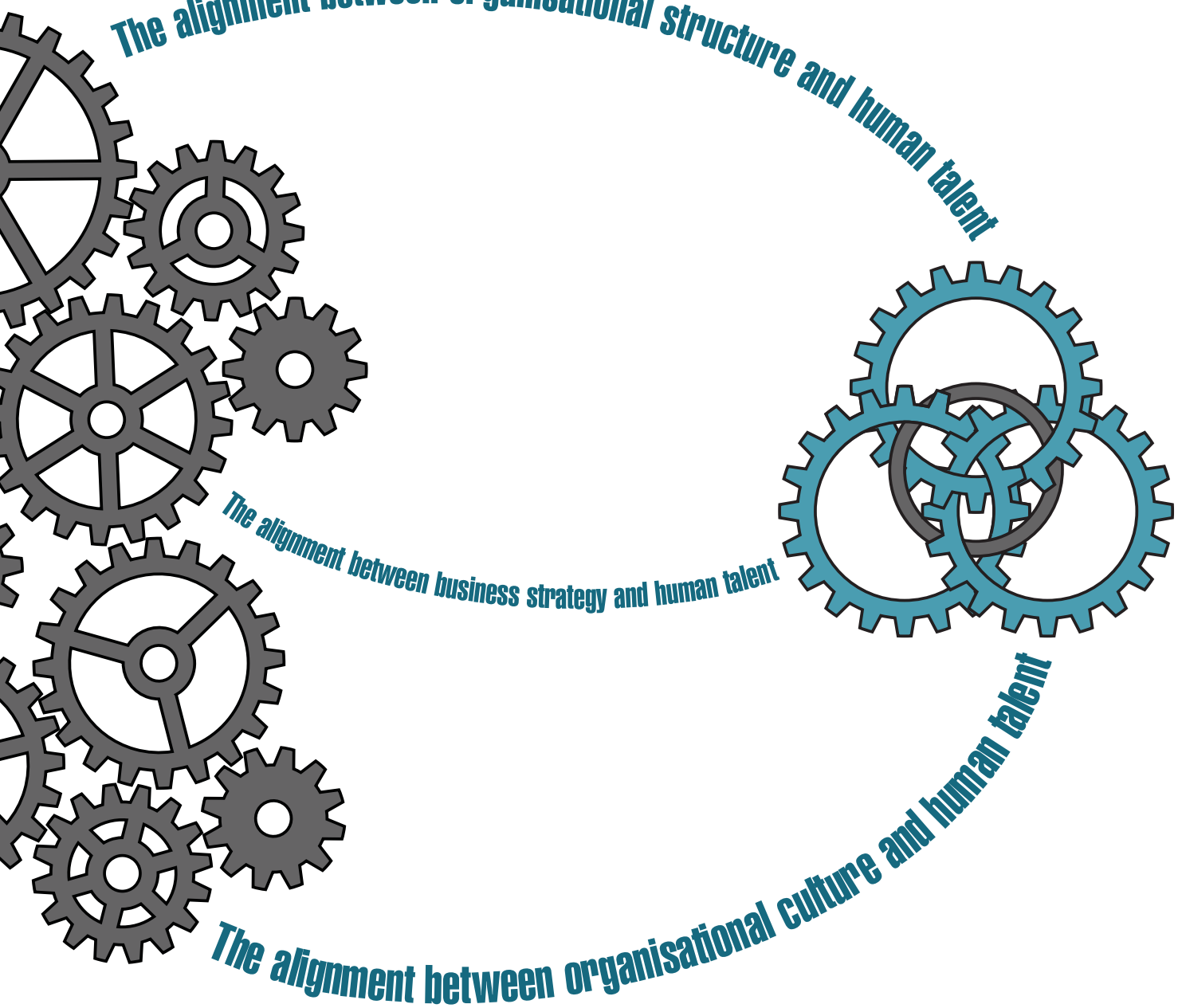
Systems-Oriented Talent Management

A Design and Validation Study

Arnold J. Brouwer



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SYSTEMS-ORIENTED TALENT MANAGEMENT

A DESIGN AND VALIDATION STUDY

DISSERTATION

to obtain
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on the authority of the rector magnificus,
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on account of the decision of the graduation committee,
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by

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to Emma and Femke

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Abbreviations

AB5C	Abridged big five dimensional circumplex model
COTAN	Dutch committee on tests and testing
CT	Dutch competence test
CVF	Competing values framework
CVLM	Competing values leadership model
EFQM	European foundation for quality management
FA	Factor analysis
FFM	Five factor model
GT	Dutch group roles test
IMAR	Inspire – Mobilise – Appreciate – Reflect
INK	Instituut Nederlandse kwaliteit
IPIP	International personality item pool
KC	Key competence
MBBF	Management building blocks framework
MTMM	Multi trait multi method matrix
NEO PI-R	Revised NEO personality inventory
NPT	Dutch personality test
NWT	Dutch work values test
OCAI	Organisational culture assessment instrument
PDCA	Plan – Do – Check – Act
PS	Path similarity
SHRM	Strategic human resource management
STM	Systems-oriented talent management
SWVI	Super's work values inventory
SWVI-R	Super's work values inventory revised
TR	Team role
TQM	Total quality management
UVM	Universal values model

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Chapter 1

Introduction

1.1. General Introduction

Our ever more rapidly changing world demands a lot from organisations, and in particular their HRM specialists, to find, retain and promote the right people for the right positions. In their search for support, a growing number of organisations turn to talent management, a specialisation defined as the process of discovering, developing and retaining top talent (Michaels, Handfield-Jones, & Axelrood, 2001). The field of talent management focuses on the recruitment and selection of the right people, helps employees develop in their professional roles and guides them to the next step in their careers. The aim is to be able to continuously anticipate the internal and external changes that all organisations face (Berger & Berger, 2011).

The day-to-day reality of this in-, through- and outflow cycle shows that managers have a tendency to select and develop their people according to those characteristics they themselves consider the most desirable. Schoonman (2013) demonstrates that people naturally tend to judge and assess others based on how they judge and assess themselves. Because of this common pitfall of perception and projection, the contribution and performance of employees are largely assessed according to the degree to which their observable qualities – the visible human behaviour – matches the assessor's own ideas of how employees ought to perform their role within the context of the currently relevant business process.

Since both behaviour and processes are subject to change, unintendedly the risk of disappointment and disagreement can be found in this method of selecting, developing and assessing people (Remmerswaal, 2013). This is because of, inter alia, the following three reasons. First, the qualities that a manager considers the most relevant for the function or the organisation are not necessarily the qualities that will allow the employee to contribute in the most effective and natural manner possible. A different, more personal approach to the position could well result in a higher value contribution. The difficulty

here is, that the employee's current observable behaviour does not make this clear immediately. Second, the current visible skills – the result of qualities developed thus far – may only in part determine job satisfaction and performance, for the employee may not yet have discovered his or her full potential. This, too, is not immediately observable in day-to-day practice without deeper analysis. Third, the employee may not be able to maintain their current style of working in the long term. This is especially the case when it becomes evident that the employee's current behaviour is mainly the result of learned or adapted techniques, rather than the employee's own personal qualities. Searching for alternative ways of working means searching for a person's true identity in isolation from the observable reality, something that demands a lot from manager and employee alike.

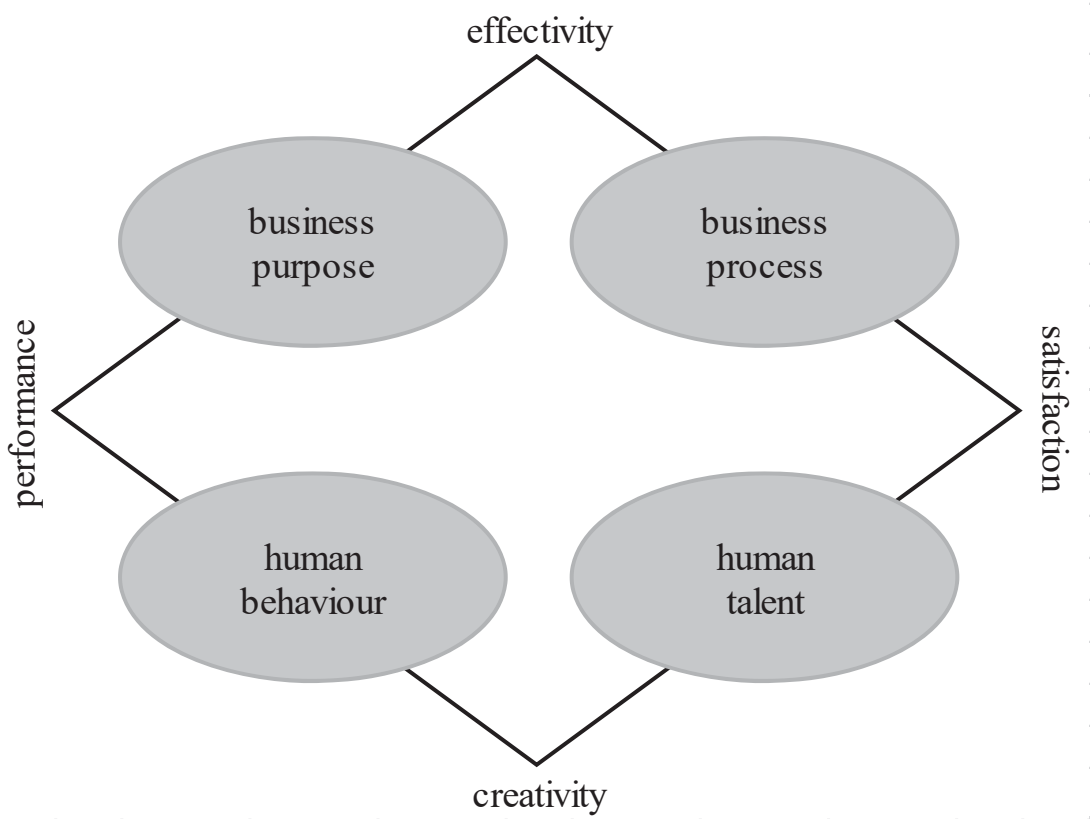
These reasons require a different approach to talent, qualities and contributions. An approach that takes account of the deeper qualities of persons that determine their natural potential and individual character, and at the same time does justice to the organisation's raison d'être. This is elaborated in the systems-oriented talent management model (STM; Brouwer, 2012).

1.2. Systems-Oriented Talent Management

STM was iteratively designed in the years 2006 through 2012. The development, implementation and evaluation of a palette of strategic human resource management (SHRM) intervention programmes within many small and medium-sized Dutch enterprises, resulted in a best-practice model. The STM model is a method to align business purpose and human talent both from a psychological and managerial perspective. It is based on the fundamental conviction that investing in a person's unique character or talents (or natural disposition) is exactly what contributes to the development of his or her full potential, and that this is the only thing he or she will be able to maintain in the long term. In the same line of thinking, the organisation's rationale or purpose, executed in continuously changing processes and procedures, represents the common thread of its mission in the long term. Therefore, within the STM model, building a sustainable match between an organisation and its employees, is about aligning on the level of business purpose and human talent instead of on the level of the present way of working and behaving.

Figure 1.1

Systems-oriented talent management (Brouwer, 2012)



STM argues for a different approach to select, develop and assess people in work situations. This is done by shifting the focus from the current observable behaviour and work style, to both the essence behind the present business processes derived from the corporate mission – as detailed in the business purpose – and the human ability behind the current visible skills and behaviours - which is found in the human talent. The approach focuses on the organisation's rationale and a person's innate individual character, and thus discovers the deeper potential that might not yet be apparent. The STM model, as shown in Figure 1.1, can be read as follows: if a person can show the behaviour that stems from his or her inner talent, that person can be true to his or her most creative self; if that behaviour fits the purpose of the organisation, the best performance is possible; if the purpose is subsequently elaborated in an optimally suitable working method (process), then the organisation is the most effective; and if that process appeals someone's innate talents, he or she will experience the most job satisfaction. The STM thus seeks the optimal balance between pleasure and performance.

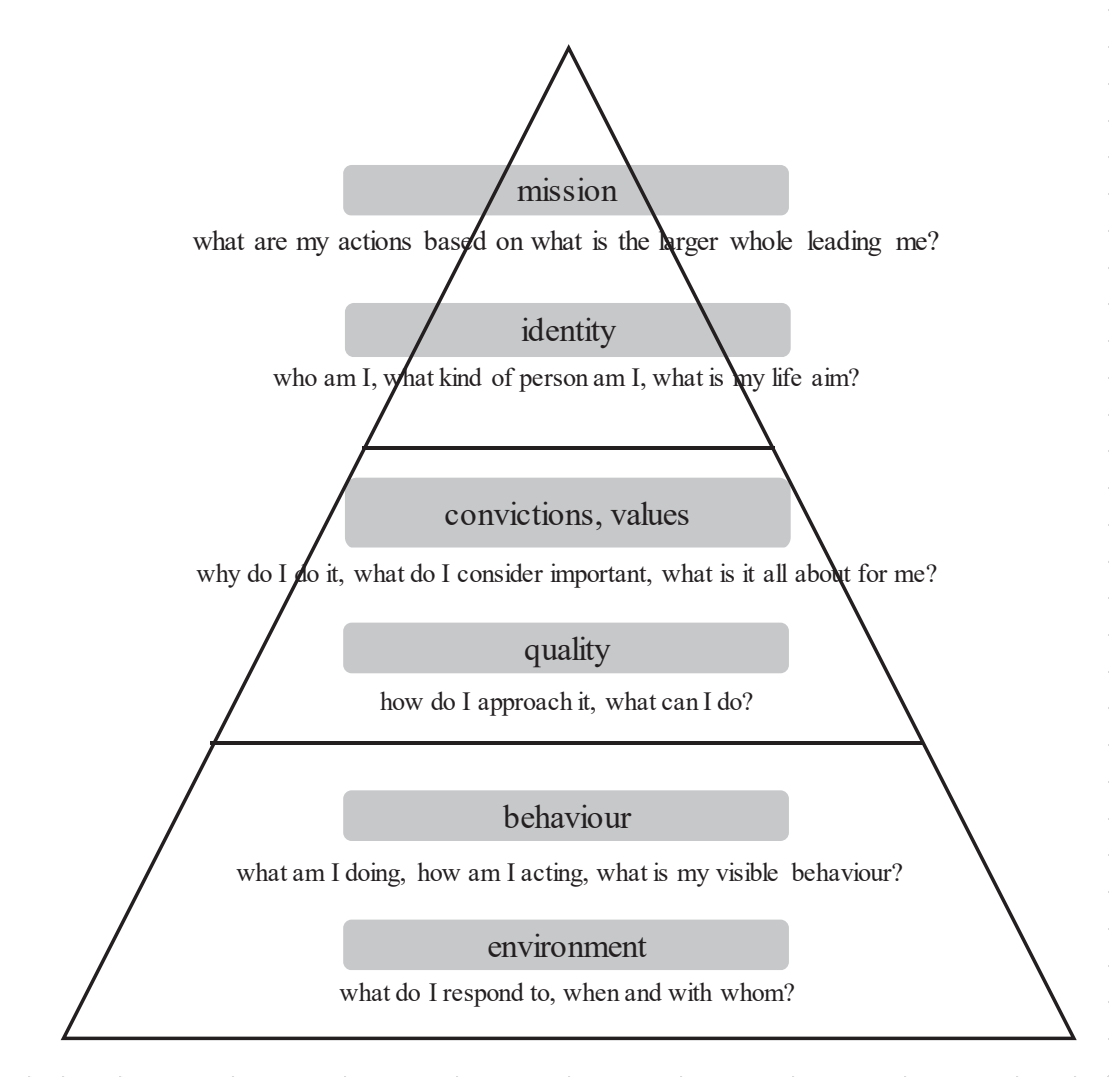
1.2.1. Key Ideas and Principles

Key to STM is the positioning of human qualities within the work context by using theories from psychology, personality theory and management science. Together they form the view of humanity and human interaction on which STM is based. STM examines people by using the logical levels in Bateson's pyramid (1979). As visualised in Figure 1.2, these levels describe how the inner person is made up and how people organise themselves and behave in relation to their working environment. The pyramid is based on a number of assumptions about people and their behaviour. First of all, Bateson assumes that a person is comprised of both visible and deeper layers. Consequently, a person is more than what he or she reveals. Second, Bateson assumes that elements located higher in the pyramid influence the lower layers. For example, identity influences behaviour. Third, the pyramid shows that learning new skills or behaviour can be effective provided the values and qualities located higher in the pyramid support these new skills or behaviour. As such, the pyramid seeks to give insight into the larger interest of interventions at higher levels as opposed to adjustment or assessment of the current behaviour in the current working environment.

When addressing talent management issues, STM follows the middle layer of the pyramid, at the level of qualities and values. By measuring these, STM attempts to provide an objective impression of the present human potential and motives that are not influenced by what someone has shown until now, is used to doing, learned to do or has been taught not to do. Measuring these qualities and values relies on two theories from the field of personality theory. Firstly, personal qualities are measured using the five factor model, or FFM (Costa & McCrae, 1992), known as a reliable framework for personality used worldwide. It is a theoretically neutral model, based on the presence of natural-language terms for describing people. The model arranges individual differences between people in the following five independent categories: extraversion, agreeableness, conscientiousness, neuroticism and openness to experience. Secondly, personal motives are measured using the universal values model, or UVM (Schwartz, 1992). This model presents four dimensions that together comprise ten values. Each value describes a human motive. Over the course of time, the model has been tested in more than 20 countries. This has demonstrated that UVM is acknowledged and recognised around the world, regardless of sociological and cultural differences.

Figure 1.2

The logical levels in Bateson's pyramid (1979)



1.2.2. The STM-Scan

In 2012, the STM model was elaborated in the initial version of the STM-scan, a Dutch multi-dimensional assessment instrument which is used for SHRM intervention programs regarding the adoption and/or adjustment of corporate strategy and culture, recruiting and selecting new personnel, coaching and developing employees, outplacement and career advice, development of teams and succession planning. Within this initial version, combinations of personality traits are organised in higher-order competences and team roles, forging a link between inner qualities and visible behaviour in the working environment. These personality traits, competences and team roles are arranged in a

business model based on the combination of the Deming quality circle (Deming, 1986), which is known as the plan – do – check – act (PDCA) cycle, in which four central steps behind the business purpose are visualised:

(1) Idea: how people arrive at ideas, labelled as the Dutch term '*het idee'*;
(2) Plan: how they devise an action plan, labelled in Dutch as '*het plan'*;
(3) Form: how people communicate their ideas with those around them, noted as '*de vorm'*, and;
(4) Action: how this is converted into action that leads to an outcome, '*de actie'*.

Next to this, work values are arranged in four higher-order culture types, representing the habits and motives found in a specific working environment, and its corresponding fundamental attitudes (I [ik], we [wij], task [taak] and human [mens]), which describe an individual's social orientation. As such, STM seeks to show at a glance how and where in the business process the employee can contribute most effectively to the business purpose given their disposition and potential, and therefore can act in a way that comes most naturally to him or her. This is aimed to result in an effective method of working that boosts both job satisfaction and performance (see Figure 1.1).

1.2.3. STM-Scan Diagrams

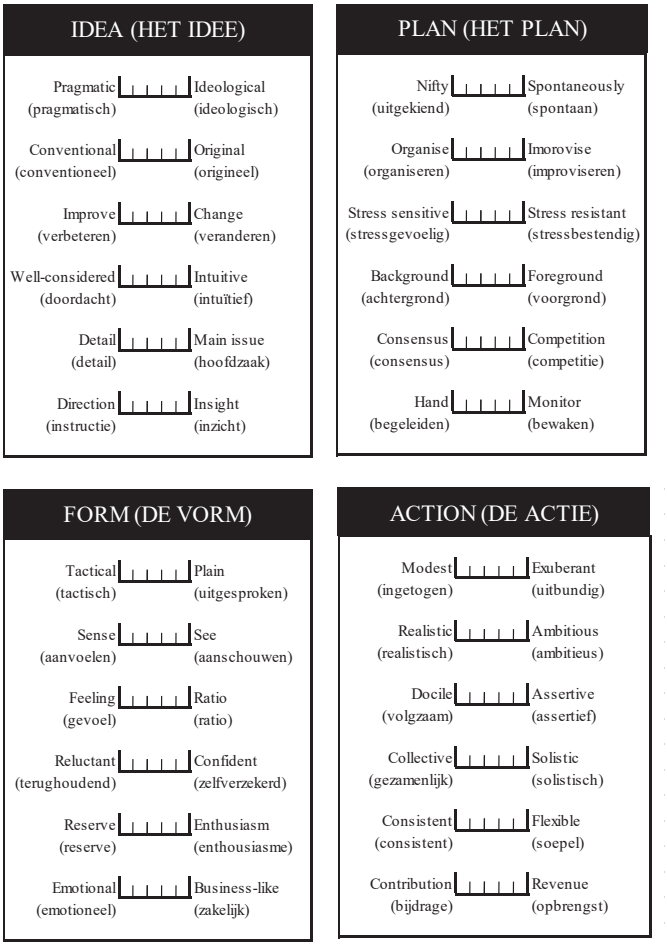
The arrangement of competences and team roles (derived from personality traits) within the four central steps and the ordering of work values in culture types and their corresponding fundamental attitudes, is detailed in three diagrams that jointly form the initial version of the STM-scan assessment instrument. These diagrams integrate the measured personality characteristics in three models that represent the business purpose. By doing so, STM seeks to forge a link between the middle and bottom layers of Bateson's pyramid.

In the first diagram, of which an example of its initial 2012 version is presented in Figure 1.3, the individual scores for the factors and underlying facets of the FFM are converted into a personality profile, in which the different personality traits are translated into 24 Dutch work-related synonyms and clustered in the four steps behind the business purpose. This allows STM to highlight how and in which step a person's disposition can contribute to the business purpose. To do justice to people's unique talents, each of the 24 synonyms has a positive and negative side, with both a high and low score for that specific trait.

Low scores also have a positive meaning, because for an organisation to achieve its goals, it sometimes is desirable that a person lacks a certain characteristic. As such, the STM-scan seeks to clearly show a person's innate characteristics and what he or she would prefer to do or not do in the working environment.

Figure 1.3

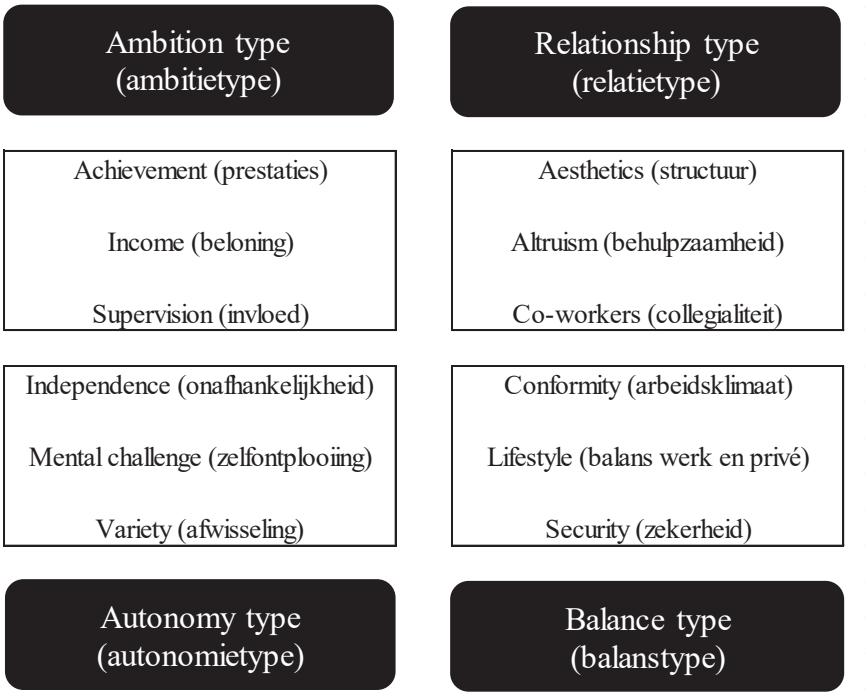
Example of the initial 2012 version of the first STM diagram



In the second diagram, of which an example of its initial 2012 version is presented in Figure 1.4, individual scores for the UVM values are converted into a motives profile, in which the values are translated into 12 work values. Under the STM method, work values are arranged in four different culture types and their corresponding fundamental attitudes. In this way, the STM-scan shows where and how a person and his or her motives fit in and click with the organisation's working environment.

Figure 1.4

Example of the initial 2012 version of the second STM diagram



In the third diagram, of which an example of its initial 2012 version is shown in Figure 1.5, scores for the 24 personality facets (clustered in groups of three) are converted into a score for a set of 24 competences. This set is compiled from a literature study on agreements, differences and linguistic synonyms found in common Dutch-language competency manuals. The 24 competences are then grouped into eight work-related team roles (three competences per team role), derived from Belbin (2010). To do this, team roles with underlying combinations of competences must be arranged in the four central steps in the primary business purpose. As such, the STM-scan seeks to visualise which competences and team roles best fit a person's inner qualities and where in the working environment he or she can exhibit the behaviour that comes most naturally to them.

Figure 1.5

Example of the initial 2012 version of the third STM diagram

1.2.4. STM-Scan Technique

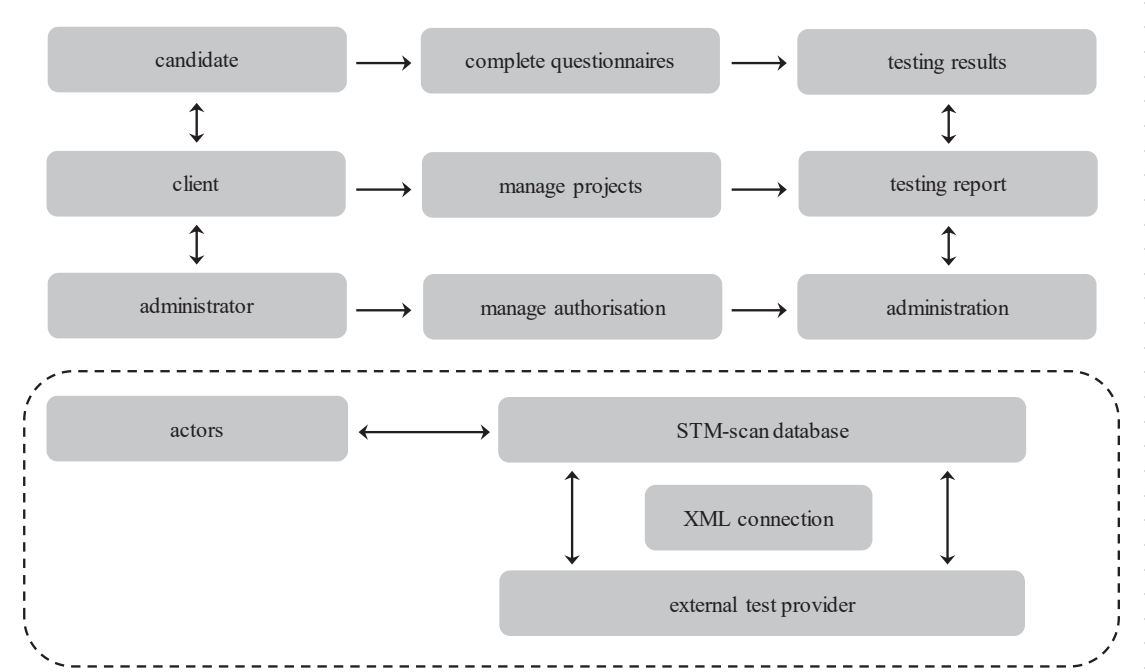
The initial 2012 STM-scan was automated as an online testing instrument, for which an object-oriented Microsoft .Net C# application was developed. This application, as presented in Figure 1.6, was placed on the internet domain https://www.stm-scan.com via an encrypted HTTPS (HyperText Transfer Protocol Secure) link. The STM scan web portal is constructed from different layers and, besides the administrator monitoring the entire portal, has two different actors: (1) the client who prepares and purchases test assignments, and (2) the candidate who completes the tests.

Via a secured Extensible Markup Language, or XML link, the STM-scan web portal is fed a five factor test and a universal values test, both of which satisfy the guidelines described by COTAN, the Netherlands Testing Commission (Evers, Lucassen, Meijer, &

Sijtsma, 2010). Personality traits are tested using the Dutch personality test, or NPT (Van Thiel, 2008a). This test measures the five personality factors and underlying 30 facets via 300 questions (items) according to a five-point Likert scale, on which participants indicate to what extent they agree with the questions. Completing this test takes around 20 minutes. Work values are tested using the Dutch work values test, or NWT (Van Thiel, 2008b), which takes around 10 minutes to fill in. This test originally measures the 14 universal work values via 140 questions (items) according to a five-point Likert scale. In the STM, these are clustered into 12 values.

Figure 1.6

The STM-scan application



The initial STM-scan has been used over 1,000 times as talent management cycle instrument. It helps to find answers for four types of talent management questions: (1) questions regarding adoption and/or adjustment of corporate strategy and culture, (2) recruiting and selecting new personnel, (3) coaching and developing employees within their existing work situation, and (4) outplacement and career advice to employees that focus on a new work situation.

1.3. Overview of this Dissertation

1.3.1. Research Questions

Multiple intermediate evaluations have established that both clients and candidates are satisfied with the initial STM-scan. The instrument's possibilities of application as well as the insights provided by the instrument are highly valued. However, an assessment instrument design based solely on practice, raises a couple of questions. First, there is the question of whether the composition and configuration of the STM can also be scientifically proven. This so called evidence-based scientific substantiation requires a thorough understanding of the context, preconditions and critical success factors found in the best-practice oriented design (Bogan & English, 1994). Second, it brings up the question of whether the initial version supports two of the key criteria of the COTAN review system: reliability and validity. Finally, it raises the question of what can be asserted about STM's utility. Consequently, this dissertation is a design and validation study of the initial systems-oriented talent management model, that in 2012 was detailed in a first version of the multi-dimensional assessment instrument named STM-scan.

1.3.2. Research Methodologies and Structure

In order to evaluate the best-practice oriented model and to design and validate an evidence-based version of the initial designed STM-scan, the current study uses both qualitative and quantitative research methods. The three STM diagrams are dealt with successively. Firstly, in Chapter 2 and 3, the first 2012 diagram that represents the ordering of personality facets in the four steps within the primary business process that stem from the business purpose, and the second diagram that shows the ordering of work values in the four culture types and the corresponding fundamental attitudes, are studied by conducting lexical-semantic analyses. Lexical-semantic analyses address a language's lexicon, or the collection of words in a language (Murphy, 2003). It can be used to study word meanings and the relationships between (groups of) words and sentences. In this way this dissertation further elaborates the relationships between human talent and business purpose via both personality facets (Chapter 2) and work values (Chapter 3).

Secondly, in Chapter 4, multiple linear regression analysis and moderation analysis are used to study the associations between the personality facets of the first and the work values of the second initial diagram. In order to make the renewed STM more applicable

for HRM practices concerning sustainable employability, the influence of age on these associations is studied as well. Then, Chapter 5 uses both qualitative and quantitative research methods to introduce the blueprint of a renewed version of the initial third STM diagram. Within this renewed version, the results of the Chapters 2, 3 and 4 are combined in a set of key competences and team roles, that both are composed of a combination of personality facets (Chapter 2) and work values (Chapter 3) and ordered in a more detailed elaboration of a managerial representation of the organisation. Subsequently, the reliability, known as the extent to which the calculated test score is repeatable, and the validity, defined as the extent to which the test scores are usable for the purpose of the test (Furr and Bacharach, 2014), are examined by conducting factor analyses and multitrait multimethod matrixes.

Chapter 6 presents the results of a set of interviews, held with a panel of experts certified for the initial STM. The respondents were interviewed in line with the four levels of Kirkpatrick (1998), which not only evaluates the current usage and outcomes, but also assesses future improvements. In this way, the interview results consist of both a best-practice oriented evaluation of the initial STM model and STM-scan, and of a first prediction of the assumed effects of the proposed adaptations, that result from the findings in the Chapter 2, 3, 4 and 5. Finally, in Chapter 7 the renewed STM model is presented by introducing three separate paths that can be appointed between human resources and organisational results. These paths are grafted on the managerial blocks found in the management building blocks framework (MBBF; Nieuwenhuis, 2006), a value chain that describes the composition of and joint interactions within the primary business process. The paths result in a renewed version of the initial three STM-scan diagrams, that, in the previous chapters, have been tested on their reliability, validity and utility.

Chapter 2

A Lexical-Semantic Analysis of the Relationship Between Organisational Effectiveness and Personality Facets

Today's constantly changing business environment demands a renewed view of the attuning of characteristics of employees who cooperate in diverse teams of professionals and thus contribute to organisational effectiveness. Because earlier studies did not fully determine the interplay between organisational effectiveness and personality on a detailed level, this study elaborates on the mutual relationships involved on a personality facet level. This chapter studies the lexical-semantic relationships found in organisational effectiveness, which is elaborated into a semantic network of competing values and personality facets that are treated as 'synsets' of Dutch non-normative and work-related synonyms and antonyms of the bipolar abridged big five-dimensional circumplex model (AB5C) facets of the five factor personality model (FFM). The quantitative and qualitative lexical-semantic analyses completed in the study result in path similarity. On basis of the strongest path similarity between the organisational effectiveness semantic network and the synsets of non-normative, work-related personality facets, this study provides an algorithm that predicts the optimal composition of a team of employees. With these findings, an individual's contribution to organisational effectiveness can be measured by completing a five factor personality questionnaire. The study will contribute to future assessments of the attuning of teams of professionals who collaborate within the context of constantly changing organisational environments.

2.1. Introduction

2.1.1. Problem Situation and Purpose of the Study

The field of organisational design faces a major change. It shifts from the classic organisational chart that consists of management layers and fixed teams, to collaborative teams of professionals who cooperate in constantly changing compositions, depending on the character of the joint assignment (Robertson, 2015). A central theme in this modern organisational design is to maintain and improve organisational effectiveness by attuning the roles, processes, and formal reporting relationships in an organisation (Galbraith, 2002; Chen & Huang, 2007; Tushman, Smith, Wood, Westerman, & O'Reilly, 2010).

2.1.1.1. Organisational Effectiveness

Organisational effectiveness is the efficiency with which an organisation is able to meet its objectives. It is about every employee doing what he or she does best. The main measure of organisational effectiveness for a business is generally expressed in terms of how well the achieved results compare with the predefined goals (Pedraza, 2014). Research on organisational effectiveness focuses on two key areas. The first examines organisational effectiveness as a part of the business design and considers it as one of the building blocks that make up an organisation. (Polling & Kampfraath, 2007). The second approach concentrates on logically ordered chains of activities, and studies the role of organisational effectiveness in achieving company goals (Keuning & Wolters, 2007).

The two research areas of organisational effectiveness mainly focus on the managerial side of organisational design. Although they acknowledge the influence of employees' contributions to organisational effectiveness, the effect of specific employees' characteristics receives less attention (Nieuwenhuis, 2006). However, in reality, people and organisations cannot be seen separately: both the design of an organisation and the effect of this design are partly determined by the type of employees working for that company (Galbraith, 2002).

