704 (17,135)	0,254	6,987 (11,165)	0,533	6,392 (10,832)	0,555
Political diversity	-154,548 (101,297)	0,131	-108,274 (93,474)	0,251	-114,849 (92,074)	0,216	-114,895 (108,677)	0,294	-70,019 (139,780)	0,618	-96,995 (89,848)	0,284	-35,413 (85,344)	0,678
Age diversity	0,527 (12,686)	0,967	1,064 (11,777)	0,928	2,607 (11,531)	0,822	2,481 (13,290)	0,852	-20,219 (18,885)	0,288	-2,897 (12,306)	0,814	3,674 (11,429)	0,748
Tenure	0,000 (0,026)	0,987	-0,010 (0,023)	0,660	0,006 (0,024)	0,813	-0,025 (0,035)	0,485	0,070 (0,040)	0,085	0,022 (0,025)	0,371	0,003 (0,022)	0,894
Emotions TMT positive	-1,562 (3,143)	0,620	-1,185 (3,279)	0,719	-1,870 (2,857)	0,515	-3,538 (4,864)	0,470	-2,229 (5,116)	0,664	-1,844 (3,415)	0,591	-1,627 (3,242)	0,616
Emotions TMT negative	19,262 (9,315)	0,042	23,565 (8,961)	0,011	19,676 (8,467)	0,023	11,799 (10,264)	0,254	-9,366 (15,007)	0,534	17,899 (9,891)	0,074	13,381 (8,036)	0,096
Adjusted R ²	0,493		0,593		0,508		0,499		0,354		0,458		-	

Notes: N= 102 except Robust 1 and 2; Robust 1, N= 87; Robust 3, N=89; standard error in parenthesis.

Chapter 6: Discussion

Affect has gotten more attention in some business and management literature that showed effects on creativity, workout comes and decision-making. Although, up until now no research used affect as a perspective or theoretical angle to study board of directors and to expand our knowledge of boards. Current literature falls short in assuming board processes are entirely rational and cognitive. Nevertheless, board members are just like any of us human beings and affect, including emotions and moods, influence our preferences (Forgas, 1995; Maitlis & Ozcelik, 2004) and behaviour (Cacioppo & Gardner, 1999). This study proposes affect as a new frame to be used when studying boards of directors and examined the relationship between affect and board performance. Also, the moderating effect of tenure on this relationship was investigated. To study these relationships, the central question of this thesis was:

“What is the influence of affect of board members of Dutch water authorities on their performance, and how does tenure moderate this relationship?”

Based on the analysis, I am unable to conclude that the affect of board members influences their performance. In turn, I am also unable to conclude that tenure impacts this relationship. However, the negative emotions of the top management that was used as a control variable tested to be significant in the main analysis ($p < 0,05$), in robustness checks 1 and 2 ($p < 0,05$) and in robustness checks 5 and 6 ($p < 0,1$). This significant control variable provides opportunities to approach group performance from the theoretical angle of affect. Moreover, it suggests that it might be interesting to focus on the emotions of the top management, instead of the emotions of the board of directors. Contrary to the negative emotions of the top management, the positive emotions of the top management were not significant in all models implying that these are not interesting for future research.

Even though no significant results have been found, this study contributes to the literature by empirically investigating the relationship between affect and board performance. Using affect as a perspective to study and broaden our understanding of what happens inside boardrooms is new and therefore contributes to the literature by offering a new research angle. The inclusion of affect in the study of boards criticizes the assumption of rationality and allows for a reevaluation of how we see boards, their processes and performance. Besides, not finding any significant results indicates boundaries to the current literature on affect that exists. Researchers that have studied affect have found significant results in small groups or one on one interactions. The results of the current study suggest that these relationships do not hold in larger groups such as boards. This thesis also contributes methodologically by measuring emotions with techniques based on machine learning, a relatively new research method proposed, tried and tested by Choudhury et al. (2019). Previously, emotions were mainly measured by

self-report or by coding by hand, measurements that leave room for bias or subjectivity as respondents might answer what is socially acceptable or what suits the research (Adams & Funk, 2012). Additionally, respondents are not always honest about what they feel or are simply not aware of what they feel (Ashkanasy et al., 2017).

Practical implications

This study was primarily focused on theoretical contributions. Nevertheless, as no significant results have been found, this study suggests that affect has no influence on board performance and more specifically, the number of amendments and motions. This implies that when trying to influence motions and amendments in a meeting, showing your negative or positive emotions does not matter. Furthermore, as tenure did not turn out to moderate the relationship between affect and board performance, it is not beneficial to take tenure into account when composing ideal boards in an attempt to improve the effectiveness and the performance of the board.

Limitations and recommendations for future research

In this section limitations and possibilities for future research are addressed. First of all, literature about the topic of affect uses various terms such as emotions, moods and affect (Delgado-Garcia & De la Fuente-Sabate, 2010; Menges & Kilduff, 2015). For this research, affect is defined as an umbrella term, including both emotions and moods (Bartel & Saavedra, 2000; Menges & Kilduff, 2015). However, only emotions were measured as these can be measured by facial expressions as opposed to moods that are more difficult to measure. Future research could investigate both emotions and moods to measure affect more broadly.

Secondly, emotions can either be measured by self-report or by coding facial expressions. The independent variable in this study was measured by measuring displayed emotions by analysing facial expressions. Research of Jarvis (2017) showed that people sometimes pretend or conceal their emotions and as a consequence, the displayed and experienced emotions do not align. So, there can be a discrepancy between the emotions felt by a person and the emotions displayed as some people show their emotions more than others or even show other emotions compared to what they feel. Research measuring emotions by analysing facial expressions, including this thesis, encounter the limitation that it cannot measure true emotions, but only displayed.

Another remark can be made about the independent variable emotions, as it was measured in terms of valence, following the example of other researchers (Barsade et al., 2000; Isen, 2001; Maitlis & Ozcelik, 2004; Parke & Seo, 2017; van Knippenberg et al., 2010). Although, other researchers concluded that the structure of affect in terms of valence and arousal could vary between persons or situations (Feldman,

1995; Kuppens et al., 2013) and the relationship between these two aspects shows a consistent but weak V-shaped type of relationship (Kuppens et al., 2013). This suggests that the two constructs of affect, valence and arousal, are not independent, so future research might include and combine both constructs of affect instead of focussing on one of them.

Furthermore, research suggested that the relationship between affect and performance might be nonlinear and show an inverted u shape (Seo & Barrett, 2007), since too high emotionality can confiscate short-term memory and hinder attention, influencing decision-making performance negatively (Barrett, Tugade, & Engle, 2004). An additional check was performed in SPSS make a better and more substantiated recommendation (see appendix 8). Polynomial values were included to test for nonlinear relationships. For the board of directors, the test of nonlinear relationships did not provide new insights. Linearity of this relationship was also confirmed when testing the assumptions prior to the multiple regression analysis. On the contrary, the relationship between the emotions of the top management team, especially the positive emotions of the top management team, and the number of motions and amendments seems to be nonlinear. This could be relevant for further research into the affect of top management teams.

Also, the dependent variable was measured on meeting level, and more precisely measured by the number of motions and amendments put forward by the board of directors, while the independent variables negative and positive emotions were measured over the whole meeting. It can be suggested to only measure the emotions at the point in time a motion or amendment is put forward by the board of directors to measure the influence of affect more closely, which could be explored by future research.

Another possibility is that this research can be replicated in the future by measuring both affect and performance on year level when more videos are available. The dependent variable board performance was measured on meeting level in this research. Originally the dependent variable was planned to be firm performance, so measured on year level. The measurement of board performance on year level by measuring revenue or profits is mainly suggested by other research (Cohen & Bailey, 1997; Forbes & Milliken, 1999; Hillman & Dalziel, 2003; Zahra & Pearce, 1989). This alteration was made due to the limited availability of board meeting videos, only 31 year observations would be possible which would not have been sufficient to perform a multiple regression analysis properly. Nevertheless, measuring performance on meeting level has the advantage of measuring more closely to the object of interest of the research, in this case, the board of directors. Commonly, firm performance is used because it is difficult to obtain data inside boardrooms. At the moment only nine water authorities videotape their meetings of which three started doing this in 2019. Therefore, it can be expected that more water authorities will videotape their meeting in the future. The availability of more video material makes it possible to measure performance on year level and can enhance future research by having more

observations. Smaller effect sizes require a bigger sample size to show significant results (Hair et al., 2014). Possibly, the sample size of the current research is not sufficient enough to show significant results for the influence of affect on performance.

