Implications of uncertainty, leadership, autonomy and their interactions on work-engagement.

How to improve the motivational process

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Chapter 1. Conceptual design

1.1. Scope of thesis

In 1996 Novartis AG emerged from two pharmaceutical giants Ciba-Geigy and Sandoz, but Novartis AG and its predecessor companies go back in time for more than 250 years. Novartis AG researches, develops, manufactures, and markets a range of innovative medicines in more than 155 countries. In 2017 approximately 126.000 employees with 145 nationalities have generated a net sales of $49.1b (Novartis, 2018). A good performance, but the questions are what drives a good performance and how can it be upgraded from good to great?

Since beginning of 2018 Novartis has a new CEO, Vasant Narasimhan, and in order to ensure Novartis AG continues to improve performance the Executive Committee of Novartis (ECN) including the CEO beliefs that a cultural change is needed. The Novartis culture should be based on three core elements; unboss, inspire and curious. Authors such as Daniel Pink (2009) who wrote a book about the three elements that motivate (autonomy, mastery and purpose) inspired the ECN. A more recent article in the Harvard Business Review from Pisano (2019) reflects on the specific elements that are needed to change into an innovative culture.

This thesis focuses on the cultural change and its effect on the Dutch Affiliation of Novartis (DAN) operating in the Dutch healthcare system with approximately 350 employees. DAN is structured in two business units with their own Board of Directors (BoD). The BoD has embraced the cultural change initiated by the ECN and beliefs this cultural change will lead to better performance.

Shareholders continue to invest in Novartis (Nasdaq, 2018), as the results are good. These investments are needed to fund the research programs managed by the Novartis Institute for BioMedical Research (NIBR), as some of these projects will lead to new innovative patented medicines. Subsequently these will lead to an increase in revenue and improvement of performance. As the business performance is an important indicator, Novartis AG continuously reviews the performance and makes strategic choices to improve the performance, such as the choice that a cultural change is needed. Usually the performance is measured objectively (Venkatraman & Ramanujam, 1986) using financial and operational indicators from various data sources. Return on investment is the ultimate test of success (Reese and Cool, 1978) or other various models can be used, i.e. high performing systems model (Porter, 1991) or balance scorecard (Kaplan and Norton, 1995). Alternatively, the performance could be measured through perception in absence of objective measurement (Dess and Robinson, 1984) and these significantly correlate with each other (Geringer and Hébert, 1989; Hansen and Wernerfelt, 1989; Venkatraman and Ramanujam, 1987).

But as this thesis focuses on the cultural change, theories were explored that captures the elements of the cultural change, unboss, inspire and curious. After a search a model was found in the Journal of Applied Psychology that captures the elements and variables that are mentioned previously. This is the Job Demands-Resource (JD-R) model developed by Demerouti (2001) and Schaufeli & Bakker (2004). An explanation why this model is suitable for this thesis is described in the next paragraphs per element (unboss, inspire and curious).

The JD-R model proposes two psychological processes; stress process (high job demands lead – via burnout – to negative outcomes) and motivational process (job resources lead – via engagement – to positive outcomes). Focusing on the motivational process, which will leads to a positive outcome, the unboss element of the cultural change is explored. Pisano (2019) describes in his article what the

impact of autonomy and leadership separate and more important interacting with each other is. Autonomy - freedom in carrying out one's work (Christian, 2011) - seems interchangeable with unboss - independent of your boss ensure you get the best out of yourself in order to contribute to the organization. Therefore, a certain level of autonomy, by mediation of engagement, will lead to increase of the performance. This is the motivational process. Therefore **autonomy,** an example of job resource and linked to the cultural change, is included as a variable in this thesis.

In the Pisano's article (2019) leadership was mentioned as an important factor and this was also included in the JD-R model (Schaufeli, 2015). It was shown that leadership had an impact on the performance directly and via mediation of job demands or job resources. Leadership was defined by Bass (1999) as moving the followers beyond immediate self-interests thought charisma, inspiration, intellectual stimulation and consideration. In his definition, the next element of the culture change is incorporated; inspire. Finally curiosity could also be a part of leadership, because by asking the right questions at the right time you can inspire and stimulate the associates intellectually. The right leadership can motivate associates. Therefore **leadership,** as part of the JD-R model and linked to the cultural change, is included as a variable in this thesis.

As DAN is focusing on improving the performance via a cultural change the focus of this thesis will be on the motivational process of the JD-R model. As mentioned previously this motivational process proves that job resources will lead to positive outcomes via the mediator engagement. Therefore **engagement**, which mediates the relationship between job resource and performance, is included as a variable in this thesis.

DAN was successful the last few years, despite the continuous changes and uncertainty in the Dutch environment (RIVM, 2018; Zorgwijzer, 2018; EHCI, 2017). It would be interesting to explore if this environmental uncertainty has an impact on the level of personal uncertainty. Sequentially if the personal uncertainty affects personal motivation and eventually the performance.

From an intrapersonal perspective, four changes potentially affect the level of personal uncertainty for DAN's associates. First of all the work location will change. The office, after being for more than 50 years in Arnhem, will move to Amsterdam. This has a significant impact on the travelling time for most associates. Secondly, due to this travelling time and based on benchmark it is expected more than 50% turnover of associates. The first wave was Q4 2018 after the announcement, the second wave takes place in July 2019, two months before the move and the last wave in March 2020. Associates could therefore feel more uncertain as they need to choose if they want to stay or go. The third element that will lead to uncertainty is workload. The workload could increase, as the remaining associates need to compensate for those who are leaving. The fourth element that will lead to elevated level of uncertainty is that DAN will change the way it wants to operate, by switching to activity based working. Employees do not have their own office anymore, but depending on your activity you can choose where you want to work during that period. These environmental and more important internal changes could potentially all lead to increased level of personal uncertainty.

In the stress process of the JD-R model (high job demands lead – via burnout – to negative outcomes) uncertainty is explicitly mentioned as one of the job demands, which via the mediator burnout lead to a negative outcome (Schaufeli, 2013). The outcome is defined by Christian (2011) in the Personnel Psychology as job performance. The element uncertainty is as mentioned reality for the associates of

DAN and also captured in the JD-R model. Therefore **uncertainty**, an example of job demands and linked to DAN, is included as a variable in this thesis.

Over the years the JD-R model has not shown an association of job demand, such as uncertainty (Demerouti, 2001; Schaufeli & Bakker 2004), directly with engagement, only via the interaction of job demands and job resources. Therefore it would be interesting for scientific purposes and for DAN to answer the question if uncertainty has a direct association with engagement and therefore influences the motivational process. In addition, not only the direct relationship of leadership with engagement is included, but also the relationship between the interaction of leadership and autonomy (job resource) or uncertainty (job demand) with engagement is included in this thesis. The interaction effect on engagement has been proven for the stress or motivational processes separately by Schaufeli (2015). This has not been proven for the interaction between the stress process and motivational process; interaction of uncertainty (stress process) and leadership with engagement (motivational process).

In summery the scope of this thesis is based on the key variables **engagement**, **uncertainty** , **autonomy** and **leadership**. This thesis focuses, inspired by the JD-R model, on the motivational process as DAN wants to improve the performance. The question is whether there is a relationship between uncertainty, as a job demand, and engagement. In addition whether there is a relationship between the interactions of uncertainty and leadership with engagement. Secondly the question if the relationship between autonomy, as a job resource, and engagement can be reproduced, as was already shown by Demerouti (2001) and Schaufeli et al (2004, 2013, 2015). Also the question if the relationship between leadership and engagement can be reproduced, as was shown by Schaufeli (2015). Finally if there is a relationship between the interaction of autonomy and leadership with engagement.

1.2. Objective

The objective is to give a recommendation to the DAN BoD on how to improve the **engagement** by giving insights in the difference and similarities between the preferable and current situation about the relationship of **uncertainty**, **autonomy** and **leadership** and their interactions on engagement.

1.3. Research model

A deductive empirical diagnostic gap-analysis is used in this thesis with research object DAN. Based on a psychological theory the preferable (SOLL) situation will be determined. This specific theory is used as the JD-R model was first published in the Journal of Applied Psychology and throughout the years researchers have used this model and published articles in various other psychological journals. Based on various data set the current (IST) situation will be determined. By using a GAP-analysis, insights in differences and similarities between both situations can be gathered and analyzed. Based on the analysis recommendations for the BoD of DAN will be formulated.