2.1.1.2. Strategic Talent Management

A research field that does focus on the interplay between the characteristics of employees and the organisation in general, is strategic talent management. This is defined as the science of using tactical human resource planning to improve business value and to make

it possible for companies and organisations to reach their goals (Berger & Berger, 2011). Strategic talent management aims to create a sustainable competitive advantage by selecting, developing, and promoting the best people for the organisation's purpose. Even though this field provides insights into the contribution of human talent to organisational success, it does not unravel the concept of organisational effectiveness itself.

As such, neither the organisational design perspective, nor the strategic talent management approach seem to focus on the more detailed interplay between organisational effectiveness and human characteristics (Lewis & Heckman, 2006; Gibson, Ivancevich, Donnelly Jr., & Konopaske, 2011; Huang & Tansley, 2012; Dries, 2013). The current research aims to close this gap and therefore studies the relationship between organisational effectiveness and personality.

2.2. Theoretical Framework

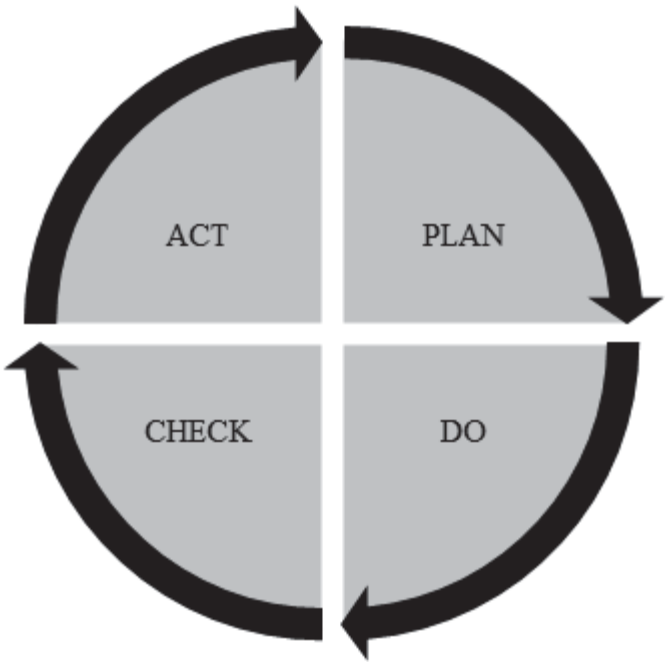
2.2.1. Designing and Controlling Organisational Effectiveness Using the PDCA Cycle

According to Mitchell (2012), organisational effectiveness is typically evaluated using logic models that specify how resources ought to produce activities and outputs, which in turn will lead to outcomes. From this perspective, organisational effectiveness provides the foundation on which operating procedures and routines rest (Bidault & Cummings, 1994), and prescribes which individuals will get to participate in which decision-making processes (Robbins & Decenzo, 2001). In this dissertation, the elaboration of this process management approach of designing and controlling organisational effectiveness, is defined as the content side of organisational effectiveness. This content side follows the Deming quality circle (Deming, 1986), which is known as the PDCA (for plan – do – check – act) cycle (Figure 2.1). In the cycle:

(1) *plan* is the act of identifying opportunities and ways for improvement;
(2) *do* refers to the actions necessary to effect the change;
(3) *check* is the verification of whether the changes resulted in the desired improvements; and
(4) *act* refers to what one does in response to the effects that are observed.

Figure 2.1

The content side of organisational effectiveness



In practice, the four steps of the PDCA form a repeating learning cycle; in which someone learns from the previous round each time he or she follows the steps. In this way the cycle helps people to improve themselves. Whereas the PDCA cycle is a widely accepted four-step management method for designing and controlling the conditions for organisational effectiveness, an additional method is necessary to judge the impact of the organisational effectiveness cycle on the organisation's success. This method is found in the competing values framework (CVF; Cameron & Quinn, 2011).

2.2.2. Judging Organisational Effectiveness Using the Competing Values Framework

Cameron and Quinn (1999) researched the key indicators of organisational success, defined as how effective an organisation is in achieving its intended outcomes (Quinn & Rohrbaugh, 1983). The study resulted in two underlying value dimensions that characterise organisational effectiveness. The first is related to organisational focus and ranges from an internal, micro emphasis on the wellbeing and development of people in the organisation, to an external, macro emphasis on the well-being and development of

the organisation itself. The second value dimension is related to organisational structure, ranging from an emphasis on stability to an emphasis on flexibility (Yu & Wu, 2009). Since the two dimensions are contradictory to each other, they are called competing values: organisations need to be adaptable and flexible, but they also need to be stable and controlled (Cameron & Quinn, 2011).

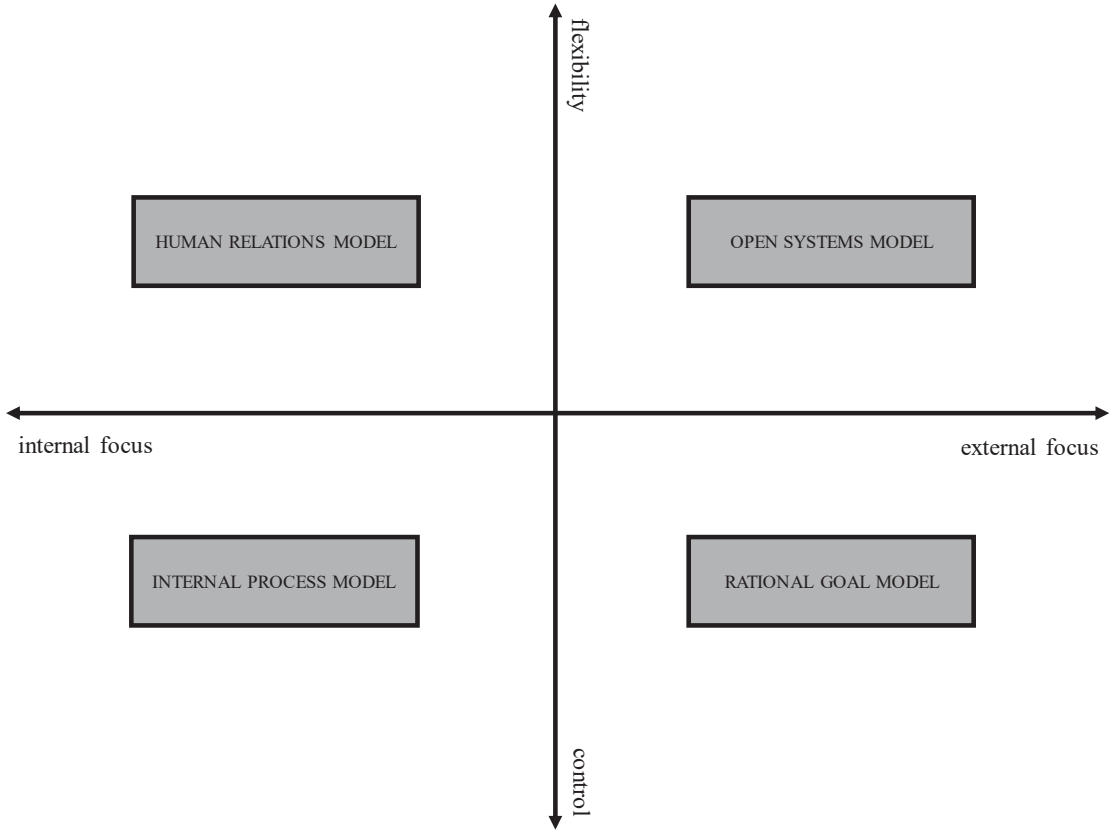
The combination of the two value dimensions result in four basic models that jointly form the CVF. Although these four models each seem to represent a different perspective, a meta-analysis by Hartnell, Ou and Kinicki (2011) shows they are actually four interrelated subdomains of the larger construct of 'organisational effectiveness'. Each model describes a different set of effectiveness criteria:

(1) the *open systems model*, in which growth, new resources, and external support are worked on by maintaining flexibility and availability;
(2) the *rational goal model*, where productivity and efficiency are worked on through goal setting and planning;
(3) the *internal process model*, in which stability and control are worked on through information management and coordination; and
(4) the *human relations model*, in which human resources are developed by maintaining cohesion and morale (Cameron & Quinn, 2011).

The four models, as visualised in Figure 2.2, are applicable for making sense of the organisational effectiveness phenomenon (Mitchell, 2012). Jointly they form a cycle of process improvement that, in this dissertation, is dealt with as the contribution side of organisational effectiveness.

Figure 2.2

The contribution side of organisational effectiveness



2.2.3. The Joint Approach: The Competing Values Leadership Model

To make organisational effectiveness applicable for studying its relationship with personality, the four steps of both the PDCA cycle and the four models of the CVF must be elaborated in four central activities that jointly form a continuous cycle of human interpretation of the content and contribution side of organisational effectiveness. This is found in the competing values leadership model (CVLM; Cameron, Quinn & Degraff, 2014), which expresses the combination of the PDCA and the CVF in four verbs that represent human activity:

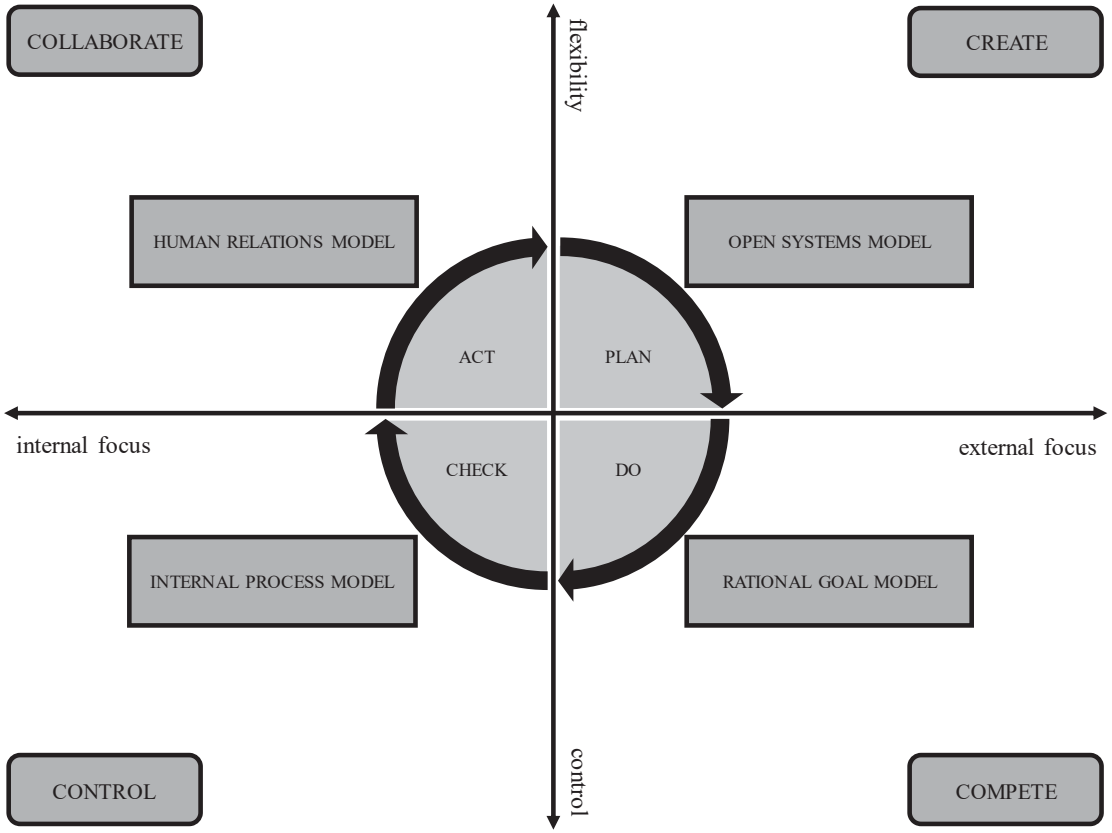
(1) *create*, defined as ‘doing new things’ and considered as the junction of ‘plan’ and the open systems model;
(2) *compete*, specified as ‘doing things now’ and perceived as the link between ‘do’ and the rational goal model;

(3) *control*, determined as 'doing things right' and perceived as the junction of 'check' and the internal process model; and

(4) *collaborate*, or 'doing things that last', considered as the link between 'act' and the human relations model.

Figure 2.3

The content-contribution approach of organisational effectiveness



As visualised in Figure 2.3, the integration of the four steps of the PDCA cycle and the four models of the CVF into the CVLM, results in one continuous improvement cycle that contains both the content and contribution side of organisational effectiveness. This makes the CVLM a useful framework to study the relationship between organisational effectiveness and personality on a detailed level.

2.2.4. Personality: The Five Factor Model

Personality theory is about the systematic study of the similarities and differences in personality between people, in which personality means how the individual acts (1) in his social environment, (2) with other people, and, (3) in different situations (Ekkel & Ranty, 2006). Personality itself is conceptualised as a stable system of tendencies to act, think and feel in a certain way (Digman, 1990; Guilford, 1959). Today, the most popular model of personality used for investigating employee personality is the five factor model, or FFM (Costa & McCrae, 1985). This model suggests that personality, viewed from a trait approach, consists of five major clusters of personality characteristics: openness, conscientiousness, extraversion, agreeableness and neuroticism, also known as the OCEAN-model (Digman, 1996). In the FFM,

(1) *openness to experience,* refers to creativity, curiosity and the willingness to try new things;
(2) *conscientiousness,* refers to self-discipline, ambition and being organised;
(3) *extraversion*, expresses assertiveness, talkativeness and the search for interaction with others;
(4) *agreeableness*, is described as helpfulness and sensitivity towards the needs of others; and
(5) *neuroticism,* reflects the extent to which someone is inclined to experience negative feelings such as anxiety, depression and helplessness.

Each factor can be further elaborated in six subscales that help to express the many meanings and components of personality, Costa and McCrae suggest. These subscales are called personality facets. For example, the six facets of extraversion are warmth, gregariousness, assertiveness, activity, excitement seeking and positive emotions (see Table 2.1 for the personality facets of all factors).

2.2.5. Relationships Between Organisational Effectiveness and Personality

The PDCA cycle, which is considered as the content side of organisational effectiveness, has frequently been applied as a problem-solving model in the field of quality management (Anderson, Rungtusanatham, & Schroeder, 1994; Dahlgaard & Kanji, 1995; Deming, 2000). A subsequent meta-analysis of the relationship between quality management practices and company performance affirms that the PDCA cycle, by its

nature, is above all a quality management model (Nair, 2006), which makes it less suitable for studying its direct relationship with personality traits. Therefore, no known previous research focusses on this connection between the PDCA cycle and personality.

Although seldom studied empirically, earlier research examined the direct relationship between the CVF, considered as the contribution side of organisational effectiveness, and personality traits. In 2008, Belasen and Frank studied the relationship between leadership roles and personality traits by using the CVF. Later, in 2012, the researchers used the framework to address the interactive effects of gender and personality traits on transformational and transactional leadership. In both studies, Belasen and Frank found positive correlations between the open systems model and openness, between the rational goal model and extraversion, the internal process model and conscientiousness, and between the human relations model and agreeableness. Comparable results were found in subsequent research by Gardner et al. (2012) and Caroll (2015)[1].

The before mentioned researches all focus on personality at the factor level. A shared recommendation in these studies is to further investigate the relationships between the four CVF models and personality at the more detailed facet level. The present study follows this line of thinking by examining the relationships between the CVLM, which is

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[1] Caroll (2015) used Holland's model (Holland, 1985), instead of the FFM, as a measure for personality. This model consists of six personality types: artistic, investigative, enterprising, social, conventional and realistic. A meta-analysis by Larson, Rottinghaus and Borgen (2002) between the six personality types of Holland's model and the FFM found correlations between both the artistic and investigative types and openness, between the enterprising type and extraversion, and between the social type and both extraversion and agreeableness (Larson, Rottinghaus, & Borgen, 2002). These analyses are in line with the findings of several previous studies (De Fruyt & Mervielde, 1996; Costa, McCrae, & Holland, 1984; Gottfredson, Jones, & Holland, 1993), which found that openness was most strongly related to the artistic type, extraversion was related to the enterprising type, and conscientiousness was mainly related to the conventional type. The earlier studies did not find a relationship between the investigative or social personality types and one of the five factors of the FFM.

a combination of the four steps of the PDCA cycle and the four models of the CVF, and the personality facets of the FFM. One typical way to study their correlations, is to conduct a multiple regression analysis. However, the underlying facets of each of the personality factors are strongly correlated, while regression analysis results in a linear model that assumes that there is little or no multicollinearity in the data. Therefore, another method must be used to study the relationships on a personality facet level.

Since the organisational effectiveness concept and personality facets are defined textually, this dissertation studies the relationship between organisational effectiveness and personality facets from a lexical-semantic point of view. The central question in this chapter is: **'How should the relationship between organisational effectiveness and personality facets be elaborated, using lexical-semantic analysis?**' Elucidating the lexical relationship between organisational effectiveness and personality facets may contribute to an improved alignment between an organisation and its workers.

2.2.6. The Lexical Operationalisation of Personality Facets

The facets of the five personality factors form an efficient system for identifying and communicating personality and thus allow one to follow the lexical hypothesis. This hypothesis is a concept in personality psychology that suggests that the personality traits and differences that are most important and relevant to people, eventually become a part of the natural language (Goldberg, 1990).

The initial FFM consisted of a lexical expression of one end or pole of each facet that represents a high score on that specific facet. For example, 'fantasy' is a facet of the factor 'openness'. But studying the relationship between the CVLM and personality requires an elaboration with the antonym of each personality facet, which represents a low score on that specific facet. For example, whereas the first model of the CVLM 'create' is expected to require a high score on the facet 'fantasy', the third model 'control' might merely call for a lower score on the same facet, which represents a human characteristic such as 'retentive'.

This elaboration of facets in both poles of the underlying dimensions is found in Hofstee and De Raad's (1991) abridged big five-dimensional circumplex (AB5C) model. In contrast to the hierarchical FFM, which breaks each factor into a set of underlying facets, the AB5C model treats personality facets as multidimensional constructs. In the AB5C,

each facet is represented by a mixture of a high or a low score on an abridged combination of two of the five higher-order factors. For example, as outlined in Table 2.1, a high score on the facet I.1 (warmth) is notated as I+II+ (extraversion+ agreeableness+) and is labelled 'sociable', whereas a lower score on the same facet is notated as I-II- (extraversion- agreeableness-) and labelled as 'unsociable'. The AB5C facets provide both an external structure (derived from the participants' ratings from questionnaires) and an internal structure that refers to the strict semantic relationships of these facets (Hofstee, De Raad, & Goldberg, 1992).

In a clarification study on the FFM with the help of the AB5C model, Johnson (1994) studied the correlations between each personality facet and the two strongest correlating overlying factors. Earlier, Hofstee et al. (1992) introduced a lexically valid thesaurus of both poles of each personality facet that correlated strongest to its corresponding AB5C bipolar facet. Johnson (1994) varimax-rotated the factor loadings of the different combinations of two of the five factors behind the facets of the AB5C model. With the exception of the bipolar facets IV+III+ ('depression') and V+III- ('fantasy'), both studies came to the same conclusions, which resulted in a set of 24 unique combinations of work-related synonyms and their corresponding antonyms. Table 2.1 presents these earlier similarities between the five factor personality facets and the bipolar AB5C facets, including its lexical thesaurus.

Table 2.1

Similarities between the five factor model (FFM) and the bipolar AB5C facets, including its lexical thesaurus

FFM (Costa and McCrae, 1992)	AB5C bipolar facets (Johnson, 1994)		AB5C lexical thesaurus (Hofstee et al., 1992)	
I. Extraversion	**-/- pole**	**+/+ pole**	**-/- pole**	**+/+ pole**
1. Warmth	I- II-	I+ II+	Unsociable	Sociable
2. Gregariousness	I- IV-	I+ IV+	Cowardly	Courageous
3. Assertiveness	*I- III-*	*I+ III+*	Uncompetitive	Competitive
4. Activity	*I- III-*	*I+ III+*		
5. Excitement seeking	I- II+	I+ II-	Submissive	Dominant
6. Positive emotion	I- I-	I+ I+	Silent	Talkative
II. Agreeableness	**-/- pole**	**+/+ pole**	**-/- pole**	**+/+ pole**
1. Trust	II- IV-	II+ IV+	Selfish	Generous
2. Straightforwardness	II- III-	II+ III+	Inconsiderate	Considerate
3. Altruism	*II- I-*	*II+ I+*	Unfriendly	Friendly
4. Compliance	II- II-	II+ II+	Unsympathetic	Sympathetic
5. Modesty	II- IV+	II+ IV-	Unaffectionate	Affectionate
6. Tender mindedness	*II- I-*	*II+ I+*		
III. Conscientiousness	**-/- pole**	**+/+ pole**	**-/- pole**	**+/+ pole**
1. Competence	*III- IV-*	*III+ IV+*	Inconsistent	Consistent
2. Order	III- V+	III+ V-	Unconventional	Conventional
3. Dutifulness	III- II-	III+ II+	Unreliable	Reliable
4. Achievement striving	III- I-	III+ I+	Unambitious	Ambitious
5. Self-discipline	*III- IV-*	*III+ IV+*		
6. Deliberation	III- I+	III+ I-	Reckless	Cautious
IV. Neuroticism	**-/- pole**	**+/+ pole**	**-/- pole**	**+/+ pole**
1. Anxiety	*IV- IV-*	*IV+ IV+*	Unenvious	Jealous
2. Angry hostility	IV- II-	IV+ II+	Patient	Irritable
3. Depression	IV- III-	IV+ III+	-	-
4. Self-consciousness	*IV- IV-*	*IV+ IV+*		
5. Impulsiveness	IV- I+	IV+ I-	Unexcitable	Excitable
6. Vulnerability	IV- III-	IV+ III+		
V. Openness	**-/- pole**	**+/+ pole**	**-/- pole**	**+/+ pole**
1. Fantasy	*V- III+*	*V+ III-*	-	-
2. Aesthetics	V- V-	V+ V+	Uncreative	Creative
3. Feelings	V- I+	V+ I-	Unscrupulous	Introspective
4. Actions	V- I-	V+ I+	Uninquisitive	Inquisitive
5. Ideas	V- IV-	V+ IV+	-	Intellectual
6. Values	*V- III+*	*V+ III-*		

Since the early 1990s, different studies researched the robustness of the AB5C model and its application. A central question in these studies is how personality inventories – built on applications of the AB5C model on a facet level prior to a factor level – represent personality structure for the purposes of assessment in organisations, and how the scales of different inventories converge and diverge (Ones & Anderson, 2003; Hough & Johnson, 2013). The studies support the prominence of using narrower personality variables than the five factor personality factors in understanding the relations of traits and work-relevant criteria. This was confirmed by research conducted by Roberts, Chernyshenko, Stark, and Goldberg (2005) and Timmermann (2006), which both provided evidence that facets predict work-relevant criteria beyond their broader higher-order factors. Subsequently, Woods and Anderson (2016) found that the AB5C model represents a common framework to examine different work-related models.These prior studies support the assumption that the relationship between organisational effectiveness (operationalised in the CVLM) and personality facets (semantically operationalised in the bipolar AB5C facets), can be elaborated on by using lexical-semantic analysis.

2.2.7. The Lexical-Semantic Association Between Organisational Effectiveness and Personality Facets

So far, this study described an operationalisation of the concept of organisational effectiveness and the concept of personality facets. From a lexical-semantic perspective, both concepts are derived from their own text corpuses, which are defined as large and structured sets of texts within a specific language territory (Moon, 2009). Since organisational effectiveness and personality facets can be explained by these text corpuses, the current research examines a possible lexical-semantic relationship between (1) the four models of the CVLM and (2) personality on a facet level that is built on the bipolar AB5C model's facets, including its lexical thesaurus.

Lexical semantics address a language's lexicon, or the collection of words in a language (Murphy, 2003). The units of analysis are lexical items that include words, sub-words, and sub-units such as affixes and compound words and phrases. Lexical items are involved in regular patterns of association with one another and jointly make up the catalogue of words in a language: the lexicon (Murphy, 2003).

A set of words that can be grouped semantically (because they refer to a specific subject) is called a semantic field. The relationships between semantic fields is called a semantic network, which may be thought of as a combination of a dictionary and a thesaurus. In this way, a semantic network is a visualisation of the lexical description of a specific phenomenon that is elaborated on in corresponding semantic fields and situated within a semantic context. For example, dog, cat, and rabbit form a semantic field of pets, whereas lion, elephant, and tiger form a semantic field of wild animals. Together, these two semantic fields form a semantic network of animals (Jackson & Zé Amvela, 2000). One characteristic of a semantic field is that the specific words in the field are not necessarily synonymous or antonymous but are all used to talk about the same general phenomenon and its opposite. From this perspective, the meaning of a word partly depends on its relation to other words in the same conceptual area (Brinton, 2000; Mihalicek & Wilson, 2015).

The most common lexical-semantic relations within a semantic field are synonymy (where A denotes the same as B) and antonymy (where A denotes the opposite of B). A set of the synonym and antonym of a specific phenomenon is called a synset of that semantic field. Other types of relationships are found in hyponymy, hypernymy, meronymy and holonymy, in which:

(1) *hyponymy* means that A is subordinate to B, and A is a kind of B. For example: red, white, blue are hyponyms of colour;
(2) *hypernymy* is a relationship where A is superordinate to B: parent is a hypernym of mother and father;
(3) *meronymy* can be found between synsets, where A is a part of B (B has A as part of itself): monarch and crown are meronyms; and
(4) *holonyny* means that B is a part of A (A has B as part of itself), for example: body is a holonym of arm, leg and heart.

Whereas the field of lexical semantics focusses on the meanings of individual words, the field of compositional semantics looks at the meanings of sentences and longer utterances. One way of presenting compositional semantic relationships is through entailment, which is a relation between sentence meanings that may be defined as follows:

sentence A entails sentence B (A ||- B) if and only if whenever A is true, B is also true. For example: 'John wears a red sweater' ||- 'John wears a sweater'.

The four models of the CVLM are treated as four separate semantic fields, and the personality facets, built on the bipolar AB5C facets, are treated as separate synsets. To make the relationships applicable for the purpose of assessment in organisations, the bipolar AB5C facets are translated into synonyms and their antonyms, which together will describe a person's nature from a non-normative, work-related context. This means that both poles of the facets are formulated in a neutral manner. In many personality models, when a person has a high score on a certain characteristic, it is described positively (for example sociable), but when someone doesn't have that characteristic it is described in a negative way (unsociable). To do justice to the uniqueness of every employee, it is important to use judgement-free labels. Moreover, for an organisation to achieve its goals, it is sometimes desirable that a person has a low score on a certain characteristic.

2.3. Methodology

2.3.1. Procedures

This chapter studies the lexical-semantic relationship between organisational effectiveness and personality facets. To test this, the study works with two automated online text corpuses.

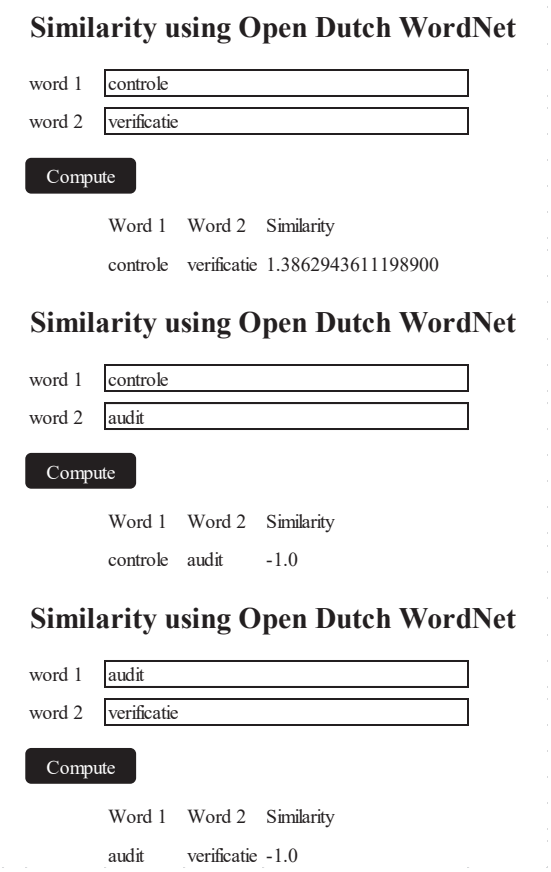
First, for the interpretation of organisational effectiveness, the English WordNet (Fellbaum, 2005; Davies & Fuchs, 2015) and its Dutch equivalent, the Open Dutch WordNet (Vossen, Bloksma, & Boersma, 1999; Postma, van Miltenburg, Segers, Schoen, & Vossen, 2016) are used. The English WordNet is a lexical database that groups words together based on their meaning. It contains sets of synonyms called synsets, it provides short, general definitions, and it records the various semantic relations between these synonym sets. The Open Dutch WordNet is a Dutch version of the semantic database that combines the same structure and content as the English WordNet.

For example, the semantic field ‘control’ of organisational effectiveness is built on semantic relationships between key terms of the definition of the check phase of the PDCA-cycle, defined as ‘verification of changes’ and the internal process model of the CVF, defined as ‘working on control’. The Open Dutch WordNet is used to test the average lexical-semantic distance between these key terms. This distance is defined as the number of lexical steps required to relate the meaning and longer utterance of the content and contribution side per semantic field, which is noted as (*k*) and calculated as μ_k.

In the illustration above, the key terms are ‘control’ for internal process, and ‘verification’ for check. The Open Dutch WordNet shows that one extra key term, ‘audit’, is needed to build the strongest lexical-semantic relationship between the two models of the semantic field ‘control’ (see Figure 2.4).

Figure 2.4

An example of the Open Dutch WordNet



Second, the text corpus to lexically describe personality on a facet level, is found in the Dutch 'Idioticon of Personality' (De Raad & Doddema-Winsemius, 2006). This idioticon is a lexical matrix derived from the 1,203 trait terms of Brokken (1978), well known as the main resource for both the AB5C model (Hofstee & De Raad, 1991) and the International Personality Item Pool (IPIP; Goldberg, 1990), which is a public domain collection of personality measures. Within the Dutch Idioticon of Personality, the trait terms are used as a vocabulary to describe both poles of each of the five factor personality facets in characteristics and their antonyms, which together describe a person's nature.

The assumed relationship between organisational effectiveness and personality facets is examined by linking the Dutch non-normative and work-related terms (representing the synonyms and antonyms of the bipolar AB5C facets of the five factor personality facets) to the four models of the CVLM. The quality of these relationships is determined by path similarity, known as the lexical distance between the two models. For example, the Dutch translation of the work-related term 'considerate' of the five factor facet II.2 'straightforwardness' is fijngevoelig, whereas the antonym of considerate (inconsiderate) may be translated as uitgesproken. This synonym and its antonym are lexically related to the meaning and longer utterance of the central activity 'control' of the CVLM. The semantic field 'control' of organisational effectiveness is the elaboration of both the check phase of the PDCA cycle (the verification of whether the changes have resulted in the desired improvements) and the internal process model of the CVF (in which stability and control are worked on through information management and coordination).

This way of determining the lexical relationship between organisational effectiveness and personality facets is assumed to further clarify the indicators behind the organisational success of modern designed organisations.

2.3.2. Analyses

A four-step procedure of subsequent lexical-semantic analyses was conducted to test the different levels of the assumed lexical-semantic relationships between organisational effectiveness and personality facets.

The first analysis studies organisational effectiveness as a semantic network that consists of four separate semantic fields. Each of the semantic fields represents one of the four models of the CVLM. Conducting an analysis of the compositional entailment

relationship between the underlying combination of the four steps of the PDCA cycle and the corresponding four models of the CVF, results in a semantic network of the construct 'organisational effectiveness'. The quality of this network is presented as the average lexical-semantic distance within each of the four semantic fields.

The second analysis studies the translations of the bipolar AB5C facets (Hofstee et al., 1992; Johnson, 1994) of the five factor personality facets into their Dutch non-normative and work-related synonyms and antonyms, which are derived from the Dutch Idioticon of Personality (De Raad & Doddema-Winsemius, 2006). The lexical distance between the initial AB5C facet and its corresponding Dutch term is then reported as the number of lexical steps necessary to reach the final Dutch interpretation. This results in a synset for each of the five factor personality facets.

The third analysis studies the compositional entailment relationship between the four semantic fields of organisational effectiveness and the synonym-antonym synsets, which are derived from the bipolar AB5C facets. This results in a semantic network that consists of four semantic fields, each representing the lexical-semantic relationship between one of the four semantic fields of organisational effectiveness and that field's corresponding synsets.

The fourth analysis tests the quality of the lexical-semantic distance between the four semantic fields of organisational effectiveness and the field's corresponding synsets of personality facets. Therefore the average lexical-semantic distances within each of the four semantic fields, noted as a, complemented with the average lexical-semantic distances between the semantic field and the field's synsets, noted as b, are presented in terms of path similarity (Meng, Huang, & Gu, 2003), calculated as $1 / ((a + b) + 1)$ and noted as *PS*. The fourth analysis results in a quantification of the quality of the lexical-semantic relationship between organisational effectiveness and personality facets, which differs from 0.01 (least identical) to 0.50 (most identical).

2.4. Results

Table 2.2 is a visualisation of the semantic network of organisational effectiveness. This semantic network contains the integration of the content and contribution sides of organisational effectiveness. The content side is found in the four steps of the PDCA cycle: plan – do – check – act (Deming, 1986). The contribution side is found in the four models of the CVF: open systems, rational goal, internal process, and human relations (Quinn & Rohrbaugh, 1983). Jointly, the two sides result in the four models of the CVLM: create – compete – control – collaborate (Cameron et al., 2014), which form four individual semantic fields of the semantic network organisational effectiveness.

2.4.1. Analysis 1

For each of the four semantic fields, Table 2.3 presents the compositional entailment relationships between the content and contribution sides of the organisational effectiveness semantic network. The lexical-semantic analysis was performed by linking the keyword of the definition of the content side to the matching sense of the contribution side of each semantic field. The keyword used is that specific term without which the definition no longer covers the meaning of the overlapping semantic field. For example, the contribution side ‘open systems’ (Cameron & Quinn, 2011) of the semantic network ‘create’ (Cameron et al., 2014) is concerned with the keyword ‘growth’ that occurs through ‘improvement’, which we can see as the matching sense of the content side ‘plan’ (Deming, 1986). Together, these two linking keywords become the lexical-semantic operationalisation of the definition ‘doing new things’ of the semantic field ‘create’. The lexical-semantic relationships are derived from the English WordNet (Fellbaum, 2005; Davies & Fuchs, 2015) and are translated into their Dutch equivalents using the Open Dutch WordNet (Vossen et al., 1999; Postma et al., 2016). An entailment is represented as ||-, a synonym is symbolised as =, and a hypernym is noted as >>.

Table 2.3 also shows the average lexical-semantic distance between the meaning and longer utterances of the content and contribution side per semantic field. The distance between the semantic field and its content side is counted as the number of their mutual lexical-semantic relationships. Then the distance between the semantic field and its contribution side is counted in the same way. The average of both numbers is seen as the average lexical-semantic distance between the content and contribution side of that

peculiar semantic field. For example, the number of lexical steps between the semantic field ‘create’ and the key term ‘improvement’ of its content side ‘plan’ is two (2). The number of lexical steps between the semantic field ‘create’ and the key term ‘growth’ of its contribution side ‘open systems’ is one (1). On average, the lexical-semantic distance between the content and contribution side of the semantic field ‘create’ is 1.5, noted as μcreate = (1 + 2) / 2 = 1.5.