Besides, assumptions have been made in chapter three. The lack of suitable literature, specifically in the area of affect and boards made these assumptions necessary. There is no research investigating affect in the context of boards or other larger groups. It could be that mechanisms explained in individual or small group decision-making and affect literature work differently in boards. Research of Adams and Funk (2012), showed that the values of men and woman on boards are different but in other ways than in the general population. Therefore implying that board members differ from the general population.

Moreover, the methodology and especially how the emotion scores were captured from the static images was based on Choudhury et al. (2019). These researchers used video material of interviews, in which the camera angle is fixed on the interviewee. The video material that was worked with for this study had the problem that the camera angle often was not aimed at a person's face, as members of the board tend to look down at their notes when they spoke. Additionally, the quality of the materials proved of inferior quality as some images were not very sharp. Consequently, the API could not calculate scores for all images, varying between 15% and 93%, as the angle of the camera used to record the board meetings is not adjusted all the time to ensure an optimal image of the persons face that is talking at a specific moment or due to blurriness of the picture at hand. As a consequence, not the whole meeting and every affect present in the meeting is represented by the API scored well.

It could also be relevant to look into other types of decisions influenced by affect because more positive might lead to more explorative team decisions opposing to exploitative (Hakonsson et al., 2016). An explanation for this could be that a positive mood leads to more originality and creativity and risk-taking (Schwarz & Bless, 1991). Lastly, the board size in this study has a mean of 31,6 and varies between 27 and 33 which is quite large compared to other research that finds average board sizes around 10 (Coles et al., 2008; Goodstein, Gautam, & Boeker, 1994). Research about the contagion of emotions has been mainly conducted in small groups or with one on one interactions (Barsade, 2002; Pugh, 2001). Therefore, future research could examine the influence of affect on performance in smaller sized boards.

Conclusion

In an attempt to unravel what influences board performance, this research introduces affect as a new theoretical and research perspective to study boards of directors. Affect serves as a unique angle to grasp the psychological- and social processes in boards. The relationship between affect and board performance and the moderating affect or tenure is examined in the setting of Dutch water authorities by analysing videos of board meetings. Consequently, this thesis is an answer to the call of S.G. Johnson et al. (2013) for research in new contexts, mechanism-based research and exploring new data in order to extend our understanding of boards and to reveal more complex relationships. To explain how affect influences board performance, two mechanisms of information processing are used: steering attention and the way people deal with information. Information processing influences decision-making and ultimately performance. None of the proposed hypothesis could be accepted. Nevertheless, as this research is the first to examine the influence of affect within boards, it contributes to the literature by showing a novel approach to extend our understanding and change how we see boards. Moreover, boundaries of existing literature on affect and boards of directors are pointed out. Also, a methodological contribution is made by using techniques based on machine learning that make it possible to measure affect more objectively and to analyse visual material such as videos. Lastly, several suggestions for future research have been proposed. One of them is to investigate affect within top management teams as one of the control variables, the negative emotions of the top management team, was significant in multiple models and therefore offers a promising area to explore further.

References

- Adams, R. B., & Funk, P. (2012). Beyond the Glass Ceiling: Does Gender Matter? *Management Science*, 58(2), 219-235. doi:10.1287/mnsc.1110.1452
- Amabile, T. M., Barsade, S. G., Mueller, J. S., & Staw, B. M. (2005). Affect and creativity at work. *Administrative Science Quarterly*, 50(3), 367-403. doi:10.2189/asqu.2005.50.3.367
- Ashkanasy, N. M., Hartel, C. E. J., & Daus, C. S. (2002). Diversity and emotion: The new frontiers in organizational behavior research. *Journal of Management*, 28(3), 307-338. doi:10.1016/s0149-2063(02)00130-7
- Ashkanasy, N. M., Humphrey, R. H., & Huy, Q. N. (2017). Integrating emotions and affect in theories of management. *Academy of Management Review*, 42(2), 175-189. doi:10.5465/amr.2016.0474
- Barkema, H. G., & Shvyrkov, O. (2007). Does top management team diversity promote or hamper foreign expansion? *Strategic Management Journal*, 28(7), 663-680. doi:10.1002/smj.604
- Barrett, L. F., Tugade, M. M., & Engle, R. W. (2004). Individual differences in working memory capacity and dual-process theories of the mind. *Psychological Bulletin*, 130(4), 553-573. doi:10.1037/0033-2909.130.4.553
- Barsade, S. G. (2002). The ripple effect: Emotional contagion and its influence on group behavior. *Administrative Science Quarterly*, 47(4), 644-675. doi:10.2307/3094912
- Barsade, S. G., & Gibson, D. E. (2007). Why does affect matter in organizations? *Academy of Management Perspectives*, 21(1), 36-59. doi:10.5465/amp.2007.24286163
- Barsade, S. G., Ward, A. J., Turner, J. D. F., & Sonnenfeld, J. A. (2000). To your heart's content: A model of affective diversity in top management teams. *Administrative Science Quarterly*, 45(4), 802-836. doi:10.2307/2667020
- Bartel, C. A., & Saavedra, R. (2000). The collective construction of work group moods. *Administrative Science Quarterly*, 45(2), 197-231. doi:10.2307/2667070
- Blau, P. M. (1977). *Inequality and heterogeneity : a primitive theory of social structure*. New York: Free Press.
- Blevins, D. P., Tsang, E. W., & Spain, S. M. (2015). Count-based research in management: Suggestions for improvement. *Organizational Research Methods*, 18(1), 47-69. doi:10.1177/1094428114549601
- Boivie, S., Bednar, M. K., Aguilera, R. V., & Andrus, J. L. (2016). Are Boards Designed to Fail? The Implausibility of Effective Board Monitoring. *Academy of Management Annals*, 10(1), 319-407. doi:10.1080/19416520.2016.1120957
- Cacioppo, J. T., & Gardner, W. L. (1999). Emotion. *Annual Review of Psychology*, 50(1), 191-214.
- Carpenter, M. A., Geletkanycz, M. A., & Sanders, W. G. (2004). Upper echelons research revisited: Antecedents, elements, and consequences of top management team composition. *Journal of Management*, 30(6), 749-778. doi:10.1016/j.jm.2004.06.001

- Choudhury, P., Wang, D., Carlson, N. A., & Khanna, T. (2019). Machine learning approaches to facial and text analysis: Discovering CEO oral communication styles. *Strategic Management Journal*, 40(11), 1705-1732. doi:10.1002/smj.3067
- Cohen, S. G., & Bailey, D. E. (1997). What makes teams work: Group effectiveness research from the shop floor to the executive suite. *Journal of Management*, 23(3), 239-290. doi:10.1016/S0149-2063(97)90034-9
- Coles, J. L., Daniel, N. D., & Naveen, L. (2008). Boards: Does one size fit all? *Journal of financial economics*, 87(2), 329-356. doi:10.1016/j.jfineco.2006.08.008
- Daily, C. M., Dalton, D. R., & Cannella, A. A. (2003). Corporate governance: Decades of dialogue and data. *Academy of Management Review*, 28(3), 371-382. doi:10.2307/30040727
- Delgado-Garcia, J. B., & De la Fuente-Sabate, J. M. (2010). How do CEO emotions matter? Impact of ceo affective traits on strategic and performance conformity in the spanish banking industry. *Strategic Management Journal*, 31(5), 562-574. doi:10.1002/smj.817
- Eisenhardt, K. M., & Zbaracki, M. J. (1992). Strategic decision-making. *Strategic Management Journal*, 13, 17-37. doi:10.1002/smj.4250130904
- Ekman, P. (1992). An argument for basic emotions. *Cognition & Emotion*, 6(3-4), 169-200. doi:10.1080/02699939208411068
- Ekman, P., & Oster, H. (1979). Facial expression of emotion. *Annual Review of Psychology*, 30, 527-554. doi:10.1146/annurev.ps.30.020179.002523
- Feldman, L. A. (1995). Valence and arousal focus - Individual differences in the structure of affective experience. *Journal of personality and social psychology*, 69(1), 153-166. doi:10.1037/0022-3514.69.1.153
- Forbes, D. P., & Milliken, F. J. (1999). Cognition and corporate governance: Understanding boards of directors as strategic decision-making groups. *Academy of Management Review*, 24(3), 489-505. doi:10.2307/259138
- Forgas, J. P. (1995). Mood and judgment- the affect infusion model (AIM). *Psychological Bulletin*, 117(1), 39-66. doi:10.1037/0033-2909.117.1.39
- Forgas, J. P., & George, J. M. (2001). Affective influences on judgments and behavior in organizations: An information processing perspective. *Organizational Behavior and Human Decision Processes*, 86(1), 3-34. doi:10.1006/obhd.2001.2971
- George, J. M. (1990). Personality, affect, and behavior in groups. *Journal of applied psychology*, 75(2), 107-116. doi:10.1037/0021-9010.75.2.107
- Goodstein, J., Gautam, K., & Boeker, W. (1994). The effects of board size and diversity on strategic change. *Strategic Management Journal*, 15(3), 241-250. doi:10.1002/smj.4250150305
- Gruenfeld, D. H., Mannix, E. A., Williams, K. Y., & Neale, M. A. (1996). Group composition and decision making: How member familiarity and information distribution affect process and