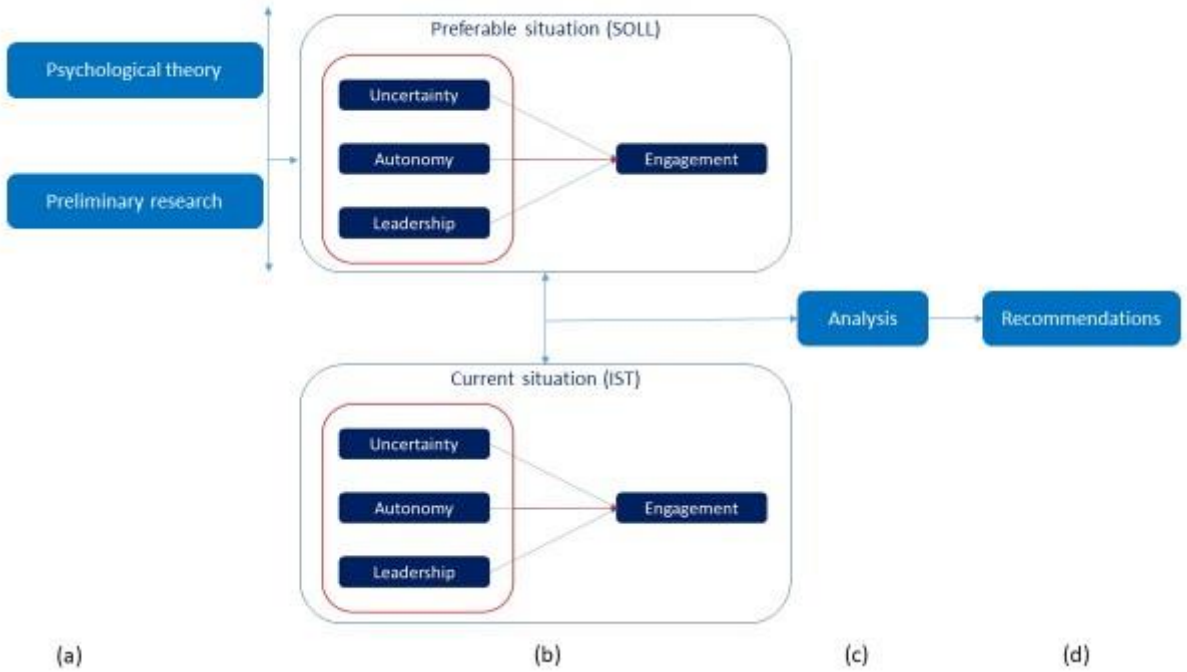

Figure 1. Research model

1.4. Questions

The research question of this thesis is:

How does uncertainty, autonomy and leadership and their interactions affect engagement?

The sub-questions that needs answering before the research question can be answered are:

A. What is uncertainty and how does this affect engagement?

B. What is autonomy and how does this affect engagement?

C. What is leadership and how does this affect engagement?

D. What is the effect of the interaction between autonomy and leadership with engagement?

E. What is the effect of the interaction between uncertainty and leadership with engagement?

Over the years the JD-R model has not shown an association of job demand such as uncertainty, directly with engagement, but only via the interaction of job demands and job resources (Demerouti, 2001; Schaufeli & Bakker 2004). Therefore it would be interesting for scientific purposes to answer the question if uncertainty, as the starting point of the stress process, could also have a direct interaction with engagement and therefore could also influence the motivational process (sub-question A). As high level of personal uncertainty is reality for the associates for DAN the answer to this question also has practical value for DAN. Reproduction of the effect of autonomy on engagement (sub-question B) and leadership on engagement (sub-question C) will be included in this thesis. In addition reproduction of the interaction effect of autonomy and leadership with engagement (Schaufeli, 2015) will be included in this thesis (sub-question D). For scientific purposes this thesis will also research if there is an interaction between the stress process and motivational process; is there an effect of the interaction of uncertainty (stress process) and leadership with engagement (motivational process) (sub-question E). In the next chapter the theoretical framework will be further deepened based on psychological theory, as in the third chapter the methodology of this thesis will described followed in chapter four with the results and answers to questions A to E. The thesis will conclude with chapter five with the conclusions and recommendations.

Chapter 2. Theoretical Framework

2.1. Global conceptual model

In this thesis, the key concepts are engagement, uncertainty, autonomy and leadership, as was introduced in chapter one. The dependent variable is engagement and the independent variables are uncertainty, autonomy and leadership. Figure two shows a schematic display of the global conceptual model. The relationships between independent and dependent variables are expressed with a blue arrow. The orange box is reflecting the interaction between the independent variables uncertainty and leadership and the orange arrow is reflecting the relationship between the interaction of these two independent variables and the dependent variable engagement. The green box is reflecting the interaction between independent variables autonomy and leadership and the green arrow is reflecting the relationship between the interaction of these two independent variables and the dependent variable engagement.

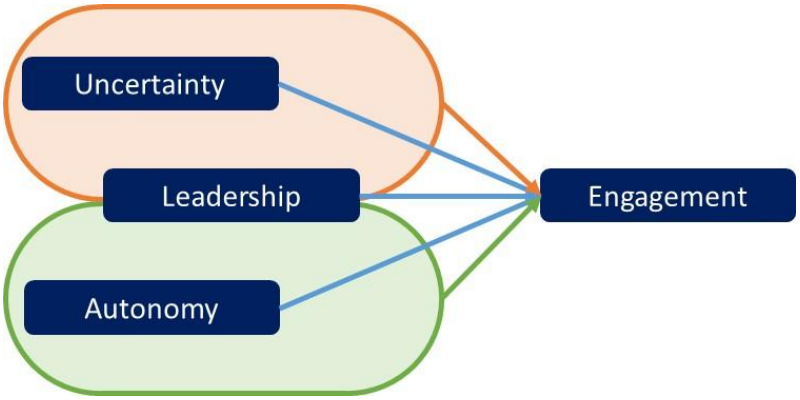

Figure 2. Global conceptual model

The key concepts as stated in this global conceptual model are explored and specified per concept, starting with the dependent variable engagement followed by the independent variables uncertainty, autonomy and finally leadership. Per breakdown of the independent variables the association with engagement is expressed and explored if there is a link between the independent variables. The exploration and specification is based on the psychology theory. After this exploration and specification a final conceptual model is defined.

2.2. Work Engagement (WE)

In the article of Kahn (1990), psychological conditions of personal engagement and disengagement, personal engagement was mentioned probably for the first time. In the years before 1990 research appears to only focus on three concepts based on person-role relationships and was conceptualized in three generalized states that associates of an organization could have; job involved, committed to the organization or alienated at work. Kahn (1990) defined the personal engagement as “the harnessing of organization members' selves to their work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances”. Searching through the literature it appears that there are various forms of engagement, i.e. employee, job, role, personal and work engagement. Kim, Kolb & Kim (2013) described that the term employee engagement is interchangeable with work, job, role and personal engagement. Engagement has been used in various forms in numerous articles and a group of researchers explored engagement extensively. They included it in the concept of Job Demands Resource (JD-R) model. Which was first proposed in 2001 by Demerouti, Bakker, Nachreiner & Schaufeli and evolved throughout the years

(Schaufeli et al, 2002; Schaufeli & Bakker, 2004; Schaufeli & Taris, 2013; Bakker et al, 2014; Schaufeli, 2015). As described by Schaufeli (2015) the JD-R model proposes two psychological processes: high job demands lead – via burnout – to negative outcomes (the stress process) and job resources lead – via work engagement – to positive outcomes (the motivational process). This model is applicable on the DAN situation as described in the previous chapter and therefore the JD-R model is used for this thesis as is work engagement (WE) specifically. WE is defined by this group as a positive motivational state of vigor, dedication and absorption. Vigor refers to high levels of energy and mental resilience while working. Dedication refers to being strongly involved in one's work and experiencing a sense of significance, enthusiasm, and challenge. Absorption is characterized by being fully concentrated and happily engrossed in work, such that time passes quickly.

The consequences of WE is described in the JD-R model as well. High level of WE is correlated with higher employability, self-rated performance, performance behavior and commitment (Schaufeli, 2015). Multiple studies have demonstrated a significant correlation between self-rated measures and objective measures for performance (Geringer and Hébert, 1989; Hansen and Wernerfelt, 1989; Venkatraman and Ramanujam, 1987). Also in studies that are more recent a positive relationship between WE and performance was demonstrated (Salanova et al, 2005; Halbesleben & Wheeler, 2008; Leiter & Bakker, 2010; Christian et al, 2011). More specific and based on a meta-analysis Harter et al (2002) shows that higher WE is related to higher profitability and customer satisfaction/loyalty.