2.4.2. Analysis 2

Table 2.4 presents a review of the elaboration of the bipolar AB5C facets (Hofstee et al., 1992; Johnson, 1994) of each of the five factor personality facets into their Dutch non-normative and work-related synonyms and antonyms, derived from the Dutch Idioticon of Personality (De Raad & Doddema-Winsemius, 2006). Whereas the Dutch terms can be experienced as condemnatory in a working context, they have been altered into non-normative formulated alternatives. The lexical-semantic analysis resulted in 24 different synsets of Dutch personality facets. The table presents the semantic technique that was used for both poles of each synset. A synonym or antonym relationship is presented as =, a hyponymy or hypernymy relationship is visualised as ||=, and a meronymy or holonymy relationship is noted as >>. The lexical distance between the initial AB5C facet and its corresponding Dutch term is also reported as the number of lexical steps necessary to reach the final Dutch interpretation and is noted as (*k*). For example, the AB5C plus pole ‘courageous’ can be converted into ‘high-spirited’ (levenslustig) via two extra labels, ‘brave’ (moedig) and ‘dynamic’ (energiek) by using a synonym relationship, noted as = (3). The non-normative and work-related antonym of ‘high-spirited’ (levenslustig) is ‘shy’(teruggetrokken), which was found via a two-step synonym relationship, noted as = (2).

Table 2.2

The semantic network of organisational effectiveness

semantic field **CREATE**	**PLAN**: identifying opportunities and ways for improvement ⇕ **OPEN SYSTEMS**: working on growth, new resources and support by maintaining flexibility and availability
semantic field **COMPETE**	**DO**: the actions needed to implement the plan ⇕ **RATIONAL GOAL**: working on productivity and efficiency through goal setting and planning
semantic field **CONTROL**	**CHECK**: the verification whether the changes resulted in the desired improvements ⇕ **INTERNAL PROCESS**: working on stability and control through information management and coordination
semantic field **COLLABORATE**	**ACT**: taking actions in response to the effects observed ⇕ **HUMAN RELATIONS**: working on the development of human resources by collaborating

Table 2.3

Semantic relationships within the semantic fields of organisational effectiveness

Semantic field: CREATE

PLAN: [identifying opportunities and ways for improvement] ||- **OPEN SYSTEMS**: [way of working on growth]

CREATE >> [(1) growth (groei) = [(2) improvement (verbetering / vooruitgang)]

μcreate = (1 + 2) / 2 = 1.5

Semantic field: COMPETE

DO: [implementing a plan] ||- **RATIONAL GOAL**: [way of goal setting]

COMPETE >> [(1) goal, purpose, aim (doelstelling)] = [(2) preparation (voornemen)] = [(3) planning (planning)]

μcompete = (1 + 2 + 3) / 3 = 2

Semantic field: CONTROL

CHECK: [verification of changes] ||- **INTERNAL PROCESS**: [way of working on control]

CHECK = [(1) control (controle)] = [(2) audit (audit)] = [(3) verification (verificatie)]

μcontrol = (1 + 2 + 3) / 3 = 2

Semantic field: COLLABORATE

ACT: [taking actions] ||- **HUMAN RELATIONS**: [way of collaborating]

COLLABORATE = [(1) collaboration (samenwerking)] = [(2) human action (menselijke handeling) = [(3) act (handelen)]

μcollaborate = (1 + 2 + 3) / 3 = 2

Table 2.4

The Dutch non-normative and work-related synsets, including the semantic technique used and lexical distance (LD)

AB5C ++ pole	Dutch non-normative work related synonym			L.D.	Dutch non-normative work related antonym			L.D.
Sociable	Friendly (vriendelijk)	Forthcoming (tegemoetkomend)	**Approachable (toegankelijk)**	= (3)	Impervious (ontoegankelijk)	Repulsive (afstotend)	**Stiff (stroef)**	= (3)
Courageous	Brave (moedig)	Dynamic (energiek)	**High-spirited (levenslustig)**	= (3)	Quiet (stil)	- -	**Shy (teruggetrokken)**	= (2)
Competitive	Competitive (competitief)	Intensive (intensief)	**Active (bedrijvig)**	||= (3)	Motionless (bewegingloos)	- -	**Inert (inert)**	= (2)
Dominant	Dominant (dominerend)	Compulsion (dwang)	**Lively (druk)**	||= (3)	- -	- -	**Calm (rustig)**	= (1)
Talkative	Talkative (praatzuchtig)	- -	**Communicative (mededeelzaam)**	= (2)	Close-lipped (gesloten)	- -	**Reticent (zwijgzaam)**	= (2)
Generous	Noble (edelmoedig)	Chivalrous (galant)	**Tactful (tactvol)**	||= (3)	Passionate (hartstochtelijk)	- -	**Fanatical (fanatiek)**	= (2)
Considerate	Thoughtful (attent)	Attentive (aandachtig)	**Sensitive (fijngevoelig)**	||= (3)	Unmistakble (ondubbelzinnig)	- -	**Uncompromising (uitgesproken)**	= (2)
Friendly	Friendly (vriendelijk)	Sympathetic (welwillend)	**Cooperative (coöperatief)**	= (3)	Competing (wedijverend)	- -	**Competitive (competitief)**	= (2)
Sympathetic	Willing (genegen)	- -	**Accomodating (inschikkelijk)**	= (2)	Loath (ongenegen)	Unruly (weerspannig)	**Persistent (vasthoudend)**	= (3)
Affectionate	Warm-hearted (warm)	Favourable (welwillend)	**Indulgent (toegevend)**	= (3)	Stubborn (weerbarstig)	Contrary (balorig)	**Demanding (veeleisend)**	= (3)
Consistent	Consistent (consistent)	- -	**Methodical (systematisch)**	= (2)	Unsystematic (onsystematisch)	- -	**Disorganised (ongeordend)**	= (2)
Conventional	Conventional (conventioneel)	Prevailing (gangbaar)	**Disciplined (gedisciplineerd)**	||= (3)	Disorderly (onordelijk)	- -	**Improvised (geïmproviseerd)**	||= (2)
Reliable	Reliable (betrouwbaar)	Thoroughly (deugdelijk)	**Attentive (aandachtig)**	||= (3)	Inattentive (onaandachtig)	Routine (routinematig)	**As usual (gewoontegetrouw)**	||= (3)
Ambitious	Ambitious (ambitieus)	- -	**Diligent (ijverig)**	= (2)	Idle (lui)	- -	**Dosed (gedoseerd)**	||= (2)
Cautious	Cautious (behoedzaam)	- -	**Circumspect (bedachtzaam)**	= (2)	Thoughtless (onbedachtzaam)	Reckless (roekeloos)	**Impulsively (spontaan)**	||= (3)
Jealous	Wary (waakzaam)	Beware (op zijn hoede)	**Hesistant (weifelachtig)**	||= (3)	Decisive (besluitvaardig)	- -	**Self-assured (zelfverzekerd)**	||= (2)
Irritable	- -	- -	**Touchy (lichtgeraakt)**	= (1)	Poised (beheerst)	- -	**Composed (kalm)**	= (2)
Depression	Depressive (depressief)	Unstable (onstandvastig)	**Fickle (wispelturig)**	||= (3)	Unvarying (onveranderlijk)	Firm (stabiel)	**Evenly (evenwichtig)**	= (3)
Excitable	Touchy (prikkelbaar)	Sensible (gevoelig)	**Intuitive (intuïtief)**	>> (3)	Rational (rationeel)	- -	**Well-considered (doordacht)**	= (2)
Fantasy	Innovative (oorspronkelijk)	Authentic (authentiek)	**Unconventional (vrijgevochten)**	>> (3)	Required (voorgeschreven)	Formal (formeel)	**Conventional (conventioneel)**	>> (3)
Creative	Artistic (kunstzinnig)	Contemplative (bespiegelend)	**Reflective (reflectief)**	||= (3)	Observing (constaterend)	Perceiving (waarnemend)	**Perceptively (perceptief)**	||= (3)
Introspective	Introspective (introspectief)	- -	**Contemplative (beschouwend)**	= (2)	Conservative (behoudend)	- -	**Reactionary (reactionair)**	>> (2)
Inquisitive	Curious (nieuwsgierig)	Investigative (onderzoekend)	**Original (origineel)**	>> (3)	Stereotypical (stereotiep)	- -	**Traditional (traditioneel)**	= (2)
Intellectual	Intellectual (intellectueel)	Intelligent (intelligent)	**Ingenious (vindingrijk)**	= (3)	Dependent (afhankelijk)	Subservient (dienstbaar)	**Docile (volgzaam)**	= (3)

2.4.3. Analysis 3

Table 2.5 presents the compositional entailment relationships between the four semantic fields of the semantic network of organisational effectiveness and the 24 synsets of personality facets. The relationships are built on (1) the meaning of the sentence and longer utterances of the four semantic fields of organisational effectiveness and (2) a set of the best-matching synsets of personality facets, which represent the human interpretation of that specific semantic field. For example, the semantic field 'create', which is the combination of 'plan' and 'open systems', is defined as 'working on growth through identifying opportunities and ways for improvement'. Elaborated in lexically matching human characteristics, this definition calls for personality facets such as 'original' (origineel), 'intuitive' (intuïtief), 'ingenious' (vindingrijk), 'unconventional' (vrijgevochten), 'contemplative' (beschouwend), and 'reflective' (reflectief). Similarly, personality facets such as 'methodical' (systematisch) and 'circumspect' (bedachtzaam) match lexically with the semantic field 'compete', defined as 'working on goal setting through implementing a plan'. This analysis then results in the lexical-semantic relationship between organisational effectiveness and personality facets.

2.4.4. Analysis 4

Table 2.6 presents the quality of the lexical-semantic relationships between the four semantic fields of the organisational effectiveness semantic network and the corresponding synsets of personality facets. The average lexical-semantic distances within each of the four semantic fields, noted as a, complemented with the average lexical-semantic distances between the semantic field and the field's synsets, noted as b, are presented by path similarities (Meng et al., 2003), calculated as $1 / ((a + b) + 1)$ and noted as PS. This fourth analysis results in a quantification of the quality of the lexical-semantic relationship between organisational effectiveness and personality facets, which differs from 0.01 (the least identical, where the lexical distance between the two terms is a row of 99 successive semantic relations) to 0.50 (the most identical, where the two terms are each other's direct lexical-semantic synonyms).

Table 2.5

Lexical-semantic relationships between organisational effectiveness and synsets of personality facets

Table 2.6

Path similarity of the relationship between the four semantic fields of the organisational effectiveness semantic network and the synsets of personality facets

Semantic field: CREATE

Create = To create (Creëren) = (2) Creative (Creatief)

Creative = (3) Original (**Origineel)** = Innovative (Oorspronkelijk) ||- (5) Intuitive (**Intuïtief)**
= (3) **Ingenious (Vindingrijk)** = Authentic (authentiek) = (6) Unconventional (**Vrijgevochten**)
||- Introspective (Introspectief) = (8) Contemplative (**Beschouwend)**
= Speculative (Bespiegelend) = (10) Reflective (**Reflectief)**

μ_{create} = 1.5
μ_{synset} = (3 + 5 + 3 + 6 + 8 + 10) / 6 = 5.8
$\mu_{subtotal}$ = (1.5 + 5.8) / 2 = 3.7
PS_{create} = 1 / (3.7 + 1) = 0.21

Semantic field: COMPETE

Compete = To rival (Wedijveren) ||- To aspire (Ambiëren) = (3) Ambitious (Ambitieus)

Ambitious = Hard working (Werkzaam) = Efficient (Efficiënt) = (6) Systematic (**Systematisch)**
= Efficatious (Hardwerkend) = (5) Active (**Bedrijvig)**
= (5) Lively (**Druk)**
= Efficacious (Doeltreffend) ||- (5) Circumspect (**Bedachtzaam)**
= Hardworking (Arbeidzaam) ||- Efficatious (Werkzaam) = Sympathetic (Welwillend)
= (7) Indulgent (**Toegevend)**
= Cooperative (Samenwerkend) ||- (7) Tactful (**Tactvol)**

$\mu_{compete}$ = 2.0
μ_{synset} = (6 + 5 + 5 + 5 + 7 + 7) / 6 = 5.8
$\mu_{subtotal}$ = (2.0 + 5.8) / 2 = 3.9
$PS_{compete}$ = 1 / (3.9 + 1) = 0.20

Semantic field: CONTROL

Control = To verify (Controleren) ||- (2) To signal (Signaleren) ||- (3) To caution (Waarschuwen)

To caution = To draw attention (Attenderen) ||- Exactness (Precisie) ||- (6) Sensitive (**Fijngevoelig)**
= (6) Attentive (Aandachtig)
||- Cautious (Behoedzaam) ||- (5) Hesistant (**Weifelachtig**)
Signaleren ||- To observe (Observeren) ||- Different aspects (Van meerdere kanten) ||- (6) Fickle (**Wispelturig)**
||- Woke (Alert zijn) ||- Focused (Gefocust zijn) = (6) Disciplined (**Gedisciplineerd)**
= Accurate (Scherp zijn) ||- (6) Touchy (**Lichtgeraakt)**

$\mu_{control}$ = 2.0
μ_{synset} = (6 + 6 + 5 + 6 + 6 + 6) / 6 = 5.8
$\mu_{subtotal}$ = (2.0 + 5.8) / 2 = 3.9
$PS_{control}$ = 1 / (3.9 + 1) = 0.20

Semantic field: COLLABORATE

Collaborate = (1) To cooperate (Samenwerken) = (2) To involve (Meewerken) = (3) To support (Helpen)

To involve ||- To accomodate (Inschikken) = (4) Accomodating (**Inschikkelijk)**
To support ||- Compliant (Meegaand) = (5) Approachable (**Toegankelijk)**
= To give attention (Aandacht geven) ||- To explain (Uitleg geven)
||- (6) Communicative (**Mededeelzaam)**

To cooperate = (2) Cooperative (**Coöperatief)**
= To clump (Samendoen) = To rouse (In actie komen) ||- Active (Actief) = Energetic (Energiek)
= (6) High-spirited (**Levenslustig)**
= (5) Diligent (**Ijverig)**

$\mu_{collaborate}$ = 2.0
μ_{synset} = (4 + 5 + 6 + 2 + 6 + 5) / 6 = 4.7
$\mu_{subtotal}$ = (2.0 + 4.7) / 2 = 3.4
$PS_{collaborate}$ = 1 / (3.4 + 1) = 0.23

Semantic network: The lexical-semantic relationship between organisational effectiveness and personality facets

$\mu_{semantic\ fields}$ = (1.5 + 2.0 + 2.0 + 2.0) / 4 = 1.9
$\mu_{synsets}$ = (5.8 + 5.8 + 5.8 + 4.7) / 4 = 5.5
$\mu_{overall}$ = (1.9 + 5.5) / 2 = 3.7
$PS_{overall}$ = 1 / (3.7 + 1) = 0.21

The $PS_{overall}$ = 0.21, which means that, on average, the lexical distance between organisational effectiveness and personality facets is 3.7.

2.5. Conclusion, Discussion and Recommendations

2.5.1. Conclusion

This study examined the relationship between organisational effectiveness and personality facets by using lexical-semantic analysis. Organisational effectiveness was elaborated upon into a semantic network consisting of four semantic fields: create – compete – control – collaborate. Each semantic field contained the integration of the specific content (plan – do – check – act) and corresponding contribution (open systems – rational goal – internal process – human relations) sides of organisational effectiveness. The first semantic field 'create' contained an entailment relationship with an average lexical distance of 1.5 between plan and open systems. The second semantic field 'compete' was built on an entailment relationship with an average lexical distance of 2.0 between do and rational goal. The semantic field 'control' comprised a synonym relationship with an average lexical distance of 2.0 between check and internal process. Finally, the semantic field 'collaborate' contained a synonym relationship with an average lexical distance of 2.0 between act and human relations. Because the average lexical distance consists of a maximum of two steps, the different models seem to linguistically describe the same subject, only using different perspectives.

Personality facets were elaborated into 24 synsets, consisting of Dutch non-normative and work-related synonyms and antonyms of the bipolar AB5C facets, derived from the Dutch Idioticon of Personality. Half (12) of the 24 synonyms came about through a

synonym relationship, nine of the 24 synonyms were effected through a hyponymy relationship, and three of the 24 synonyms were established through a meronomy relationship. The lexical distance between the initial AB5C facet and its corresponding Dutch term differed from 1 to 3. One of the synonyms was built on a lexical distance of 1, six were built on a lexical distance of 2, and 17 of the synonyms contained a lexical distance of 3 from their initial AB5C poles. For the lexical-semantic relationships between the synonyms and their antonyms, 16 of the 24 were built on a synonym relationship, six came about through a hyponymy relationship, and two were effected through a meronomy relationship. One of the relationships between the synonym and its antonym was built on a lexical distance of 1, 14 contained a lexical distance of 2, and the lexical distance between nine of the 24 synonyms and their antonyms was 3.

The overall lexical-semantic relationship between organisational effectiveness and personality facets was found in compositional entailment relationships between the four semantic fields of organisational effectiveness and six of the 24 synsets of personality facets per semantic field. The semantic field ‘create’ contained an entailment relationship with an average lexical distance of 1.5 between plan and open systems, while the average lexical distance between the semantic field ‘create’ and its synsets was found to be 5.8. Together, this situation resulted in a path similarity of 0.21, meaning that the semantic field ‘create’ on average showed a lexical distance of 3.7 between the organisational effectiveness side and the personality facet aspects.

The semantic field ‘create’ was related to a mixture of 12 facets of the personality factor openness, six facets of extraversion, four facets of neuroticism, and two facets of conscientiousness. ‘Create’ was not related to facets of the factor agreeableness. The path similarity of the semantic field ‘compete’ was found to be 0.20, representing an average lexical distance of 3.9 between its organisational and personality sides. ‘Compete’ was related to six facets of agreeableness, conscientiousness, neuroticism, and extraversion, but showed no relationships with openness.

The semantic field ‘control’ was built on a path similarity of 0.20, signifying an average mutual lexical distance of 3.9. It was related to eight facets of the two factors agreeableness and conscientiousness, to six facets of neuroticism, and to two facets of openness. No relationship was found between ‘control’ and facets of extraversion.

The fourth semantic field ‘collaborate’ was built on a path similarity of 0.23, representing a lexical distance of 3.4 between its organisational effectiveness and personality facet sides. The semantic field was related to 12 facets of the extraversion factor, eight facets of agreeableness, two facets of conscientiousness, and two facets of neuroticism. No relationship was found between ‘collaborate’ and the facets of openness.

Overall, the path similarity of the lexical-semantic relationship between the semantic network organisational effectiveness and personality facets was found to be 0.21, indicating that, on average, its mutual lexical distance was calculated as 3.7. In summary, this study has used lexical-semantics to further clarify the interplay between competing values and personality on a facet level, which helped to illuminate the human indicators behind the organisational effectiveness of modern designed organisations.

2.5.2. Discussion and Limitations of the Study

Previous empiric studies (Belasen & Frank, 2008, 2012; Larson et al., 2002; Caroll, 2015) found relationships between the open systems model of the CVF and the openness factor of the FFM, between the rational goal model and extraversion, between the internal process model and conscientiousness, and between the human relations model and agreeableness. One shared recommendation among these studies was to clarify the relationships on a personality level. The present study expanded this line of thinking to regard the competing values as four separate models of the construct organisational effectiveness, consisting of both content and contribution sides. The facets of the five personality factors of the FFM, were amplified in synsets of Dutch non-normative and work-related synonyms and antonyms of the bipolar AB5C facets. This approach resulted in detailed insights into the relationships between both sides of each personality facet and the four individual semantic fields of the organisational effectiveness semantic network. By doing so, this study has laid the foundation for future measurement of the fit between an employee’s individual characteristics and the different aspects of organisational effectiveness.

The present study was built on a heuristic method that was used to systematically study which personality facets were most strongly related to organisational effectiveness models in terms of mutual path similarities. It provides an algorithm that is applicable for the purpose of assessment in organisations. An individual’s contribution to organisational

effectiveness can now be measured by completing a five factor personality questionnaire. Since each synset is built on a combination of high or low scores on two of the factors, it is sufficient to use a short questionnaire that only measures the five factor dimensions, instead of using a detailed five factor inventory that measures every facet per factor. The optimal composition of a team of employees can be predicted on the basis of the strongest path similarity between the semantic network of organisational effectiveness and the synsets of non-normative, work-related personality facets.

Although the algorithm used in this study provides detailed insights into the interplay between competing values and personality facets, a few limitations do need to be taken into account. Methodically discovering the different path similarities through a type of heuristic analysis operates partly on the basis of interpreting different text corpuses. This situation means that certain other existing lexical-semantic relations between organisational effectiveness and personality could have been overlooked. Repeatedly executing the analysis through an expert group might help to increase the study's internal consistency reliability.

Whereas previous empiric studies have found relationships of one personality factor per competing value, the present study provides more diversity within these relationships. This multidimensionality could be affected by the composition of the models that were used. The four semantic fields were built on the lexical similarities of two underlying models, which together generate a wider range of leads for possible relationships with personality aspects, while the synsets were derived from the AB5C model, which studies each facet as a mixture of high and low scores in a combination of two higher-order factors. These multiple combinations produce extra potential points of lexical connection as well. The diversity that is found within the relationships could somehow be influenced by the complexity of the underlying models. For several of the semantic fields, however, the results of the present study show overlap with previous empiric studies, although in the current study this overlap was explained at the facet level.

The present study provides a framework to achieve a more detailed alignment of an individual's characteristics on a personality facet level, as well as to show the different aspects of organisational effectiveness. By doing so, the study appears to be relatively straightforward in terms of human attributes, since the two poles of facets of the various

factors interdependently contribute to the four semantic fields of organisational effectiveness. With respect to a potential multicollinearity effect as part of multiple regression analysis, the present study elucidates the domination of the strongest hierarchical correlation between factors and facets that influence the outcomes of linear models. This approach, which consists of a quantitative completion of a qualitative analysis, provides a more holistic view of the interplay of the organisation's effectiveness and the characteristics of its employees.

2.5.3. Recommendations and Implications

This study elaborated on the interplay between competing values and personality on a facet level, thus further clarified the human indicators behind the organisational effectiveness of modern designed organisations. A few empiric studies have been conducted on the relationships found in organisations (Belasen & Frank, 2008, 2012; Larson et al., 2002; Caroll, 2015), but these studies bear little resemblance to the present work. The previous studies were built on the CVF, whereas the present study uses the CVLM, which is a combination of the four steps of the PDCA cycle and the four models of the CVF. This format raises the question of whether the results can be compared on a one-on-one basis. The lexical-semantic relationships between the CVF and the synsets of personality facets should also be examined, which would help to determine if such a comparison would result in the same outcomes. If so, this would call for a simplification of the present associations that exist in the actual elaboration of the construct organisational effectiveness. In addition, any lexical-semantic relationship found should be empirically substantiated using a stepwise multiple regression analysis.

Another recommendation would be to build the lexical-semantic relationships on the same language. The present study uses a translation of the English bipolar AB5C facets for its Dutch equivalent, derived from the Dutch Idioticon of Personality. This translation increases the average lexical distance between the semantic fields and the synsets, which then influences the path similarity. Several of the relationships that were found, were entailment types, which because its use to clarify longer utterances, is generally considered a semantic relation with a strong kind of implication and assumption (Yule, 1996). This approach makes the present paper a qualitative study rather than an empiric study. To further diminish these limitations, the same study should be conducted using text mining techniques for a further objectification and optimisation of the models for

both describing organisational effectiveness and the corresponding synsets of personality facets (Belov, Veldkamp, & Kary, 2013). The heuristic method of analysis used in the present study lays the foundation for doing so.

Chapter 3

A Lexical-Semantic Analysis of the Relationship Between Organisational Climate and Work Values

Selecting workers on the basis of the fit between their intrinsic motivators and the purpose of an organisation has become a critical success factor in today's business environment. Earlier studies on this subject focussed on classifying both organisational climate and value typologies at a higher-order level. This study intends to clarify this alignment by studying the relationship between an elaborated framework for organisational climate and best-fitting individual motivators on a work values level. It researches the lexical-semantic relationship between organisational climate and culture types. Organisational climate is worked out into a semantic network of both the content and contribution sides of competing values; culture types are treated as 'synsets' of work values. In this study, the lexical-semantic distance between organisational climate and work values is minimised, which results in path similarity representing the quantitative completion of the lexical-semantic analysis. This chapter provides an algorithm that designates the optimal intrinsic alignment between one's values and beliefs in the purpose of an employer's organisation. With this, the study contributes to future assessments of the optimal alignment between employees' intrinsic motivators and the specific meanings and goals of an employer's organisation.

3.1. Introduction

3.1.1 Problem Situation and Purpose of the Study

As noted in the previous chapters, today's business environment is facing changes. More and more attention is paid to employees' characteristics, to make sure they get a position within the organisation that fits their personality and in which they can thrive. Another result of this transformation in business, is the increased focus on the fit between a person's motives and the values of the organisation he or she works for. Not only knowledge and experience are essential criteria for organisations in the selection and development of their employees, but also the drive to work for that specific company with those specific goals becomes more important. In this, we need to know what makes people and companies tick. Why do we do what we do?

From an organisational perspective, the question above is elaborated in the reason of existence of a company, its mission. This motivation is outlined in the culture of an organisation, which Schein (2010, p. 18) defines as "a pattern of shared basic assumptions learned by an organisation as it solved its problems of external adaptation and internal integration, which has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to these problems." In other words: organisational culture determines the values and behaviours an organisation requests from its (potential) employees.

Although the field of organisational culture provides insights into the contribution of employees' individual motives, or work values, to organisational success, it does not operationalise the fit between an organisation's principles and individual work values. As a result, it is difficult to precisely define and measure this match in practice. A research field that tries to close this gap is the field of organisational climate (Patterson et al., 2005).

Whereas organisational culture defines the values and behaviours an organisation requests from its employees, organisational climate focuses on employees' actual experiences and the attitudes or workstyles they see being rewarded and encouraged by the company (Ehrhart, Schneider, & Macey, 2014). An organisation's culture and climate often are at odds with each other, precisely because it is difficult to match a company's

core values with an individual's work values in advance. Research shows that organisations that do succeed to make this fit in the recruitment, selection and development of their employees, achieve a climate of well-being in which the staff experiences more meaningfulness and shows less procrastination, because they know what is expected of them and why (Aarons & Sawitzky, 2006; Uçanok, 2008; Bao, Dolan, & Tzafrir, 2012). However, until now, this seems to happen by chance, rather than skill and wisdom. In order to make a better and sustainable match, more insight is needed into how human values in a work context fit in with the purpose of an organisation.

To do this, organisational climate research offers two approaches: the focussed or strategic climate approach, also known as the cognitive schema approach (Kuenzi & Schminke, 2009), and the generic or molar climate approach, also known as the shared perception approach (Schneider & Reichers, 1983). The focussed or strategic climate approach considers the concept of climate as an individual perception and cognitive representation of the work environment (Kuenzi & Schminke, 2009). This line of research stems from a managerial approach to organisational climate, that aims to provide a framework for capturing peoples' activities and experiences and the climate they infer about what those experiences mean (Verquer, Beehr, & Wagner, 2003; Hoffman & Woehr, 2006; Gimenez-Espin, Jiménez-Jiménez, & Martínez-Costa, 2013).

The molar climate approach emphasises the importance of shared perceptions as underpinning the notion of organisational climate, thereby capturing the generic or overall sense of the experiences people have at work (Schneider & Reichers, 1983). This approach investigates the cohesion between specific employee attitudes and the culture of the organisation by studying the contribution of organisational climate to the organisation's culture (Markus, 2000; Payne, 2001).

With its purported positive effects on employee attitudes and behaviours, organisational climate is a prolific field of research (Verquer et al., 2003; Hoffman & Woehr, 2006). Organisational climate has been studied from different angles, including staffing and socialisation, job attitudes and performance, and leadership (Ostroff, Shin, & Kinicki, 2005; Dastmalchian et al., 2015; Steinke et al., 2015). Despite the abundant findings, the different methodological treatments and theoretical perspectives involved have made organisational climate research fragmented, leading to confusion about the nature of the

concept and making the relationship between organisational values and individual values difficult to ascertain (Bao et al., 2012).

Furthermore, the organisational and molar approaches for organisational climate research are more concerned with demonstrating consensus between an organisation's motives and those of its employees, than with conceptually elaborating on the constructs or elements beyond the shared meaning that characterises organisational climate (Ehrhart et al., 2014). Therefore, it is unclear how organisational climate (what do employees experience in practice?) is congruent with organisational culture (what does the organisation expect from its (future) employees?). The current study suggests that a detailed elaboration on which work values underlie the core values of the organisational culture, helps to explain the fit between an organisation and its employees and makes it possible to measure and improve this match with the aid of an assessment instrument. Because this study tries to link the individual work values to the purpose of the organisation, it focuses on organisational climate as a bridge between individual work values and organisational culture.

3.2. Theoretical Framework

3.2.1. Designing and Controlling Organisational Climate Using the IMAR Cycle

The first of the two areas of research on organisational climate, the focussed or strategic climate approach, is process-orientated and aims to provide a framework that captures and explains employees perceptions and cognitive representations of the work environment (Kuenzi & Schminke, 2009). The design of the framework is based on the same line of thinking that can be found in models for total quality management. These models make a connection between human contribution and the performance of the organisation, which is seen as a cycle that continuously repeats and improves itself. A well-known quality model is the European Foundation for Quality Management (EFQM) excellence model (Hendricks & Singhal, 1996; EFQM, 1999). This is a framework for management, based on the needs and function of the organisation. The interaction of the EFQM building blocks are described in an improvement cycle known as RADAR (for results – approaches – deploy – assess – refine) logic (Hendricks & Singhal, 1996; EFQM,

1999). RADAR was originally derived from the PDCA (plan – do – check – act) cycle (Deming, 1986) and proceeds as follows:

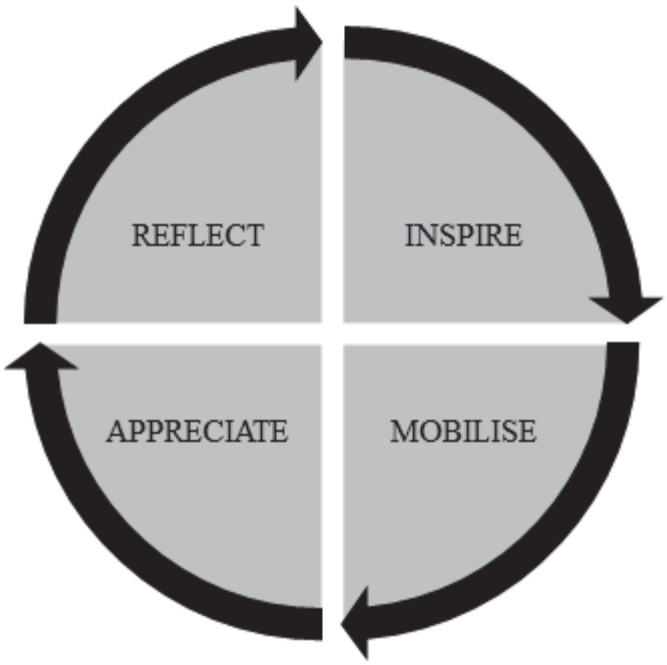
(1) determine the *results* that part of the strategy aims for;
(2) plan and develop a set of *approaches* to deliver the required results now and in the future;
(3) *deploy* the approaches in a systematic way to ensure implementation; and
(4) *assess* and *refine* the deployed approaches based on monitoring and analysis of the results and ongoing learning (EFQM, 1999; Sokovic, Pavletic, & Pipan, 2010).

For the Dutch market, EFQM has been used to develop the INK (Instituut Nederlandse Kwaliteit) model (INK, 2008). The RADAR logic of the EFQM model, is elaborated into the IMAR (for inspire – mobilise – appreciate – reflect) cycle (INK, 2008), which is a method for designing and controlling organisational climate from a 'level of excellence' perspective. Where the RADAR logic and PDCA cycle are functional and technical focussed, the IMAR cycle contains the human sociocultural aspects necessary for an organisation and its teams to function properly (Gimenez-Espin et al., 2013). In the present research, the elaboration of the PDCA cycle in human attitudes and behaviours, is seen as the content side of organisational climate. As presented in Figure 3.1, this content side is interpreted as follows:

(1) *inspire*, which is the act of stimulating the mind and generating new ideas;
(2) *mobilise*, or the act of deploying and developing the capabilities of all stakeholders in and around the organisation;
(3) *appreciate*, or the act of discussing with stakeholders what is really of value; and
(4) *reflect*, which is the act of discussing what matters, what will be possible or difficult to do, and what to do about anything that is decided on.

Figure 3.1

The content side of organisational climate



Whereas the IMAR cycle is a repeatable four-step management method for facilitating and stimulating the continuous improvement of human behaviour, it is not clear how this contributes to the consensus between the actual experienced organisational climate and the predefined organisational culture. An additional method is required to judge the impact of the organisational climate cycle to the organisational culture. The second field of organisational climate research, the molar climate approach, offers a starting point.

3.2.2. Judging Organisational Climate Using the Organisational Culture Assessment Instrument

The molar climate approach researches the effects of organisational climate. It focusses on the cohesion between specific employee attitudes and the culture of the organisation by studying the contribution of organisational climate to the organisation's culture (Markus, 2000; Payne, 2001). Ideally, organisational climate and culture are congruent in a way that employees' actual experiences and the attitudes or workstyles they see being appreciated by the company, are the same as the organisation's predefined principles and core values. To achieve this, a link between organisational climate and organisational

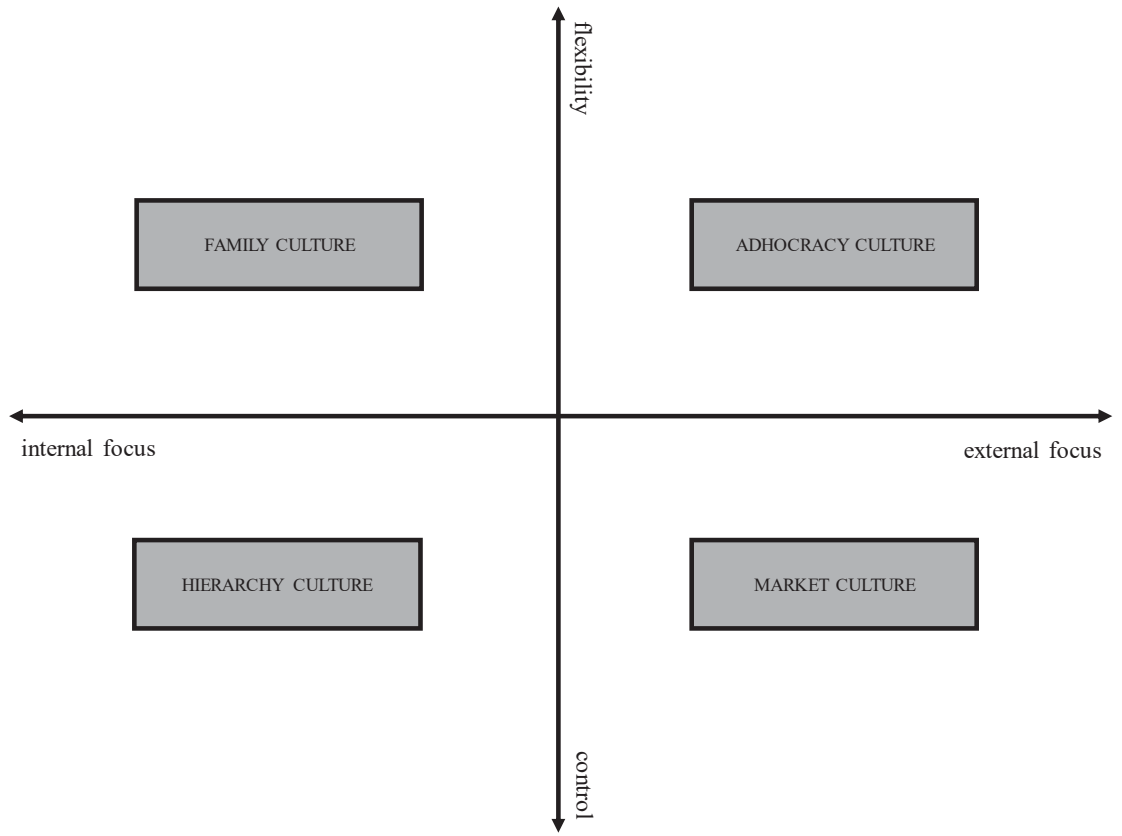
culture is necessary. This link can be found in the organisational culture assessment instrument, or OCAI (Cameron & Quinn, 2011). This quantitively based culture survey provides a framework for clarifying the underlying relationships between organisational climate and its effects on the performance of the organisation. The OCAI was derived from a follow-up study on the competing values framework, or CVF (Quinn & Rohrbaugh, 1983), in which Cameron and Quinn (2011) conducted research on organisational effectiveness and success.