- performance. *Organizational Behavior and Human Decision Processes*, 67(1), 1-15.
doi:10.1006/obhd.1996.0061
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). *Multivariate data analysis* (7th ed.). Harlow: Pearson Education Limited.
- Hakonsson, D. D., Eskildsen, J. K., Argote, L., Monster, D., Burton, R. M., & Obel, B. (2016). Exploration versus exploitation: Emotions and performance as antecedents and consequences of team decisions. *Strategic Management Journal*, 37(6), 985-1001. doi:10.1002/smj.2380
- Hambrick, D. C. (2007). Upper echelons theory: An update. *Academy of Management Review*, 32(2), 334-343. doi:10.5465/amr.2007.24345254
- Hambrick, D. C., & Daveni, R. A. (1992). Top team deterioration as part of the downward spiral of large corporate bankruptcies. . *Management Science*, 38(10), 1445-1466.
doi:10.1287/mnsc.38.10.1445
- Hambrick, D. C., & Mason, P. A. (1984). Upper Echelons - The organization as a reflection of its top managers. *Academy of Management Review*, 9(2), 193-206. doi:10.2307/258434
- Hambrick, D. C., Misangyi, V. F., & Park, C. A. (2015). The quad model for identifying a corporate directors's potential for effective monitoring: Toward a new theory of board sufficiency. *Academy of Management Review*, 40(3), 323-344. doi:10.5465/amr.2014.0066
- Harrison, D. A., & Klein, K. J. (2007). What's the difference? Diversity constructs as separation, variety, or disparity in organizations. *Academy of Management Review*, 32(4), 1199-1228.
doi:10.5465/amr.2007.26586096
- Harrison, D. A., Price, K. H., & Bell, M. P. (1998). Beyond relational demography: Time and the effects of surface- and deep-level diversity on work group cohesion. *Academy of Management Journal*, 41(1), 96-107. doi:10.2307/256901
- Hess, U., & Kirouac, G. (2000). Emotion in groups. In M. Lewis & J. M. Haviland-Jones (Eds.), *Handbook of Emotion* (Vol. 2, pp. 368-381). New York: Guilford Press.
- Hillman, A. J., & Dalziel, T. (2003). Boards of directors and firm performance: Integrating agency and resource dependence perspectives. *Academy of Management Review*, 28(3), 383-396.
doi:10.5465/amr.2003.10196729
- Hinsz, V. B., Tindale, R. S., & Vollrath, D. A. (1997). The emerging conceptualization of groups as information processors. *Psychological Bulletin*, 121(1), 43-64. doi:10.1037/0033-2909.121.1.43
- Isen, A. M. (2001). An influence of positive affect on decision making in complex situations: Theoretical issues with practical implications. *Journal of consumer psychology*, 11(2), 75-85.
doi:10.1207/S15327663JCP1102_01
- Jarvis, L. C. (2017). Feigned versus felt: Feigning behaviors and the dynamics of institutional logics. *Academy of Management Review*, 42(2), 306-333. doi:10.5465/amr.2014.0363

- Johnson, J. L., Daily, C. M., & Ellstrand, A. E. (1996). Boards of directors: A review and research agenda. *Journal of Management*, 22(3), 409-438. doi:10.1177/014920639602200303
- Johnson, S. G., Schnatterly, K., & Hill, A. D. (2013). Board Composition Beyond Independence: Social Capital, Human Capital, and Demographics. *Journal of Management*, 39(1), 232-262. doi:10.1177/0149206312463938
- Katz, R. (1982). The effects of group longevity on project communication and performance. *Administrative Science Quarterly*, 81-104. doi:10.2307/2392547
- Kuppens, P., Tuerlinckx, F., Russell, J. A., & Barrett, L. F. (2013). The Relation Between Valence and Arousal in Subjective Experience. *Psychological Bulletin*, 139(4), 917-940. doi:10.1037/a0030811
- Leiblein, M. J., Reuer, J. J., & Zenger, T. (2018). What makes a decision strategic? *Strategy Science*, 3(4), 558-573. doi:10.1287/stsc.2018.0074
- Luciano, M. M., Nahrgang, J., & Shropshire, C. (in press). Strategic leadership systems: viewing top management teams and boards of directors from a multiteam systems perspective. *Academy of Management Review*. doi:10.5465/amr.2017.0485
- Maitlis, S. (2005). The social processes of organizational sensemaking. *Academy of Management Journal*, 48(1), 21-49. doi:10.2307/20159639
- Maitlis, S., & Ozcelik, H. (2004). Toxic decision processes: A study of emotion and organizational decision making. *Organization Science*, 15(4), 375-393. doi:10.1287/orsc.1040.0070
- Menges, J. I., & Kilduff, M. (2015). Group Emotions: Cutting the Gordian Knots Concerning Terms, Levels of Analysis, and Processes. *Academy of Management Annals*, 9(1), 845-928. doi:10.1080/19416520.2015.1033148
- Milliken, F. J., & Martins, L. L. (1996). Searching for common threads: Understanding the multiple effects of diversity in organizational groups. *Academy of Management Review*, 21(2), 402-433. doi:10.2307/258667
- Ministerie van Binnenlandse Zaken en Koninkrijksrelaties. (n.d.). Waterschappen. Retrieved from <https://kennisopenbaarbestuur.nl/thema/politieke-ambtsdragers/waterschappen/>
- Myers, M. D. (2013). *Qualitative research in business & management* (2nd ed.). London: SAGE.
- Overheid in Nederland. (n.d.). Waterschappen. Retrieved from <http://www.overheidinnederland.nl/waterschappen>
- Parke, M. R., & Seo, M.-G. (2017). The role of affect climate in organizational effectiveness. *Academy of Management Review*, 42(2), 334-360. doi:10.5465/amr.2014.0424
- Pelled, L. H., Eisenhardt, K. M., & Xin, K. R. (1999). Exploring the black box: An analysis of work group diversity, conflict, and performance. *Administrative Science Quarterly*, 44(1), 1-28. doi:10.2307/2667029
- Pettigrew, A. M. (1992). On studying managerial elites. *Strategic Management Journal*, 13, 163-182. doi:10.1002/smj.4250130911