The causes of high level WE are explained by the JD-R model as job resources as part of the motivational process (Schaufeli, 2015). In the JD-R model (Schaufeli & Bakker, 2004) examples of job resource are social support from colleagues, supervisory coaching and performance feedback. Mauno et al (2007) found in a longitudinal study that higher level of job control has led to higher levels of WE after an interval of 2 years. Job control refers to the ability to make decisions and the opportunity to exercise a degree of control over the work to be accomplished (Karasek 1979; Karasek & Theorell, 1990). In the meta-analysis of Christian et al (2011) autonomy seemed to be a predictor of WE, next to transformational leadership, task variety, task significance and feedback.

The JD-R model gives a solid framework and base in which various variables as part of the psychological stress and motivational process are studied. The focus of this thesis is on the motivational process and what the impact of uncertainty and the interaction between uncertainty and leadership on WE is. Secondly the reproduction of the fact that autonomy and leadership independent or combined have an impact on WE.

2.3. Uncertainty (IU)

As introduced in chapter one uncertainty can be broken down and characterized within DAN by the change in work location (From Arnhem to Amsterdam), work force (>50% turnover), work load (compensate for associates that leave) and the way you work (activity based working), which leads to the psychological effect of perceived uncertainty. Uncertainty, and more specific the job uncertainty has been included in the JD-R model (Demerouti et al, 2001; Schaufeli & Bakker, 2004) as part of job demands. The JD-R model described two processes - stress and motivational – and job uncertainty is part of the stress process and proven as part of a job demand to have a negative outcome via burn-out. Next to these two specific processes Schaufeli (2015) described that the job demands and job resource by interaction have effect on WE. In case the job demands are high, as expected within DAN due to the perceived high level of uncertainty, the decrease in level of WE could be neutralized with sufficient level of job resources. Interestingly in the JD-R model no direct association between job

demands and WE has been proven. In the JD-R model job-uncertainty has been included, but as uncertainty in the scope of this thesis is broader other options are sought in order to define and measure uncertainty.

A commonly used variable in scientific research that characterizes uncertainty is environmental uncertainty (EU) or perceived environmental uncertainty (PEU), which has been explored throughout the years (Miles & Snow, 1978; Waldman et al, 2001; DeSarbo et al, 2005; Judge, Naoumova and Douglas, 2009; Judge and Douglas, 2009). The concept of PEU was argued to influences the performance (Miles and Snow, 1978) and Bourgois (1985) and confirmed that PEU was positively related to performance. Milliken (1987), who defined uncertainty in terms of an individual's perceived inability to understand the direction in which an environment might be changing, describes the potential impact of those changes on that individual's organization and whether or not particular responses to the environment might be successful. This EU or PEU is measurable with validated questionnaires, but as EU and PEU are more externally focused and are part of the strategic management theory this will not be included in the thesis. Therefore the search continues focusing more on the personal level based on psychological theory.

Intolerance of uncertainty has been described in more detail in the anxiety domain, part of the psychological theory and applied in health care. Intolerance of Uncertainty (IU) has been characterized as the tendency for an individual to consider the possibility of a negative event occurring as unacceptable and threatening irrespective of the probability of its occurrence (Freeston et al, 1994; Carleton et al, 2007). This characterization of uncertainty captures the essence applicable for the associates of DAN; change in work location (from Arnhem to Amsterdam), work force (>50% turnover), work load (compensate for associates that leave) and the way you work (activity based working), leading to the psychological effect of perceived uncertainty. Therefore in scope of the thesis this characterization of IU is used as job demand and explored if this has an effect on WE (chapter 1.4, sub-question A). Based on previous studies the assumption would be that associates who have high IU and work in situations in which the outcome is uncertain are more likely to have an increased level of anxiety (Dugas, Gosselin, & Ladouceur, 2001) and feel i.e. fear (Barlow, 2002).

As in the JD-R model no association has been mentioned directly between job demands and WE it would be interesting to investigate this relationship and therefore the following hypothesis is defined:

Hypothesis 1: An increased level of IU has a negative effect on the level of WE.

2.4. Autonomy

Autonomy is a relevant variable to measure as this is associated with unboss, which is one of the three elements of the cultural change within Novartis. Self-Determination Theory (SDT) (Deci & Ryan, 1985; Deci & Ryan, 2000) states that individuals have basic psychological needs for autonomy, competence, and relatedness. When focusing on autonomy in the SDT, this would refer to the experience of volition and self-endorsement of one’s actions (deCharms, 1968). Autonomy is assumed to directly enhance psychological and physical well-being (Deci & Ryan, 2008). In a study (Fernet et al, 2013) perceived autonomy was measured with elements from the Autonomy Perceptions in Life Contexts Scale from Blais & Vallerand, although this was an unpublished manuscript. This would have been an interesting scale to incorporate, but as it has not been published it will not be included in this thesis. Results suggest that employees’ perceptions of

autonomy can prevent burnout, given that they are linked to central characteristics of the workplace environment (Fernet et al, 2013).

Based on the framework of JD-R model (Demerouti, 2001; Schaufeli & Bakker, 2004) and more specific the motivational process, the focus of this thesis is on the reproduction of the effect of autonomy on WE (chapter 1.4, sub-question B). This is a reproduction as in the meta-analysis of Christian et al (2011) autonomy seemed to be an independent predictor of WE, next to transformational leadership, task variety, task significance and feedback. Christian described autonomy as the freedom in carrying out one's work and it was studied on an individual level. This is based on the argument of Kahn (1990) and Macey & Sneider (2008) that some aspect of work are intrinsically motivating and therefore affect the individual level of willingness to invest their individual energy in tasks. Autonomy is a part of motivational characteristics and this is associated with an increase in engagement (Humphrey, Nahrgang, & Morgeson, 2007). This leads to the following hypothesis:

Hypothesis 2: An increased level of autonomy has a positive effect on the level of WE.

2.5. Leadership

Leadership has been studied extensively and throughout the years different leadership theories have been developed. In the 1930's there was the Trait Theories in which all kinds of characteristics, i.e. enthusiasm, friendliness, integrity, teaching skills and faith were mentioned as necessary qualities in leaders (Tead, 1935). In the 1940's and 1950's Behavioral Theories on leadership emerged focusing on two major classes of leader behavior, being task-orientated and relationship orientated behaviors (Carasco, 2015). In 1960's Contingency Theories concluded that specific elements in specific situations determine whether leader characteristics and behaviors have effect (Fiedler, 1967) and in the 1970's transformational leaderships emerged (Burns, 1978). Finally new definitions of leadership are defined, i.e. servant, ethical or authentic leaderships (Hoch, 2018).

The definition of leadership has been given by Tannenbaum et al (1961) "an interpersonal influence, exercised in situations and directed, through the communication process, toward the attainment of a specific goal or goals". Katz & Kahn (1966) define it as "any act of influence on a matter of organizational relevance". Mac Gregor (1979) defines it as leaders inducing followers to act for certain goals that represent the values and motivations – the want and needs, the aspirations and expectations – of both leaders and followers and the genius of leadership lies in the manner in which leaders see and act on their own and their followers' values and motivations.

Based on the concept of transformational leadership, which has been worked out over the past decades and used in various theories, i.e. management and also psychology theory, the first definition from a psychology perspective was given by Burns (1978). Bass (1999) described it as a leader that moves the followers beyond immediate self-interests thought charisma, inspiration, intellectual stimulation and consideration. Based on the psychological theory transformational leaders uplift the morale, motivation, and morals of their followers. They foster autonomy and challenging work and it refers to the leader moving the follower beyond immediate self-interests through idealized influence (charisma), inspiration, intellectual stimulation, or individualized consideration. Transformational leaders are able to bring feelings and passion and identification with one's work (Bass and Avolio, 1990; Macey & Schneider, 2008). This transformational leadership definition based on psychological theories are relevant in the context of this thesis.

Based on the framework of JD-R model (Demerouti, 2001; Schaufeli & Bakker, 2004) and more specific the motivational process, the focus of this thesis is on the reproduction of the effect of leadership on engagement (chapter 1.4, sub-question C). This is a reproduction as leadership has been included in the JD-R model as a job resource (Breevaart et al., 2014; Schaufeli, 2015) and it was proven it affects WE. In addition, in the meta-analysis of Christian et al (2011) transformational leadership seemed to be an independent predictor of WE. This leads to the following hypothesis

Hypothesis 3: Strong leadership has a positive effect on the level of WE

Based on psychological theory transformation leadership fosters autonomy and challenging work and it refers to the leader moving the follower beyond immediate self-interests through idealized influence (charisma), inspiration, intellectual stimulation, or individualized consideration (Bass, 1999). In the context of this thesis, as autonomy is selected as a job resource, based on the previous described definition, it would imply that there should be an interaction between the variable autonomy of an individual and variable leadership through inspiration. Breevaart et al (2014) reasons that leadership has an indirect effect on WE through increasing job resources. More specifically he shows that transformational leadership increases job resources such as autonomy which as a consequence increases the level of WE. Therefore the interaction between these two variables should have an effect on WE, based on the JD-R model theory. This leads to the following hypothesis:

Hypothesis 4: The interaction effect between autonomy and leadership has a positive effect on the level of WE.