The OCAI explains the cycle behind the interaction between the EFQM and INK building blocks in four culture types. Each gives a description of the attitudes and behaviour that dominate in that type. In this study, the OCAI is seen as an interpretation of the contribution side of organisational climate. Built on the same two dimensions of the CVF (internal/external and flexibility/control), the mutual combinations of these two dimensions result in four basic culture models that jointly affect the intended organisational effectiveness. As presented in Figure 3.2, the culture models consist of:

(1) *adhocracy culture*, a culture that is dynamic and entrepreneurial, in which people concentrate on doing things first;
(2) *market culture*, which is a results-oriented culture that focusses on getting the job done;
(3) *hierarchy culture*, where the culture is structured and controlled, with the intention of doing things right; and
(4) *family culture*, where the culture is characterised by mentoring and nurturing, with the aim of doing things together.

Figure 3.2

The contribution side of organisational climate



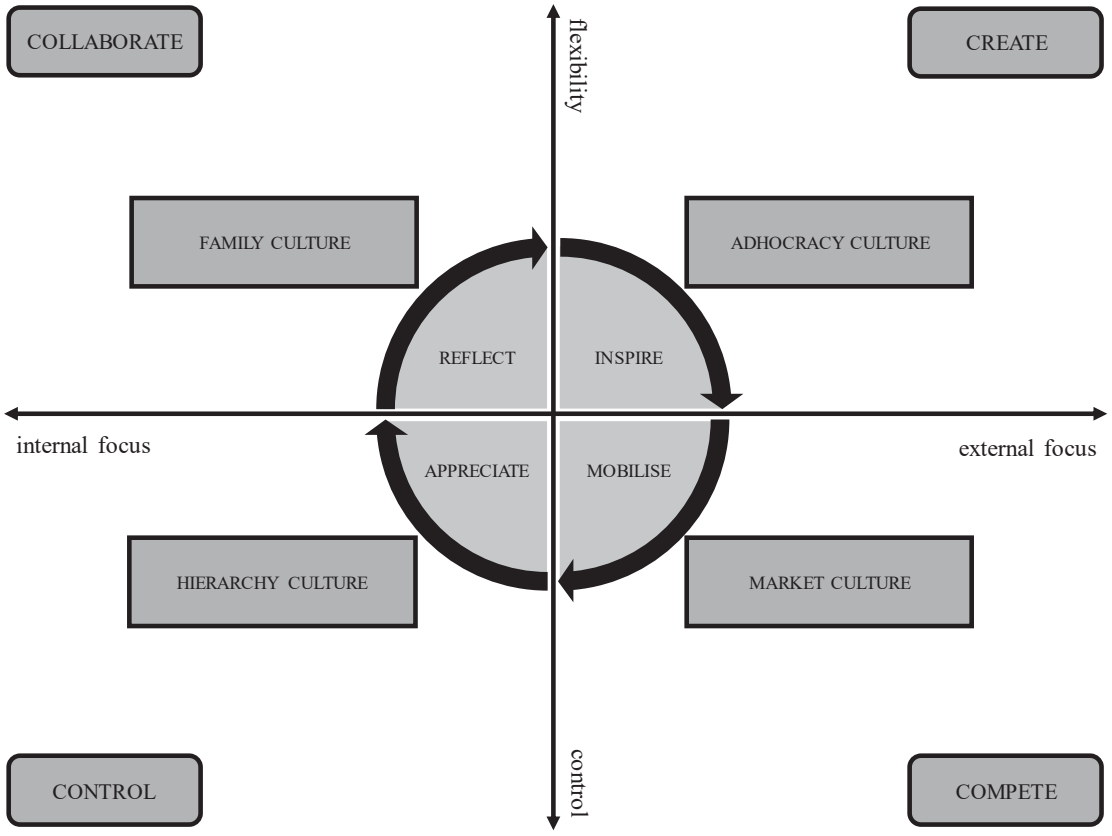
3.2.3. The Joint Approach: The Competing Values Leadership Model

Because organisational climate is built on individual and social foundations within a specific workplace context, a more comprehensive view of employees' value profiles and work-related consequences is needed (Ren & Hamann, 2015) to make organisational climate applicable for studying the climate's relationship with work values. Therefore, the four steps of both the IMAR cycle and the four models of the OCAI need to be expressed in four central activities that, jointly, will form a continuous cycle of human interpretation of the content and contribution side of organisational climate. This is found in the competing values leadership model (CVLM; Cameron, Quinn, & Degraff, 2014), which is a framework for understanding organisational climate outcomes that is applied to analyse an employee's impact on organisational culture. The CVLM expresses the combination of the IMAR and the OCAI in four verbs that represent the human attitude:

(1) *create*, which refers to 'doing new things' and is the junction of 'inspire' and the 'adhocracy' culture;
(2) *compete*, which refers to 'doing things now' and is the link between 'mobilise' and the 'market' culture;
(3) *control*, which refers to 'doing things right' and is the junction of 'appreciate' and the 'hierarchy' culture; and
(4) *collaborate*, which refers to 'doing things that last' and is the link between 'reflect' and the 'family' culture.

Figure 3.3

The content-contribution approach of organisational climate



As visualised in Figure 3.3, the integration of the four steps of the IMAR cycle and the four models of the OCAI into the four models of the CVLM results in one repeatable improvement and learning cycle that contains both the content and contribution sides of organisational climate. This makes the framework shown in Figure 3.3 a useful framework to study the relationship between organisational climate and work values on a detailed level.

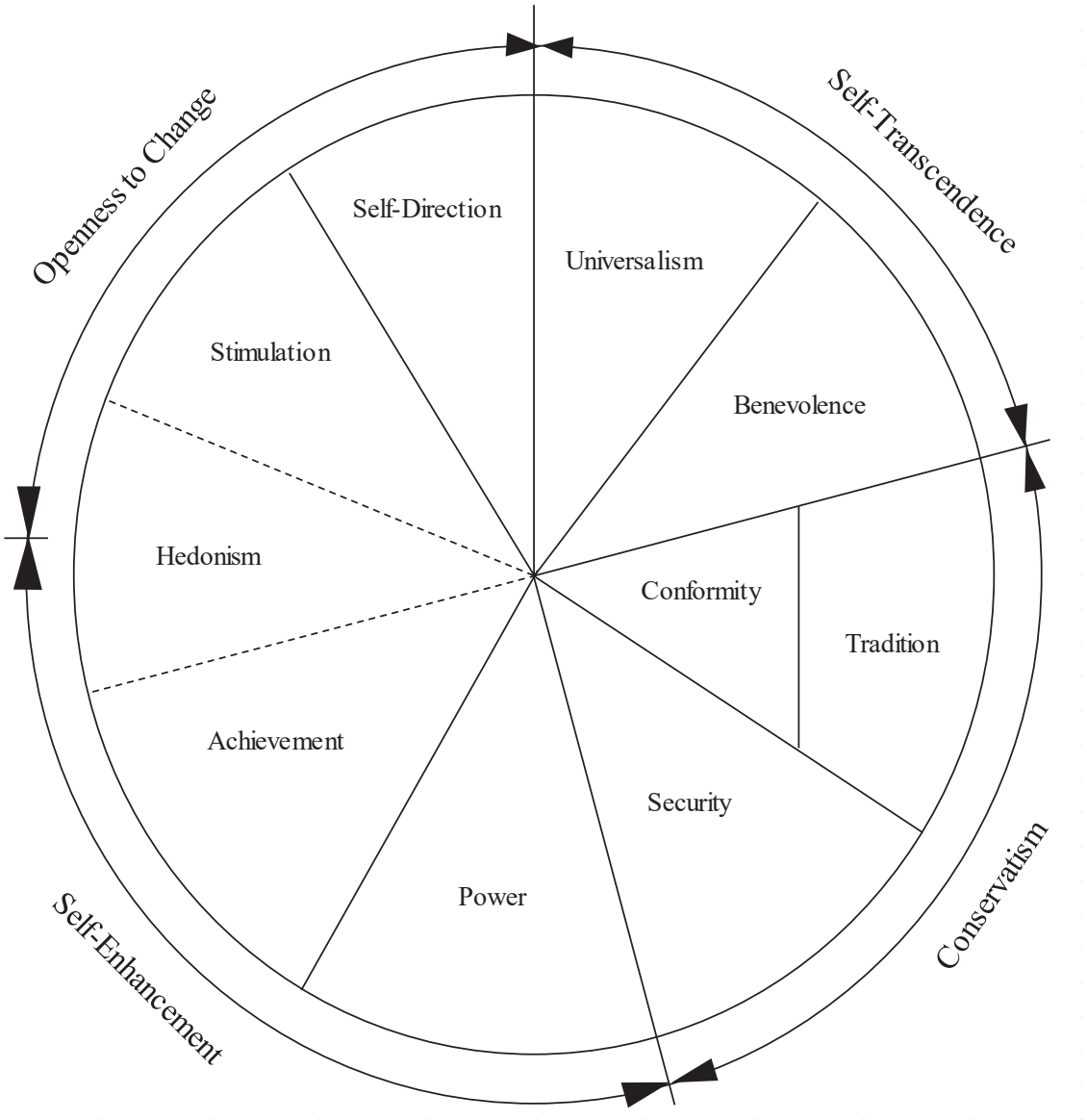
3.2.4. Work Values: The Universal Values Model

This study aims to align organisational climate and work values. Values are beliefs and motivations people have concerning what situations and actions are desirable. They underlie what we do and how we do it. A well-known model regarding values, is the universal values model (UVM), which was introduced by Schwartz in 1992. The UVM is built on the idea that values form a circular structure that reflects the motivations each value expresses. The model captures conflicts and compatibility among ten values. As presented in Figure 3.4, the ten values can be accommodated in four clusters, describing their central motivational goals:

(1) *openness to change*, which is defined as 'readiness for new experience' and consists of self-direction (creativity and freedom) and stimulation (exciting life);
(2) *self-enhancement*, which refers to 'focus on oneself' and is elaborated upon in achievement (success and ambition), hedonism (pleasure), and power (authority and wealth);
(3) *conservatism*, or 'resistance to change', which consists of tradition (humility and devoutness), security (social order), and conformity (obedience); and
(4) *self-transcendence*, which is defined as 'focus on others' and is made up of benevolence (helpfulness) and universalism (social).

Figure 3.4

The universal values model (Schwartz, 1992)



These ten values cover the distinct content categories found in earlier value theories, in value questionnaires from different cultures, and in religious and philosophical discussions on values (Schwartz, 2006). The UVM is often used in a work context, where the original values are adapted to work values.

In a meta-inventory of human values, Cheng and Fleischman (2010) found that the UVM could be further expanded in a three-level hierarchy that includes four first-level value

dimensions, ten second-level value types, and 56 third-level basic human values. The ten value types are visualised in a two-dimensional space in which one dimension is defined by a spectrum from conservatism to openness to change, and the other is defined by a spectrum from self-enhancement to self-transcendence.

In Ros, Schwartz, and Surkiss's (1999) correlational research involving the factor analysis of 999 responses to the Basic Values Survey (a shortened form of Schwartz [1992]) and the Work Value Survey, both of which used common work values, the authors found that the UVM factor 'openness to change' matched with intrinsic values, described as self-actualisation values; the UVM 'self-enhancement' factor matched with prestige or power values; the UVM factor 'conservatism' matched with extrinsic values such as security or material values; and the UVM 'self-transcendence' factor matched with social values, which the authors described as relational values.

Zytowski (2006) introduced the Super's work values inventory (SWVI), which consists of 14 individual work values based on the UVM and is operationalised as personal preferences for selected outcomes and rewards of working. Robinson and Betz's (2008) psychometric evaluation of the SWVI resulted in four theoretically consistent higher-order factors known as excitement, esteem, safety, and environment.

Daehlen (2008) differentiated work values in intrinsic values aimed towards personal development, and extrinsic values aimed towards altruism and monetary rewards. According to this classification, typical intrinsic values included interesting and challenging work, which were comparable with Schwartz's (1992) openness to change and self-enhancement factors. High income, job security, and helping others were typical extrinsic values, which were similar to the conservatism and self-transcendence factors.

Van Thiel (2008b) studied human drivers or motivators in a work-related context for the Dutch market, which resulted in a Dutch work values model, described as a validated Dutch translation of the UVM (Schwartz, 1992). The model consists of four clusters of work values that can be elaborated in 14 underlying work values:

(1) *independently profile (zelfstandig profiel)*, composed of 'variety' (afwisseling), 'independence' (autonomie), 'creativity' (creativiteit), and 'mental challenge' (zelfontwikkeling);

(2) *ambition profile (anbitie profile)*, consisting of 'supervision' (invloed), 'achievement' (prestaties), and 'prestige' (prestige);
(3) *conventional profile (conventioneel profiel)*, which consists of 'work environment' (arbeidsomstandigheden), 'lifestyle' (balans werk en privé), 'income' (financiële beloning), 'aesthetics and management' (structuur), and 'security' (zekerheid); and
(4) *people-oriented profile (mensgericht profiel),* consisting of 'altruism' (altruïsme) and 'co-workers' (relaties op het werk).

Table 3.1 shows a comparison of the similarities in the ordering of the four culture types in underlying work values of the above-mentioned studies. This chapter continues with a review of earlier empiric research on the relationship between organisational climate and work values.

3.2.5. Relationships Between Organisational Climate and Work Values

Although both the continuous improvement cycle's RADAR and the IMAR were derived from the core values component of the well-known EFQM model, no known research has been conducted on the direct relationship between the IMAR cycle and work values. However, previous studies on the relationship between EFQM and motivational or attitudinal characteristics have shown associations between the managerial components of the EFQM model and organisational success criteria such as performance, satisfaction, and loyalty (Nabitz, Klazinga, & Walburg, 2000; Vernero, Nabitz, Bragonzi, Rebelli, & Molinari, 2007; Savić, Dordević, Nikolić, Mihajlović, & Živkovi, 2014). This scenario suggests that the IMAR cycle itself, which was originally derived from the PDCA cycle, is particularly treated as a managerial model. This makes the IMAR cycle less appropriate for studying the cycle's direct relationship with work values.

Table 3.1

Similarities between the ordering of work values of Schwartz (1992), Ros et al. (1999), Zytowski (2006), Daehlen (2008), and Van Thiel (2008b)

UVM (Schwartz, 1992)	Ros et al. (1999)	SWVI (Zytowski, 2006)	Daehlen (2008)	Van Thiel (2008b)
Openness to Change	**Intrinsic values**	**Excitement**	**Intrinsic values**	**Autonomy type** (autonomietype)
Self-direction (creativity, freedom)	-	Creativity	Self-direction	Creativity (creativiteit)
-	-	Independence	-	Independence (autonomie)
-	-	Mental challenge	-	Mental challenge (zelfontwikkeling)
Stimulation (exciting life)	-	Variety	Stimulation	Variety (afwisseling)
Self-Enhancement	**Prestige values**	**Esteem**		**Ambition type** (ambitietype)
Achievement (success, ambition)	-	Achievement	Achievement	Achievement (prestaties)
Hedonism (pleasure)	-	Prestige	Hedonism	Prestige (prestige)
Power (authority, wealth)	-	Supervision	Power	Supervision (invloed)
Conservatism	**Extrinsic values**	**Safety**	**Extrinsic values**	**Balance type** (balanstype)
-	-	Aesthetics, Management	-	Aesthetics, Management (structuur)
-	-	Income	-	Income (financiële beloning)
Tradition (humility, devoutness)	-	Lifestyle	Tradition	Lifestyle (balans werk en privé)
Security (social order)	-	Security	Security	Security (zekerheid)
Conformity (obedience)	-	Work environment	Conformity	Work environment (arbeidsomstandigheden)
Self-Transcendence	**Social values**	**Environment**		**Relationship type** (relatietype)
Benevolence (helpfulness)	-	Altruism	Benevolence	Altruism (altruïsme)
Universalism (social justice, equality)	-	Co-workers	Universalism	Co-workers (relaties op het werk)

Earlier research did focus on the relationship between the OCAI and work values. In 2007, Burchell and Seale studied the connection between the four dimensions of the OCAI model and 24 shared values associated with modern business organisations derived from McDonald and Gandz's work (1992). The researchers found that a series of these values, such as cooperation and social equality, which are lexically similar to benevolence (helpfulness) and universalism (social) and can both be found in the UVM factor self-transcendence (focus on others) of Schwartz, appeared to correlate strongest to the clan or family culture of the OCAI. Values like obedience and orderliness, comparable to conformity (obedience) and security (social order) of the conservatism (resistance to change) factor of the UVM, correlated strongest with the hierarchy culture dimension of the OCAI. Finally, values such as assertiveness and initiative, comparable to achievement (success and ambition) and power (authority and wealth) of the self-enhancement (focus on oneself) factor of the UVM, correlated strongest with the market culture dimension of the OCAI.

Hartnell et al. (2011), in their analysis of the relationships between the OCAI and personal values, found detailed relationships between the four culture types and personal values. Adhocracy culture was related to growth, stimulation, variety, autonomy, and attention to detail, while market culture was linked to communication, competition, competence, and achievement. Hierarchy culture was associated with communication, routinisation, formalisation, and consistency, while family culture was related to attachment, affiliation, collaboration, trust, and support.

To summarise the similarities found in these earlier studies, a relationship appears to exist between the adhocracy culture and openness to change–related work values, between the market culture and self-enhancement-related work values, between the hierarchy culture and conservatism-related work values, and between the family culture and self-transcendence-related work values.

Remarkable of these previous researches, is that they mainly focus on the relationship between the four culture types of the OCAI and clusters of work values. However, a more comprehensive view of the value profiles of employees is required to explain work-related consequences (Ren & Hamann, 2015). Therefore, the objective of this study is to elaborate upon the relationship between organisational climate and work values.

A typical way of studying these correlations is to conduct a multiple regression analysis. However, the underlying work values of each of the culture type factors are strongly correlated, while regression analysis results in a linear model that assumes that there is little to no multicollinearity in the data. Another method is thus required to study the relationships on a work values level. Since the concepts of organisational climate and work values are defined textually, this paper studies the relationship from a lexical-semantic point of view. By looking at organisational climate as a broader construct than just the OCAI, it is possible to establish the relationship between organisational climate and work values at different levels within the organisational climate cycle: the focussed approach (content side) and the molar approach (contribution side of organisational climate).

The central question in this chapter is: **'How can the relationship between organisational climate and work values be elaborated upon by using lexical-semantic analysis?'** Providing clarity on the lexical relationship between organisational climate and work values may contribute to the success of organisations that align intrinsically motivated employees with their specific meanings and goals.

3.2.6. The Lexical-Semantic Association Between Organisational Climate and Work Values

So far, this chapter described an operationalisation of the concepts of organisational climate and of work values. From a lexical-semantic perspective, both concepts are derived from their own respective text corpuses, defined as a large and structured set of texts within a specific language territory (Moon, 2009).

Since both the concept of organisational climate and the concept of work values can be lexically explained from their own text corpuses, the current study intends to find (1) a lexical-semantic relationship between the four models of the CVLM (Cameron et al., 2014) as the junction of the IMAR cycle (EFQM, 1999; INK, 2008) and the OCAI (Cameron & Quinn, 2011), and (2) the similarities between the organisation of work values of the UVM in four higher-order clusters or culture types (Schwartz, 1992; Ros et al., 1999; Zytowski, 2006; Daehlen, 2008; Van Thiel, 2008b).

As explained earlier in this dissertation, there are different kind of lexical-semantic relations. The most typical are synonymy (where A means the same as B) and antonymy

(where A stands for the opposite of B), whereas a set of synonymies and their antonymies of a specific topic within that particular semantic field is defined as a synset of that semantic field. Other relationships are found in hyponymy (A is subservient to B), hypernymy (where A is superordinate to B), meronymy (A is part of B; B has A as a part of itself), and holonymy (B is part of A; A has B as a part of itself).

In addition to the area of lexical-semantics, which focusses on the meaning of separate words, the field of compositional semantics concentrates on the meanings of sentences and longer utterances. A common way of presenting these compositional semantic relationships is through entailment, which allows for visualising the relation between sentence meanings: for example, sentence A 'entails' B (i.e. A ||- B) if, whenever A is true, then B must also be true. Due to its use to clarify longer utterances, entailment is generally considered a semantic relation with a strong kind of implication and assumption (Yule, 1996).

To examine the lexical-semantic relationship between organisational climate and work values, a mixture of the above-mentioned techniques is conducted for the present study. In doing so, the four models of the CVLM – create, compete, control and collaborate - are treated as four separate semantic fields. To make the relationships applicable for the purpose of assessment in organisations, the four higher-order synsets of culture types are elaborated into individual work values, each derived from Schwartz's UVM.

3.3. Methodology

3.3.1. Procedures

In testing the lexical-semantic relationships between organisational climate and work values, this study uses two automated online text corpuses: the English WordNet (Fellbaum, 2005; Davies & Fuchs, 2015) and the Open Dutch WordNet (Vossen, Bloksma, & Boersma, 1999; Postma, Van Miltenburg, Segers, Schoen, & Vossen, 2016). The English WordNet is a lexical database that groups words together by joint meanings. It contains synsets, which include the words' short general definitions, and it records the various semantic relations between these synsets. The Open Dutch WordNet is a Dutch version of the English WordNet, using the same structure and content.

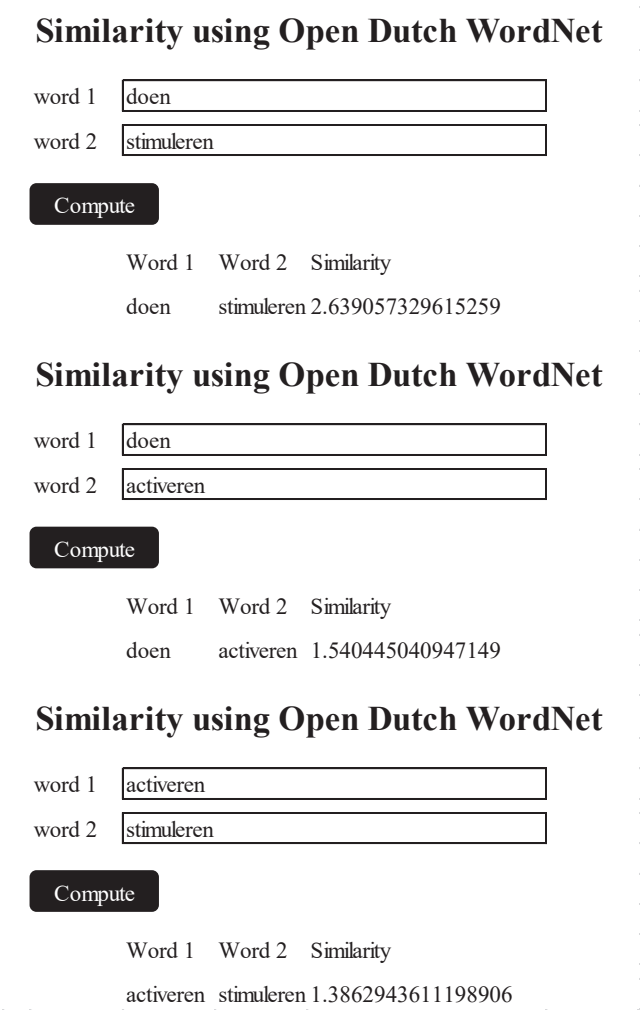
For example, the semantic field ‘create’ of organisational climate is built on semantic relationships between key terms of the definition of the inspire phase of the IMAR-cycle, defined as ‘stimulating the mind’ and the adhocracy culture model of the OCAI, defined as ‘way of doing things first’. The Open Dutch WordNet is used to test the average lexical-semantic distance between these key terms. The lexical-semantic distance in this paper is defined as the number of lexical steps necessary to relate the meaning and longer utterance of the content and contribution side per semantic field, noted as (k) and calculated as μk.

The key terms in this example are ‘doing things’ for adhocracy and ‘stimulating’ for inspire. Open Dutch WordNet shows that one extra key term ‘activate’ (activeren) is needed to build the strongest lexical semantic relationship between the two models of the semantic field ‘create’ (see Figure 3.5).

The assumed relationship between organisational climate and work values is studied by lexically semantically linking the four models of the CVLM to the ordering of work values of the UVM into four clusters or culture types. The strength of these relationships is determined by their path similarity, known as the lexical distance between the two models. For example, the work value ‘independence’ (autonomie) is lexically linked to the meaning and longer utterance of the semantic field ‘create’, defined as ‘doing new things’. ‘Create’ is the elaboration of both the inspire phase of the IMAR-cycle, or ‘the act of stimulating the mind and generating news ideas’, as well as the adhocracy culture of the OCAI, or ‘a culture that is dynamic and entrepreneurial, with a concentration on doing things first’. This method of unravelling the lexical relationship between organisational climate and work values is assumed contribute to the success of the process of aligning intrinsically motivated employees with the specific meaning and goals of the employers’ organisation.

Figure 3.5

An example of the Open Dutch Wordnet



3.3.2. Analyses

This study conducts a sequence of three subsequent lexical-semantic analyses to test the different levels of the lexical-semantic relationship between organisational climate and work values.

The first analysis studies the organisational climate semantic network, built on four separate semantic fields, each representing one of the four models of the CVLM. Analysing the compositional entailment relationship between the content side of organisational climate, known as the four steps of the IMAR cycle (INK, 2008), and the contribution side of organisational climate, found in the four corresponding models of the

OCAI (Cameron & Quinn, 2011), results in the semantic network of the organisational climate construct. The strength of the semantic network, defined as the number of lexical steps needed to relate the meaning and longer utterance of the content and contribution side per semantic field, noted as (*k*), is calculated as the average lexical-semantic distance within each of the four semantic fields and is noted as μ_k.

The second analysis studies the compositional entailment relationship between the four semantic fields of organisational climate and the corresponding synsets of work values, derived from the ordering of work values in higher-order clusters or culture types, as presented in Table 3.1. This analysis results in a semantic network that is made up of four semantic fields, each presenting the lexical-semantic relationship between one of the four semantic fields of organisational climate and the corresponding synset of work values.

The third analysis tests the strength of the lexical-semantic distance between the four semantic fields of organisational climate and the corresponding synsets of work values. This analysis calculates the lexical-semantic distance between the four semantic fields of organisational climate, noted as *a*, and the corresponding four synsets of work values, noted as *b*, presented in the path similarity, or *PS* (Meng, Huang, & Gu, 2003), and calculated as $1 / ((a + b) + 1)$. This third analysis results in a quantification of the strength of the lexical-semantic relationship between organisational climate and work values, differing from 0.01 (least identical) to 0.50 (most identical).

3.4. Results

Table 3.2 presents a visualisation of the organisational climate semantic network. This semantic network contains the integration of the content and contribution sides of organisational climate. The content side is found in the four steps of the IMAR cycle: inspire – mobilise – appreciate – reflect. The contribution side is found in the four models of the OCAI: adhocracy – market – hierarchy – family. The two sides together result in the four models of the CVLM (create – compete – control – collaborate), which are four individual semantic fields of the organisational climate semantic network.

3.4.1. Analysis 1

For each of the four semantic fields, Table 3.3 presents the compositional entailment relationships between the content and contribution sides of the organisational climate semantic network. The lexical-semantic analysis was conducted by relating the 'key' of the content side to the corresponding connotation of the contribution side of each semantic field. The specific key is the central term without which the definition no longer represents the sense of the overlapping semantic field. For example, the contribution side 'adhocracy culture' of the semantic network 'create' is about the key term 'doing things'. This takes place by 'stimulating', which is the corresponding term of the field 'inspire' of the content side of organisational climate. The lexical-semantic relationships are derived from the English WordNet (Fellbaum, 2005; Davies & Fuchs, 2015) and translated into their Dutch equivalents using the Open Dutch WordNet (Vossen et al., 1999; Postma et al., 2016). An entailment is represented as ||-, a synonym is symbolised as =, and a hypernym is noted as >>.

Also shown is the average lexical-semantic distance between the meaning and longer utterances of the content and contribution side per semantic field. At first, the number of lexical-semantic relationships between the semantic field and its content side is counted. Then the number of lexical-semantic relationships between the semantic field and its contribution side is counted. The average of both numbers is presented as the average lexical-semantic distance between the content and contribution sides of that specific semantic field. For example, the number of lexical steps between the semantic field 'create' and the key term 'doing things' of its content side 'inspire' is one (1). The number of lexical steps between the semantic field 'create' and the key term 'stimulating' of its contribution side 'adhocracy' is three (3). On average, the lexical-semantic distance between the content and contribution side of the semantic field 'create' is two (2), noted as $\mu create = (1 + 3) / 2 = 2.0$.

Table 3.2

The organisational climate semantic network

semantic field **CREATE**	**INSPIRE:** stimulating the mind and generating new ideas	**ADHOCRACY:** a dynamic and entrepreneurial culture, concentrating on doing things first
semantic field **COMPETE**	**MOBILISE:** deploying the capabilities of all stakeholders around the organisation	**MARKET:** a results oriented culture, focussing on getting the job done
semantic field **CONTROL**	**APPRECIATE:** discussing with stakeholders about what is of value	**HIERARCHY:** a structured and controlled defined culture, focusing on doing things right
semantic field **COLLABORATE**	**REFLECT:** discussing what matters, what will be possible or difficult and what to with it	**FAMILY:** a mentoring and nurturing characterized culture, aiming to doing things together

Table 3.3

Semantic relationships within the semantic fields of organisational climate

Semantic field: CREATE

INSPIRE: [stimulating the mind] ||- **ADHOCRACY**: [way of doing things first]

CREATE >> [(1) doing things (doen)] = [activating (activeren)] ||- [(3) stimulating (stimuleren)]

μcreate = (1 + 3) / 2 = 2.0

Semantic field: COMPETE

MOBILISE: [deploying capabilities] ||- **MARKET**: [way of getting the job done]

COMPETE >> [striving (inspannen) ||- (2) deploying (inzetten)] ||- ||- [do one's best (je best doen)
||- (4) getting the job done (ondernemen)]

μcompete = (2 + 4) / 2 = 3.0

Semantic field: CONTROL

APPRECIATE: [discussion of what is of value] ||- **HIERARCHY**: [way of doing things right]

CONTROL = [check (nakijken)] ||- [fit (aansluiten))] ||- [(3) discussing the value (de toegevoegde waarde bespreken)
||- evaluating (evalueren) >> (5) doing things right (het juiste doen)]

μcontrol = (3 + 5) / 2 = 4.0

Semantic field: COLLABORATE

REFLECT: [discussing what matters] ||- **FAMILY**: [way of doing things together]

COLLABORATE = [(1) doing things together (samendoen)] >> [human action (menselijke handeling)] ||- [acting (handelen)]
||- [adding (toevoegen) >> (5) discussing what matters (de meerwaarde bespreken)]

μcollaborate = (1 + 5) / 2 = 3.0

3.4.2. Analysis 2

Table 3.4 presents the compositional entailment relationships between the four semantic fields of the semantic network of organisational climate and the corresponding synsets of work values. The relationships are built on (1) the meaning of the sentences and longer utterances of the four semantic fields of organisational climate, and (2) a set of the best-matching synsets of work values, which represent the human attitude behind the embodying of that specific semantic field. For example, the semantic field 'create', which is the combination of 'inspire' and 'adhocracy', is defined as 'concentrating on doing things first through stimulating the mind and generating new ideas'. Elaborated in lexically matching human motives, this semantic field calls for work values such as creativity (creativiteit), independence (autonomie), mental challenge (zelfontwikkeling), and variety (afwisseling). Similarly, work values such as achievement (prestaties) and supervision (invloed) match lexically with the semantic field 'compete', defined as 'focussing on getting the job done through deploying capabilities'. This analysis thus results in a lexical-semantic relationship between organisational climate and work values.

Table 3.5 is a representation of the strength of the lexical-semantic relationships between the four semantic fields of the organisational climate semantic network and the corresponding synsets of work values. For each semantic field, the lexical-semantic distance between the average lexical-semantic distance between the meaning and longer utterances of the content and contribution side per semantic field, as presented in Table 3.3, and the average lexical-semantic distance between the synsets of work values per semantic field, are used to calculate the path similarity. For example, Table 3.3 presents an average lexical-semantic distance of 2.0 for the semantic field 'create' (μcreate = 2.0). Table 3.5 shows that, on average, the four work values (creativity, variety, mental challenge and independence) of the synset that corresponds with the semantic field 'create', is calculated as 3.5 (μsynset = 3.5). This results in an average lexical-semantic distance between the semantic field 'create' and its corresponding synset of work values of (2.0 + 3.5) / 2 = 2.8. Presented in the path similarity (PS) formula of Meng et al. (2003), known as 1 / ((1 + b) +1), this results in a PS of 1 / (2.8 + 1) = 0.26. This third analysis results in a quantification of the strength of the lexical-semantic relationship between organisational climate and work values, differing from 0.01 (least identical, representing a lexical distance of 99 successive semantic relations in between the two terms) to 0.50 (most identical, where the two terms are each other's direct lexical-semantic synonyms).