- Powell, T. C., Lovallo, D., & Fox, C. R. (2011). Behavioral strategy. *Strategic Management Journal*, 32(13), 1369-1386. doi:10.1002/smj.968
- Pugh, S. D. (2001). Service with a smile: Emotional contagion in the service encounter. *Academy of Management Journal*, 44(5), 1018-1027. doi:10.2307/3069445
- Rijksoverheid. (n.d.). Openbaarheid van overheidsinformatie. Retrieved from <https://www.rijksoverheid.nl/onderwerpen/wet-openbaarheid-van-bestuur-wob/openbaarheid-van-overheidsinformatie>
- Russell, J. A. (1980). A circumplex model of affect. *Journal of personality and social psychology*, 39(6), 1161. doi:10.1037/h0077714
- Schwarz, N., & Bless, H. (1991). Happy and Mindless, But Sad and Smart? The Impact of affective states on analytic reasoning. In J. P. Forgas (Ed.), *Emotion and social judgments* (pp. 55-71). London: Pergamon Press.
- Schwenk, C. (1993). Management tenure and explanations for success and failure. *Omega-International Journal of Management Science*, 21(4), 449-456. doi:10.1016/0305-0483(93)90077-x
- Seo, M. G., & Barrett, L. F. (2007). Being emotional during decision making-good or bad? An empirical investigation. *Academy of Management Journal*, 50(4), 923-940. doi:10.2307/20159897
- Staw, B. M., & Barsade, S. G. (1993). Affect and managerial performance- a test of the sadder but wiser vs happier and smarter hypotheses. *Administrative Science Quarterly*, 38(2), 304-331. doi:10.2307/2393415
- Staw, B. M., Sutton, R. I., & Pelled, L. H. (1994). Employee positive emotion and favorable outcomes at the workplace. *Organization Science*, 5(1), 51-71. doi:10.1287/orsc.5.1.51
- Tukey, J. W. (1962). The future of data analysis. *The annals of mathematical statistics*, 33(1), 1-67.
- Unie van waterschappen. (n.d.-a). Waterschappen in Nederland. Retrieved from <https://www.uvw.nl/thema/wet-en-regelgeving/waterschappen-in-nederland/>
- Unie van waterschappen. (n.d.-b). Waterschapsspiegel. Retrieved from <https://www.waterschapsspiegel.nl>
- Unie van waterschappen. (n.d.-c). Waves: waterschap analyse en verbetersysteem. Retrieved from <https://waves.databank.nl>
- van Knippenberg, D., Kooij-de Bode, H. J. M., & van Ginkel, W. P. (2010). The Interactive Effects of Mood and Trait Negative Affect in Group Decision Making. *Organization Science*, 21(3), 731-744. doi:10.1287/orsc.1090.0461
- Weick, K. E., Sutcliffe, K. M., & Obstfeld, D. (2005). Organizing and the process of sensemaking. *Organization Science*, 16(4), 409-421. doi:10.1287/orsc.1050.0133
- Wooldridge, B., & Cowden, B. (2020). Strategic Decision-Making in Business. *Oxford Research Encyclopedia of Business and Management*. doi:10.1093/acrefore/9780190224851.013.1

Zahra, S. A., & Pearce, J. A. (1989). Boards of directors and corporate financial performance: A review and integrative model. *Journal of Management*, 15(2), 291-334.
doi:10.1177/014920638901500208

Appendices

Appendix 1 - Circumplex model of affect

1168

JAMES A. RUSSELL



Figure 3. Multidimensional scaling solution for 28 affect words.

Appendix 2 - Decisions list (besluitenlijst) board meeting

Algemeen Bestuur



Concept besluitenlijst

d.d. 23 mei 2017

Voorzitter

P.A.E. van Erkelens

DB-leden

B. de

Winter, M.A.J. Jager-Wöltgens,

J.J. van Weperen, E. Berenst

Directie

O. Bijlsma

Bestuursadviseur

L.J. Vos

Aanwezig

Water Natuurlijk

CDA

ChristenUnie

Geborgde zetels ongebouwd

Geborgde zetels bedrijven

PvdA

Lagere Lasten Burger

VVD

FNP

Bedrijf, Boer en Burger

Partij voor de Dieren

T. Clevering, A. Wouda, M. Dijkhoff, I. Groeneveld, J. Arjaans

M. Speerstra, M.H. van Stee

R. Ferwerda, K.B. Stelma

W.Sinnema, C.P. van Burgsteden, F. Jorna

J. van Zanden, C.E. Schultz

H.C.G. van Asten, R.J. Admiraal

S. de Jong, O. van der Galiën

L. Tamminga, L.Efdé-Kleefstra

J. van der Kooi

P. Kuipers

T.N. Scheper

Afwezig

P. v.d. Burg (CDA), S. van der Meer (FNP)

1. Opening

De voorzitter opent de vergadering.

2. Vaststelling agenda

De agenda wordt ongewijzigd vastgesteld.

3. Rondvraag

Er wordt geen gebruik gemaakt van de rondvraag.

4. Besluitenlijst d.d. 21 maart 2017

De besluitenlijst wordt ongewijzigd vastgesteld.

5. A. Acties/toezeggingen gezamenlijke adviescommissie d.d. 8 mei 2017

Conclusie Voor kennisgeving aangenomen.

B. Acties/toezeggingen adviescommissie WFB d.d. 8 mei 2017

Conclusie Voor kennisgeving aangenomen.

C. Acties/toezeggingen adviescommissie APZF d.d. 8 mei 2017

Conclusie Voor kennisgeving aangenomen

D. Acties/toezeggingen gezamenlijke adviescommissie d.d. 9 mei 2017

Conclusie Voor kennisgeving aangenomen

6. Mededelingen Auditcommissie

Er zijn geen mededelingen van de auditcommissie.

7. Actielijst AB

AB vergadering d.d. 23-05-2017

Er zijn geen openstaande acties.

HAMERSTUKKEN

8. Zienswijze begroting FUMO

Het algemeen bestuur besluit:

1. De zienswijze op de ontwerp begroting 2018 van de FUMO vast te stellen

Conclusie: het algemeen bestuur besluit conform.

9. Zienswijze begroting HWH (Het Waterschapshuis)

Het algemeen bestuur besluit:

1. Kennis te nemen van de gewijzigde begroting 2017 en de conceptbegroting 2018 van Het Waterschapshuis
2. De zienswijze op de begrotingswijziging 2017 en de conceptbegroting 2018 vast te stellen

Conclusie: het algemeen bestuur besluit conform.

10. Proef Lauwersmeerdijk

Het algemeen bestuur besluit:

1. In te stemmen met het Plan van Aanpak "Deltagoot-proeven bestaand asfalt Lauwersmeerdijk"
2. Voor de uitvoering van het plan van aanpak een bruto krediet van € 2.688.000 beschikbaar te stellen (netto € 0,0 - 100% HWBP subsidie)
3. Kennis te nemen van de verplichting die het dagelijks bestuur is aangegaan vooruitlopend op de formele toekenning van het uitvoeringskrediet.

Conclusie: het algemeen bestuur besluit conform.

BESPREEKSTUKKEN

11. Rapportage werkgroep Bestuurlijke Ontwikkelingen (Otto van der Galiën)

De voorzitter van de werkgroep, de heer van der Galiën, licht de totstandkoming van de rapportage toe. Het bestuur spreekt waardering uit voor dit initiatief van mevrouw Clevering (WN) en voor de rapportage van de werkgroep.

Conclusie: Het algemeen bestuur stemt in met de rapportage; met uitzondering van het instellen van een testgroep voor een naamsverandering.

Actie/toezegging: het dagelijks bestuur zegt het volgende toe:

- Het reglement van orde wordt aangepast naar aanleiding van de rapportage.
- Er komt een lange termijnplanning voor bestuursbesluiten.
- Bij bestuursvoorstellen worden alternatieven, scenario's, startnotities betrokken.
- De mogelijkheden voor advertorials in huis-aan-huis-bladen worden onderzocht.
- Bespreekpunten zoals geformuleerd in commissies worden toegevoegd aan de adviezen in de bestuursvoorstellen.
- Voor elke fractie is één bestuursadviseur aanspreekpunt.
- Er worden gesprekken tussen ambtelijke organisatie en ab-leden georganiseerd voor het vergroten van de politiek-bestuurlijke sensitiviteit.
- Er wordt naar een evenwichtige verdeling van de vergaderingen over het jaar gestreefd.
- De indeling van de agenda voor de commissies wordt opnieuw bezien.

12. Jaarrapportage 2016

Het algemeen bestuur besluit:

1. Kennis te nemen van het accountantsverslag en de reactie van het dagelijks bestuur hierop zoals verwoord in de bestuursnotitie.
2. De jaarrapportage 2016 van Wetterskip Fryslân vast te stellen.
3. Kennis te nemen van de beheerrapportage 2016.
4. Het nog te bestemmen resultaat van de taak watersysteembeheer (€ 6,6 miljoen) toe te voegen aan de reserve voor tariefsegalisatie watersysteembeheer.