The effect on engagement has been proven for the stress or motivational processes separately by Schaufeli (2015). Therefore a high job demands, such as IU, leads to negative outcomes, mediated by burn-out (stress process) and job resources, such as autonomy, leads to positive outcomes, mediated by WE. This has not been shown for the interaction between a variable of the stress process, such as IU, and leadership with a variable of the motivational process (WE). Transformational leaders contributes to a favorable work environment (Piccolo and Colquitt, 2006) and they foster autonomy and challenging work, such as coping with uncertainty. This effect could be accomplished through influence, intellect stimulation, inspiration and individualized consideration. Soane (2014) shows that inspiration and individualized consideration increases the WE. In addition, Breevaart et al (2014) reasons that leadership has an indirect effect on WE through lowering job demands. Therefore the interaction between IU and leadership could have a positive effect on WE. This leads to the following hypothesis:

Hypothesis 5: The interaction effect between IU and leadership has a positive effect on the level of WE

2.6. Final conceptual model

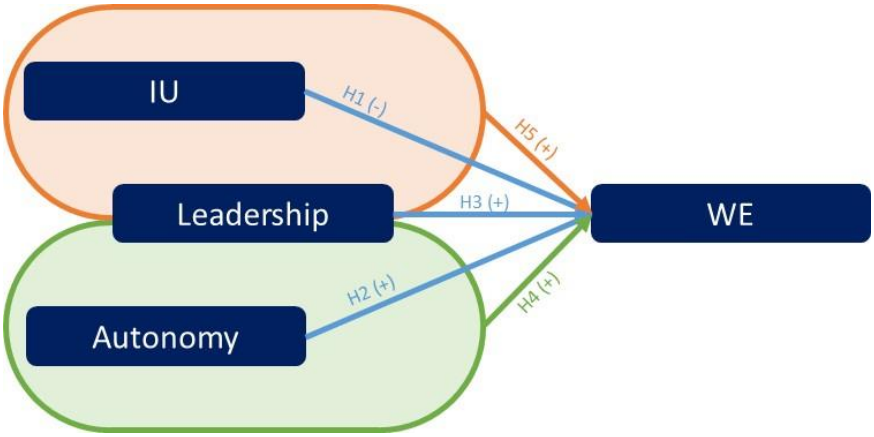

Figure 3. Final conceptual model

Chapter 3. Methodology

3.1. Research strategy

Research optic of the thesis is a deductive empirical diagnostic gap-analysis. The objective of this research is to give recommendations to DAN BoD on how to improve the work-engagement by giving insights in differences and similarities between the preferable and current situation within DAN, thus a diagnostic gap-analysis. It is deductive research as a scientific theory, the psychology theory, is used on the variables in order to determine an preferable (SOLL) situation. Regarding the current (IST) situation a broad and representative insight of the employees within the organization and their perspectives will be gathered by using a quantitative approach. Within the set timeframe of this thesis quantitative data will be collected with a cross-sectional survey (CSS) which will give an indication of the interaction between variables but will not prove causality between both.

CSS is a research where data is gathered at one point in time within DAN. After analyzing the CSS data correlations and regression analyses will be run in order to test the hypothesis. The CSS will be conducted within DAN and the survey will be send to the entire organization (~350). To have a representative sample size a minimum response rate between 40 and 50 responses or 20 responses per variable (Verschuren and Doorewaard, 2015) are needed. As there are four variables in the final conceptual model (chapter 2.6) the minimum is set on 80.

3.2. Data collection

In the research strategy two different data sources are mentioned. For the preferable situation (SOLL) various scientific literature is used, see chapter 2 and literature list. This is the first data source. For the current situation (IST) a second data source is used, which are persons, the associates of DAN. They are data sources and could be defined as respondents and informants. Respondents are those who provide data about themselves and informants are those who provide data about others or known situations or processes (Verschuren and Dooreweerd, 2015). Disclosure of the data sources is displayed in figure 3.

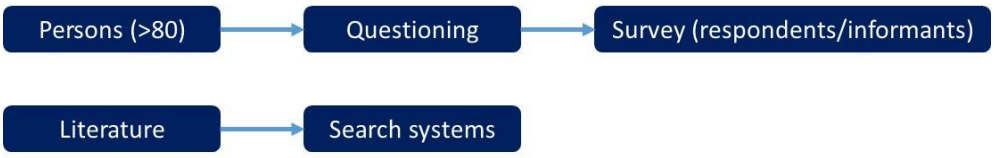

Figure 3. Technique for disclosing data sources

The program SurveyGizmo will be used to send out the survey and the data will also be collected and stored in survey gizmo. Search systems that are used are Google, Google Scholar and Web of Science.

3.3. Operational definitions

The key variables as mentioned in the final conceptual model will further be unraveled. Verschuren and Doorewaard (2015) defines this process as operationalizing. In order to define the dimensions and topics linked to the key variables insights and validated constructs are used. This operationalization is included in the following scales:

In the survey the UWES (Schaufeli et al, 2006) is used to measure the WE. This is a validated questionnaire and contains 9 items based on three categories; vigor, dedication and absorption. All 9 items are scored on a 7 points scale ranging from 0 (never) to 6 (always) The internal consistency of

this scale is: α = .93. This will be used in order to determine the level of WE in DAN (Appendix I, part 2).

A scale to measure the level of IU was developed to assess reactions to ambiguous situations, uncertainty, and future events (Carleton et al, 2007). It consist of 12 items and scored on a 5 point scale ranging from 1 (not at all characteristic of me) to 5 (entirely characteristic of me). The internal consistency of this scale is: α = .91. This scale determines the level of IU within DAN (Appendix I, part 3).

As the scale of Blais & Vallerand has not been published a search was done to find other scales that measure autonomy. Another autonomy scale was developed and validated, more specific on work autonomy (Breaugh, 1985; Breaugh, 1999). This scale contains 9 items clustered in three categories: method autonomy, scheduling autonomy and criteria autonomy. As the scale of WE contains 9 items, the scale of IU contains 12 items and leadership and the control variables need to be included as well, a further exploration has been done using other data-sources in order to measure the autonomy with less items. The search focused on surveys that included the measurement of autonomy and this led to The European Social Survey (ESS), which is an academically driven cross-national survey that has been conducted every two years across Europe since 2001. The ESS was awarded European Research Infrastructure Consortium (ERIC) status in November 2013. It is directed by a Core Scientific Team from City University of London (UK) alongside seven other partner institutions, such as The Institute for Social Research (SCP) from the Netherlands. One of the main objectives of ESS is to chart stability and change in the social structure, conditions and attitudes in Europe and to interpret how Europe's social, political and moral fabric is changing. Included in this survey is the measurement of task discretion (Europeansocialsurvey, 2019). Task discretion refers to the degree of control that people can exercise over the way they do their work. More specifically the ability to influence the way that the work is done and the pace of work. If compared with the definition of autonomy in this thesis: the freedom in carrying out one's work (Christian, 2011), this seems to be corresponding with the definition of task discretion. In the ESS autonomy was measured with three items, being less than the scale of Breaugh (1985). These three items from Europeansocialsurvey (2019) will be used in the survey to measure the level of autonomy. The items are scored on a 10 point scale ranging from 1 (I have no influence) to 10 (I have complete control) and included in the survey (Appendix I, Part 4)

Schaufeli used three items to measure the implication and effect of leadership within the JD-R model (2015). The objective of this thesis is to measure the relationship of leadership and the interaction of leadership with a job demand (IU) or job resource (autonomy) on WE. Therefore the items from Schaufeli (2015) are used in this thesis. The items are scored on a 5 points scale ranging from 1 (completely disagree) to 5 (completely agree) and included in the survey (Appendix I, Part 4).