Table 3.4

The lexical-semantic relationship between organisational climate and synsets of work values

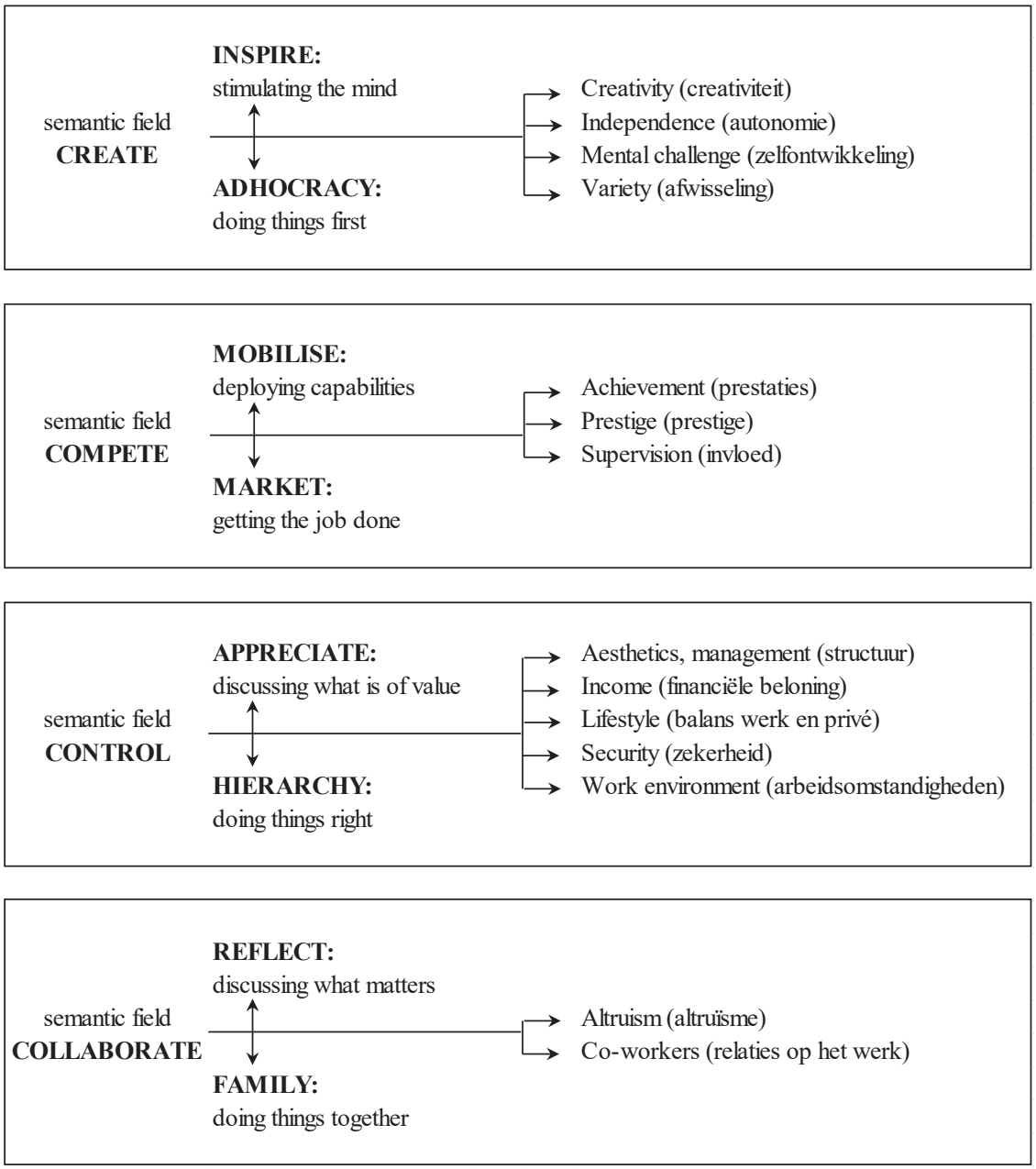


Table 3.5

Path similarity of the relationship between the four semantic fields of the organisational climate semantic network and the synsets of work values

Semantic field: CREATE

Create	= To create (Creëren) = (2) **Creativity** (Creativiteit) ‖- To vary (Variëren) = Variation (Variatie) = (4) **Variety** (Afwisseling) = To compose (Scheppen) ‖- To develop (Ontwikkelen) ‖- (4) **Mental challenge** (Zelfontwikkeling) ‖- To fill in oneself (Zelf invullen) ‖- At its discretion (Naar eigen inzicht) ‖- (4) **Independence** (Autonomie)
μ_{create}	= 2.0
μ_{synset}	= (2 + 4 + 4 + 4) / 4 = 3.5
$\mu_{subtotal}$	= (2.0 + 3.5) / 2 = 2.8
PS_{create}	= 1 / (2.8 + 1) = 0.26

Semantic field: COMPETE

Compete	= To dispute (Strijden) ‖- To achieve (Presteren) = (3) **Achievement** (Prestaties) = Competition (Competitie) ‖- Wanting to win (Willen winnen) ‖- (3) **Supervision** (Invloed) ‖- Wanting to excel (Willen uitblinken) ‖- Wanting to stand out (Willen opvallen) ‖- (4) **Prestige** (Prestige)
$\mu_{compete}$	= 3.0
μ_{synset}	= (3 + 3 + 4) / 3 = 3.3
$\mu_{subtotal}$	= (3.0 + 3.3) / 2 = 3.2
$PS_{compete}$	= 1 / (3.2 + 1) = 0.24

Semantic field: CONTROL

Control	= Verification (Controle) = To verify (Toetsen) ‖- To adjust (Passend maken) >> To create balance (Balans zoeken) ‖- (5) **Lifestyle** (Balans werk en privé) ‖- To ensure (Garanderen) = Te secure (Verzekeren) ‖- (5) **Security** (Zekerheid) ‖-To adapt (Afstemmen) ‖- To sort (Ordenen) ‖- (5) **Aesthetics, management** (structuur) ‖- To value (Waarderen) >> To reward (Belonen) ‖- >> (6) **Income** (beloning) = To verify (Verifiëren) ‖- Conditions (Omstandigheden) >> (3) **Work environment** (Arbeidsomstandigheden)
$\mu_{control}$	= 4.0
μ_{synset}	= (5 + 5 + 5 + 6 + 3) / 5 = 4.8
$\mu_{subtotal}$	= (4.0 + 4.8) / 2 = 4.4
$PS_{control}$	= 1 / (4.4 + 1) = 0.19

Semantic field: COLLABORATE

Collaborate	= To cooperate (Samenwerken) ||- To support (Elkaar helpen) ||- (3) **Altruism** (Altruïsme) = Teamwork (Samenspel) ||- Team spirit (Collegialiteit) ||- (3) **Co-workers** (Relaties op het werk)
$\mu_{collaborate}$	= 3.0
μ_{synset}	= (3 + 3) / 2 = 3.0
$\mu_{subtotal}$	= (3.0 + 3.0) / 2 = 3.0
$PS_{collaborate}$	= 1 / (3.0 + 1) = 0.25

Semantic network: lexical-semantic relationship between organisational climate and work values

$\mu_{semantic\ fields}$	= (2.0 + 3.0 + 4.0 + 3.0) / 4 = 3.0
$\mu_{synsets}$	= (3.5 + 3.3 + 4.8 + 3.0) / 4 = 3.7
$\mu_{overall}$	= (3.0 + 3.7) / 2 = 3.4
$PS_{overall}$	= 1 / (3.4 + 1) = 0.23

The $PS_{overall}$ = 0.23, which means that, on average, the lexical distance between organisational climate and work values is 3.3.

3.5. Conclusion, Discussion and Recommendations

3.5.1. Conclusion

This chapter studied the relationship between organisational climate and work values by using lexical-semantic analysis. Organisational climate was elaborated into a semantic network built on four semantic fields (create – compete – control – collaborate), derived from the CVLM. Each semantic field of the organisational climate network consists of the specific content side (inspire – mobilise – appreciate – reflect) found in the IMAR cycle (INK, 2008) and the corresponding contribution side (adhocracy – market – hierarchy – family), derived from the OCAI (Cameron & Quinn, 2011). The first two semantic fields, ‘create’ and ‘compete’, were built on entailment relationships, with an average lexical distance of 2.0 between inspire and adhocracy and 3.0 between mobilise and market. The semantic fields ‘control’ and ‘collaborate’ both consisted of a

combination of entailment and hypernym relationships, with an average lexical distance of 4.0 between appreciate and control and 3.0 between reflect and family.

The complete lexical-semantic relationship between organisational climate and work values was found in compositional entailment relationships between the four semantic fields of organisational climate and the corresponding synsets of work values, derived from the ordering of work values in higher-order clusters or culture types, as presented in Table 3.1. The first semantic field 'create' contained an entailment relationship with an average lexical distance of 2.0 between inspire and adhocracy, whereas the average distance between 'create' and its synset of work values was found to be 3.5. Jointly, this resulted in a path similarity of 0.26, meaning that the semantic field 'create' showed an average lexical distance of 2.8 between the organisational climate side and work values. The path similarity of the semantic field 'compete' appeared to be 0.24, representing an average lexical distance of 3.2 between the organisational climate and work values sides. The semantic field 'control' was built on a path similarity of 0.19, signifying an average mutual lexical distance of 4.4. The fourth semantic field 'collaborate' was built on a path similarity of 0.23, representing a lexical distance of 3.4 between the organisational climate and work values sides. Overall, the path similarity of the lexical-semantic relationship between organisational climate and work values was found to be 0.23, indicating that, on average, the mutual lexical distance was calculated as 3.7.

In a review of semantic similarity measures in WordNet by Meng et al. (2003), it appeared that there is no standard to evaluate computational measures of semantic similarity. The present study shows that when the number of working values per semantic field increases, the average lexical distance within that specific semantic field also increases. When the average lexical distance is studied as the distance of an individual value within its corresponding semantic field, the average lexical distance appears to move within the range [0.7 - 1.5]. Despite the lack of a semantic similarity standard, an individual lexical semantic distance of, on average 1.1, shows that in general one extra semantic is needed to link the models of organisational climate to the corresponding work values.

3.5.2. Discussion and Limitations of the Study

Earlier researchers found relationships between Quinn and Rohrbaugh's CVF (1983), Cameron and Quinn's OCAI (2011), and different models of work values (Burchell &

Saele, 2007; Hartnell et al., 2011; Gardner, Reithel, Cogliser, Walumbwa, & Foley, 2012; Parks-Leduc et al., 2015). One remarkable factor of these previous studies, is the focus on higher-order clusters of work values, which represent different culture types. In order to explain the work-related consequences of aligning intrinsically motivated employees with their specific meanings and goals, the field requires a more comprehensive view of employees' value profiles (Ren & Hamann, 2015).

The present study amplifies this line of thinking by regarding the four models of the CVLM as four separate semantic fields of the organisational climate construct, which consists of both content (IMAR) and contribution (OCAI) sides. Work values were elaborated in synsets, derived from the ordering of work values in higher-order clusters or culture types, as presented in Table 3.1. This approach provided comprehensive insights into the relationships between the four individual fields of the organisational climate semantic network and the corresponding set of individual work values. By doing so, the study contributes to future measurements of the alignment between an individual and the organisation he or she works for.

By conducting a lexical-semantic analysis, this study gives a detailed insight into the relationship between organisational climate and work values in terms of mutual path similarities. The optimal composition of the members of a team can be estimated on the basis of the strongest path similarity between the organisational climate semantic network and the corresponding synsets of work values. This heuristic type of analysis results in an algorithm that can be applied in future assessments of the optimal alignment between intrinsic motivators of employees (i.e. work values) and the specific meanings and goals of the employers' organisation, treated as organisational climate.

Although this study provides a further understanding of the lexical-semantic relationships between organisational climate and work values, certain limitations do need to be taken into account. The used algorithm, found through heuristically reviewing the path similarities of the different semantic fields, arose from analysing the lexical similarities within a semantic database. For the different levels of lexical-semantic relationships that were found, in most cases a compositional entailment relationship was necessary to link organisational climate to work values. Yule (1996) has pointed out that entailment, which is used to clarify sentences and longer utterances, is a semantic relation that could be

sensitive to implications and assumptions, (Yule, 1996) and therefore less reliable. But because earlier empiric studies have confirmed the synsets of work values (Schwartz, 1992; Ros et al., 1999; Zytowski, 2006; Daehlen, 2008; Van Thiel, 2008b), future researchers should focus on repeatedly executing lexical-semantic analyses within the semantic fields of organisational climate in order to contribute to higher internal consistency reliability of any relationships they find.

This study used an approach to quantitatively complete a qualitative analysis. By doing so, the study provides a detailed structure for aligning individuals' intrinsic motivators on a work values level with the specific meanings and goals of an employer's organisation, elaborated into four subsequent models of organisational climate. By using a lexical analysis, the current research clarified the domination of the strongest hierarchical correlations between culture types and the underlying work values.

3.5.3. Recommendations and Implications

Earlier research on the relationship between the OCAI and the UVM (Burchell & Saele, 2007) and on the relationship between the OCAI and personal values (Hartnell et al., 2011) show outcomes comparable to the current study, but no known research has been conducted on the relationship between the IMAR cycle and work values. This raises the question whether the relationship between the OCAI and work values differs from the relationship of work values with the derivation of organisational climate on the content (IMAR) and contribution (OCAI) sides. In order to investigate if such an examination would result in a simplification of the present model, future researchers could examine the lexical-semantic relationships between the OCAI culture types and the UVM work values as well.

Still, organisational climate is a wider concept than organisational culture types alone, since the field aims to diminish the distance between one's values and one's beliefs in attaining a specific goal through the act of work (Uçanok, 2008; Bao et al., 2012). This situation suggests that the chosen detailing of organisational climate should be maintained at both the content and contribution sides; an additional recommendation is thus to empirically substantiate the lexical-semantic relationships that are found, by using multiple regression analysis.

Because in most cases a compositional entailment relationship is necessary to link organisational climate to work values, the present study should be repeated using statistical natural language processing techniques such as those found in the Natural Language Toolkit, or NLTK (Bird, Klein, & Loper, 2009). Providing an elaboration of the entailment relationships in more one-on-one lexical relationships such as synonymy and hyponymy, would help to diminish the implications such as Yule (1996) has indicated. But because the present study is built on a combination of English and Dutch text corpuses, these processing techniques should be conducted for the two languages separately, for which the present study approach has laid the foundation.

This study contributes to future assessments of the optimal alignment between employees' intrinsic motivators and the specific meanings and goals of an employer's organisation. This is important because organisations consists of groups of people, who all have different values and different ways of looking at things. Everyone interprets the prescribed principles and core values of the organisational culture in their own way, which can cause friction between organisational climate and culture. The results of the current study help to explore which work values best suit which phase of organisational climate and make it easier to work out an organisation's purpose in clear core values. For example, this study shows that an 'innovative, creative organisation' in its core values should primarily look for people who are driven by 'creativity', 'variety', 'self-development' and 'independence'. If you subsequently appoint a manager who steers, for example, on 'structure', 'cooperation', 'pleasant working conditions' and 'balance in work and private life', there is a mismatch between the interpretation of the core values between the employees and their manager. As a result, the experienced organisational climate ('I can go home on time, if I only make sure I help my colleagues') is not in line with how the employee himself interprets the core values of the organisation ('I get the space and freedom to come up with my own ideas'). A more detailed insight into how work values colour employees' experiences of organisational climate, can prevent this kind of mismatch.

Chapter 4

How Age Affects the Relation Between Personality Facets and Work Values of Business and Private Bankers[2]

Personality traits and work values are important characteristics in personnel selection. Studies on their associations show limited agreement. In order to clarify, this paper investigates their association on a personality facet level. Work values are differentiated in intrinsic and extrinsic factors. This chapter adds the role of age to the association. Earlier studies on traits, values and the influence of age on their development and associations are reviewed. Then the moderating influence of age in the association between facets of the five-factor model and work values of the universal values model of 465 Dutch bankers is studied. The results elucidate the association between personality facets and work values, and the role of age in their associations. Considering this in personnel selection might contribute to sustainable employability of both the young as well as the older worker. Therewith, the study contributes to the debate of ageing in recruitment and selection.

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4.1. Introduction

4.1.1. Problem Situation and Purpose of the Study

The field of personnel selection is subject to major changes. In the pre financial crisis era until approximately the year 2008, it was common to hire future employees for a specific job description. The main focus those days was to match the candidate with the tasks to be done and the corresponding responsibilities to be taken. However, since the economic recovery that started around the year 2012, many companies have organised themselves rigorously different. Ever since, topics such as adaptability and technological developments have been emerging. This resulted in a renewed approach on recruitment and hiring, in which both the initial fit between the job profile and the candidate as well as his future development opportunities or potential are assessed. Christensen and Schneider (2010), McDowell (2013) and Dos Santos and Russi De Domenico (2015) showed that today's constantly changing workplace requires from the employee to be an authentic talent that is able to collaborate with other talents through shared values, seen as the stable factor within the less stable working environment. With this in mind, many companies these days try to select those types of employees who are able to disseminate the organisation's values beyond matching with a specific job profile.

This renewed approach has great and tangible consequences for the way organisations fit their employees with the new and continuous changing business requirements. Next to selecting employees on their personal characteristics and skills, the match with the organisation's values is more and more becoming a critical success factor. This pleads for a joint approach on personality traits and work values that, in conjunction, give meaning to one's abilities and fit with the specific organisation's characteristics. The holistic way of studying individual characteristics aims to contribute to value congruence, defined as minimising the distance between individual and organisational characteristics and motives (Cable & Edwards, 2004; Uçanok, 2008). In studying the value congruence, Roberts et al. (2006) elaborated personal characteristics in personality traits and work values, following the historic segregation of attributes from value judgments (Allport, 1937). This way of elucidating a person's characteristics is said to contribute to a more long-term tenable fit between the employee and the constantly changing organisation, transcending the fit with a specific job profile. However, the association between personality traits and work values has rarely been studied (Parks & Guay, 2009).

The few studies that have been conducted on this subject (e.g. Berings, De Fruyt, & Bouwen, 2004; Furnham, Petrides, Tsaousis, Pappas, & Garrod, 2005; Parks, 2007; Parks-Leduc et al., 2015) all assume an association between them. However there is little agreement on which personality traits and work values relate strongest (Parks, 2007; Parks-Leduc et al., 2015). A possible explanation might be that previous studies all were constructed on the five major clusters of personality traits, known as the five factor model (Costa & McCrae, 1985). In the present study it is expected that elaborating these personality factors into their underlying facets, will contribute to further elucidating its assumed relations. With this, the study follows the suggestion of Ones and Viswesvaran (1996), that the identification of employee characteristics in personnel selection from a developmental perspective pleads for the use of narrower personality traits instead of the use of broader traits. Work values, in the present study, are dealt with as the ten values of the universal values model, or UVM (Schwartz, 1992). In studying their associations with personality facets, the paper follows the differentiation of these work values in two clusters of intrinsic and extrinsic motivation factors, found in the studies of Daehlen (2008), Bruyninckx and Valkeneers (2010) and Bipp (2010). This way of ordering work values is expected to further clarifyS the associations between personality facets and work values in a work-related context.

Next to the increased attention for a long-term tenable fit between the employee and the organisation, the labour market is confronted with the issue of ageing. The reduced social security ensures that people continue to work longer and longer. This observation emphasizes the importance of an age-dependent match next to the long-term tenable fit between the employee and the organisation. Combining both, is expected to result in a more sustainable match. Earlier research suggested that both personality traits and work values evolve over time (Costa & McCrae, 2006; Johnson, 2001; Schwartz, 2006). Therefore, to further increase the insight in the personality facets and work values in a work-related context, this present study examines the role of age on its mutual association. This is expected to contribute to establishing both a long-term tenable and an age-dependent fit between the individual's characteristics and the constantly changing organisation. With this, the central research question of this study is: "**What is the role of age in the association between personality facets and work values?**"

The banking world is one of the sectors in which this long-term tenable and age-specific association between facets and values is a current topic. Following the financial crisis, banking employees were confronted with major changes in the way they were used to exert their jobs. The sector faced an ascending tension between the liability for a lack of a duty of care and a growing distrust of clients. In order to adjust this downward spiral, the sector responded with newly defined company values. Within this change process, both the young and older employees were addressed for a quick adaptation of both their skills and attitudes. The effects of these changing circumstances were strongest for the front office employees, since they maintained direct contact with their clients. Moreover, characteristic for the banking sector was the presence of both young professionals and senior staff. Therefore, in order to study the role of age in the association between personality facets and work values in an appealing environment, this study is conducted under a sample of Dutch commercial business or private bankers.

4.2. Theoretical Framework

4.2.1. Personality Facets

A reliable and worldwide used framework for personality is the five factor model (FFM; Costa & McCrae, 1992). This model describes five major clusters of personality factors: openness to experience, conscientiousness, extraversion, agreeableness and neuroticism. Each of these five factors contains six subscales, known as personality facets (Costa & McCrae, 1991). These 30 facets, as presented in Table 4.1, jointly give a detailed view on the composition of the five main factors. When the 30 facets are factor analysed, the five factors emerge, each defined by high loadings from six facets of the same scale (Costa & McCrae, 1991). The FFM underlies different personality tests, like the NEO-PI-R (Costa & McCrae, 1985), the NEO-FFI (Costa & McCrae, 1991) and the FFPI (Hendriks, Hofstee, & De Raad, 1999). In investigating the intrapersonal fit between personality facets and work values, the present study uses these 30 personality facets behind the five clusters of the FFM. This to further elucidate which personality traits and work values relate strongest (Parks, 2007; Parks-Leduc et al., 2015). With this, the study follows Ones and Viswesvaran (1996) in their view on the bandwidth-fidelity dilemma in personality measurement for personnel selection purposes.

Table 4.1

The Five Factors and their Underlying 30 Facets (Costa & McCrae, 1991)

I. Openness	**II. Conscientiousness**	**III. Extraversion**	**IV. Agreeableness**	**V. Neuroticism**
1. Fantasy	1. Competence	1. Warmth	1. Trust	1. Anxiety
2. Aesthetics	2. Order	2. Gregariousness	2. Straightforwardness	2. Angry hostility
3. Feelings	3. Dutifulness	3. Assertiveness	3. Altruism	3. Depression
4. Actions	4.Achievement striving	4. Activity	4. Compliance	4. Self-consciousness
5. Ideas	5. Self-discipline	5. Excitement seeking	5. Modesty	5. Impulsiveness
6. Values	6. Deliberation	6. Positive emotion	6. Tender mindedness	6.Vulnerability

The five factors differ from values, defined as the criteria people use to evaluate actions, people and events (Rokeach, 1973), in three ways that support their separate conceptual treatment (Bilsky & Schwartz, 1994): (a) traits are seen as descriptions of the unique attributes beyond observed behaviour, whereas values are criteria used to judge or appreciate the desirability of performed behaviour, (b) traits vary in terms of how much of a characteristic individuals exhibit, whereas values vary in terms of the importance that individuals attribute to particular goals, and, (c) personality traits describe actions presumed to emerge from 'what persons are like' regardless of their intentions, whereas values refer to the individual's intentional goals that are available to consciousness. In order to investigate the intrapersonal fit between personality facets and work values, the next section further elaborates the latter.

4.2.2. Work Values

Schwartz (1992) defines values as desirable, trans-situational goals, varying in importance, that serves as guiding principles in people's lives. The crucial content aspect that distinguishes among values is the type of motivational goal they express (Schwartz, 2006). Work values are seen as the expressions of basic values in the work setting. Schwartz (1992) introduced his universal values theory, in which he presented four value factors: self-transcendence, conservatism, self-enhancement and openness to change, jointly consisting of ten value types. Each of the ten basic values can be characterised by describing its central motivational goal. Even though the types of human motivation that values express and the structure of their relations are universal, individuals differ substantially in the importance they attribute to their values. That is, individuals have different value priorities that derive of adaptation to life experiences (Schwartz, 2006).

Daehlen (2008) subsequently differentiated work values in intrinsic and extrinsic values. This distinction identifies work values as being either developmental or reward-driven. According to this classification, typical intrinsic values included interesting and challenging work, matching with the two factors: openness to change and self-enhancement of Schwartz (1992). High income, job security and helping others are typical extrinsic values that correspond with the factors: conservatism and self-transcendence. In spite of the distinctions between personality traits and work values, it can be difficult to disentangle the two constructs in practice (Parks & Guay, 2009), because in mutual interaction both confer to human abilities. Therefore, to work on an improved insight in the interplay between these two personal characteristics, the next section will focus on the interrelatedness of facets and values.

4.2.3. The Association Between Personality Facets and Work Values

In line with the assumed direction of causality (Furnham et al., 2005), this study investigates the association between personality facets and intrinsic and extrinsic work values, studying the impact of facets on values rather than vice versa. This direction follow the conceptualisation and joint interactions of Bilsky & Schwartz (1994). Studies conducted on this subject, however, do not agree on which associations are stronger or strongest.

Different researchers studied the association between personality traits and work values. Some of them included demographic variables such as gender, age and education as part of their joint explanatory relation with a declared work-related aspect. Berings et al. (2004), in their study on the incremental validity of work values to predict vocational interests over and above personality traits, found that especially the factors conscientiousness and extraversion positively explained work values in general. Furnham et al. (2005), in their two-study investigation into the relationships between the personality factors and individual's work values for both British and Greek employees, found that agreeableness, extraversion and openness were robust predictors of work values in general. In her subsequent meta-analysis of eleven studies on the relation between personality traits and work values, Parks (2007) concluded that mainly agreeableness and openness had the strongest relations with work values in general. She emphasized the lack of agreement on which relations are stronger or strongest. Bruyninckx and Valkeneers (2010) found, as part of their study on the influence of

personality on work motivation, that extraversion and openness related strongest positive and agreeableness related strongest negative to intrinsic values. Bipp (2010), studied the relation between personality traits and the valuation of intrinsic and extrinsic motivation factors. She found that extraversion and conscientiousness related positively and agreeableness related negatively to intrinsic motivation factors. Parks-Leduc et al. (2015), in a meta-analysis of 60 papers, studying relationships between the personality traits and the Schwartz values, demonstrated that traits and values are distinct constructs. Support was found for the premise that openness is most strongly related to values, neuroticism is least related to values and agreeableness, conscientiousness and extraversion are moderately related to values.

Because of the differences in the outcomes of the above mentioned studies, the conclusion of Parks (2007) and Parks-Leduc et al. (2015) on the lack of agreement remains up-to-date and relevant. However, based on the similarities within the different studies, there seems to be a tentative indication that mainly the factors extraversion, conscientiousness and openness have a stronger positive relation with intrinsic work values than with extrinsic work values. The agreeableness and neuroticism factors seem to have a stronger positive relation with extrinsic than with intrinsic work values. Possibly the intrinsic values are, just like traits, part of the more enduring aspects of people's essential orientations towards employment (Cook, Hepworth, Wall, & Warr, 1981, p.132). Following the suggestion of Ones and Viswesvaran (1996), in further elucidating which personality traits and work values relate strongest, the present study investigates its relationships on a personality facet level. Next to this, work values are differentiated in two clusters of intrinsic and extrinsic motivation factors (Bipp, 2010; Bruyninckx & Valkeneers, 2010; Daehlen, 2008). It is hypothesized to find stronger positive relations between the personality facets behind the factors extraversion, conscientiousness and openness and intrinsic work values and stronger positive relations between the personality facets behind the factors agreeableness and neuroticism and extrinsic work values.

H_{1a}: *Personality facets behind the extraversion, conscientiousness and openness factors show a stronger positive relation with intrinsic than with extrinsic work values.*

H_{1b}: *Personality facets behind the agreeableness and neuroticism factors show a stronger positive relation with extrinsic than with intrinsic work values.*

In line with the indication of Johnson (2001), Costa & McCrae (2006) and Schwartz (2006) that age influences the development of both personality traits and work values, this paper continues with studying the question to what amount age influences personality on a facet level. Therefore, the next section will focus on earlier studies about the effect of age on the development of employee personality, viewed from a trait approach.

4.2.4. The Influence of Age on the Development of Personality Traits

Until around 1994, the generally accepted view on personality was that it stopped changing in adulthood (McCrae & Costa, 1994). For example, Caspi and Roberts (1990) confirmed, through a longitudinal study amongst 1,000 children, the conceptualisation of an inborn and immutable set of personality traits. Ever since, cross-sectional and longitudinal studies of personality trait change in adulthood have forced a re-evaluation of this assumption (Roberts et al., 2006). Research now shows that personality continues to change in adulthood often into old age, and that these changes may be quite substantial and consequential.

Costa and McCrae (2006) found a modest change from the age of 45 years and older. They concluded that extraversion and neuroticism decline, whereas agreeableness and conscientiousness increase with age while Openness first increases and then decreases. In their study, Costa and McCrae (2006) used the three age-arrays of Rabinowitz and Hall (1981): (1) early career with age 21 – 35, (2) midcareer with age 36 – 49, and (3) late career with age 50 and over, building on the three career stages of Super (1957): (1) trial stage, (2) stabilization stage and (3) maintenance stage. In subsequent research, Roberts, Wood, and Caspi (2008) found that personality traits increase in rank-order consistency throughout the lifespan. Specht et al. (2014) confirmed these findings, noting that mainly the differences between people in their younger years until around 35 years and people of around 45 years and older appeared to be the most obvious. These studies seem to suggest that personality change is, in part, predictable, because it follows age development, whereas the most notable change seems to take place in the late midcareer age. Therefore, it is hypothesized to find a higher rating for extraversion, neuroticism and openness in a group of people until the age of 35 years. It is hypothesized to find a higher rating for agreeableness and conscientiousness in the group of people of 45 years and older.

H_{2a}: People until the age of 35 years give a higher rating to the personality facets behind the extraversion, neuroticism and openness factors than people of 45 years and older.

H_{2b}: People of 45 years and older give a higher rating to the personality facets behind the agreeableness and conscientiousness factors than people until the age of 35 years old.

4.2.5. The Influence of Age on the Development of Work Values

Next to the assumed effect of age on the development of personality traits, different researchers have indicated an effect of age on the maturation of work values as well. Cherrington, Condie, and England (1979) found that the individual development of work values, just like personality, is significantly influenced by age, even when the effects of income, education, gender, seniority and occupational level are being controlled for. This seems to be confirmed by Schwartz (2006), who concludes that individuals own different value priorities that develop from the adaption to life experience and therefore derive from an increasing age. Rhodes (1983), through a review of more than 185 studies, examined age-related differences in attitudes, behaviours and values. She found that each of the three age-arrays of Rabinowitz and Hall (1981) has its own set of strongly appreciated values. Noticeable in her study is that she found that the importance of needs for extrinsic factors increase with the development in career stage, whereas the importance of intrinsic factors decreases. Inglehart (1997) confirmed the outcomes of Rhodes (1983) by demonstrating that, linearly measured, older people give, as a result of a cohort effect, higher priority to economic security and stability, whereas younger people give preference to self-expression and quality of life. Johnson (2001) concludes that, on average, young people in their early career, attach lesser importance to materialist job rewards than older workers, reaffirming Cherrington et al. (1979), Rhodes (1983) and Inglehart (1997). Vecchionea, Schwartz, Alessandria, Döringe, and Castellania (2016) examined four types of stability and change in values during young adulthood. The study showed that the mean importance of conservation, self-transcendence, and power values increased over time, the mean importance of achievement values decreased, and openness to change values remained stable.

These findings seem to indicate a strong difference in appreciated work values between people in their early career and those in their mid- or late career stage. More specific,

these studies appear to indicate that the change in values follows age development, in a sense that people give higher priority to intrinsic values until their midcareer, whereas people later in their career seem to appreciate extrinsic values more. Therefore it is hypothesized to find a higher rating for intrinsic work values in the group of people until the age of 35 years. Additionally it is hypothesized to find a higher rating for extrinsic work values in the group of people of 45 years and older.

H_{3a}: *People until the age of 35 years give a higher rating to intrinsic work values than people of 45 years and older.*

H_{3b}: *People of 45 years and older give a higher rating to extrinsic work values than people until the age of 35 years old.*

4.2.6. The Influence of Age in the Association Between Traits and Values

The above mentioned studies on the separate development of both traits and values seem to indicate a transition point at the end of the midcareer age, which begins around the age of 45 (Rabinowitz & Hall, 1981). Until their midcareer, people seem to target on the so-called myself-oriented characteristics (extraversion, neuroticism, openness, intrinsic values), whereas people from the end of the midcareer appear to focus on the fellow human-oriented characteristics (agreeableness, conscientiousness, extrinsic values). Therewith, traits and values seem to affect one another, whereas the type of significant positive associations evolve over time. More specific, it is hypothesized to find a significant positive relation between the facets behind extraversion, neuroticism and openness and intrinsic values for people in their early career until the age of 35 years. Next to this, it is hypothesized to find a significant positive relation between the facets behind agreeableness and conscientiousness and extrinsic values for people in their late midcareer, starting at the age of 45 years.

H_{4a}: *Age influences the association between the personality facets behind extraversion, neuroticism and openness and intrinsic work values in the sense that this association is stronger for people until the age of 35 compared to people of 45 years and older.*

H_{4b}: Age influences the association between the personality facets behind agreeableness and conscientiousness and extrinsic work values in the sense that this association is stronger for people of 45 years and older compared to people until the age of 35.

4.3. Methodology

4.3.1. Participants and Procedures

This study investigates the moderating influence of age in the association between facets behind the personality factors and work values of Dutch commercial business or private bankers. This because the effects of the changing environment are expected to be strongest for the front office employees. The role of a commercial business or private banker is seen as a typical front office job profile. All participants (N = 465) completed an assessment procedure as part of their personal development program during the period 2008 – 2013. To prevent any bias of social desirability aspects, permission for the use of their results was asked afterwards. The participants completed both the 300 items Dutch personality test, or NPT (Van Thiel, 2008a) and the 140 items Dutch work values test, or NWT (Van Thiel, 2008b) online. Gender, age and educational level were reported. All items (300 NPT and 140 NWT) were measured on a 5-point Likert scale. Item scores were summarised as sum scores for each personality facet and work value. Sum scores were converted to standardised Z-scores, to precisely compare the scores on the different variables. After an explanation of the testing procedure by a certified test psychologist, questionnaires were completed in approximately 45 minutes, with a small coffee break in between the two tests. All participants completed the entire questionnaires. The average age of the 465 respondents (182 female, 282 male) was 37.12 years (SD = 9.16), with 44.5% until the age of 35 years, 33.8% with an age between 36 and 44 years and 21.7% of 45 years and older. 21.7% of the respondents holds a vocational degree and 78.3% owns an university degree.

4.3.2. Measures

4.3.2.1. Measurement of Personality Facets

For the measurement of personality facets, the NPT (Van Thiel, 2008a) was used. This measure is a Dutch translation, adaptation and extension of those parts of the International personality item pool, or IPIP (Goldberg et al., 2006), measuring dimensions highly similar to those of the NEO PI-R (Costa & McCrae, 1985). The questionnaire measures the five personality factors and its 30 underlying facets. Analysis of the 300 items on a 5-point Likert scale, Cronbach's alpha and factor analysis were carried out on a sample of 577 respondents in the Netherlands (Van Thiel, 2008a). The domain scales show internal reliabilities that range from .70 to .92.

4.3.2.2. Measurement of Work Values

Work values were measured with the NWT (Van Thiel, 2008b). This test measures scales highly similar to the 12 values of the Super's work values inventory revised, or SWVI-R (Zytowski, 2006) plus two extra values, both derived from the 1970 version of the SWVI ('aesthetics/management' and 'altruism'). The SWVI is based on the universal values theory (Schwartz, 1992) and revealed good reliability results ranging from .72 to .88. Analysis of the 140 items of the NWT on a 5-point Likert scale, Cronbach's alpha and factor analysis were carried out on a sample of 510 respondents in the Netherlands. The domain scales show internal reliabilities which range from .74 to .92.