AB vergadering d.d. 23-05-2017

5. Het nog te bestemmen resultaat voor de taak zuiveringsbeheer (€ 2,4 miljoen) toe te voegen aan de reserve voor tariefseglisatie zuiveringsbeheer.
6. Een bedrag van € 30.000 vrij te laten vallen vanuit de bestemmingsreserve sloopkosten persleiding Duinkersoord ten gunste van de reserve voor tariefseglisatie zuiveringsbeheer.

Conclusie: het algemeen bestuur besluit conform.

13. Aanvullend krediet Vijfhuizen

Het algemeen bestuur besluit:

1. De scope van het project Vijfhuizen te wijzigen door de meest recente veiligheidsnormen voor primaire keringen toe te passen.
2. Vanwege de onder 1 genoemde scopewijziging, de marktontwikkelingen en de noodzakelijke risicoreservering een aanvullend krediet te verstrekken van bruto € 1.095.000 en netto € 797.500.

Amendement: stoppen met Vijfhuizen, ingediend door LLB, VVD (zie bijlage)

Resultaat stemming amendement stoppen met Vijfhuizen

	WN	CDA	G-lb	FNP	PvdA	LLB	VVD	CU	G-be	BBB	PvdD	totaal
	5	2	3	1	2	2	2	2	2	1	1	23
Voor						2	2					4
Tegen	5	2	3	1	2			2	2	1	1	19

Resultaat stemming besluit aanvullend krediet Vijfhuizen

	WN	CDA	G-lb	FNP	PvdA	LLB	VVD	CU	G-be	BBB	PvdD	totaal
	5	2	3	1	2	2	2	2	2	1	1	23
Voor						2	2			1		5
Tegen	5	2	3	1	2			2	2		1	18

Conclusie: het algemeen bestuur besluit conform met uitzondering van BBB, LLB, VVD.

Actie/toezegging: Mevrouw Jager geeft aan dat gedeputeerde Kramer heeft bevestigd de verantwoordelijkheden zoals opgenomen in de samenwerkingsovereenkomst te zullen nakomen.

14. Mededelingen

Actie/toezegging: Naar aanleiding van de opmerking van de heer Van Zanden wordt de terugblik op het functioneringsgesprek met de dijkgraaf geagendeerd in het fractievoorzittersoverleg.

15. Ingekomen stukken

Brief d'Ansembourg

Actie/toezegging: geen.

16. Sluiting

De voorzitter sluit de vergadering.

Appendix 3 – Python face script

```
import requests
import json
import os
import csv
import pandas as pd
from pandas.io.json import json_normalize

# set to your own subscription key value
subscription_key = '1fa65f95859e41f59d9ff5a05750c293'
assert subscription_key

# replace <My Endpoint String> with the string from your endpoint URL
face_api_url = 'https://westeurope.api.cognitive.microsoft.com/face/v1.0/detect'

# replace C:/Test/ with the directory in which the photos are
files_dir = '/Users/anne-fleurmulder/Desktop/FACE_TEST'
files = os.listdir(files_dir)

# the following lines create JSON files out of each image
for f in files:
    if f.lower().endswith(('png', 'jpg', 'jpeg')):
        image_path = files_dir + '/' + f
        image_data = open(image_path, "rb").read()
        headers = {'Ocp-Apim-Subscription-Key': subscription_key, 'Content-Type': 'application/octet-stream'}
        params = {
            'returnFaceId': 'true',
            'returnFaceLandmarks': 'false',
            'returnFaceAttributes': 'emotion',
        }

        response = requests.post(face_api_url, params=params,
                                headers=headers, data=image_data)
        analysis = response.json()
        print(analysis)
        with open(files_dir + '/' + f + '.json', 'w', encoding = "utf-8") as f:
            json.dump(response.json(), f)
```

Appendix 4 – Python CSV script

```
import requests
import json
import os
import csv
import pandas as pd
from pandas.io.json import json_normalize

# replace C:/Test/ with the directory in which the photos are
files_dir = '/Users/anne-fleuralder/Desktop/FACE_TEST'
files = os.listdir(files_dir)

# the following lines transform the JSONs to a CSV
for g in files:
    print(g)
    if g.lower().endswith('.json'):
        print(g)
        with open(files_dir + '/' + g) as h:
            data = json.load(h)
            df = json_normalize(data).assign(filename=g)
            print(df)
# replace C:\Test\output_u.csv with the filename you want to have
df.to_csv('/Users/anne-fleuralder/Desktop/FACE_output/output.csv', index=True, mode='a')
```

Appendix 5 - Output API

Output API

```
[{"faceId": "a7c51035-c48a-4336-990d-a9d9c06b1c5f", "faceRectangle": {"top": 414, "left": 948, "width": 241, "height": 241}, "faceAttributes": {"emotion": {"anger": 0.0, "contempt": 0.0, "disgust": 0.0, "fear": 0.0, "happiness": 0.0, "neutral": 0.999, "sadness": 0.001, "surprise": 0.0}}}]
```

Output API converted to CSV

faceId	Anger	Contempt	Disgust	Fear	Happiness	Neutral	Sadness	Surprise	filename
0 a7c51035-c4	0	0	0	0	0	0,999	0,001	0	Friesland-180529-
0 5f240966-d5	0	0	0	0	0	0,934	0,063	0,002	Friesland-180529-
0 1f251401-54	0	0	0	0	0,009	0,988	0,003	0	Friesland-180529-
0 571c0bc1-d0	0,001	0,001	0	0	0,003	0,981	0,015	0	Friesland-180529-
0 b05c1c0a-fff	0,001	0,001	0	0	0,03	0,967	0,001	0,001	Friesland-180529-
0 647a3bc0-b9	0,006	0,001	0,001	0	0,001	0,981	0,002	0,008	Friesland-180529-
0 ab839728-8f	0,237	0,215	0,002	0	0,001	0,542	0,003	0	Friesland-180529-
0 ac4059fd-b9	0,001	0	0	0	0	0,992	0,001	0,005	Friesland-180529-
0 7cfc5528-5b	0,001	0,001	0	0,003	0	0,699	0,001	0,295	Friesland-180529-
0 c567d9f2-03	0,028	0,002	0,001	0	0,003	0,848	0	0,118	Friesland-180529-
0 c51244a3-a7	0,001	0	0	0,001	0,388	0,456	0,001	0,153	Friesland-180529-
0 fbae77f7-56	0,002	0,001	0	0,001	0,014	0,964	0,002	0,017	Friesland-180529-
0 fc9c1d35-8d	0	0	0	0	0	0,998	0,001	0	Friesland-180529-
0 e4d24d16-fd	0,001	0	0	0	0,001	0,995	0	0,003	Friesland-180529-
0 dd73dd38-8c	0	0	0	0	0	0,981	0,018	0	Friesland-180529-
0 1d6be742-af	0	0	0	0	0,012	0,954	0,032	0,001	Friesland-180529-
0 1af1fa3c-2b	0,001	0	0	0,001	0,001	0,877	0,117	0,004	Friesland-180529-
0 35be6cee-f0	0,002	0,002	0	0	0	0,995	0,001	0	Friesland-180529-
0 1d977342-2a	0,001	0,002	0	0	0	0,985	0,011	0,001	Friesland-180529-