Variable	Number of items
Work Engagement	9
Intolerance of uncertainty	12
Autonomy	3
Leadership	3
Total	**27**

Table 1. Overview variables

The key variables in the final conceptual model are controlled for number of working years within DAN, number of roles within DAN and role within Novartis, but outside the Netherlands. Business unit; there are two business units within DAN, oncology unit and pharmaceuticals unit. An associate could work for one of these units or a combination. Role-classification, in general there are three types of roles within DAN. The commercial associates responsible for setting and reaching the commercial target. The medical associates, who are not allowed to have commercial targets, are responsible for scientific engagement with experts on specific diseases. Thirdly there is a group of associates that supports the business and or the commercial and medical associates. Base; an associate either is based in the office or in the field. Age; three cohorts are defined >35, between 35 and 55 and 55<. Direct reports; associates could have direct reports and are leaders of people. Board of directors; for oncology unit the board is called Oncology Executive Committee (OEC) and for pharmaceuticals the board is called Pharma Leadership Team (PLT). WE is controlled for by measuring self-efficacy, using the GSE scale of Schwarzer and Jerusalem (2010). The GSE scale was created to assess a general sense of perceived self-efficacy with the aim in mind to predict coping with daily hassles as well as adaptation after experiencing all kinds of stressful life events. As this definition seems similar with the definition of WE (see chapter 2.2: a positive motivational state of vigor, dedication and absorption. Vigor refers to high levels of energy and mental resilience while working. Dedication refers to being strongly involved in one's work and experiencing a sense of significance, enthusiasm, and challenge. Absorption is characterized by being fully concentrated and happily engrossed in work, such that time passes quickly) the GSE scale is used. This is a questionnaire which consistent of 10 items and validated with an internal consistency of $\alpha = .81$. The items are scored on a 4 point scale ranging from 1 (not at all true) to 4 (exactly true) and included in the survey (Appendix I, part 5).

3.4. Data analysis

During the execution of the CSS the gathered data will transferred from SurveyGizmo via Microsoft Excel to SPSS Statistics 24. Once all the data is gathered this program will be used to analyze the current situation of DAN, therefore a correlation and regression analysis will be done in order to test the hypotheses. In addition, this data, representing the IST situation, will be used to compare with the SOLL situation in the GAP-analysis and finally define conclusions and recommendations for BoD DAN.

Chapter 4. Results

4.1. Assumption check

Before the results can be analyzed an assumption check has been carried out to determine the reliability and validity. Combining all questionnaire in the CSS could have implications on the reliability and therefore an analysis had been conducted in SPSS included all 46 questions (Appendix I). Based on the Cronbach's Alpha score of .77 the reliability is acceptable (DeVellis, 2016) and therefore the survey is measuring what it was designed to measure. The construct validity is acceptable as the separate questionnaires measuring their variable are validated, see chapter 3. To determine the convergent validity the correlations between variables needs to be checked for relevant confounders. There is a correlation when the outcome is significant. The higher the value the stronger the correlation. In case the value is higher than 0,7 there is a multi-collinearity between variables and therefor the variable is excluded. Finally the outcome variables are checked for normal distribution and linear relationship between independent variables and dependent variable. The normal probability probability plot chart is following the line and therefore acceptable. After accepting all assumptions the data output can be used for analysis. Please find below the descriptive statistics.

	Mean	Std. Deviation	N
WE	40,424	8,050	177
Employee years	1,870	1,092	177
Number of roles	2,096	1,137	177
Roles outside of the Netherlands	0,124	0,331	177
Business unit	1,977	0,665	177
Role-classification	1,983	0,772	177
Base	1,339	0,509	177
Age	1,791	0,645	177
Direct reports	0,446	0,499	177
Board member	0,102	0,303	177
Self-Efficacy	32,215	5,395	177
Uncertainty	24,040	7,296	177
Autonomy	19,887	5,141	177
Leadership	11,542	2,644	177
Autonomy x Leadership	236,452	82,363	177
Uncertainty x Leadership	280,802	97,146	177

Table 2. Descriptive statistics

4.2. Pearsons correlations

The Pearsons correlations shows the relationships between various variables (control and independent) and the dependent variable WE. Only the correlation can be determined, but no conclusions can be made over the causality between two variables. Starting with the control variables, there is a very weak, but significant, positive correlation between employee years and WE ($r=.132$, $p <.05$). The same is applicable for role classification ($r =.169$, $p <.05$), base ($r =.181$, $p <.01$) and for board member ($r =.187$, $p <.01$).

The number of roles of associates within Novartis has a weak positive correlation with WE, which is significant ($r =.266$, $p <.001$). This also applies for business unit ($r =.244$, $p <.001$), age ($r =.264$, $p <.001$) and direct reports ($r =.290$, $p <.001$). Self-efficacy controls WE as mentioned in chapter 3.3 and this is confirmed by the Pearsons correlations, as there is a strong, positive and significant correlation ($r =.642$, $p <.001$). Of all the control variables only the number of roles outside of the Netherlands has no significant correlation with WE.

Secondly the correlation of the independent variables and dependent variable is determined. IU has a weak, positive and significant correlation with WE ($r =.283$, $p <.001$). Autonomy has a moderately strong correlation with WE, which is positive and significant ($r =.570$, $p <.001$). Leadership has a strong, positive and significant correlation with WE ($r =.614$, $p <.001$). When the interaction effect between autonomy and leadership and the correlation with WE is determined a moderately strong, positive, significant correlation between these two variables is found ($r =.544$, $p <.001$). This also applies for the correlation between the interaction effect of uncertainty and leadership on each other and WE ($r =.421$, $p <.001$).

Thirdly the correlation between the independent variables is determined. IU has a very weak, but significant positive correlation with autonomy ($r=.126$, $p <.05$) and leadership ($r=.174$, $p <.05$). Leadership has a moderately strong positive significant correlation with autonomy ($r=.511$, $p <.001$).

Pearson Correlations

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	WE															
2	Employee years	,132*														
3	Number of roles	,266***	,637***													
4	Roles outside of the Netherlands	,108	,155*	,406***												
5	Business unit	,244***	,058	-,004	-,116											
6	Role-classification	,169*	,146*	,034	,008	,320***										
7	Base	,181**	,018	,032	-,150*	-,028	-,072									
8	Age	,264***	,445***	,229**	,096	-,038	,073	,113								
9	Direct reports	,290***	,128*	,175*	,144*	-,038	-,039	,094	,186**							
10	Board member	,187**	,143*	,136*	,213**	-,045	,153*	-,151*	,138*	,262***						
11	Self-Efficacy	,642***	,197**	,250***	,138*	,226**	,320***	,141*	,336***	,091	,122					
12	Uncertainty	,283***	,072	,069	-,023	,322***	,103	,220**	,008	,072	-,051	,163*				
13	Autonomy	,570***	,102	,176**	,109	,072	,207**	,075	,162*	,130*	,219**	,548***	,126*			
14	Leadership	,614***	,056	,066	,020	,159*	,158*	,276***	,170*	,087	,115	,550***	,174*	,511***		
15	Autonomy x Leadership	,544***	,021	,072	,077	,024	,136*	,112	,069	,100	,220**	,466***	,066	,861***	,789***	
16	Uncertaintyx Leadership	,421***	,016	,015	-,042	,230**	,078	,241***	-,017	,082	,020	,227**	,811***	,281***	,617***	,462***

* p >0,05 ** p >0,01 *** p>0,001

Table 3. Pearsons Correlations

Variables	Model 1	Model 2a	Model 2b	Model 2c	Model 3	Model 4	Model 5	Model 6	Model 7
Control									
Employee years	-,157*	-,164*	-,142	-,154*	-,148*	-,150*	-,158*	-1,29	-,134
	(,586)	(,578)	(,554)	(,536)	(,548)	(,516)	(,529)	(,508)	-0,508
Number of roles	,184*	,182*	,166*	,211**	,164*	,192**	,206*	,161*	,163*
	(,564)	(,556)	(,533)	(,517)	(,527)	(,498)	(,510)	(,495)	,494
Roles outside of the Netherlands	-,041	-,045	-,035	-,040	-,039	-,040	-,048	-,026	-,025
	(1,524	(1,503)	(1,439)	(1,393)	(1,422)	(1,340)	(1,380)	(1,320)	-1,329
Business unit	,155**	,111	,171**	,135*	,131*	,112*	,081	,096	,083
	,716	(,740)	(,677)	(,656)	(,702)	(,663)	(,705)	(,652)	,681
Roleclassification	-,045	-,045	-,057	-,036	-,057	-,046	-,040	-,065	-,063
	(,638)	(,629)	(,603)	(,584)	(,596)	(,562)	(,577)	(,556)	(,554)
Base	,084	,053	,078	,005	,052	-,010	-,036	-,028	-,033
	(,908)	(,918)	(,858)	(,858)	(,868)	(,844)	(,899)	(,838)	(,864)
Age	,062	,070	,074	,070	,081	,084	,067	,020	,033
	(,817)	(,806)	(,772)	(0,747)	(,763)	(,719)	(,754)	(,740)	(,745)
Direct reports	,194**	,184**	,180**	,190***	,172**	,173***	,182**	,172**	,167**
	(,937)	(,926)	(,886)	(,857)	(,877)	(,826)	(,847)	(,812)	(,812)
Board member	,093	,098	,052	,057	,057	,040	,063	,055	,057
	(1,572)	(1,550)	(1,503)	(1,447)	(1,487)	(1,404)	(1,430)	(1,390)	(1,387)
Self-Efficacy	,550***	,541***	,396***	,360***	,394***	,286***	,321***	,174*	,200*
	(,096)	(,095)	(,103)	(,100)	(,102)	(,102)	(,114)	(,113)	(0,118)
Hypothesed									
IU (Ho accepted)		,141*			,124*	,118*	,271		-,027
		(,065)			(,061)	(,058)	(,183)		(,204)
Autonomy (H1 accepted)			,289***		,279***	0,192**		,680***	,671***
			(,098)		(,097)	(,096)		(,249)	(,289)
Leadership (H1 accepted)				,359***		0,293***	,470**	,700***	,606***
				-0,189		(,190)	(,432)	(,420)	(,482)
Autonomy x leadership (H1 accepted)								-,703**	-,693**
								(,021)	(,024)
IU x leadership (Ho accepted)							-,185		,134
							(,017)		(,018)
F Change	17,439***	5,813*	21,221***	33,574***	20,243***	21,915***	13,641***	19,759***	4,127*
Adjusted R2	,483	,498	,539	,568	,550	,601	,579	,614	,616
Δ Adjusted R2		,015†	,056†	,085†	,052‡	,051§	,096†	,131†	,015˚