Following Schwartz (1992), Ros, Schwartz, and Surkiss (1999), and Daehlen (2008), this study categorises the 14 NWT work values into seven intrinsic work values:

(1) *Independence*: work of which one determines the content himself and that can be carried out in one's own way;
(2) *Creativity*: work in which there is room for inventing innovative ideas;
(3) *Variety*: work that offers variety and varying assignments;
(4) *Mental challenge*: work in which there is room for the ambition to further develop oneself;
(5) *Supervision*: work in which one determines what others have to do and in which one can influence decisions;
(6) *Prestige*: work from which one can derive status and prestige;

(7) *Achievement*: work in which ambition and individual performance are valued and rewarded.

and seven extrinsic work values:

(8) *Aesthetics*/*management*: work that consists of fixed activities and routines;
(9) *Security*: work with certainty about one's job and future;
(10) *Income*: work with which one earns a lot of money;
(11) *Lifestyle*: work that goes well with one's private life and connects with one's free time;
(12) *Work environment*: work that is carried out in a nice building in a pleasant workspace under favourable working conditions;
(13) *Co-workers*: work in which there is pleasant social interaction with nice colleagues;
(14) *Altruism*: work in which one is committed to others.

4.3.3. Data Analysis

This study used SPSS version 23 (IBM Corp., 2015) to conduct a quantitative analysis of a set of (1) 14 dependent work values, (2) 30 independent personality facets behind the five personality factors, (3) two background variables: gender and educational level, and, (4) one moderating variable: age. Age was measured on a linear scale and reversed to two age groups. There were no outliers in the dataset. A correlation matrix was created to test the coherence between the variables. Next, an independent samples *t*-test was conducted to estimate the effect of the background variables gender and educational level on the personality facets and on the work values. After that, multicollinearity was assessed on the basis of the significant correlations between the explanatory variables. The criterion in this respect was that correlations should not exceed the value of .80 (Ten Hacken, 2009).

A stepwise multiple linear regression analysis of the dependent NWT work values, the independent NPT personality facets and the background variables was conducted. The regression models were estimated with the *F*-value at a significance level of 5% where the values were explained based on the personality facets and the significant background variables. For determining the moderating influence of age, interaction terms with age were calculated for each of the independent NPT personality facets and the two

background variables gender and educational level. Then a stepwise moderation analysis with multiple linear regression analysis was conducted on the NWT work values, the NPT personality facets and the interaction terms with age. Since the study aimed to measure the strength of the relationships, a moderation analysis instead of a mediation analysis was conducted.

4.4. Results

Table 4.2 reports the descriptive statistics of the means, standard deviations, Cronbach's alpha and inter-correlations for the intrinsic work values and the personality facets behind the five factors. The facets behind extraversion related positively to six of the seven intrinsic work values. Five of the six facets behind neuroticism related negatively to six of the seven intrinsic work values. The facets behind conscientiousness related positively to the intrinsic value mental challenge. Its facet achievement striving showed a positive relation to six of the seven intrinsic work values. The facets behind agreeableness showed a somewhat contradictory picture. The facet altruism related positively to six of the seven intrinsic values, whereas the facet modesty related negatively to all of the intrinsic values. The majority of the facets behind the factor openness related positively to five of the seven intrinsic work values.

Table 4.3 reports the descriptive statistics of the means, standard deviations, Cronbach's alpha and inter-correlations for the extrinsic work values and the personality facets behind the five factors of the NPT. The facets behind extraversion showed a somewhat contradictory picture. All its facets related negatively to the extrinsic aesthetics/management work value, whereas the majority of its facets related positively to co-workers and altruism. Five of the six facets of neuroticism related positively to aesthetics/management and negatively to co-workers and altruism. The facets behind conscientiousness related positively to co-workers and altruism, whereas three of its facets related negatively to aesthetics/management and lifestyle. Most of the facets behind agreeableness related positively to co-workers and altruism, while the same facets related negatively to income. The facets behind openness related negatively to aesthetics/management, whereas the majority of its facets related positively to altruism.

Table 4.2

Means, standard deviations, Cronbach's alpha and inter-correlations for the intrinsic work values

	M	SD	α	Independence	Creativity	Variety	Mental challenge	Supervision	Prestige	Achievement
M				0.214	0.040	0.237	0.535	0.156	-0.031	0.413
SD				0.979	0.975	0.950	1.094	0.907	0.917	0.894
α				0.84	0.92	0.85	0.88	0.89	0.90	0.81
Extraversion										
Warmth	0.783	0.942	0.88	0.189	0.194	0.426	0.454	0.255		0.379
Gregariousness	0.716	0.882	0.86		0.150	0.413	0.422	0.318	0.121	0.386
Assertiveness	0.395	0.841	0.88	0.453	0.343	0.547	0.529	0.644	0.212	0.515
Activity	0.563	0.916	0.81	0.342	0.381	0.565	0.566	0.391	0.124	0.391
Excitement seeking	0.052	0.803	0.90	0.299	0.423	0.528	0.313	0.350	0.207	0.388
Positive emotion	0.317	0.848	0.86	0.223	0.323	0.502	0.464	0.299		0.424
Neuroticism										
Anxiety	-0.542	0.797	0.92	-0.314	-0.189	-0.398	-0.453	-0.303		-0.355
Angry hostility	-0.337	0.835	0.84	-0.151	-0.161	-0.266	-0.355	-0.164		-0.213
Depression	-0.653	0.757	0.91	-0.308	-0.266	-0.453	-0.466	-0.342		-0.411
Self-consciousness	-0.472	0.744	0.89	-0.383	-0.329	-0.504	-0.525	-0.425		-0.432
Impulsiveness	-0.544	0.750	0.74				-0.202			
Vulnerability	-0.473	0.789	0.89	-0.337	-0.274	-0.443	-0.512	-0.356		-0.383
Conscientiousness										
Competence	0.620	0.851	0.81	0.452	0.408	0.612	0.631	0.513	0.174	0.518
Order	0.534	0.868	0.84	-0.158			0.160			
Dutifulness	0.723	0.959	0.72			0.264	0.413			0.206
Achievement striving	0.684	0.968	0.78	0.257	0.365	0.534	0.658	0.436		0.469
Self-discipline	0.849	0.833	0.89		0.202	0.341	0.442	0.259		0.273
Deliberation	0.648	1.146	0.80				0.165			
Agreeableness										
Trust	0.602	0.921	0.82	0.225	0.149	0.322	0.320			0.216
Straightforwardness	0.313	0.918	0.80	-0.184				-0.239	-0.243	-0.139
Altruism	0.345	0.964	0.75	0.156	0.264	0.429	0.519	0.161		0.233
Compliance	0.306	0.786	0.72					-0.160	-0.226	-0.221
Modesty	-0.084	0.920	0.78	-0.308	-0.206	-0.312	-0.214	-0.418	-0.337	-0.465
Tender mindedness	0.135	0.812	0.70		0.192	0.188	0.213			
Openness										
Fantasy	-0.600	0.890	0.83	0.242	0.347	0.192			0.166	
Aesthetics	-0.067	0.910	0.81	0.192	0.343	0.318	0.314	0.127		0.159
Feelings	-0.327	0.802	0.86	0.240	0.320	0.301	0.295			0.198
Actions	0.463	0.941	0.81	0.498	0.467	0.632	0.535	0.366		0.342
Ideas	0.133	0.914	0.79	0.332	0.456	0.503	0.558	0.349		0.379
Values	-0.157	0.780	0.75	0.281	0.198	0.143	0.138			

all correlations are significant at the $p < 0.01$ level (2-tailed)

Table 4.3

Means, standard deviations, Cronbach's alpha and inter-correlations for the extrinsic work values

	M	SD	α	Aesthetics, management	Security	Income	Lifestyle	Work environment	Co-workers	Altruism
M				-0.238	-0.155	-0.158	-0.351	-0.204	0.389	0.279
SD				0.918	0.905	0.925	0.963	0.949	0.919	0.866
α				0.91	0.88	0.89	0.74	0.80	0.84	0.77
Extraversion										
Warmth	0.783	0.942	0.88	-0.245					0.341	0.366
Gregariousness	0.716	0.882	0.86	-0.227			-0.160		0.308	0.214
Assertiveness	0.395	0.841	0.88	-0.432	-0.214		-0.175	-0.147	0.122	0.154
Activity	0.563	0.916	0.81	-0.339	-0.128				0.216	0.313
Excitement seeking	0.052	0.803	0.90	-0.328	-0.222		-0.155			
Positive emotion	0.317	0.848	0.86	-0.281					0.385	0.329
Neuroticism										
Anxiety	-0.542	0.797	0.92	0.373	0.202		0.187	0.154	-0.154	-0.183
Angry hostility	-0.337	0.835	0.84	0.237			0.125		-0.206	-0.284
Depression	-0.653	0.757	0.91	0.329					-0.241	-0.249
Self-consciousness	-0.472	0.744	0.89	0.441	0.202		0.204		-0.130	-0.216
Impulsiveness	-0.544	0.750	0.74							-0.226
Vulnerability	-0.473	0.789	0.89	0.392	0.178		0.225	0.143	-0.163	-0.240
Conscientiousness										
Competence	0.620	0.851	0.81	-0.412			-0.139		0.232	0.294
Order	0.534	0.868	0.84	0.240	0.231			0.194	0.161	0.233
Dutifulness	0.723	0.959	0.72		0.248				0.326	0.488
Achievement striving	0.684	0.968	0.78	-0.233			-0.172		0.258	0.407
Self-discipline	0.849	0.833	0.89	-0.135			-0.135		0.160	0.391
Deliberation	0.648	1.146	0.80		0.151					0.274
Agreeableness										
Trust	0.602	0.921	0.82	-0.216	-0.131	-0.154			0.233	0.346
Straightforwardness	0.313	0.918	0.80	0.177	0.276				0.137	0.399
Altruism	0.345	0.964	0.75	-0.166					0.365	0.616
Compliance	0.306	0.786	0.72			-0.182				0.239
Modesty	-0.084	0.920	0.78	0.273	0.198	-0.205				
Tender mindedness	0.135	0.812	0.70			-0.161			0.222	0.477
Openness										
Fantasy	-0.600	0.890	0.83		-0.144					
Aesthetics	-0.067	0.910	0.81	-0.152				0.120		0.284
Feelings	-0.327	0.802	0.86	-0.151					0.165	0.279
Actions	0.463	0.941	0.81	-0.616	-0.306		-0.196	-0.124		0.135
Ideas	0.133	0.914	0.79	-0.320					0.140	0.262
Values	-0.157	0.780	0.75	-0.312	-0.292					

all correlations are significant at the $p < 0.01$ level (2-tailed)

Studying the inter-correlations between the personality facets behind the five factors of the NPT and the background variables gender, age and educational level show that five of the six facets of the factor extraversion (warmth, gregariousness, activity, excitement seeking and positive emotion) correlate negatively to age within a range of r = -0.278 until r = -0.130. The facet compliance of the factor agreeableness correlates positively to age (r = 0.268). Investigating the inter-correlations between the different work values and the background variables gender, age and educational level show that two of the seven intrinsic work values and one of the seven extrinsic values correlate negatively to age (mental challenge, r = -0.218, achievement, r = -0.161 and co-workers, r = -0.157).

Table 4.4 gives the results of the model summary of the stepwise multiple linear regression analyses, predicting both the seven dependent intrinsic work values and the seven dependent extrinsic work values with the independent personality facets and the gender, educational level and age background variables. The personality facets and the gender, educational level and age background variables explained 14% until 70% with an average of 47% of the variance in intrinsic work values and 8% until 52% with an average of 28% of the variance in extrinsic work values.

Table 4.4

Model summary of the multiple linear regression analyses of work values

Intrinsic work value	**R^2**	**F (df)**	**Sig.**
Independence	0.47	45.303 (9)	$p < 0.000$
Creativity	0.47	44.203 (9)	$p < 0.000$
Variety	0.58	88.699 (7)	$p < 0.000$
Mental challenge	0.70	149.959 (7)	$p < 0.000$
Supervision	0.49	71.928 (6)	$p < 0.000$
Prestige	0.14	25.402 (3)	$p < 0.000$
Achievement	0.42	65.244 (5)	$p < 0.000$
Extrinsic work value	**R^2**	**F (df)**	**Sig.**
Aesthetics, management	0.46	48.506 (8)	$p < 0.000$
Security	0.24	29.113 (5)	$p < 0.000$
Income	0.14	14.458 (5)	$p < 0.000$
Lifestyle	0.08	13.436 (3)	$p < 0.000$
Work environment	0.15	16.361 (5)	$p < 0.000$
Co-workers	0.24	24.264 (6)	$p < 0.000$
Altruism	0.52	98.914 (5)	$p < 0.000$

Table 4.5 gives the results of the stepwise multiple linear regression analyses, predicting the seven dependent intrinsic work values with the independent personality facets and the gender, educational level and age background variables. The variance in the intrinsic work value independence was explained by facets of the agreeableness, openness and extraversion factors. The variance in creativity was explained by facets of the extraversion and openness factors. The variance in variety was mainly described by facets of conscientiousness and extraversion. The variance in mental challenge was mainly explicated by facets of openness. The variance in supervision was primarily explained by facets of conscientiousness and extraversion. The variance in prestige was explicated by facets of agreeableness. And achievement was primarily described by facets of agreeableness and conscientiousness.

Table 4.5

Stepwise multiple linear regression analyses, predicting the intrinsic work values with the background variables and the personality facets

Independence		**B**	**Std.Error**	**Beta**	**t**	**Sig.**
(O)	Actions	0.319	0.046	0.334	6.966	0.000
(E)	Assertiveness	0.355	0.055	0.329	6.504	0.000
(O)	Fantasy	0.244	0.039	0.261	6.327	0.000
(E)	Gregariousness	-0.265	0.046	-0.300	-5.766	0.000
	Educational level	0.220	0.052	0.195	4.247	0.000
(E)	Activity	0.187	0.046	0.201	4.039	0.000
(A)	Tender mindedness	-0.178	0.048	-0.146	-3.687	0.000
(A)	Compliance	0.237	0.051	0.200	4.672	0.000
(A)	Straightforwardness	-0.113	0.044	-0.109	-2.562	0.011

Creativity		**B**	**Std.Error**	**Beta**	**t**	**Sig.**
(O)	Ideas	0.210	0.044	0.199	4.804	0.000
(E)	Excitement seeking	0.176	0.053	0.145	3.314	0.001
(O)	Fantasy	0.258	0.041	0.283	6.254	0.000
(E)	Actions	0.228	0.046	0.245	4.978	0.000
(E)	Activity	0.250	0.045	0.276	5.532	0.000
(E)	Gregariousness	-0.146	0.045	-0.170	-3.235	0.001
	Gender	0.349	0.065	0.279	5.377	0.000
	Educational level	-0.255	0.060	-0.232	-4.244	0.000
(O)	Aesthetics	0.142	0.045	0.133	3.188	0.002

Variety		**B**	**Std.Error**	**Beta**	**t**	**Sig.**
	Intercept	-0.210	0.041		-5.159	0.000
(C)	Competence	0.237	0.053	0.212	4.478	0.000
(E)	Excitement seeking	0.326	0.046	0.276	7.164	0.000
(E)	Activity	0.188	0.043	0.182	4.351	0.000
(A)	Tender mindedness	0.127	0.040	0.109	3.185	0.002
(E)	Positive emotion	0.111	0.043	0.099	2.611	0.009
(E)	Assertiveness	0.127	0.049	0.113	2.585	0.010
(A)	Compliance	0.112	0.043	0.092	2.618	0.009
(C)	Achievement striving	0.127	0.046	0.130	2.762	0.006
(C)	Order	-0.087	0.037	-0.080	-2.346	0.019

Mental challenge		**B**	**Std.Error**	**Beta**	**t**	**Sig.**
(C)	Achievement striving	0.354	0.044	0.345	7.985	0.000
(O)	Actions	0.219	0.041	0.188	5.306	0.000
(O)	Ideas	0.234	0.040	0.178	5.802	0.000
(A)	Altruism	0.166	0.039	0.140	4.233	0.000
(N)	Anxiety	-0.192	0.045	-0.152	-4.321	0.000
	Age	-0.130	0.033	-0.117	-3.984	0.000
(E)	Activity	0.133	0.046	0.117	2.905	0.004

Supervision		**B**	**Std.Error**	**Beta**	**t**	**Sig.**
	Intercept	-0.212	0.061		-3.470	0.001
(E)	Assertiveness	0.558	0.055	0.517	10.141	0.000
(C)	Competence	0.140	0.053	0.131	2.645	0.008
(A)	Straightforwardness	-0.138	0.037	-0.140	-3.772	0.000
(E)	Warmth	-0.134	0.040	-0.139	-3.330	0.001
(C)	Achievement striving	0.154	0.044	0.164	3.476	0.001
	Gender	0.172	0.065	0.092	2.661	0.008

Prestige		**B**	**Std.Error**	**Beta**	**t**	**Sig.**
	Intercept	-0.182	0.088		-2.053	0.041
(A)	Modesty	-0.278	0.046	-0.279	-6.096	0.000
(A)	Compliance	-0.157	0.053	-0.134	-2.981	0.003
	Educational level	0.224	0.098	0.101	2.279	0.023

Achievement		**B**	**Std.Error**	**Beta**	**t**	**Sig.**
	Intercept	0.116	0.043		2.709	0.007
(C)	Competence	0.239	0.056	0.228	4.315	0.000
(A)	Modesty	-0.237	0.041	-0.244	-5.735	0.000
(C)	Achievement striving	0.188	0.045	0.203	4.196	0.000
(A)	Compliance	-0.150	0.044	-0.132	-3.438	0.001
(E)	Positive emotion	0.147	0.044	0.139	3.335	0.001

Table 4.6 gives the results of the stepwise multiple linear regression analyses, predicting the seven dependent extrinsic work values with the independent personality facets and the gender, educational level and age background variables. The variance in the extrinsic work value aesthetics/management was mainly explained by facets of the conscientiousness, extraversion and openness factors. The variance in security was mainly explained by facets of neuroticism and openness. The variance in income and

altruism both were mainly explained by facets of the agreeableness factor. The variance in lifestyle was described by facets of neuroticism. The variance in work environment was primarily explicated by facets of conscientiousness. And co-workers was mainly explained by facets of conscientiousness and extraversion.

Table 4.6

Stepwise multiple linear regression analyses, predicting the extrinsic work values with the background variables and the personality facets

Aesthetics, management	**B**	**Std.Error**	**Beta**	**t**	**Sig.**
(O) Actions	0.391	0.049	-0.432	-7.981	0.000
(C) Order	0.152	0.042	0.163	3.615	0.000
(E) Assertiveness	-0.126	0.055	-0.123	-2.298	0.022
(C) Competence	-0.117	0.059	-0.130	-1.973	0.049
(O) Values	-0.136	0.047	-0.114	-2.889	0.004
(O) Aesthetics	0.079	0.039	0.076	2.041	0.042
(E) Activity	-0.142	0.046	-0.161	-3.102	0.002
(C) Dutifulness	0.104	0.042	0.131	2.487	0.013
(N) Anxiety	0.129	0.052	0.131	2.475	0.014
(E) Gregariousness	0.086	0.042	0.103	2.069	0.039

Income	**B**	**Std.Error**	**Beta**	**t**	**Sig.**
(A) Compliance	-0.147	0.059	-0.132	-2.495	0.013
(A) Trust	-0.173	0.047	-0.203	-3.650	0.000
(A) Modesty	-0.276	0.051	-0.272	-5.399	0.000
(A) Straightforwardness	0.160	0.052	0.166	3.092	0.002
Educational level	-0.135	0.054	-0.127	-2.491	0.013

Work environment	**B**	**Std.Error**	**Beta**	**t**	**Sig.**
Educational level	-0.202	0.062	-0.184	-3.272	0.001
(C) Order	0.265	0.050	0.279	5.321	0.000
(C) Achievement striving	-0.175	0.050	-0.214	-3.528	0.000
(O) Aesthetics	0.173	0.047	0.163	3.716	0.000
(N) Anxiety	0.111	0.056	0.110	1.995	0.047

Altruism	**B**	**Std.Error**	**Beta**	**t**	**Sig.**
(A) Altruism	0.326	0.041	0.367	7.892	0.000
(A) Tender mindedness	0.235	0.042	0.213	5.550	0.000
(C) Dutifulness	0.075	0.043	0.099	1.760	0.079
(A) Straightforwardness	0.109	0.041	0.117	2.695	0.007
(A) Achievement striving	0.098	0.037	0.127	2.605	0.009

Security	**B**	**Std.Error**	**Beta**	**t**	**Sig.**
Intercept	-0.229	0.053		-4.323	0.000
(O) Actions	-0.210	0.047	-0.218	-4.443	0.000
(C) Dutifulness	0.284	0.042	0.301	6.733	0.000
(N) Anxiety	0.373	0.073	0.329	5.092	0.000
(O) Values	-0.188	0.051	-0.162	-3.651	0.000
(N) Depression	-0.213	0.077	-0.178	-2.756	0.006

Lifestyle	**B**	**Std.Error**	**Beta**	**t**	**Sig.**
Intercept	-0.285	0.057		-5.016	0.000
(N) Vulnerability	0.311	0.082	0.255	3.782	0.000
(N) Depression	-0.305	0.086	-0.240	-3.554	0.000
(N) Self-consciousness	0.250	0.088	0.194	2.837	0.005

Co-workers	**B**	**Std.Error**	**Beta**	**t**	**Sig.**
(C) Dutifulness	0.163	0.045	0.196	3.605	0.000
(E) Positive emotion	0.310	0.054	0.281	5.693	0.000
(E) Gregariousness	0.213	0.047	0.243	4.522	0.000
(E) Assertiveness	-0.155	0.054	-0.144	-2.886	0.004
(C) Order	0.098	0.046	0.100	2.120	0.035
(A) Tender mindedness	0.103	0.049	0.085	2.105	0.036

Table 4.7 gives the results of the model summary of the stepwise moderation analyses with multiple regression analysis, predicting the influence of age in the association between both the seven dependent intrinsic work values and the seven dependent extrinsic work values, the independent personality facets and the two background variables gender and educational level. For four of the seven intrinsic work values, the study found a moderating influence of age, explaining 2% until 12% of the variance. For four of the seven extrinsic work values, a moderating influence of age, explaining 1% until 8% of the variance was found.

Table 4.7

Model summary of the stepwise moderation analyses of work values

Intrinsic work value	**R^2**	**F (df)**	**Sig.**	**ΔR^2**
Independence	0.52	37.445 (13)	$p < 0.000$	0.05
Creativity	0.47	44.203 (9)	$p < 0.000$	0.00
Variety	0.63	76.897 (10)	$p < 0.000$	0.05
Mental challenge	0.72	96.574 (12)	$p < 0.000$	0.02
Supervision	0.49	71.928 (6)	$p < 0.000$	0.00
Prestige	0.14	25.344 (3)	$p < 0.000$	0.00
Achievement	0.54	59.916 (9)	$p < 0.000$	0.12
Extrinsic work value	**R^2**	**F (df)**	**Sig.**	**ΔR^2**
Aesthetics, management	0.47	51.173 (8)	$p < 0.000$	0.01
Security	0.32	16.345 (13)	$p < 0.000$	0.08
Income	0.14	15.503 (5)	$p < 0.000$	0.00
Lifestyle	0.08	13.436 (3)	$p < 0.000$	0.00
Work environment	0.18	16.842 (6)	$p < 0.000$	0.03
Co-workers	0.27	20.590 (8)	$p < 0.000$	0.03
Altruism	0.52	98.919 (5)	$p < 0.000$	0.00

Table 4.8 gives the results of the model fit of the stepwise moderation analyses with multiple regression analysis, predicting the influence of age in the association between the seven dependent intrinsic work values, the independent personality facets and the two background variables gender and educational level. This study found for the intrinsic work value independence a negative interaction between age and tender mindedness

(agreeableness), a positive interaction between age and assertiveness (extraversion), a negative interaction between age and aesthetics (openness) and a positive interaction between age and feelings and values (openness). For the intrinsic work value variety, this study found positive interactions between age and ideas (openness), between age and achievement striving (conscientiousness). A negative interaction was found between age and positive emotion (extraversion) and a positive interaction was found between age and aesthetics (openness). For the intrinsic work value mental challenge, this study found a negative interaction between age and actions (openness), and positive interactions between age and fantasy (openness), age and deliberation (conscientiousness) and age and trust (agreeableness). For the intrinsic work value achievement a positive interaction between age and aesthetics (openness) and a negative interaction between age and tender mindedness (agreeableness) was found.

Table 4.9 gives the results of the stepwise moderation analyses with multiple regression analysis, predicting the influence of age in the association between the seven dependent extrinsic work values, the independent personality facets and the two background variables gender and educational level. For the extrinsic work value aesthetics/management this study found a positive interaction between age and aesthetics (openness) and negative interactions between age and fantasy (openness) and between age and activity (extraversion). For the extrinsic value security, this study found positive interactions between age and anxiety (neuroticism) and between age and aesthetics (openness). Negative interactions were found between age and fantasy (openness) and between age and depression (neuroticism). Positive interactions were found between age and impulsiveness (neuroticism) and between age and straightforwardness (agreeableness). A negative interaction was found between age and achievement striving (conscientiousness). For the extrinsic income value a positive interaction between age and straightforwardness (agreeableness) was found. For the extrinsic work environment value, a negative interaction between age and assertiveness (extraversion) and a positive interaction between age and aesthetics (openness) was found. For the extrinsic co-workers work value a positive interaction was found between age and order (conscientiousness). The study demonstrated a significant moderating influence of age in the association between personality facets and nine of the 14 work values.

Table 4.8

Stepwise moderation analyses with multiple linear regression analysis, predicting the influence of age in the association between intrinsic work values, personality facets and the background variables

Independence	**B**	**Std.Error**	**Beta**	**t**	**Sig.**
Actions	0.307	0.045	0.322	6.818	0.000
(E) Age * Assertiveness	0.088	0.050	0.089	1.757	0.008
Fantasy	0.178	0.040	0.191	4.495	0.000
Age * Educational level	0.272	0.044	0.251	6.116	0.000
(A) Age * Tender mindedness	-0.140	0.038	-0.140	-3.642	0.000
Activity	0.172	0.045	0.184	3.848	0.000
Compliance	0.184	0.049	0.155	3.758	0.000
Straightforwardness	-0.097	0.042	-0.094	-2.317	0.021
Gregariousness	-0.214	0.042	-0.243	-5.058	0.000
Assertiveness	0.267	0.066	0.248	4.029	0.000
(O) Age * Aesthetics	-0.134	0.040	-0.150	-3.395	0.001
(O) Age * Feelings	0.134	0.048	0.129	2.797	0.005
(O) Age * Values *(I.6 Table 4.1)*	0.097	0.043	0.088	2.237	0.026

Creativity	**B**	**Std.Error**	**Beta**	**t**	**Sig.**
Ideas	0.210	0.044	0.199	4.804	0.000
Excitement seeking	0.176	0.053	0.145	3.314	0.001
Fantasy	0.258	0.041	0.283	6.254	0.000
Actions	0.228	0.046	0.245	4.978	0.000
Activity	0.250	0.045	0.276	5.532	0.000
Gregariousness	-0.146	0.045	-0.170	-3.235	0.001
Gender	0.349	0.065	0.279	5.377	0.000
Educational level	-0.255	0.060	-0.232	-4.244	0.000
Aesthetics	0.142	0.045	0.133	3.188	0.002

Variety	**B**	**Std.Error**	**Beta**	**t**	**Sig.**
Intercept	-0.163	0.041		-4.015	0.000
Actions	0.256	0.038	0.254	6.792	0.000
Competence	0.170	0.046	0.152	3.695	0.000
Excitement seeking	0.211	0.043	0.179	4.958	0.000
Activity	0.169	0.039	0.163	4.354	0.000
(O) Age * Ideas	0.065	0.031	0.079	2.109	0.035
Positive emotion	0.222	0.051	0.198	4.360	0.000
(C) Age * Achievement striving	0.117	0.029	0.155	4.041	0.000
Fantasy	0.074	0.034	0.069	2.202	0.028
(E) Age * Positive emotion	-0.122	0.043	-0.121	-2.823	0.005
(O) Age * Aesthetics	0.057	0.028	0.067	2.031	0.043

Mental challenge	**B**	**Std.Error**	**Beta**	**t**	**Sig.**
Achievement striving	0.348	0.044	0.338	7.850	0.000
Actions	0.327	0.051	0.281	6.399	0.000
Ideas	0.190	0.042	0.144	4.450	0.000
Altruism	0.101	0.041	0.085	2.469	0.014
(O) Age * Actions	-0.159	0.040	-0.156	-3.938	0.000
Vulnerability	-0.160	0.047	-0.121	-3.362	0.001
(O) Age * Fantasy	0.131	0.033	0.131	3.952	0.000
Activity	0.107	0.046	0.094	2.333	0.020
(C) Age * Deliberation	0.094	0.027	0.122	3.530	0.000
Gregariousness	0.089	0.038	0.083	2.331	0.020
Age	-0.129	0.045	-0.177	-2.861	0.004
(A) Age * Trust	0.081	0.035	0.083	2.337	0.020

Supervision	**B**	**Std.Error**	**Beta**	**t**	**Sig.**
Intercept	-0.212	0.061		-3.470	0.001
Assertiveness	0.558	0.055	0.517	10.141	0.000
Competence	0.140	0.053	0.131	2.645	0.008
Straightforwardness	-0.138	0.037	-0.140	-3.772	0.000
Warmth	-0.134	0.040	-0.139	-3.330	0.001
Achievement striving	0.154	0.044	0.164	3.476	0.001
Gender	0.172	0.065	0.092	2.661	0.008

Prestige	**B**	**Std.Error**	**Beta**	**t**	**Sig.**
Intercept	-0.182	0.088		-2.053	0.041
Modesty	-0.278	0.046	-0.279	-6.096	0.000
Compliance	-0.157	0.053	-0.134	-2.981	0.003
Educational level	0.224	0.098	0.101	2.279	0.023

Achievement	**B**	**Std.Error**	**Beta**	**t**	**Sig.**
Competence	0.227	0.054	0.242	4.208	0.000
Modesty	-0.184	0.042	-0.173	-4.393	0.000
Achievement striving	0.190	0.044	0.229	4.334	0.000
Gregariousness	0.107	0.039	0.123	2.709	0.007
Compliance	-0.165	0.046	-0.141	-3.613	0.000
(O) Age * Aesthetics	0.125	0.032	0.142	3.924	0.000
(A) Age * Tender mindedness	-0.118	0.037	-0.121	-3.191	0.002
Gender	0.152	0.050	0.121	3.045	0.002
Trust	0.082	0.038	0.091	2.151	0.032

Table 4.9

Stepwise moderation analyses with multiple linear regression analysis, predicting the influence of age in the association between extrinsic work values, personality facets and the background variables

Aesthetics, management	**B**	**Std.Error**	**Beta**	**t**	**Sig.**
Intercept	-0.101	0.049		-2.066	0.039
Actions	-0.396	0.046	-0.406	-8.531	0.000
Order	0.173	0.039	0.163	4.386	0.000
Values	-0.143	0.046	0.121	-3.130	0.002
(O) Age * Aesthetics	0.125	0.032	0.152	3.931	0.000
(O) Age * Fantasy	-0.118	0.030	-0.145	-3.896	0.000
(E) Age * Activity	-0.127	0.032	-0.150	-3.962	0.000
Anxiety	0.138	0.046	0.120	3.008	0.002
Assertiveness	-0.184	0.049	-0.168	-3.717	0.000
Gregariousness	0.097	0.042	0.093	2.297	0.022

Security	**B**	**Std.Error**	**Beta**	**t**	**Sig.**
Intercept	-0.160	0.053		-3.021	0.003
Actions	-0.217	0.045	-0.226	-4.862	0.000
Dutifulness	0.202	0.048	0.214	4.192	0.000
(N) Age * Anxiety	0.262	0.068	0.285	3.875	0.000
Values	-0.201	0.053	-0.174	-3.786	0.000
(O) Age * Aesthetics	0.152	0.038	0.188	4.052	0.000
(O) Age * Fantasy	-0.136	0.040	-0.170	-3.434	0.001
(N) Age * Depression	-0.197	0.068	-0.222	-2.896	0.004
(N) Age * Impulsiveness	0.110	0.049	0.120	2.234	0.026
(A) Age * Straightforwardness	0.113	0.037	0.155	3.054	0.002
Trust	-0.122	0.045	-0.124	-2.695	0.007
Altruism	0.138	0.049	0.147	2.786	0.006
(C) Age * Achievement striving	-0.091	0.038	-0.126	-2.423	0.016
Compliance	-0.116	0.052	-0.101	-2.233	0.026

Income	**B**	**Std.Error**	**Beta**	**t**	**Sig.**
Compliance	-0.161	0.059	-0.145	-2.740	0.006
Trust	-0.166	0.046	-0.195	-3.581	0.000
Modesty	-0.248	0.048	-0.244	-5.148	0.000
(A) Age * Straightforwardness	0.135	0.036	0.184	3.764	0.000
Educational level	-0.117	0.054	-0.110	-2.167	0.031

Lifestyle	**B**	**Std.Error**	**Beta**	**t**	**Sig.**
Intercept	-0.285	0.057		-5.016	0.000
Vulnerability	0.311	0.082	0.255	3.782	0.000
Depression	-0.305	0.086	-0.240	-3.554	0.000
Self-consciousness	0.250	0.088	0.194	2.837	0.005

Work environment	**B**	**Std.Error**	**Beta**	**t**	**Sig.**
Educational level	-0.233	0.058	-0.212	-3.993	0.000
Order	0.273	0.051	0.287	5.377	0.000
(E) Age * Assertiveness	-0.168	0.046	-0.176	-3.639	0.000
(O) Age * Aesthetics	0.150	0.039	0.173	3.882	0.000
Achievement striving	-0.119	0.049	-0.146	-2.410	0.016
Fantasy	0.091	0.046	0.100	1.980	0.048

Co-workers	**B**	**Std.Error**	**Beta**	**t**	**Sig.**
Intercept	0.218	0.072		3.004	0.003
Positive emotion	0.318	0.055	0.294	5.820	0.000
Dutifulness	0.191	0.050	0.199	3.792	0.000
Gregariousness	0.182	0.052	0.175	3.479	0.001
Assertiveness	-0.122	0.055	-0.112	-2.201	0.028
(C) Age * Order	0.145	0.040	0.068	3.602	0.000
Age	-0.156	0.052	-0.133	-3.008	0.003
Tender mindedness	0.103	0.049	0.091	2.109	0.036
Self-discipline	-0.115	0.058	-0.104	-1.979	0.048

Altruism	**B**	**Std.Error**	**Beta**	**t**	**Sig.**
Altruism	0.326	0.041	0.367	7.892	0.000
Tender mindedness	0.235	0.042	0.213	5.550	0.000
Dutifulness	0.075	0.043	0.099	1.760	0.079
Straightforwardness	0.109	0.041	0.117	2.695	0.007
Achievement striving	0.098	0.037	0.127	2.605	0.009

4.5. Conclusion, Discussion and Recommendations

4.5.1. Conclusion

This study examined the role of age in the association between personality on a facet level and work values, differentiated in two clusters of intrinsic and extrinsic motivation factors. This study was conducted in the banking sector, that, following the financial

crisis, was confronted with major changes in the way there employees were used to exert their jobs. The sector experienced directly the importance of selecting and bringing into action authentic and versatile employees from a long-term tenable and age-dependent approach.