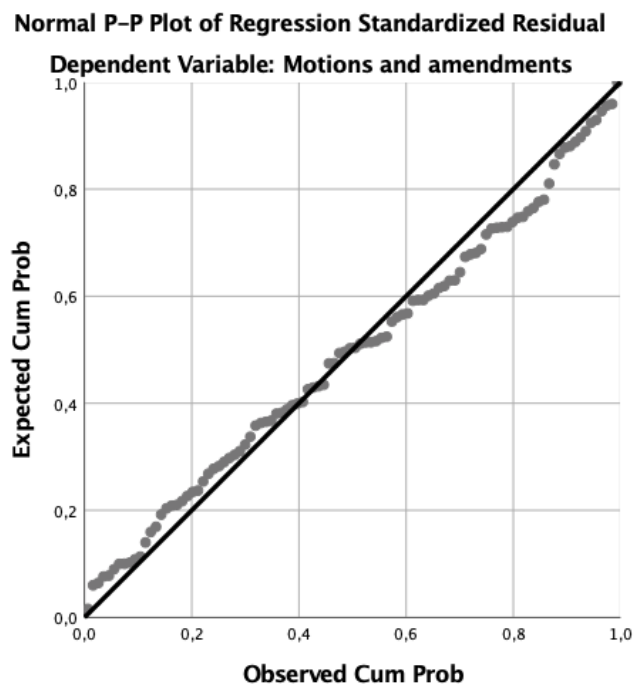
Appendix 6- Assumptions

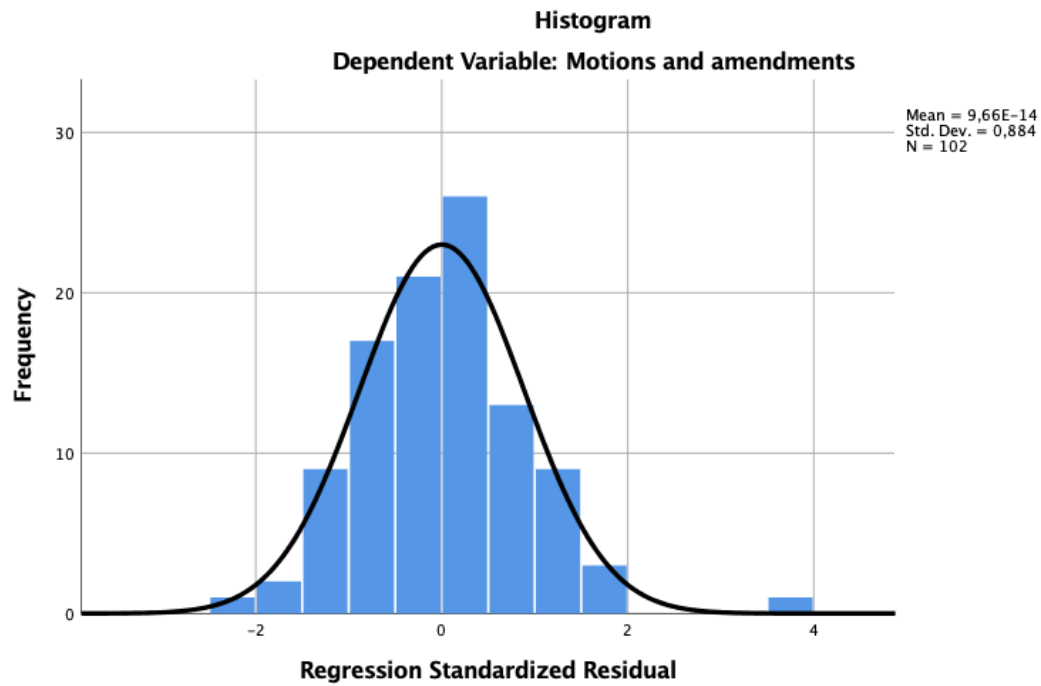
Descriptives extended

Statistics

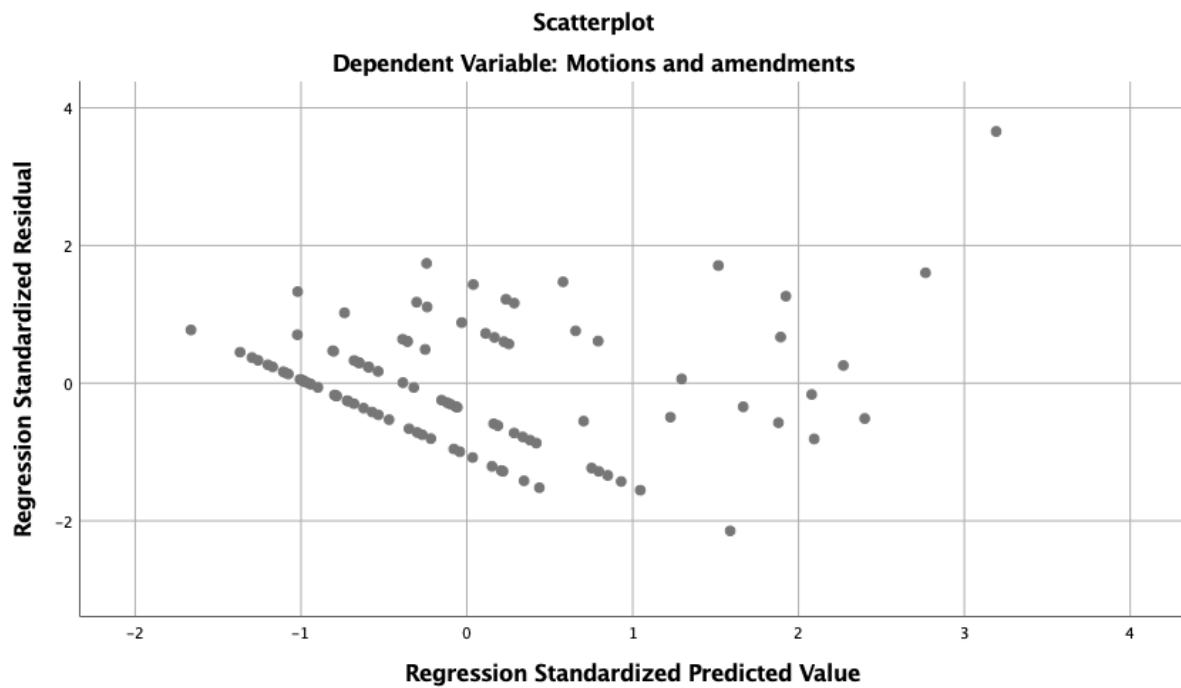
		eab_pos	eab_neg	tenure	Motions and amendments
N	Valid	102	102	102	102
	Missing	0	0	0	0
Mean		,07293328995	,04238662664	43,46	1,6569
		6	7		
Median		,06758895760	,03898195062	44,50	1,0000
		0	0		
Std. Deviation		,04660931625	,01785373852	13,737	2,23161
		34	89		
Variance		,002	,000	188,706	4,980
Skewness		1,191	,402	-,088	2,176
Std. Error of Skewness		,239	,239	,239	,239
Kurtosis		1,853	-,364	-1,238	6,574
Std. Error of Kurtosis		,474	,474	,474	,474
Minimum		,0008375818	,0050000000	20	,00
Maximum		,2330268300	,0855108300	67	13,00