Regression coeffiecients and standard errors (between parentheses) are shown. N=177 * p < ,05 ** p < ,01 *** p < ,001 † versus model 1 ‡ versus model 2a § versus model 3 ˚ versus model 4

Table 4. Model Summary

4.3. Regression models

The first model includes ten control variables and this model predict for 48% the variance of dependent variable WE with statistically significance (F(10,177) =17,439, p <.001). The control variables employee years (β =.157, p <.05), number of roles (β =.184, p <.05), business unit (β =.155, p <.01), direct reports (β =.194, p <.01) and self-efficacy (β =.550, p <.001) are significant predictors for the variance of WE. Self-efficacy has the relative highest correlation due to the overlapping framework with WE as mentioned in chapter 2. The control variables roles outside of the Netherlands, role classification, base, age and board member are not significant predictors for the variance of WE.

Model 2a includes next to the control variables IU as an independent variable. This model predicts 50% the variance of WE with statistically significance (F(11,177) =5,813, p <.05). Of the control variables business unit loses its significance. The variables employee years (β =.164, p <.05), number of roles (β =.182, p <.05), direct reports (β =.184, p <.01) and self-efficacy (β =.541, p <.001) are significant predictors. In this model the independent variable IU is a significant predictor for work-engagement (β =.141, p <.05).

Model 2b includes next to the control variables autonomy as an independent variable. This model predicts 54% the variance of WE with statistically significance (F(11,177) =21.221, p <.001). Of the control variables employee years loses its significance. The variables number of roles (β =.166, p <.05), business unit (β =.171, p <.01), direct reports (β =.180, p <.01) and self-efficacy (β =.396, p <.001) are significant predictors. In this model the independent variable autonomy is a significant predictor for work-engagement (β =.289, p <.001).

Model 2c includes next to the control variables leadership as an independent variable. This model predicts 57% the variance of WE with statistically significance (F(11,177) =33.574, p <.001). The variables employee years (β =.154, p <.05), number of roles (β =.211, p <.01), business unit (β =.135, p <.05), direct reports (β =.190, p <.001) and self-efficacy (β =.360, p <.001) are significant predictors. In this model the independent variable leadership is a significant predictor for work-engagement (β =.359, p <.001).

When leadership is included, the regression model predicts relative more in comparison to autonomy or IU. This is confirmed by the strong positive significant correlation with WE in the pearson correlation model.

The third model add to the control variables a combination of one job demand and one job resource based on the JDR model (Demerouti et al, 2001; Schaufeli et al, 2002; Schaufeli & Bakker, 2004)). The independent variables IU (demand) and autonomy (resource) are added. This model predicts 55% the variance of WE with statistically significance (F(12,177) =20,243, p <.001). Of the control variables business unit becomes significant again versus model 2a (β =.131, p <.05). The variables employee years (β =.148, p <.05), number of roles (β =.164, p <.05), direct reports (β =.172, p <.01) and self-efficacy (β =.394, p <.001) remain significant predictors.

Model 4 adds the independent variable leadership to model 3. With this all three independent variables, IU (demand), autonomy (resource) and leadership are included in model 4. This model predicts 60% the variance of WE with statistically significance (F(13,177) =21,915, p <.001). Of the control variable all remain significant, only the level of significance changes versus model 3.

Model 5 adds to the control variables of model 1 the independent variables IU and leadership, and the variable IU x leadership which measures the interaction between these two variables. This model predicts for 58% the dependent variable WE ($F(13,177)=13.641$, $p < .001$). The independent variables IU ($\beta = .271$, $p = .105$) and IU x leadership ($\beta = -.185$, $p = .361$) are not significant predictors for WE. Leadership is a significant predictor ($\beta= .470$, $p < .01$) and versus model 1 only business unit loses its significance.

Model 6 adds to the control variables of model 1 the independent variables autonomy and leadership, and the variable autonomy x leadership which measures the interaction between these two variables. This model predicts for 61% the dependent variable WE ($F(13,177)=19.759$, $p < .001$). The independent variables autonomy ($\beta = .680$, $p < .001$), leadership ($\beta = -.700$, $p < .001$) and autonomy x leadership ($\beta= -.703$, $p < .01$) are significant predictors for WE. Versus model 1 only the control variables employee years and business unit loses its significance.

Versus model 4 both interaction variables (autonomy x leadership and IU x leadership) are included and with this inclusion model 7 is the final model. This model predicts for 62% the dependent variable WE ($F(15,177)=4.127$, $p <.05$).

Of the control variables number of roles ($\beta = .163$, $p < .05$) is a significant predictor for WE. This indicates that within DAN having had more roles has a significant and positive effect on your level of WE. Direct reports ($\beta = .167$, $p < .01$) is a significant predictor for WE as well, meaning if you are managing associates within DAN this contribute significantly and positive to your level of WE. Self-efficacy ($\beta = .200$, $p < .05$) is a significant predictor for WE, meaning if you rank yourself to be efficient your level of WE is positive as well.

The independent variable IU ($\beta = -.027$, $p = .885$) is not a significant predictor for WE in the final model: **Hypothesis 1: an increased level of IU has a negative effect on the level of WE, is rejected**

The independent variable autonomy ($\beta = .671$, $p < .001$) is a significant predictors for WE, meaning that an increased level of autonomy has a positive effect on the level of WE. **Hypothesis 2: an increased level of autonomy has a positive effect on the level of WE, is accepted.**

Leadership ($\beta = .606$, $p < .001$) is also a significant predictor for WE. This means that strong leadership has an positive effect on the level of WE. **Hypothesis 3: strong leadership has a positive effect on the level of WE, is accepted.**

The interaction variable autonomy x leadership ($\beta = -.693$, $p < .01$) is a significant predictors for WE. This, including autonomy and leadership is captured in the following interaction plot.

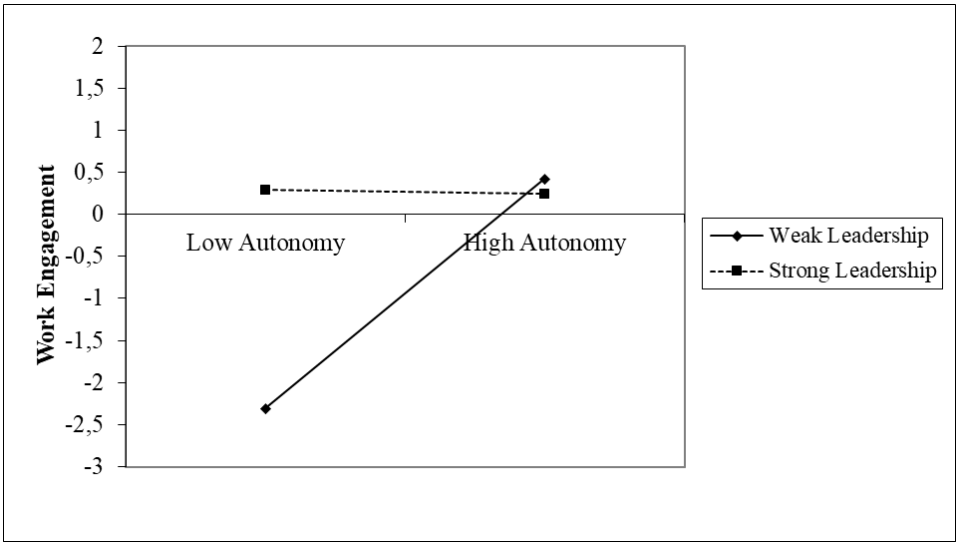

Figure 4. interaction between combined autonomy and leadership with work engagement

In an environment of low autonomy strong leadership will lead to a higher and positive level of WE and weak leadership will lead to lower and negative level of WE. In an environment of high autonomy independent of the level of leadership the WE is positive. **Hypothesis 4, interaction effect between autonomy and leadership has a positive effect on the level of WE, is accepted.**

The interaction variable IU x leadership (β = -.134, p = .541) is not a significant predictor for WE. This, including IU and leadership, is captured in the following interaction plot.