Hypothesis 1a suggests that personality facets behind the extraversion, conscientiousness and openness factors show stronger positive relations with intrinsic than with extrinsic work values. Hypothesis 1b suggests that personality facets behind the agreeableness and neuroticism factors show stronger positive relations with extrinsic than with intrinsic work values. The study found that the facets behind extraversion related positively to six of the seven intrinsic work values towards two of the seven extrinsic work values. The facets behind conscientiousness related positive to three of the intrinsic work values versus two of the extrinsic work values. The majority of the facets behind openness related positively to five of the seven intrinsic work values compared to one of the extrinsic work values. The facets of agreeableness related positively to three of the seven intrinsic as well as three of the seven extrinsic work values. The facets of neuroticism related positively to four of the seven extrinsic and none of the intrinsic work values. The personality facets and the gender, educational level and age background variables explained on average 47% within a range of 14% until 70% of the variance of intrinsic work values. The personality facets and the background variables gender, educational level and age explained on average 28% within a range of 8% until 52% of the variance in extrinsic work values. Therefore, hypothesis 1a is supported. With the exception of agreeableness, hypothesis 1b is supported as well.

Hypothesis 2a suggests that people until the age of 35 years score higher on the personality facets of the extraversion, neuroticism and openness factors than people of 45 years and older. This study shows an effect for six of the seven facets of the extraversion factor. Therefore, hypothesis 2a is supported for the facets of the extraversion factor. Hypothesis 2b suggests that people of 45 years and older score higher on the personality facets of the agreeableness and conscientiousness factors than people until the age of 35 years. This study only shows an effect for one of the six facets of the agreeableness factor. Therefore, hypothesis 2b is slightly supported for the facets of the agreeableness factor.

Hypothesis 3a suggests that people until the age of 35 years score higher on intrinsic work values than people of 45 years and older. This study presents a higher score for people until the age of 35 years on the intrinsic values mental challenge and achievement. Therefore, hypothesis 3a is supported for two of the seven intrinsic work values. Hypothesis 3b suggests that people of 45 years and older score higher on the extrinsic work values than people until the age of 35 years. This study does not present significant higher scores for people of 45 years and older on extrinsic values. In contradiction to what was expected, the study shows that people until the age of 35 years score higher on the extrinsic work value co-workers than people of 45 years and older. Therefore, hypothesis 3b is not supported.

Hypothesis 4a suggests that age influences the association between the personality facets of the extraversion, neuroticism and openness factors and intrinsic work values in the sense that this association is stronger for people until the age of 35. This study shows that for this age group the concerning association is stronger for four of the seven intrinsic values (independence, variety, mental challenge and achievement). Therefore, for four of the seven of the intrinsic work values, hypothesis 4a is supported. Hypothesis 4b suggests that age influences the association between the facets of the agreeableness and conscientiousness factors and extrinsic work values in the sense that this association is stronger for people of 45 years and older. For the income, co-workers and security values, this study shows a positive interaction between an increasing age and facets of the agreeableness and conscientiousness factors. Therefore, for three of the seven extrinsic work values, hypothesis 4b is supported. Concluding, this study found a significant contribution of age to the association between personality facets and work values, differentiated in intrinsic and extrinsic motivation factors.

4.5.2. Discussion and Limitations of the Study

Earlier studies on the relationship between personality traits and work values mentioned the lack of agreement on which associations are strongest (Parks, 2007; Parks-Leduc et al., 2015). The present study further elucidated these ambiguities, taking into account the bandwidth-fidelity dilemma (Cronbach & Gleser, 1965). This dilemma discusses the choice whether a careful measurement of a single narrowly defined variable or a more cursory exploration of many separate variables should be used in studying the personality domain. From both an empiric and a psychometric perspective, it is said that a more

accurate and comprehensive picture of personality can be obtained from the use of global, overall measures of personality traits, such as the five factors of the FFM (Ones & Viswesvaran, 1996). However, when the study aims to identify employee characteristics in personnel selection from a developmental perspective, they just plead for the use of narrower personality traits instead of the use of broader traits. Therefore, the present study chose to investigate its joint associations at a personality facet level instead of at a personality factor level. Next to that, work values were differentiated in intrinsic and extrinsic motivation factors. The most remarkable inter-correlations between facets and values show, just like the findings of Berings et al. (2004), Furnham et al. (2005), Parks (2007), Bruyninckx and Valkeneers (2010), Bipp (2010) and Parks-Leduc et al. (2015), that the facets behind extraversion, conscientiousness and openness are positively related to primarily intrinsic work values. The present study adds to this confirmation that the same facets relate positive to the two extrinsic work values co-workers and altruism as well. This strengthens the existing debate whether these two values might be more intrinsic than extrinsic in their nature. The facets behind neuroticism are positively related to only extrinsic work values. Studying the inter-correlations at a facet level also further clarifies the earlier contradictory outcomes on the factor agreeableness. The present study shows that the straightforwardness and modesty facets relate negative to intrinsic work values, whereas its facets trust and altruism relate positive to intrinsic work values. Likewise, the facets behind agreeableness relate positive to the extrinsic altruism value. This suggests that being agreeable in a work context is sometimes because the helpful act itself is inherently rewarding. Every so often, the helpful act might be instrumental in bringing about desired outcomes such as rewards or the avoidance of punishment. Summarised, the different associations found in this present study emphasize the importance of the interplay between personality facets and work values in building a long-term tenable fit between the employee and the organisation.

This study further shows that people until the age of 35 years score significantly higher on the facets behind extraversion and on the intrinsic mental challenge and achievement work values and on the extrinsic co-workers work value. The associations between the facets and values for this age group are strongest for the facets behind extraversion, neuroticism, openness and the intrinsic independence, variety, mental challenge and achievement work values. People of 45 years and older score slightly higher on the facets behind agreeableness. For this age group, the associations behind the facets behind

agreeableness and conscientiousness and the extrinsic income, co-workers and security work values are strongest. These findings confirm the earlier result of both Roberts, Walton, and Vliechtbauer (2006) and Costa & McCrae (2006), that extraversion declines with an increasing age. Furthermore, it approves the earlier noted assumptions by Rhodes (1983), Inglehart (1997) and Johnson (2001) of a decrease in intrinsic values and an increase in extrinsic values over time.

The present study gives a more detailed insight in the exact pattern of the moderating influence of age in the association between personality facets and work values. People until the age of 35 years old can be characterised by the aesthetics, actions, positive emotion and tender mindedness personality facets while seeking independence, variety, mental challenge and achievement. People of 45 years and older can be described by the order, straightforwardness and anxiety personality facets while looking for income, co-workers and security. A theoretical explanation could be that older people have a slightly greater preference for tarring their own expertise within a clear structured and reward-driven environment, whereas younger people prefer to assert themselves towards their peers within a less regulated environment. In establishing both a long-term tenable and an age-specific fit between the employee and the organisation, the present study shows the importance of the role of age in the association between personality facets and work values. Before turning to the recommendations and implications of this study, there are some limitations to take into account. The first limitation concerns the cross-sectional design. The potential influence of a cohort effect in this type of design has been limited, because permission for the use of data was asked afterwards. This prevented a bias of social desirability aspects in the data collection procedure. However, as a consequence of this design, the associations found here rely on prior research and theoretical arguments. Without further longitudinal research, this cannot be fully ascertained. Second, the fact that this study only used self-reports to measure the variables might have led to a certain mono-method bias. Third, the present study investigated a Dutch sample, without examining the robustness of the findings on a second sample from another country or working background. On the other hand, diverse results of the present study were comparable with the cross cultural British and Greek findings of Furnham et al. (2005), as well as with the findings from earlier and different composed samples (e.g. Bipp, 2010, Parks-Leduc et al., 2015).

4.5.3. Recommendations and Implications

This study contributed to building both a long-term tenable and an age-specific fit between the employee and the organisation. This, by investigating the role of age in the association of personality traits on a facet level and work values, differentiated in two clusters of intrinsic and extrinsic motivation factors. However, since the present study only investigated a sample of bankers, future research is needed to generalise the results. For example, replicating this study within different cross-cultural samples might increase the reliability and validity of these outcomes. Longitudinal studies on the association between facets and values might contribute to ascertain the existing theoretical arguments of the tested associations. Further, to limit a possible mono-method bias, it might be useful to add interpersonal reports of presumed characteristics to the self-reports of personality. This may help to elucidate the influence of the self-image of the respondent, which, in turn, might be an indication for the amount of being versatile. Remarkable is that in the existing literature, there are large differences in measuring work values. A third recommendation is to conduct and compare different studies, that all use the same set of personality facets and work values. This might elucidate the lack of clarity in the existing studies. An additional advantage could be that this will enlarge the insights in the exact role of age in the association between facets and values. Finally, it may be useful to replicate this study amongst various types of collaboration. Most studies, so far, have investigated samples of people, working in paid employment. It may be interesting to investigate whether the same effects will take place for self-employed people working on a freelance basis.

In sum, this study has shown that more older people tend to prefer a clear structured and reward-driven environment in which they can lean on their expertise, whereas the more younger people desire a less regulated and development-driven environment in which they can assert themselves towards their peers. This implies, following the study of Roberts et al. (2008), the presence of a wider socialisation process, in which age is one of the determining variables of one's life-stage. In studying this influence of life-stage, an operationalisation of the age factor, might contribute to elucidating the effect of this socialisation process in the association between personality facets and work values. Whereas age on itself is seen as an index variable, a conceptual model of life-stage may consist of a combination of biological-, social- and psychological elements of age, complemented with aspects of the self-image, the home situation and biographic aspects

of the career stage (Ornstein, Cron, & Slocum, 1989; Specht et al., 2014). Therefore, it is recommended that in a future building of a long-term tenable and an age-specific fit between the employee and the organisation, the influence of the wider concept of life-stage is taken into account. This more detailed insight in the influence of age from a wider life-stage perspective on the exact association between personality facets and work values, might be useful for nowadays recruitment and selection procedures. This way of assessing might contribute to retaining the sustainable employability of both the young as well as the older worker. This because a long-term tenable and an age-specific approach of the workforce stimulates each individual to be authentic and versatile in his or her personal, best fitting, way. Therewith, the present study may contribute to the debate of ageing in recruitment and selection policies and practices.

Chapter 5

Team Roles as the Junction in the Relationship Between Business Strategy and Key Competences[3]

One of the complexities in aligning the specific business strategy of an organisation with the characteristics and qualities of employees, is the twofold way of approaching this case: (1) the integral organisation's perspective, and (2) the individual employee's perception. This study suggests that in order to match these approaches, a combinative construct built on these both approaches needs to be introduced. In this chapter, both lexical semantic and psychometric analyses are used to study team roles as the junction in the relationship between business strategy and key competences. A set of unique key competences is introduced, consisting of a mixture of personality facets and work values, linked to corresponding team roles. The framework is ordered in four competing values leadership models, representing the organisational effectiveness and organisational climate dimensions of the process-oriented and human-contribution approach of business strategy. The results show that team roles, defined in terms of work-related human activities, function as the junction in the relationship between business strategy, representing the integral organisational perspective, and key competences, rendering the individual employee perspective of alignment. These findings may contribute to a more precise alignment of the organisation and its worker, in a way that turns employees in ambassadors while contributing to the organisation's purpose.

[3] This chapter is submitted for publication.

5.1. Introduction

5.1.1. Problem Situation and Purpose of the Study

Talent management concerns the creation of a sustainable competitive advantage by selecting, developing and promoting the best people (Berger & Berger, 2011). In this process, clear communication about the organisational direction, forms the basis of identifying the specific employees' characteristics the company is looking for (Kenny, 2014). This usually starts with elaborating the organisation's purpose, known as the company's compass, in its business strategy. The subsequent recruitment and selection process is aimed at matching the characteristics of future employees with both the specific organisation's procedures and manners that jointly give shape to the effectiveness (the efficiency with which the organisation is able to meet its objectives) and climate aspects of the business strategy (the attitudes or workstyles that are being rewarded and encouraged). From that starting point, it becomes clear to what explicit working environment the desired employees are willing to commit (Ehrhart et al., 2014; Robertson, 2015). One of the complexities in this process is the twofold way of approaching this case, on the one hand the integral organisation's perspective and on the other hand the individual employee's perception of business strategy.

5.1.1.1 The Integral Perspective

Studied from the integral organisation's point of view, defining the purpose of a company is about dissecting the business strategy in organisational effectiveness and in organisational climate. The central question in this approach is how an organisation is able to add value to the external market and which internal conditions are needed to achieve this (Freedman, 2013). Two methods can be used to answer this question: a process-oriented approach and a human-contribution approach.

The process-oriented approach studies business strategy as a management building block used to design and control the organisation's effectiveness and organisation's climate (European Foundation for Quality Management [EFQM], 1999; Polling and Kampfraath, 2007). This approach aims to provide a manageable framework that captures the experiences of their employees within a predefined continuous improvement cycle, containing the function and needs of the organisation (Gimenez-Espin et al., 2013). In the current study the process-oriented approach is elaborated in the combination of the four

steps of both the PDCA (plan – do – check – act) cycle (Deming, 1986), representing the organisational effectiveness side (see Chapter 2), and the four steps of the IMAR (for inspire – mobilise – appreciate – reflect) cycle (Instituut Nederlandse Kwaliteit [INK], 2008), rendering the organisational climate element (see Chapter 3).

The human-contribution approach studies business strategy as a logically ordered chain of human activities to investigate the interplay between specific human characteristics and both organisational effectiveness and organisational climate (Keuning & Wolters, 2007). It tries to unravel the human influence on the outcomes of the business strategy (Payne, 2001). The present study elaborates this approach as the combination of the four models of the competing values framework, or CVF (Cameron & Quinn, 1999), modelling the organisational effectiveness aspect (see Chapter 2), and the organisational culture assessment instrument, or OCAI (Cameron & Quinn, 2011), figuring the organisational climate component of the human-contribution approach of business strategy (see Chapter 3).

In order to research how an organisation can add value to the external market and which conditions contribute in achieving this, a joint view of the process-oriented and human-contribution approach of the organisational effectiveness and organisational climate aspects of business strategy is needed. In the present study, it is expected this is to be found in the lexical-semantic relationship with the four models of the competing values leadership model, or CVLM (Cameron et al., 2014).

5.1.1.2 The Individual Perspective

Studied from the individual employee's point of view, defining the organisation's purpose is about dissecting the organisational effectiveness and organisational climate dimensions of business strategy in corresponding human characteristics that indicate ways of behaving or thinking (Guion, 1991). This is found in the concept of competences, that are lexically and empirically built on personality facets of the five factor model, or FFM (see Chapter 2; Costa and McCrae, 1985) and on work values of the universal values model, or UVM (see Chapter 3; Schwartz, 1992). One of the problems, however, is that many different sets of competences have been developed, showing a lot of mutual lexical overlap. The present study introduces a number of unambiguous key competences out of these different sets, in order to come to a widely applicable set that covers the

organisational effectiveness and organisational climate aspects of the business strategy. Just as is expected for the integral organisation's view on business strategy, the present study assumes to find lexical-semantic relationships between the set of key competences and the four models of the CVLM as well.

The classification of both the organisation's perspective and the employees' perception of business strategy within the four models of the CVLM, is expected to lay the foundation for a more detailed alignment of the organisational effectiveness and organisational climate phases of the business strategy with its corresponding key competences. However, since one approach is integral and the other individual, a combinative construct, built on both approaches, is needed. Such combination is likely to be found in the theory of team roles, defined as the typical way someone behaves, contributes and interacts with others within a specific working environment (Belbin, 2010). This implies that team roles consist of both a human characteristics component, seen as the individual standpoint, and a process-oriented and human-contribution element, seen as the integral perspective. In the current study, it is expected that Belbin's team roles can be expressed in lexical similar team roles, defined in terms of work-related human activities, built on the core of the definition of corresponding key competences, and ordered in the four matching models of the CVLM, representing the business strategy.

Since all three main concepts in the present study (business strategy, key competences and team roles) are defined and described textually, this chapter starts with designing their joint relationships form a lexical-semantic point of view. After that, the reliability (is the measurement result repeatable?) and construct validity (can the test scores be used for the purpose of the test?) of the lexically designed framework is tested. The central question of this study is: "**how do team roles function as the junction in the association between business strategy and key competences?**" By elucidating this, the paper aims to contribute to a more precise alignment of the organisation and its worker in a way that turns employees in ambassadors while contributing to the organisation's purpose.

5.2. Theoretical Framework

5.2.1. Business Strategy

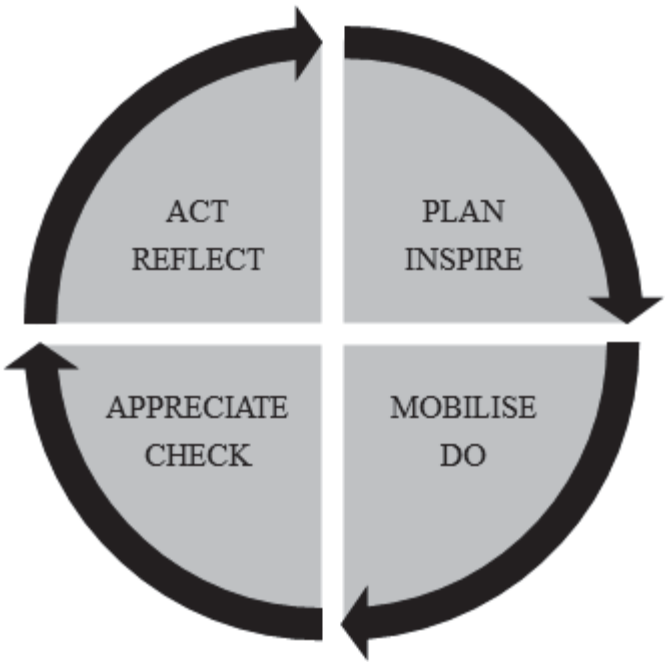
Business strategy is defined as the formulation and implementation of the organisation's purpose and initiatives taken by its employees on behalf of its stakeholders (Nag et al., 2007). Studied as a continuous process, business strategy is seen as the content and the context ('input') of successive activities ('throughput') that contribute to the desired strategy result ('output') (Wit & Meyer, 2011). Whereas the content of the throughput is found in the amount of effectiveness of the organisation design, its context is seen as the effect of their employees' contribution to the strategy (Ketchen et al., 1996). This implies that the output of business strategy is determined by the tuning of two underlying dimensions of the throughput: organisational effectiveness, describing the organisation's internal procedures, and organisational climate, representing the specific manners of the organisation's employees. Jointly, the two dimensions are known as the integral organisation's view on business strategy (Wit & Meyer, 2011). As outlined above, the specific contribution to the strategy output can be studied from a process-oriented approach as well as from a human-contribution approach.

The process-oriented view, approaches business strategy as a management building block used to design and regulate organisational effectiveness and organisational climate (Polling & Kampfraath, 2007). It aims to contribute with a manageable framework that captures the experiences of employees within a predefined continuous improvement cycle, containing the function and needs of the organisation (Gimenez-Espin et al., 2013). From a total quality management (TQM) perspective (Martínez-Lorente et al., 1998), this cycle can be elaborated in the four steps of the PDCA cycle. As found in total quality management models like the European Foundation for Quality Management (EFQM) excellence model (EFQM, 1999), these steps represent the organisational effectiveness side of the process-oriented approach of business strategy. For the Dutch market, EFQM was implemented as the INK model (INK, 2008). Within this model, the mainly rational PDCA cycle was complemented with another cycle, known as IMAR. The four steps of the IMAR cycle represent the social mechanisms behind the four corresponding steps of the PDCA cycle, and renders the organisational climate element of the process-oriented approach of business strategy. As presented in Figure 5.1, the two cycles together are read as follows:

(1) *plan – inspire*: identifying opportunities in order to generate new ideas;
(2) *do – mobilise*: effecting change in order to deploy and develop employee's capabilities;
(3) *check – appreciate*: verifying the changes in order to discuss what is of real value;
(4) *act – reflect*: reacting on the effects in order to determine what to do with it.

Figure 5.1

The process-oriented approach of business strategy



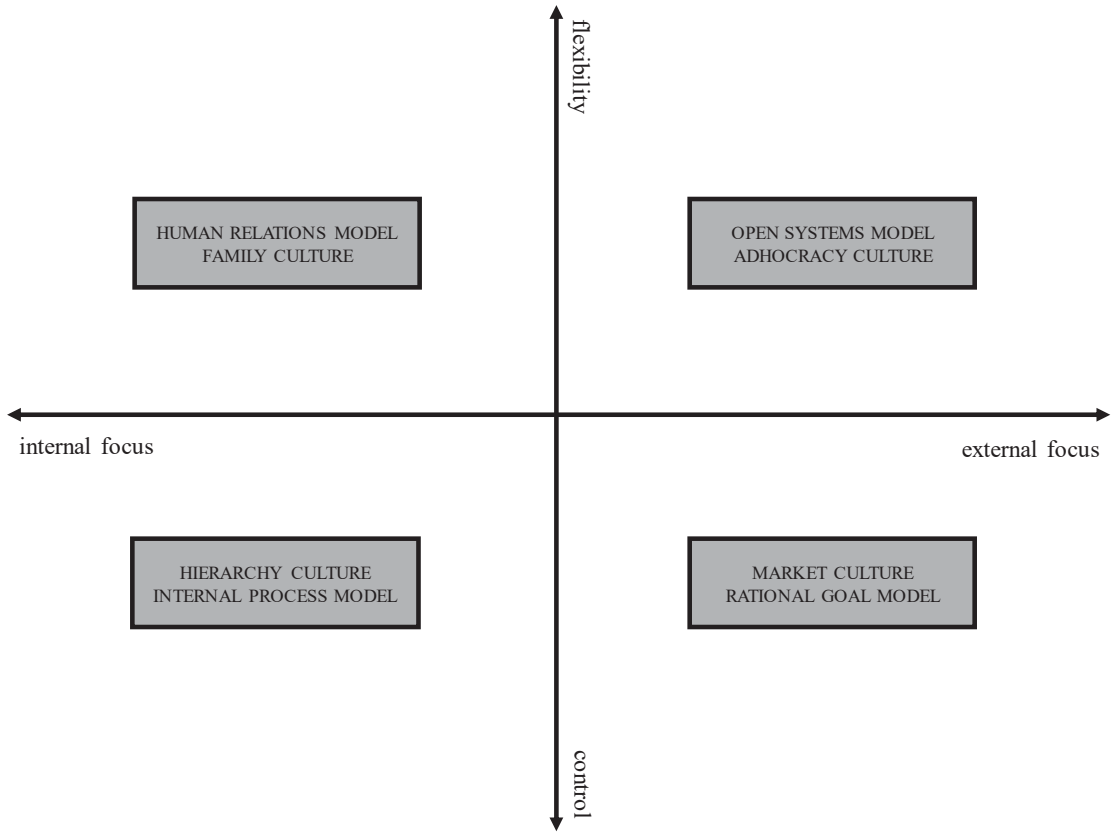
The human-contribution side approaches business strategy as a chain of human activities and investigates the interplay between specific human characteristics and both organisational effectiveness and organisational climate (Keuning & Wolters, 2007). In anticipation of the introduction of TQM, Quinn and Rohrbaugh (1983) presented four models, known as the competing values framework (CVF). These models jointly represent the value dimensions behind organisational effectiveness, which in the current study depicts the human-contribution approach of this dimension of business strategy. Derived from a follow-up study on the CVF, Cameron and Quinn (2011) implemented the organisational culture assessment instrument, or OCAI. This model contains four

culture types that represent the human influence of organisational effectiveness, which renders the organisational climate element of the human-contribution approach of business strategy. As visualised in Figure 5.2, these two sides of the human-contribution approach, are seen as follows:

(1) *open systems model – adhocracy culture:* working on growth in order to do things first;
(2) *rational goal model – market culture:* working on productivity and efficiency in order to get the job done;
(3) *internal process model – hierarchy culture:* working on stability and control in order to do things right; and
(4) *human relations model – family culture:* working on development in order to do things together.

Figure 5.2

The human-contribution approach of business strategy



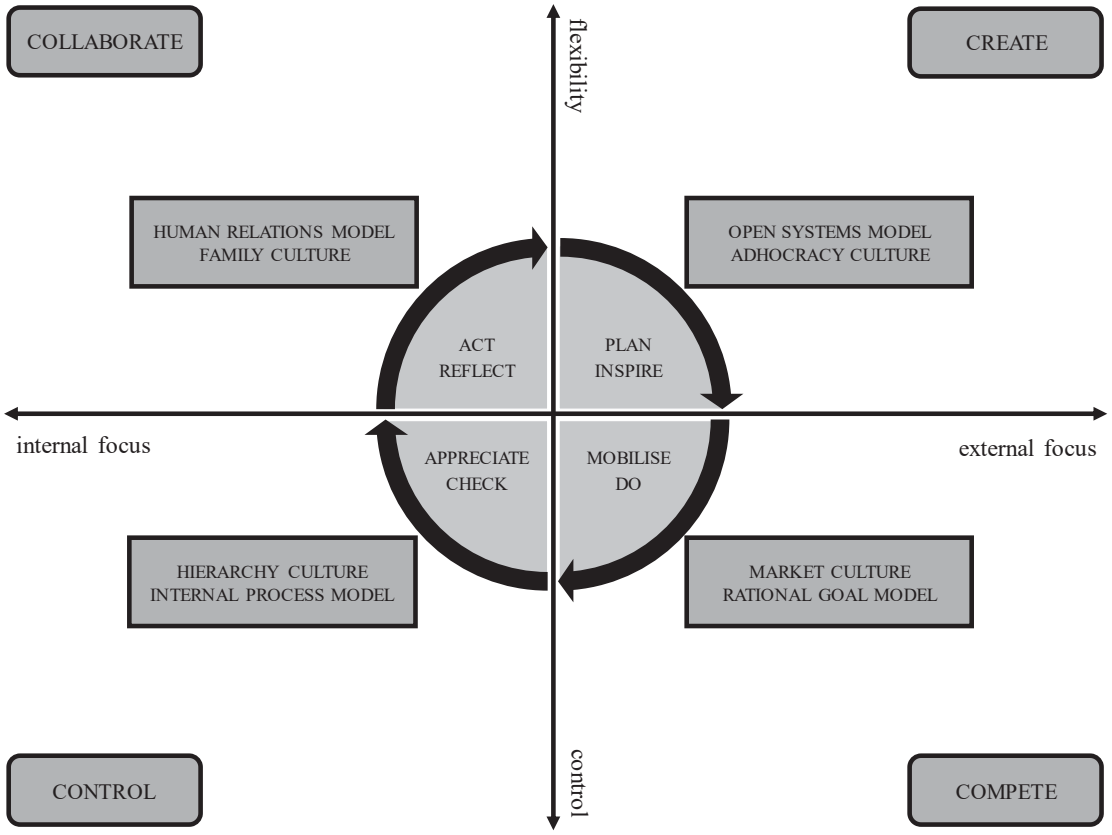
In order to examine how the organisation's employees are capable to add value to the external market and which internal conditions are needed to achieve that, a joint view on the process-oriented and human-contribution approach of business strategy is needed. In this study, it is expected that a combination of both approaches lays the foundation for studying business strategy as a managerial implementation of a four step quality cycle to which employees contribute from their own abilities and perception. This is in line with the holistic approach of the dimensions of strategy and the organisational purpose of Wit and Meyer (2011). The combination of both approaches is found in the competing values leadership model, or CVLM, in which the original CVF and OCAI models were elaborated in four human activities, each representing an individual's opinion and perception of both the organisational effectiveness and the organisational climate. With this, the CVLM brings together the process-oriented and human-contribution approach of business strategy in four integral work-related dimensions (Cameron et al., 2014). This insight might contribute to a more precise alignment of the organisation and its worker. As presented in Figure 5.3, the combination of the process-oriented and human-contribution approach of business strategy is composed as follows:

(1) *create*, defined as 'doing new things' and seen as the junction of the process-orientation *plan – inspire* (identifying opportunities in order to generate new ideas) and the human-contribution *open systems model – adhocracy culture* (working on growth in order to do things first);
(2) *compete*, specified as 'doing things now' and perceived as the combination of the process-orientation *do – mobilise* (effecting change in order to deploy and develop employee's capabilities) and the human-contribution *rational goal model – market culture* (working on productivity and efficiency in order to get the job done);
(3) *control*, stated as 'doing things right' and perceived as the link between the process-orientation *check – appreciate* (verifying the changes in order to discuss what is of real value) and the human-contribution *internal process model – hierarchy culture* (working on stability and control in order to do things right); and
(4) *collaborate*, defined as 'doing things that last' and seen as the junction of the process-orientation *act – reflect*: (reacting on the effects in order to determine

what to do with it) and the human-contribution *human relations model – family culture* (working on development in order to do things together).

Figure 5.3

The joint process-oriented and human-contribution approach of business strategy



This study researches the alignment between the organisation and its workers. Therefore, next to the above explained integral organisation's perspective on business strategy, the individual's perception of business strategy needs to be clarified as well. This is done by using the concept of competences (Guion, 1991), seen as the sum of a person's abilities, intrinsic gifts, skills, knowledge, experience, intelligence, judgment, attitude, character and drive (Michaels et al., 2001).

5.2.2. Competences

In 1959, Psychologist Robert W. White first introduced the concept of competences, which he defined as someone's capacity to effectively interact with the environment.

Since the early 1990s, competence evolved into a theory that helps organisations to define in behavioural terms what people need to do to produce the results the organisation desires, in a way that is in accordance with its culture (Collin, 1989).

Ever since, many successive definitions have been introduced. Guion (1991) defined competences as the underlying characteristics of people that indicate ways of behaving or thinking. Spencer and Spencer (1993) described competences as underlying characteristics of an individual that are causally related to effective and/or superior performance in a job or situation. In their definition, an underlying characteristic is a fairly deep and enduring part of a person's personality that can predict behaviour in a wide variety of situations and job tasks. Rodriguez et al. (2002) explained competency as a measurable pattern of knowledge, skills, abilities, behaviours and other characteristics that an individual needs to perform work roles or occupational functions successfully. Kuijpers (2003) particularised the inner and outwardly side of the competency definitions in two distinct modes, which may not be considered one entity. She suggested that competency as an intrinsic characteristic (underlying personality factors as input) cannot be compared with a competency as an extrinsic characteristic (observable behaviour as output). This psychological investigation of the nature of competences was confirmed by Bartram (2005) in his meta-analysis on both personality scales and ability tests as predictors for competences. Despite the different existing interpretations of competences, they all aim to describe outwardly visible skills in terms of behaviour that arises out of the development of underlying characteristics and that fits within the business strategy of the organisation (Kandula, 2013).

In order to link competences to the joint process-oriented and human-contribution approach of the dimensions organisational effectiveness and organisational climate of business strategy, a further elaboration of the intrinsic and extrinsic characteristics of competences is needed. Both Guilford (1959) and Rokeach (1973), considered as two of the founders of personality research, distinguished two fields of research: the inner or inborn personality and the outwardly visible behaviour.

The first field studies inner personality and emphasises the unique composition of characteristics that each individual carries in himself. Personality, from this point of view, is best understood by the description and analysis of underlying human characteristics.

Inner personality finds its origin in, among others, the trait theory (Allport, 1937) and the values theory (Rokeach, 1973). Whereas the trait theory focuses on personality traits, defined as attributes, the values theory studies human beliefs and feelings, defined as attitudes. Bilsky and Schwartz (1994) made a clear distinction between traits ('attributes') and values ('attitudes'), that support their separate conceptual treatment. Firstly, traits are seen as descriptions of the unique attributes beyond observed behaviour, whereas values are criteria used to judge or appreciate the desirability of performed behaviour. Secondly, traits vary in terms of how much of a characteristic individuals exhibit, whereas values vary in terms of the importance that individuals ascribe to particular goals. And thirdly, personality traits describe actions presumed to emerge from 'what persons are like' regardless of their intentions, whereas values refer to the individual's intentional goals that are available to consciousness. These differences support the division of inner characteristics of competences in attributes and attitudes.

The second line of research studies competences as visible behaviour and is often associated with competency-based management (Draganidis & Mentzas, 2006), in which selecting and identifying is a matter of a joint and 360-degree evaluation of visible skills and behaviour ('abilities'). This approach is grafted on the behaviourism theory (Skinner, 1953), that defines personality as the actual developed and visible skills or behaviours that people exhibit.

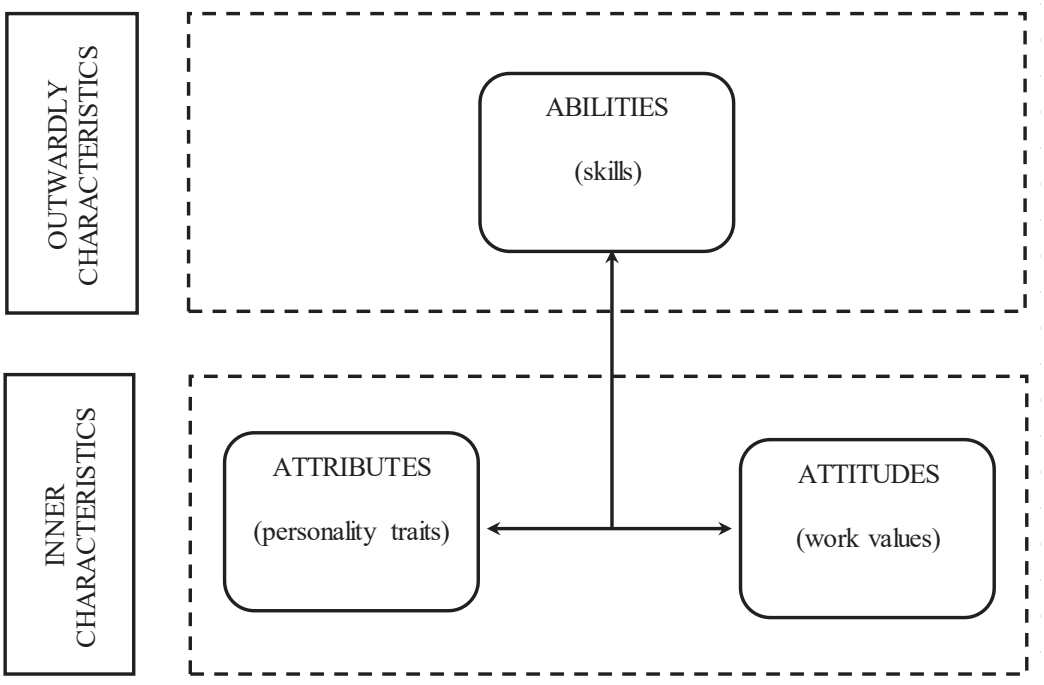
Dreher and Dougherty (2002), in their research on the distinction between employee ability, motivation and opportunity, use the same division of inner characteristics and outwardly behaviour. In their study, inner characteristics are seen as the combination of personality traits (attributes) and work values (attitudes). Skills, read from outwardly behaviour, are circumscribed as abilities. Ulrich (2006), who studied the talent trifecta of competence, commitment and contribution, supports this distinction of inner and outwardly characteristics. He emphasises the importance of, on the one hand, the inner attributes and attitudes and, on the other hand, the outwardly abilities towards the organisational effectiveness and organisational climate in which the employee works. Stahl et al. (2007), in their study on building and sustaining a talent pipeline, agree on this by underlining that both an employee's attributes and his or her attitudes are to be considered in determining their potential fit on the ability level with the organisation's environment. In preceding research on person-organisation (P-O) fit, both Bowen et al.