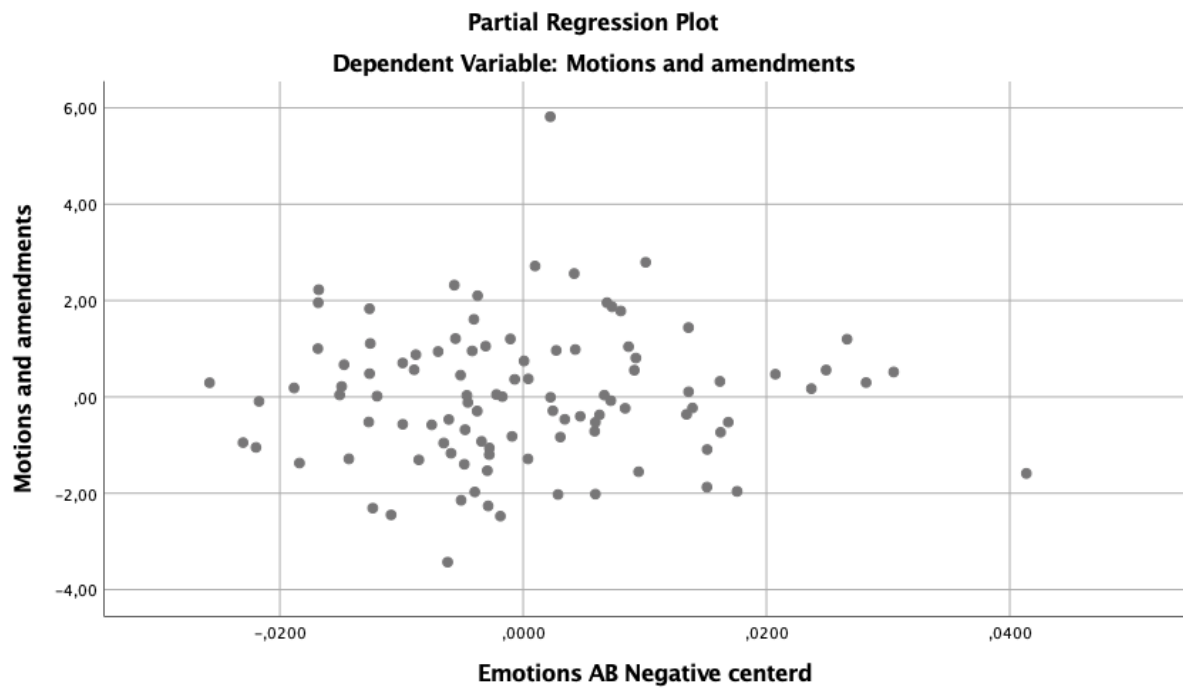
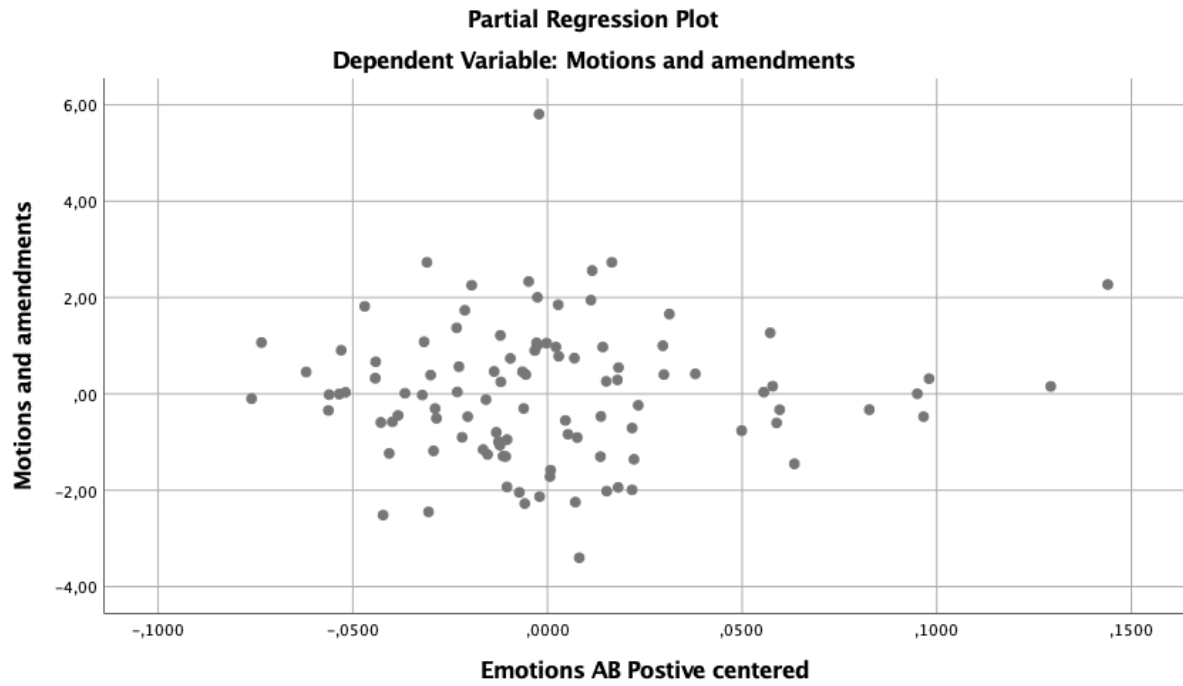
Normality





Heteroscedasticity / Linearity





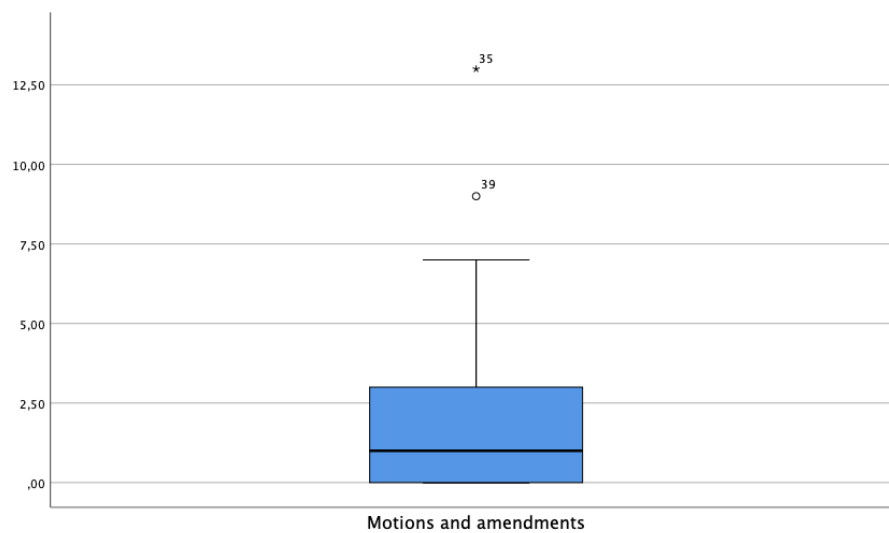
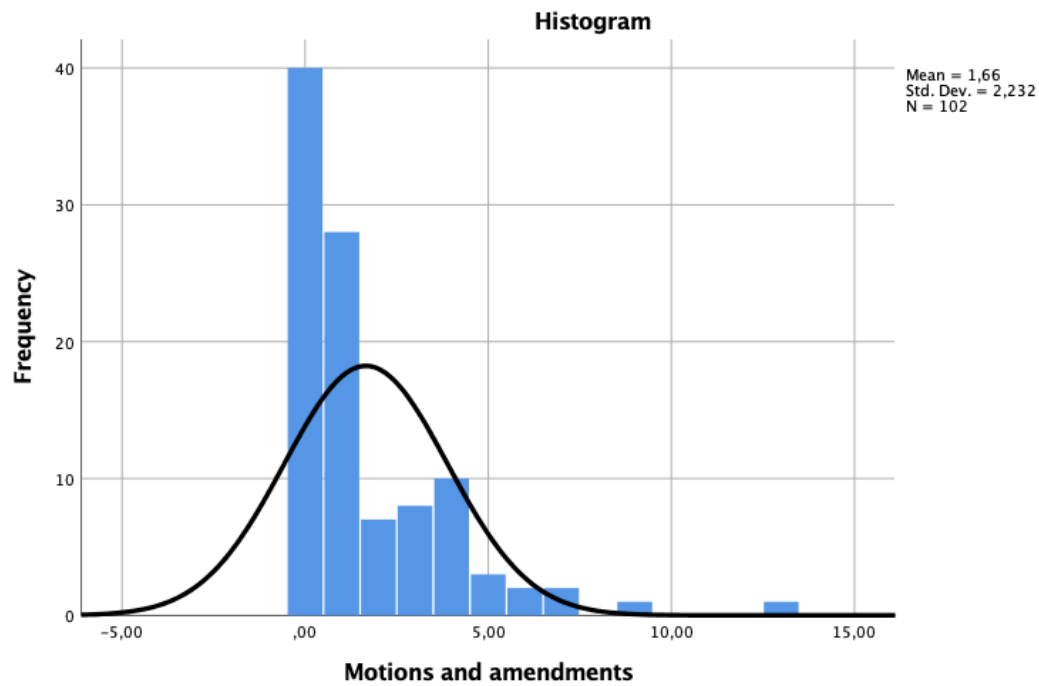
Multicollinearity