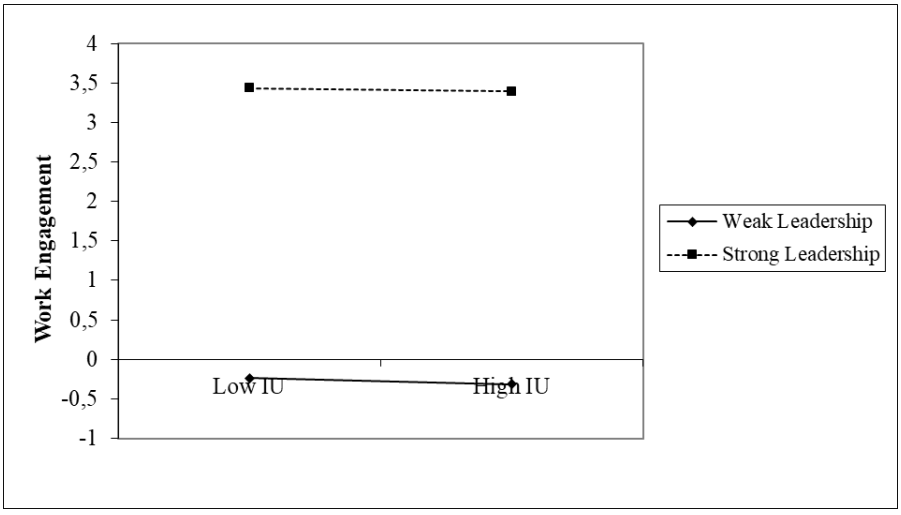

Figure 5. Interaction between combined IU and leadership with work engagement

Independent of the level of IU (low or high) strong leadership will lead to higher and positive level of WE and weak leadership to a lower and negative level of WE. **Hypothesis 5, interaction effect between IU and leadership has a positive effect on the level of WE, is rejected.**

Chapter 5. Conclusions and recommendations

Based on the results described in the previous chapter conclusions are made and recommendations will be given to DAN BoD. This thesis has been building on the JD-R model, a psychological theory first proposed by Demerouti et al (2001) and evolved throughout the years (Schaufeli et al, 2002; Schaufeli & Bakker, 2004; Schaufeli & Taris, 2013; Bakker et al, 2014; Schaufeli, 2015). As described by Schaufeli (2015) the JD-R model proposes two psychological processes: high job demands lead – via burnout – to negative outcomes (the stress process) and job resources lead – via work engagement (WE) – to positive outcomes (the motivational process).

Based on the set of control variables it can be concluded that having more roles within DAN has a positive effect on the level of WE. As number of roles has impact on the level of WE it would be expected employee years would also, but interestingly this has not a significant effect on WE. A recommendation to DAN BoD is to enable associates to have more roles. As number of roles is not further specified this could be achieved, next to actually switching to another role permanent or via a job-rotation, by offering associates to be part of a project team or work streams handling relevant organizational topics and adding this to their current role. The optimal timeframe to switch to another role is not included in this thesis, so no recommendation on this can be given.

Another element that predicts WE is having direct reports. The number of direct reports is not specified in this thesis, so no recommendation on this can be given. A recommendation to DAN BoD is to offer selected associates that do not have direct reports this managerial experience. DAN could consider this to be offered temporary to associates. Caveat it so ensure the direct reports are accepting temporary changes in management. A suitable situation could be when an associates has parental leave and needs temporary replacement.

Measuring self-efficacy is a significant predictor for WE. A recommendation to the DAN BoD would be to measure regularly the level of self-efficacy by such a questions. This could be offered to all associates with a certain frequency and by answering these questions the associate could self-assess how efficient he or she is. The implication of strong self-efficacy is related to a positive performance (Schwarzer & Fuchs, 1996). In addition, the aggregated data of all results could be used for further analysis in order to determine the general level of self-efficacy and connected to this the level of WE.

Hypothesis 1, an increased level of IU has a negative effect on the level of WE, is rejected. Intolerance of Uncertainty (IU) has been characterized as the tendency for an individual to consider the possibility of a negative event occurring as unacceptable and threatening irrespective of the probability of its occurrence (Freeston et al, 1994; Carleton et al, 2007). IU is classified in the JD-R model as a job demand. No direct association between job demands and WE has been mentioned in the JD-R model (Schaufeli, 2013) and this is confirmed in this thesis. In the JD-R model job demands have an impact on burn-out as part of the stress process, so the level of IU has been associated with the number of burn-outs (Schaufeli, 2013). Schaufeli (2015) described that the job demands and job resource by interaction also have effect on WE. In case the job demands are high, as expected within DAN due to the perceived high level of uncertainty, the decrease in level of WE could be neutralized with sufficient level of job resources. Based on the first association the recommendation to DAN BoD is to ensure the level of job demands in terms of intolerance of uncertainty is not too high as this could lead to increase of number of burn-outs with DAN. The high levels of IU in DAN is driven by the change in work location (From Arnhem to Amsterdam), work force (>50% turnover), work load

(compensate for associates that leave) and the way you work (activity based working). Based on the fact that the interaction between high level of IU and job resources combined has an effect on WE as well the recommendation to DAN BoD is to ensure the level of job resources are high enough to compensate the current high level of IU which initiate a negative and stress process. As shown in chapter 4.3. all regression models which studied IU had a significant direct effect on WE, with exception of the final model. Although IU is part of the stress process, could it be possible that IU could also influence the motivational process for specific individuals, who thrive on uncertainty?

Hypothesis 2, an increased level of autonomy has an positive effect on the level of WE, is accepted. Christian et al (2011) described autonomy as the freedom in carrying out one's work. Based on previous studies conducted on this topic (Demerouti, 2001; Schaufeli, 2004, Schaufeli, 2013, Schaufeli 2015) this thesis reproduces that autonomy has a positive effect on the level of WE as part of the motivational process. A recommendation to DAN BoD is to ensure all associates experience to work in an autonomous way. This is part of the cultural change within Novartis and more specific part of the "unboss" element (Chapter 1) and as mentioned in the Havard Business Review by Pisano (2019) all associates should have a high degree of autonomy in order to pursue innovative ideas.

Hypothesis 3, strong leadership has a positive effect on the level of WE, is accepted. Mac Gregor (1979) defines leadership as leaders inducing followers to act for certain goals that represent the values and motivations – the want and needs, the aspirations and expectations – of both leaders and followers and the genius of leadership lies in the manner in which leaders see and act on their own and their followers' values and motivations. This thesis reproduces that leadership has a positive effect on the level of WE (Carasco-Saul, 2015; Schaufeli, 2015). A recommendation to DAN BoD is to ensure the people managers within DAN are develop to become strong leaders as this will have an positive effect on the level on WE and subsequently leads to positive self-rated performance and performance behavior (Schaufeli, 2015). Although the definition of a strong leader is not included in this thesis, assumptions can be made. The cultural change within Novartis is based on three elements, inspire, curious and unboss. This cultural change is captured in the article of Pisano (2019) in which he mentioned how a strong leader in this environment would look like: "it requires the capacity to articulate compelling visions and strategies (big-picture stuff) while simultaneously being adept and competent with technical and operational issues". This is applicable for all leaders within Novartis and they should be monitored, evaluated and trained continuously.

Hypotheses 4, interaction effect between autonomy and leadership has a positive effect on the level of WE, is accepted. The effect of the combination of uncertainty and leadership has a positive effect on WE. If DAN is an organization in which the associates do not experience to work in an autonomous way, the strength of leadership has impact on the level of WE and thus the performance (Schaufeli, 2015). Therefore the recommendation is to invest in developing people managers to become strong leaders (hypothesis 3) and ensure all associates experience to work in an autonomous way (hypothesis 2). A warning to the DAN BoD on leadership as based on the data of the cross sectional survey weak leadership in an environment of low autonomy will lead to 'negative' WE, which could lead to burn-out as part of the stress process (Christian, 2011). As job resources have a consistent negative relationship with burnout, particularly with the cynicism, this could lead to an increase of cynicism within DAN. If DAN is an organization in which the associates do experience to work in autonomous way, the level of leadership appears to have limited effect on WE.