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	91,675	90,758		1,010	,316		
	eab_pos_centered	1,092	3,933	,023	,278	,782	,744	1,345
	eab_neg_centered	3,096	12,659	,025	,245	,807	,489	2,044
	Interaction_eabpcx tenurec	,161	,250	,050	,642	,523	,822	1,217
	Interaction_eabncx tenurec	-,806	,832	-,087	-,968	,336	,625	1,599
	boardsize	1,103	,959	,595	1,151	,253	,019	53,219
	meetfre	,225	,183	,320	1,233	,221	,074	13,425
	meetdura	,023	,003	,780	8,483	,000	,593	1,685
	gendiv	14,210	12,004	,302	1,184	,240	,077	12,975
	poldiv	-154,548	101,297	-,440	-1,526	,131	,060	16,608
	agediv	,527	12,686	,012	,042	,967	,057	17,574
	tenure_centerd	,000	,026	-,003	-,016	,987	,196	5,089
	dummy_friesland	1,258	1,760	,237	,714	,477	,046	21,876
	dummy_zz	1,343	4,711	,117	,285	,776	,030	33,791
	dummy_hdsr	1,738	1,675	,222	1,038	,303	,110	9,120
	dummy_2013	6,717	2,514	,587	2,672	,009	,104	9,625
	dummy_2014	4,408	2,334	,534	1,888	,063	,063	15,920
	dummy_2015	,344	1,489	,042	,231	,818	,154	6,478
	dummy_2016	2,341	1,423	,313	1,645	,104	,138	7,234
	dummy_2017	1,543	,966	,276	1,597	,114	,168	5,942
	dummy_2018	1,528	1,024	,278	1,491	,140	,144	6,932
	edb_pos	-1,562	3,143	-,040	-,497	,620	,773	1,294
	edb_neg	19,262	9,315	,175	2,068	,042	,704	1,419

a. Dependent Variable: Motions and Amendments

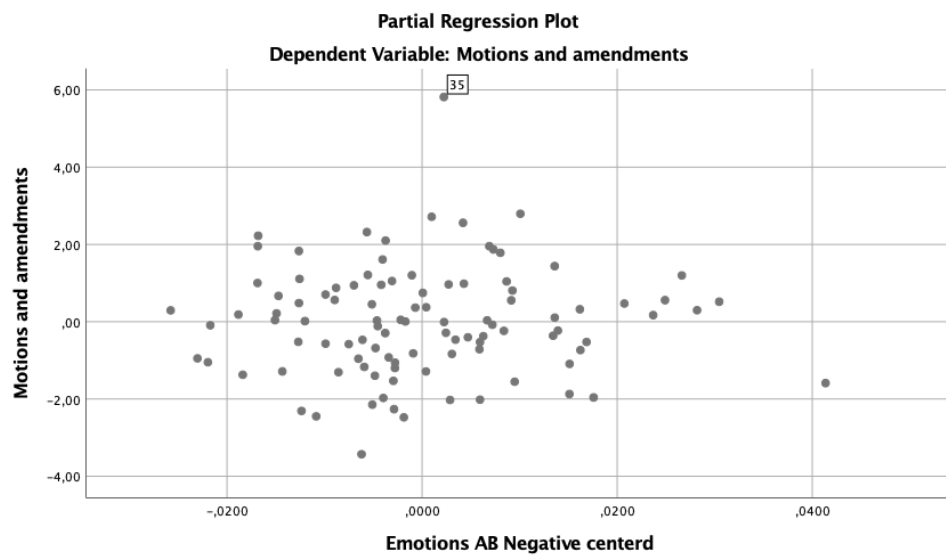
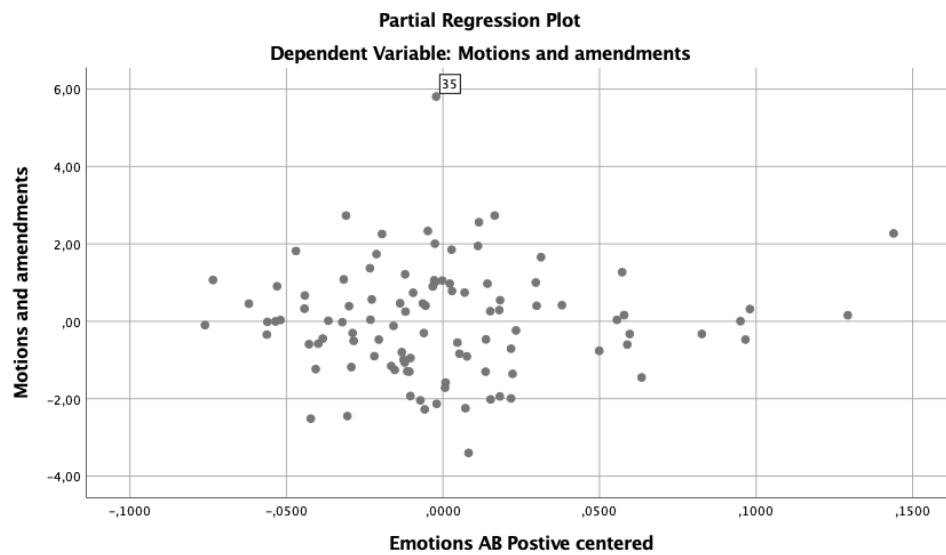
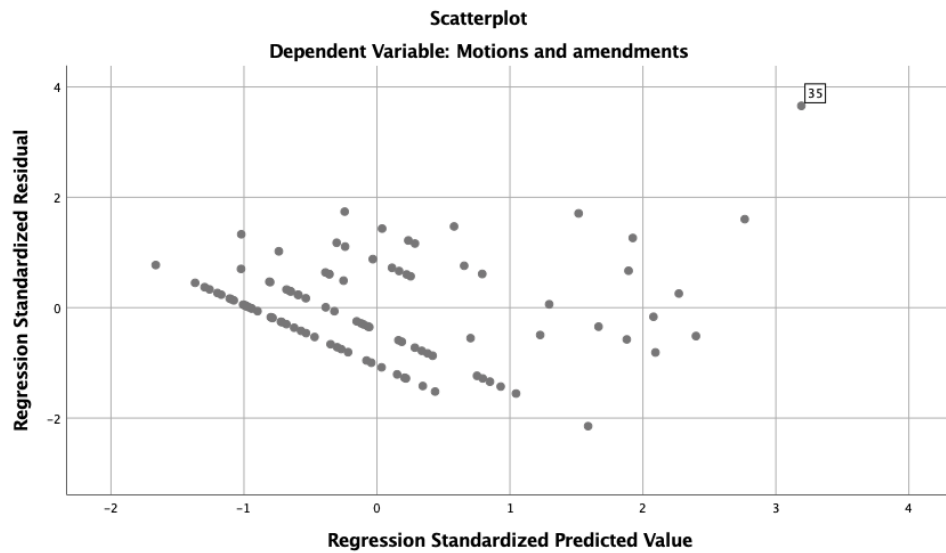
Appendix 7 - Reasons to winsorize



Casewise Diagnostics^a

Case Number	Std. Residual	Decisions3	Predicted Value	Residual
35	3,657	13,00	7,1905	5,80948

a. Dependent Variable: Motions and amendments



Appendix 8- U-shape check

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	70,025	91,080		,769	,444
	eab_pos	,882	3,873	,018	,228	,820
	eab_neg	7,493	12,375	,060	,605	,547
	boardsize	1,375	,955	,741	1,441	,154
	meetfre	,218	,181	,309	1,202	,233
	meetdura	,024	,003	,789	8,633	,000
	gendiv	19,954	11,343	,424	1,759	,083
	poldiv	-135,205	102,911	-,385	-1,314	,193
	agediv	-5,387	11,771	-,126	-,458	,649
	tenure	-,014	,027	-,087	-,524	,602
	edb_pos	-48,620	20,521	-1,247	-2,369	,020
	edb_neg	-124,959	89,039	-1,132	-1,403	,165
	dummy_friesland	2,473	1,685	,465	1,467	,146
	dummy_zz	2,894	4,681	,253	,618	,538
	dummy_hdsr	2,960	1,616	,378	1,831	,071
	dummy_2013	6,960	2,583	,608	2,695	,009
	dummy_2014	5,735	2,445	,694	2,346	,022
	dummy_2015	,786	1,432	,095	,549	,585
	dummy_2016	3,049	1,421	,408	2,147	,035
	dummy_2017	1,902	,947	,340	2,009	,048
	dummy_2018	2,063	1,012	,376	2,038	,045
	EDBNmacht2	3912,890	2285,403	3,073	1,712	,091
	EDBNmacht3	-28730,550	16682,115	-1,846	-1,722	,089
	EDBPmacht2	366,748	171,854	2,888	2,134	,036
	EDBPmacht3	-690,892	356,587	-1,777	-1,938	,056

a. Dependent Variable: Motions and Amendments