Hypothesis 5, interaction effect between IU and leadership has a positive effect on the level of WE, is rejected. In this thesis no effect of the combination of IU and leadership on WE has been seen. As shown in chapter 4.3. independent of the level of IU strong leadership will lead to higher and positive level of WE and weak leadership to a lower and negative level of WE. This implies weak leadership will lead to burn-outs or increase of cynicism of the associates.

The research question how uncertainty, autonomy and leadership independent and combined relate to engagement is summarized by leadership and autonomy independent and combined have an effect on WE as part of the motivational process and is a reproduction of previous studies. Whilst the CSS did no show a significant effect of IU and leadership, independent or combined, on WE. Although IU is part of the stress process, it could be possible that IU could also influence the motivational process for specific individuals, who thrive on uncertainty and this is explained by the first six regression models before moving to the final model.

Overall recommendation to DAN BoD is to ensure all people managers have a strong level of leadership. This level should be monitored, evaluated and trained in order to improve the level of leadership continuously as this will lead to high WE, independent of the level of IU and in an environment of low level of autonomy. In the current environment with an elevated level of uncertainty, due to different work location, turnover work force, increased work load and way to work, using the motivational process the interaction with leadership will not lead to a significant effect. As described previously IU could potentially have an effect on WE for specific individual associates. JD-R model (Schaufeli, 2015) does explain that through the stress process elevated levels of IU will lead to a decrease in performance via increase of burn-outs. Therefore the level of uncertainty in general needs to be as low as possible. In the environment of low autonomy strong leadership will not lead to cynicism and burn-outs which has an negative effect on the performance (Schaufeli & Bakker, 2004).

5.1. Limitations and directions of further research

The methodology used in this thesis is a cross sectional survey (CSS). The implications of using this quantitative methodology is that the correlations between variables can be checked, but not the causality. This is a limitation. Direction for further research would therefore be to run multiple CSS in order to measure the effect longitudinal to determine the causality.

Alternatively another methodology could be used. Mixed method research methodology (Johnson, 2004) is an option in which a combination is made between quantitative and qualitative data collection. Based on this methodology conclusions can be made and causality between variables can be determined. Qualitative research can be done by conduction in depth interviews. The limiting factor is a timeframe of 6 months. In order to have multiple in depth interviews and analyze this data after quantitative data have been collected and analyzed via the CSS was not feasible.

The focus of this thesis is on the motivational process and how and if job demands, as part of the stress process, could interact with each other. Although IU is part of the stress process, could it be possible that IU could also influence the motivational process for specific individuals, who thrive on uncertainty? The results did not support IU to have direct association with WE, but interestingly in model 1 (only IU), model 3 (IU and autonomy) and model 4 (all independent variables) IU had a significant positive effect on the level of WE and in these models the hypotheses would have been

accepted. This would be something interesting to further explore next to what level of uncertainty, personal, organizational or environmental, could have an impact on WE.

As leadership has an important role to play in the JD-R model and as this variable is extensively been researched further research could be done mapping out which specific elements of leadership have more impact on WE and which not.

It is not defined what more roles within DAN means. Does this mean more of the same roles, but for instance in different countries or does this mean roles with different tasks and or responsibilities. The level of WE will probably not increase for all associates when they are switching to a new role or asked for a project team, therefore a recommendation to P&O to further explore which criteria could be used in order to select the associates, which would benefit the most. As the number of direct reports is not quantified, this can be further explored.

5.2. Ethical reflection

The ethical principles that are used in this thesis can be summarized as followed; (a) Consent from research responders and informants. Therefore an introduction email was send out to invite all associates and when they consent they can participate in the CSS. (b) Minimize the risk of harm to responders and informants by protecting their anonymity and confidentiality. All data was anonymized before entering the SPSS software and analyzing started. This is also shared with all potential responders and informants upfront. (c) Once an associate enters the CSS they remain the right to withdraw from the research. These partial filled in responses (44) are excluded for analysis.

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Appendix I – Cross sectional survey

Part 1.

1. How long are you an employee of Novartis Pharma BV?
    a. >15 years
    b. 11-15 years
    b. 5-10 years
    c. <5 years
2. How many roles did you have?
    a. >4
    b. 3
    c. 2
    d. 1
3. If 2 is a,b,c or d. Was one of this roles outside of the Netherlands?
    a. Yes
    b. No
4. What is the business unit you currently work in?
    a. Oncology
    b. Pharmaceuticals
    c. both
5. How would you classify your role in this unit?
    a. Medical
    b. Commercial
    c. Supporting
6. Where are you based?
    a. Office-based
    b. Field-based
7. What is your age?
    a. >35
    b 35-55
    c 55 <
8. Do you have direct reports?
    a. Yes
    b. No
9. Are you member of the PLT or OEC?
    a. No
    b. Yes

Part 2.

Work engagement:

The following 9 statements are about how you feel at work. Please read each statement carefully and decide if you ever feel this way about your job. If you have never had this feeling, cross the '0' (zero) in the space after the statement. If you have had this feeling, indicate how often you feel it by crossing the number (from 1 to 6) that best describes how frequently you feel that way.

	Almost never	Rarely	Sometimes	Often	Very often	Always
0	1	2	3	4	5	6
Never	A few times a year or less	Once a month or less	A few times a month	Once a week	A few times a week	Every day

10. _____ At my work, I feel bursting with energy* (VI1)
11. _____ At my job, I feel strong and vigorous (VI2)*
12. _____ I am enthusiastic about my job (DE2)*
13. _____ My job inspires me (DE3)*
14. _____ When I get up in the morning, I feel like going to work (VI3)*
15. _____ I feel happy when I am working intensely (AB3)*
16._____ I am proud on the work that I do (DE4)*
17._____ I am immersed in my work (AB4)*
18._____ I get carried away when I'm working (AB5)*

Part 3.

Intolerance for uncertainty

The following 12 statements are about the perception on your level of coping with uncertainty within your organization. Please indicate per statement the number that best corresponds to how much you agree with each item (from 1 to 5).

1	2	3	4	5
Not at all characteristic of me	A little characteristic of me	Somewhat characteristic of me	Very characteristic of me	Entirely characteristic of me

19. _____ Unforeseen events upset me greatly.
20. _____ It frustrates me not having all the information I need.
21. _____ Uncertainty keeps me from living a full life.
22. _____ One should always look ahead so as to avoid surprises.
23. _____ A small unforeseen event can spoil everything, even with the best of planning.
24. _____ When it's time to act, uncertainty paralyses me.
25. _____ When I am uncertain I can't function very well.
26. _____ I always want to know what the future has in store for me.
27. _____ I can't stand being taken by surprise
28. _____ The smallest doubt can stop me from acting.
29. _____ I should be able to organize everything in advance.
30. _____ I must get away from all uncertain situations.

Part 4.

Autonomy:

The following 3 statements are about your level of autonomy within your work. Please indicate per statement the number that best corresponds to how much you agree with each item (from 1 “I have no influence” to 10 “I have complete control”).

31. _____ The management at your work allows you to decide how your own daily work is/was organized.
32. _____ The management at your work allows you to influence policy decisions about the activities of the organization.
33. _____ The management at your work allows you to choose or change your pace of work.

Leadership:

The following 3 statements are about your perception on leadership within your organization. Please indicate per statement the number that best corresponds to how much you agree with each item (from 1 – “completely disagree” to 5 – “completely agree”)

34. _____ My supervisor is able to enthuse others for his/her plans
35. _____ My supervisor delegates tasks and responsibilities
36. _____ My supervisor encourages team members to cooperate

Part 5.

Self-efficacy:

The following 10 statements are about your perception on self-efficacy within your organization. Please indicate per statement the number that best corresponds to how much you agree with each item (from 1 to 4)

1	2	3	4
Not at all true	Hardly true	Moderately true	Exactly true

37. _____ I can always manage to solve difficult problems if I try hard enough.
38. _____ If someone opposes me, I can find the means and ways to get what I want.
39. _____ It is easy for me to stick to my aims and accomplish my goals.
40. _____ I am confident that I could deal efficiently with unexpected events.
41. _____ Thanks to my resourcefulness, I know how to handle unforeseen situations.
42. _____ I can solve most problems if I invest the necessary effort.
43. _____ I can remain calm when facing difficulties because I can rely on my coping abilities.
44. _____ When I am confronted with a problem, I can usually find several solutions.
45. _____ If I am in trouble, I can usually think of a solution.
46. _____ I can usually handle whatever comes my way.

Additional

47. Please use the box below if you wish to make any additional comments about this survey

_____

48. I give my consent that the researcher can contact me for any additional questions

No.