(1991) and Kristhof (1996) support this approach. They emphasize that selecting people whose attributes and attitudes are compatible with the organisation's environment and values, is a crucial step in the process of selecting potential abilities. Barrett (2012) continues on the same distinction as part of a study on job selection tests. In his study, attributes and attitudes are considered as the potential, which have not yet been tapped and trained to a skill level, whereas ability is regarded as something that is present here and now in the individual. Attributes and attitudes have to be trained and honed to become an ability.

In spite of the distinctions between attributes, attitudes and abilities, it can be difficult to disentangle these constructs in practice (Parks and Guay, 2009), since in mutual interaction they confer to the core elements of a person's characteristics. The present study uses this operationalisation of competences in which the two inner characteristics, personality traits (attributes) and work values (attitudes), are distinguished from the outwardly abilities (skills). This is visualised in Figure 5.4.

Figure 5.4

The operationalisation of the concept of competences



Throughout the years, within the field of competence literature many different sets of competences have been introduced. Most of these sets are ordered in a competency framework, defined as a structure that sets out and describes each individual competency, required by individuals working in an organisation or part of an organisation (Shippmann et al., 2000). As a result, competences remain diffuse terms in both the management development sector and in the organisational and occupational literature (Kandula, 2013). In order to link competences to business strategy, Weiner (2001) recommended to define and select a set of unambiguous key competences. The present study follows this suggestion by sorting the lexical overlap within these different competency frameworks. After that, the lexical synonym are pruned to its essentials. The study is limited to Dutch competency frameworks.

5.2.3. Competency Framework

Van Dongen (2003) introduced the Schouten & Nelissen competency model, which consists of 44 competences classified in the psychological trichotomy of think – sense – act. The Expertise Centre for Learning and Development of the Dutch national government (ECLO, 2004) introduced 38 competences and organised them in the same classification as Van Dongen (2003). Nieuwenhuis (2006) studied the overlap in different competence dictionaries of large Dutch government agencies, the Dutch Inland Revenue, the Dutch police force and Dutch management consultancy firms. This study resulted in a set of 29 competences that were classified in four work-related factors: (1) intellectual competences, (2) administrative and organisational competences, (3) emotional and social communicative competences, and (4) task-oriented competences. These factors form a more detailed elaboration of the think – sense – act trichotomy. The think phase is made tangible in strategic (‘intellectual visioning’) and tactical (‘organisational applying’) thinking competences. The sense phase is elaborated in emotional and social (‘sensing’) competences, and the act phase is worked out in task-oriented (‘acting’) competences. Van Thiel (2008c) added a set of 62 competences including mutual synonyms, clustered in: (1) strategic competences, (2) tactical competences, (3) communicating competences, and (4) operational competences. These factors show lexical similarities with the ordering of Nieuwenhuis (2006). Table 5.1 presents the lexical similarities and overlap between these different competency models for the Dutch market.

Table 5.1

The lexical similarities and overlap between Dutch competency models

Van Thiel (2008c)	Nieuwenhuis (2006)	ECLO (2004)	Van Dongen (2003)
Strategic	**Intellectual**	**Strategic Thinking**	**Strategic Thinking**
Creative thinking	Creativity	Create	Creativity
(creatief denken)	(creativiteit)	(creëren)	(creativiteit)
Conceptual thinking	-	-	Ingenuity
(conceptueel denken)	-	-	(vindingrijkheid)
-	-	-	Artistry
-	-	-	(artisticiteit)
Impression	Vision	Have vision	Vision
(impressie)	(visie)	(visie hebben)	(visie)
Vision	-	-	-
(visie)	-	-	-
Entrepreneurship	Undertake	Act innovatively	Innovation orientation
(ondernemerschap)	(ondernemen)	(innovatief handelen)	(vernieuwingsgerichtheid)
Act innovatively	Craftsmanship	-	Innovation
(innovatief handelen)	(vakmanschap)	-	(innovatie)
Anticipate	-	-	-
(anticiperen)	-	-	-
Problem analysis	Analysing ability	Analytical ability	Problem analysis
(probleemanalyse)	(analytisch vermogen)	(analyserend vermogen)	(probleemanalyse)
Analytical ability	-	-	-
(analyserend vermogen)	-	-	-
Self-management	Learning ability	Learning ability	Self-management
(zelfsturing)	(leervermogen)	(leervermogen)	(zelfsturing)
Selfknowledge	-	-	Selfknowledge
(zelfkennis)	-	-	(zelfkennis)
Learning ability	-	-	Cognitive learning ability
(leervermogen)	-	-	(cognitief leervermogen)
Self-development	-	-	Self-development
(zelfontwikkeling)	-	-	(zelfontwikkeling)
Financial awareness	-	-	-
(financieel bewustzijn)	-	-	-
Judgment	Judgment	Judgment	Judgment
(oordeelsvorming)	(oordeelsvorming)	(oordeelsvorming)	(oordeelsvorming)
Independence	-	Independence	Independence
(onafhankelijkheid)	-	(onafhankelijkheid)	(onafhankelijkheid)
Situational awareness	Situational awareness	Situational awareness	Situational awareness
(omgevingsbewustzijn)	(omgevingsbewustzijn)	(omgevingsbewustzijn)	(omgevingsbewustzijn)
Understand the situation	-	-	-
(inzicht in de omgeving)	-	-	-
Organisational sensitivity	Organisational awareness	Organisational sensitivity	Organisational sensitivity
(organisatiesensitiviteit)	(organisatiebewustzijn)	(organisatiesensitiviteit)	(organisatiesensitiviteit)
-	-	-	Social learning ability
-	-	-	(sociaal leervermogen)

Van Thiel (2008c)	Nieuwenhuis (2006)	ECLO (2004)	Van Dongen (2003)
Tactical	**Administrative Organizational**	**Tactical Thinking**	**Tactical Thinking**
Develop initiative (initiatief ontplooien)	Initiative (initiatief)	Initiative (initiatief)	Initiative (initiatief)
Decisiveness (besluitvaardigheid)	Decisiveness (besluitvaardigheid)	Decisiveness (besluitvaardigheid)	Decisiveness (besluitvaardigheid)
Organising (organiseren)	- -	- -	- -
Planning and organising (plannen en organiseren)	Planning and organising (plannen en organiseren)	Planning and organising (plannen en organiseren)	Planning and organising (plannen en organiseren)
Delegate (delegeren)	- -	Delegating ability (delegatievermogen)	Delegate (delegeren)
Progress check (voortgangscontrole)	- -	Progress check (voortgangscontrole)	Progress monitoring (voortgangsbewaking)
Critically (kritisch)	Quality awareness (kwaliteitsbewustzijn)	- -	Address (aanspreken)
Dealing with details (omgaan met details)	- -	Performance motivation (prestatiemotivatie)	- -
Accuracy (accuratesse)	- -	Accuracy (accuratesse)	Carefulness (zorgvuldigheid)

Van Thiel (2008c)	Nieuwenhuis (2006)	ECLO (2004)	Van Dongen (2003)
Communicating	**Emotional and Social Communicative**	**Communicating or Sensing**	**Communicating or Sensing**
Loyalty (loyaliteit)	Involvement (betrokkenheid)	Management identification (management identificatie)	Loyalty (loyaliteit)
Discipline (discipline)	- -	- -	Task-oriented leadership (taakgericht leiderschap)
Integrity (integriteit)	Integrity (integriteit)	Integrity (integriteit)	Integrity (integriteit)
Stress tolerance (stressbestendigheid)	Stress tolerance (stressbestendigheid)	Stress tolerance (stressbestendigheid)	Stress tolerance (stressbestendigheid)
Courage (durf) Assertiveness (assertiviteit)	Courage (moed) Self-confidence (zelfvertrouwen)	Courage (durf) - -	Courage (durf) Assertiveness (assertiviteit)
Tactical behaviour (tactisch gedrag) Respond sensitively (sensitief reageren)	Empathy (inlevingsvermogen) -	Empathy (inlevingsvermogen) Interpersonal sensitivity (interpersoonlijke sensitiviteit)	Empathy (inlevingsvermogen) Switching tactically (tactisch schakelen)
Hold a conversation (gesprek voeren) Oral communication (uitdrukkingsvaardigheid) Written communication (schriftelijk uitdrukken) Present (presenteren) Listening (luisteren)	Communication skills (comm. vaardigheden) - - - - - - - -	Oral communication (uitdrukkingsvaardigheid) - - - - - - Develop employees (otwikkelen medewerkers)	Oral communication (uitdrukkingsvaardigheid) - - - - Conversation skills (gespreksvaardigheid) Listening (luisteren)
Manage conflicts (conflicten beheersen) Persuade (overtuigen) Negotiate (onderhandelen) Confront (confronteren)	- - Persuasiveness (overtuigingskracht) - - - -	- - Persuasiveness (overtuigingskracht) - - - -	Managing conflicts (conflicthantering) Prevalence (overwicht) Negotiate (onderhandelen) - -

Van Thiel (2008c)	Nieuwenhuis (2006)	ECLO (2004)	Van Dongen (2003)
Operational	**Task-oriented**	**Operational Acting**	**Operational Acting**
Leadership	Lead	Lead	-
(leiderschap)	(leiding geven)	(aansturen)	-
Group-oriented leadership	-	Leadership	-
(groepsgericht leiderschap)	-	(leiderschap)	-
Coaching	Coaching	-	Coaching
(coachen)	(coachen)	-	(coachen)
Motivate	-	Motivate	-
(motiveren)	-	(motiveren)	-
People-oriented leadership	-	Develop employees	People-oriented leadership
(mensgericht leiderschap)	-	('Ontwikkelen medewerkers')	('Mensgericht leiderschap')
Result-oriented work	Result orientation	Result orientation	Result orientation
(resultaatgericht werken)	(resultaatgerichtheid)	(resultaatgerichtheid)	(resultaatgerichtheid)
Perseverance	-	Perseverance	-
(vasthoudendheid)	-	(vasthoudendheid)	-
Energy	Effort	Energy	-
(energie)	(inzet)	(energie)	-
Ambition	-	-	-
(ambitie)	-	-	-
Perseverance	-	-	Perseverance
(doorzettingsvermogen)	-	-	(doorzettingsvermogen)
Networking skills	Networking	Networking skills	-
(netwerkvaardigheid)	(netwerken)	(netwerkvaardigheid)	-
Sociablity	-	-	-
(sociabiliteit)	-	-	-
Collaborate	Collaborate	Collaborate	Collaborate
(samenwerken)	(samenwerken)	(samenwerken)	(samenwerken)
Customer orientation	Customer orientation	Customer orientation	Customer orientation
(klantgerichtheid)	(klantgerichtheid)	(klantgerichtheid)	(klantgerichtheid)
Respond flexibly	-	Anticipate	-
(flexibel reageren)	-	(anticiperen)	-
Adaptability	-	Adaptability	-
(aanpassingsvermogen)	-	(aanpassingsvermogen)	-
Flexibility	Flexibility	Flexibility	Flexibility
(flexibiliteit)	(flexibiliteit)	(flexibiliteit)	(flexibiliteit)

The four competency factors, intellectual competences (‘strategic thinking’), administrative and organisational competences (‘tactical thinking’), emotional and social communicative competences (‘sensing’), and task-oriented competences (‘acting’), as presented in Table 5.1, are dealt with as work-related factors from an individual’s point of view. Next to this type of classification, the four CVLM models bring together the process-oriented and human-contribution approach of business strategy in four integral work-related dimensions as well (Cameron et al., 2014). Following the ordering of competences in the competing values framework (CVF), as first introduced in the HR value proposition competency model of Ulrich and Brockbanck (2005), and further applied by e.g. Trivellasa and Drimoussis (2013), it is expected that the set of key competences, derived from the four work-related factors of the different competency frameworks, can be lexically ordered in the four models of the CVLM. This to link the different key competences to the organisational effectiveness and organisational climate dimensions of the joint process-oriented and human-contribution approach of business strategy.

In the field of psychometrics, it is common to estimate the amount of disposition for a competence by measuring the underlying attributes and attitudes (Gregory, 2013). Within this approach, attributes are operationalised as personality facets, derived from the five factor model, or FFM (Costa and McCrae, 1985), seen as an elaboration of the trait theory (Allport, 1937). Attitudes are operationalised as work values, derived from the universal values model, or UVM (Schwartz, 1992), grafted on the values theory (Rokeach, 1973). In the present study it is expected that competences, measured in line with this psychometric tradition, give an interpretation to the individual employee’s perception of business strategy. More specific, it is expected that the behaviouristic definition of the unique set of key competences can be expressed in a set of lexically corresponding personality facets and work values.

Classifying both the organisation’s perspective and the employees’ perception of business strategy within the four models of the CVLM, is expected to lay the foundation for a more detailed alignment of the different phases of the business strategy with its corresponding key competences. However, as described earlier, because the first approach is an integral one and the second an individual one, a combinative construct built on both approaches, is needed. This is expected to be found in the theory of team roles (Belbin, 2010).

5.2.4. Team Roles

In 1981, Belbin introduced his theory of team roles as the result of a study on the question why some (management) teams succeed and others fail. He defined a team role as a tendency to behave, contribute and interrelate with others in a particular way and used it to identify people's behavioural strengths and weaknesses in the workplace (Belbin, 2010). This practice implies a joint view of a business strategy and a human competences approach. The initial research of Belbin resulted in eight different team roles, describing the core of each team role in terms of a combination of successive elements of human characteristics:

(1) *plant* ('creative, imaginative, free thinking');
(2) *monitor evaluator* ('sober, strategic, discerning');
(3) *shaper* ('challenging, dynamic, thrives on pressure');
(4) *co-ordinator* ('mature, confident, identifies talent');
(5) *completer finisher* ('single-minded, self-starting, dedicated');
(6) *team worker* ('co-operative, perceptive, diplomatic');
(7) *implementer* ('practical, reliable, efficient');
(8) *resource investigator* ('outgoing, enthusiastic, communicative').

The behavioural and personality characteristics of the team roles were identified using three types of tests: the critical thinking appraisal (Watson and Glaser, 1991) for measuring high level reasoning (skills), the Cattell personality inventory (Cattell et al., 1970) for measuring personality (attributes), and the personal preference questionnaire (Thompson, 1994) for measuring preferences or values (attitudes). This way of ordering team roles implies a mixture of stable characteristics that, within the interaction of a team, develop into visible work-related activities. In the present study, this is seen as the joint applying of key competences. The research of Belbin continued with describing the specific contribution of each of the team roles to the business strategy:

(1) *plant* ('generates ideas and solves problems');
(2) *monitor evaluator* ('sees all options and judges accurately');
(3) *shaper* ('has the drive and courage to overcome obstacles');
(4) *co-ordinator* ('clarifies goals and delegates effectively');
(5) *completer finisher* ('searches out errors, polishes and perfects');

(6) *team worker* (‘listens and averts friction’);
(7) *implementer* (‘turns ideas into actions and organises the work to be done’);
(8) *resource investigator* (‘explores opportunities and develops contacts’).

This infers that the Belbin team roles represent the organisational effectiveness and organisational climate dimensions of the joint process-oriented and human-contribution approach of business strategy. The twofold character of Belbin team roles suggests that they can be expressed in lexical similar team roles, defined in terms of work-related human activities.

Following the operationalisation of competences as presented in Figure 5.4, it is suggested that each team role, studied from its individual contribution to business strategy, can be expressed in the key competences that are assumed to cover the lexical overlap in the competency frameworks of Van Dongen (2003), ECLO (2004), Nieuwenhuis (2006) and Van Thiel (2008c). It is hypothesised that the set of unique key competences can be lexically related to the team roles.

In succession of the work-related human activity definition of team roles, it is assumed that these team roles can be lexically linked to the same four CVLM models in which its underlying key competences are to be classified, following the earlier research of e.g. Ulrich and Brockbanck (2005) and Trivellasa and Drimoussis (2013). In this way, the team roles represent the organisational effectiveness and organisational climate dimensions of the joint process-oriented and human-contribution approach of business strategy, as presented in Figure 5.3.

The three main concepts in this paper (business strategy, key competences and team roles) are defined and described textually. Therefore, this paper first designs their joint relationships from a lexical-semantic point of view. After that, the lexically designed framework is validated using a multitrait multimethod matrix, or MTMM (Campbell and Fiske, 1959), testing its convergent and discriminant validity (Messick, 1989).

5.3. Study 1: Methodology

5.3.1. Procedures and Participants

This first study aims to design a framework of the function of team roles in the association between business strategy and key competences, using lexical semantic techniques. As a first step, the competences of the Dutch competency frameworks of Van Dongen (2003), ECLO (2004), Nieuwenhuis (2006) and Van Thiel (2008c) are ordered using lexical semantics to introduce a unique set of key competences that cover the lexical overlap in these frameworks. Secondly, the set of key competences is lexically ordered in the four models of CVLM. Thirdly, the behaviouristic definition of the set of key competences is expressed in a set of lexically corresponding personality facets, derived from the FFM, and work values, derived from the UVM. Then, as a fourth step, a set of team roles, derived from the twofold character of the Belbin team roles and defined in terms of work-related human activities, is introduced. This is followed by the lexical linking of these team roles with the key competences. After that, the team roles are lexically linked to the CVLM, which represents the organisational effectiveness and organisational climate dimensions of the process-oriented and human-contribution approach of business strategy. Jointly, these six lexical-semantic analyses result in the lexical operationalisation of the function of team roles in the relationship between business strategy and key competences.

5.3.2. Measures

In operationalising the lexical relationships, this study uses two automated online text corpuses, the English WordNet (Fellbaum, 2005; Davies and Fuchs, 2015) and its Dutch version, the Open Dutch WordNet (Vossen et al., 1999; Postma et al., 2016). Two procedures are used to test the lexical relationships. First, collections of words that can be ordered semantically, referring to a specific topic, are dealt with as semantic fields. Second, different types of lexical-semantic relations between and within the semantic fields are tested, including synonymy (A means the same as B), hyponymy (A is subservient to B), hypernymy (A is superordinate to B), meronymy (A is part of B; B has A as a part of itself), holonymy (B is part of A; A has B as a part of itself) and compositional semantic relationships (whenever sentence A is true, then B must also be true; A ||- B).

5.3.3. Analyses

The first design step uses lexical semantics to introduce a set of semantic fields (Lynne Murphy, 2003), each representing a unique key competence. Each semantic field or key competence is dealt with as a collection of competences, found in the different competence models of Van Dongen (2003), ECLO (2004), Nieuwenhuis (2006) and Van Thiel (2008c) that are lexically labelled as each other's synonym, hyponym, meronym or holonym. The second step visualises the compositional semantic relationships between the definition of each key competence and the organisational effectiveness and organisational climate dimensions of the process-oriented and human-contribution approach of business strategy elaborated in the four models of CVLM, each dealt with as a separate semantic field. The third design step presents the compositional semantic relationships between the definition of each key competence and the set of personality facets and work values that jointly comprises that specific definition. This step results for each key competence in a synset, known as a set of corresponding facets and values that mutually comprises its definition. The fourth design step introduces the compositional semantic relationships between the definition of the two sides of the Belbin team roles and lexical similar team roles, defined in terms of work-related human activities. The fifth design step visualises the compositional semantic relationship between the definition of each of the key competences and the definition of its corresponding team. The sixth design step presents the compositional semantic relationships between the definition of each team role and the organisational effectiveness and organisational climate dimensions of the process-oriented and human-contribution approach of business strategy elaborated in the four models of CVLM, each dealt with as a separate semantic field. Through this, a framework is introduced in which the team roles function as the junction between the key competences and the organisational effectiveness and organisational climate dimensions of the process-oriented and human-contribution approach of business strategy.

5.4. Results

The results of this first study are outlined below. Each of the six design steps is discussed separately. To give a concise overview of the procedures and their outcomes, out of every CVLM model a competence is selected and highlighted to serve as an example.

5.4.1. Step 1

Table 5.2 visualises the procedure of the lexical merging of competences, found in the different competence models of Van Dongen (2003), ECLO (2004), Nieuwenhuis (2006) and Van Thiel (2008c). The competences are dealt with as separate semantic fields and ordered in four higher-order semantic networks, seen as factors of matching competences in terms of subject. Those competences that are each other synonym (A means the same as B), hyponym (A is subservient to B), meronym (A is part of B; B has A as a part of itself) or holonym (B is part of A; A has B as a part of itself) are merged. As presented in Table 5.3, this lexical semantic analysis results in a set of 16 unique key competences, including their Dutch translations, classified in the corresponding work-related factor. In preparation to the second part of the study in which the lexical-semantic relationships are evaluated psychometrically, the key competences are labelled as KC1 until KC16.

Table 5.2

Examples of the emergence of the key competences, studied as semantic fields

Intellectual competences ('strategic thinking')

Creativity (Creativiteit)
= **Creative thinking** (Creatief denken)
= **To create** (Creëren)
= **Artistry** (Artisticiteit) = Imaginative (Fantasierijk) = **Inventive** (Vindingrijk)
= To envision (Zich voorstellen) = Opinion (Idee) = **Vision** (Visie)
= **Conceptual thinking** (Conceptueel denken)
= **Impression** (Impressie)

Administrative and organisational competences ('tactical thinking')

Planning and organising (Plannen en organiseren)
||= To manage (Managen) = To verify (Controleren) = **To monitor** (Voortgangscontrole / -bewaking)
= To evaluate afterwards (Evalueren) ||= To **delegate** (Delegeren)

Emotional and social communicative competences ('sensing')

Involvement (Betrokkenheid)
= Committed (Toegewijd) = **Loyalty** (Loyaliteit) = Honesty (Eerlijkheid) = **Integrity** (Integriteit)
= **Disciplined** (Discipline)
= **Task oriented** (Taakgerichtheid)

Task-oriented competences ('acting')

Result orientation (Resultaatgerichtheid)
= Passion / Enthusiasm (Gedrevenheid) = Diligence (Ijver) = **Energy** (Energie)
= **Effort** (Inzet)
= Efficacy (Werkzaamheid) = **Ambition** (Ambitie)
= **Perseverance** (Vasthoudendheid / Doorzettingsvermogen)

Table 5.3

The set of 16 unique key competences, studied as separate semantic fields

Intellectual competences ('strategic thinking')	**Administrative and organisational competences ('tactical thinking')**
KC1: Entrepreneurship (Ondernemerschap)	KC5: Initiative (Initiatief)
KC2: Creativity (Creativiteit)	KC6: Decisiveness (Besluitvaardigheid)
KC3: Problem analysis (Probleemanalyse)	KC7: Planning and organising (Plannen en organiseren)
KC4: Judgment (Oordeelsvorming)	KC8: Quality orientation (Kwaliteitsgerichtheid)
Emotional and social communicative competences ('sensing')	**Task oriented competences ('acting')**
KC9: Involvement (Betrokkenheid)	KC13: Leadership (Leidinggeven)
KC10: Stress tolerance (Stressbestendigheid)	KC14: Result orientation (Resultaatgerichtheid)
KC11: Empathy (Inlevingsvermogen)	KC15: Networking (Netwerken)
KC12: Oral communication (Mondelinge vaardigheid)	KC16: Customer orientation (Klantgerichtheid)

5.4.2. Step 2

Figure 5.5 shows the compositional entailment relationship of the four work-related factors of key competences with the four CVLM models. In this way, the factors of key competences are linked to the organisational effectiveness and organisational climate dimensions of the process-oriented and human-contribution approach of business strategy. The core of each of the CVLM models requires a specific set of competences, therefore the compositional entailment relationships are read as follows:

(1) *create*, defined as 'doing new things' and seen as the junction of the process-orientation *plan – inspire* (identifying opportunities in order to generate new ideas) and the human-contribution *open systems model – adhocracy culture* (working on growth in order to do things first), asks for *intellectual competences* ('strategic thinking');

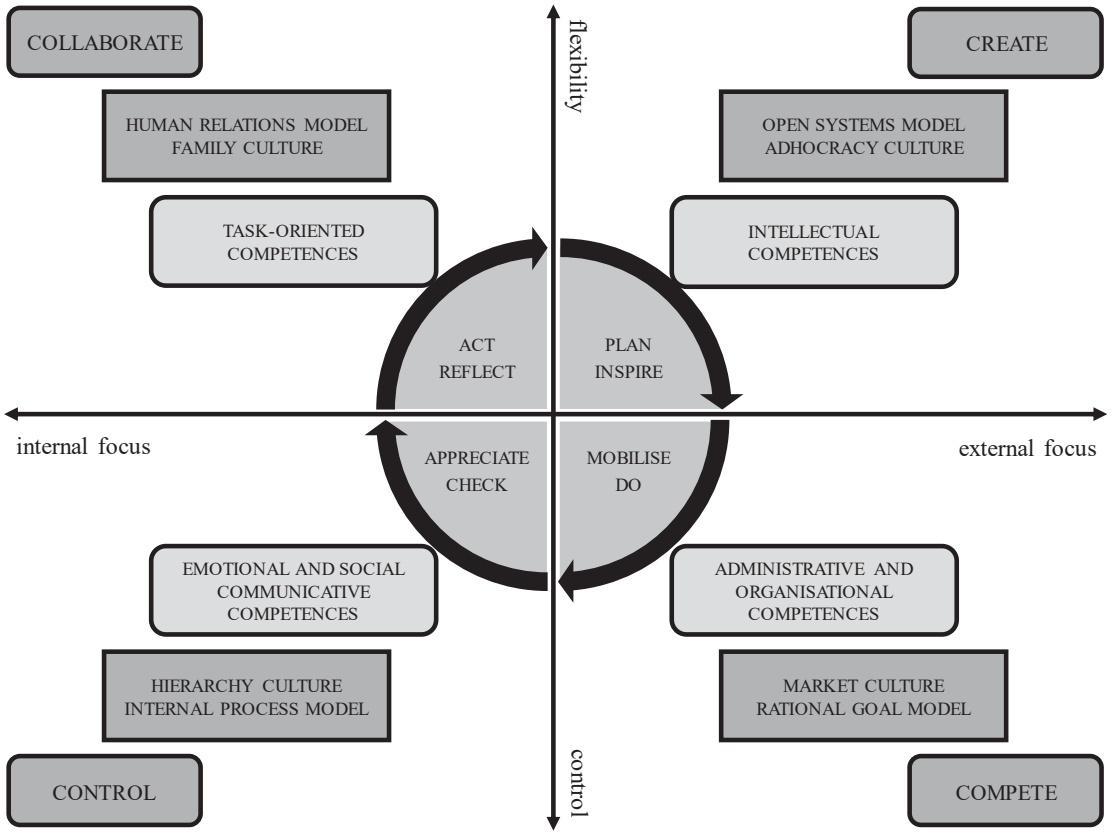
(2) *compete*, specified as 'doing things now' and defined as the combination of the process-orientation *do – mobilise* (effecting change in order to deploy and develop employee's capabilities) and the human contribution *rational goal model – market culture* (working on productivity and efficiency in order to get the job done), asks for *administrative and organisational competences* ('tactical thinking');

(3) *control*, stated as 'doing things right' and perceived as the link between the process-orientation *check – appreciate* (verifying the changes in order to discuss what is of real value) and the human-contribution *internal process model – hierarchy culture* (working on stability and control in order to do things right), calls for *emotional and social communicative competences* ('sensing'); and

(4) *collaborate*, determined as 'doing things that last' and seen as the junction of the process-orientation *act – reflect* (reacting on the effects in order to determine what to do with it) and the human-contribution *human relations model – family culture* (working on development in order to do things together), applies for *task-oriented competences* ('acting').

Figure 5.5

The business strategy approach of competences



5.4.3. Step 3

Table 5.4 illustrates the compositional semantic relationships between the definition of the key competences as presented in Table 5.3 and the set of personality facets and work values that jointly comprises that specific definition. By unravelling the definition of each key competence into sub-descriptions, it becomes possible to add the lexical similar personality facet and work value to each sub-description. In this way, the core of the definition of the key competence is elaborated in underlying characteristics, known as attributes and attitudes that mutually comprises its definition. This set of attributes and attitudes, which is visualised in Figure 5.4, is defined as the synset of that specific key competence. Table 5.4 shows the emergence of the synsets for the same four key competences as presented in Table 5.2.

Table 5.4

Examples of the synsets of personality facets and work values of the key competences, studied as semantic fields

Intellectual competences (' strategic thinking')

Creativity (Creativiteit):

1. Knows how to approach issues from different angles.
2. Comes with original ideas and unexpected solutions.
3. Comes up with new ways to work, right through existing thinking patterns.

	Facets	**Values**
ad 1.	Reflective (Reflectief)	Mental challenge (Zelfontwikkeling)
ad 2.	Original (Origineel)	Creativity (Creativiteit)
ad 3.	Ingenious (Vindingrijk)	Independence (Onafhankelijkheid)
		Variety (Afwisseling)

Administrative and organisational competences ('tactical thinking').

Planning and organising (Plannen en organiseren):
1. Knows to determine effective goals and priorities.
2. Puts in the right people and resources.
3. Knows to achieve the goals on time.

	Facets	**Values**
ad 1.	Active (Bedrijvig)	Prestige (Prestige)
ad 2.	Methodical (Systematisch)	Supervision (Invloed)
ad 3.	Lively (Druk)	Achievement (Prestaties)

Emotional and social competences ('sensing')

Involvement (Betrokkenheid):
1. Feels connected with the organisation and the work.
2. Is loyal and accepts the goals and values of the organisation.
3. Commits to the collective way of working.

	Facets	**Values**
ad 1.	Accommodating (Inschikkelijk)	Work environment (Arbeidsomstandigheden)
ad 2.	Sensitive (Fijngevoelig)	Lifestyle (Balans werk en privé)
		Security (Zekerheid)
ad 3.	Disciplined (Gedisciplineerd)	Aesthetics, management (Structuur)
		Income (Financiële beloning)

Task oriented competences ('acting').

Result orientation (Resultaatgerichtheid):
1. Is aimed at
2. actually implementing plans
3. and achieving goals.

	Facets	**Values**
ad 1.	Attentive (Aandachtig)	Co-workers (Relaties op het werk)
ad 2.	Diligent (Ijverig)	Altruism (Altruïsme)
ad 3.	Cooperative (Coöperatief)	

5.4.4. Step 4

Table 5.5 presents the compositional semantic relationships between the definition of the two sides of the Belbin team roles and the label assigned to the team role defined in terms of work-related human activities. The team roles are dealt with as separate semantic fields. In this way, the team roles are linked to the human characteristics side and the business strategy side of the original Belbin team roles (Belbin, 2010). As shown in Table 5.5, this lexical semantic analysis results in a set of eight unique team roles, including their Dutch translations. In preparation to the second part of the study in which the lexical-semantic relationships are evaluated psychometrically, the team roles are labelled as TR1 until TR8.

Table 5.5

Team roles, defined in terms of work-related human activities

TR1: Innovate (Innoveren) Being creative, imaginative and free thinking in order to generate ideas and solve problems.
TR2: Evaluate (Evalueren) Being sober, strategic and discerning in order to see all options and to judge accurately.
TR3: Activate (Activeren) Being challenging, dynamic and thrived on pressure to possess the drive and courage to overcome obstacles.
TR4: Coordinate (Coördineren) Being mature, confident and able to identify talent in order to clarify goals and delegate effectively.
TR5: Check (Controleren) Being single-minded, self-starting and dedicated in order to search out error, to polish and to perfect.
TR6: Inspire (Inspireren) Being co-operative, perceptive and diplomatic in order to be able to listen and avert friction.
TR7: Implement (Implementeren) Being practical, reliable and efficient in order to turn ideas into actions and to organise the work to be done.
TR8: Inform (Informeren) Being outgoing, enthusiastic and communicative in order to explore opportunities and develop contacts.

5.4.5. Step 5

For the same four key competences as presented in Table 5.2 and Table 5.4, Table 5.6 visualises the procedure of building the compositional semantic relationships between the definition of the eight team roles defined in terms of work-related human activities and their lexical corresponding key competences. Since the key competences have been classified in the four CVLM models, as presented in Figure 5.5, the linking of the key competences to team roles follows this grouping. Within Table 5.6, the lexical key concepts of the different compositional relationships are indicated as underlined text. As shown in Table 5.7, this lexical semantic analysis results in four models, each consisting of two corresponding team roles that both are built up of two key competences.

Table 5.6

Examples of the emergence of the lexical-semantic relationship between key competences and team roles, defined in terms of work-related human activities

CREATE: Doing new things.

Intellectual competences: Strategic thinking / intellectual visioning.

TR1: **Innovate** (Innoveren): Generates ideas and solves problems.
1. Creative
2. Imaginative
3. Free thinking

KC2: **Creativity** (Creativiteit):
1. Knows how to approach issues from different angles.
2. Comes with original ideas and unexpected solutions.
3. Comes up with new ways to work, right through existing thinking patterns.

	Facets	**Values**
ad 1.	Reflective (Reflectief)	Mental challenge (Zelfontwikkeling)
ad 2.	Original (Origineel)	Creativity (Creativiteit)
ad 3.	Ingenious (Vindingrijk)	Independence (Onafhankelijkheid)
		Variety (Afwisseling)

COMPETE: Doing things now.

Administrative and organisational competences: Tactical thinking / organisational applying.

TR3: **Activate** (Activeren): Has the drive and courage to overcome obstacles.
1. Challenging
2. Dynamic
3. Thrives on pressure

KC7: **Planning and organising** (Plannen en organiseren):
1. Knows to determine effective goals and priorities.
2. Puts in the right people and resources.
3. Knows to achieve the goals on time.

	Facets	**Values**
ad 1.	Active (Bedrijvig)	Prestige (Prestige)
ad 2.	Methodical (Systematisch)	Supervision (Invloed)
ad 3.	Lively (Druk)	Achievement (Prestaties)

CONTROL: Doing things right.

Emotional and social competences: Conforming / sensing.

TR5: **Check** (Controleren): Searches out errors, polishes and perfects.
1. Single-minded
2. Selfstarting
3. Dedicated

KC9: **Involvement** (Betrokkenheid):
1. Feels connected with the organisation and the work.
2. Is loyal and accepts the goals and values of the organisation.
3. Commits to the collective way of working.

	Facets	**Values**
ad 1.	Accommodating (Inschikkelijk)	Work environment (Arbeidsomstandigheden)
ad 2.	Sensitive (Fijngevoelig)	Lifestyle (Balans werk en privé)
		Security (Zekerheid)
ad 3.	Disciplined (Gedisciplineerd)	Aesthetics, management (Structuur)
		Income (Financiële beloning)

COLLABORATE: Doing things that last.

Task oriented competences: Applying / acting.

TR7: **Implement** (Implementeren): Turns ideas into actions and organises the work to be done.
1. Practical
2. Reliable
3. Efficient

KC14: **Result orientation** (Resultaatgerichtheid):
1. Is aimed at
2. actually implementing plans
3. and achieving goals.

	Facets	**Values**
ad 1.	Attentive (Aandachtig)	Co-workers (Relaties op het werk)
ad 2.	Diligent (Ijverig)	Altruism (Altruïsme)
ad 3.	Cooperative (Coöperatief)	

Table 5.7

The compositional semantic relationships between key competences and team roles, defined in terms of work-related human activities, and ordered in the four CVLM models

CREATE	**COMPETE**
Intellectual competences ('strategic thinking')	**Administrative and organisational competences** ('tactical thinking')
TR1: **Innovate** (Innoveren) KC1: Entrepreneurship (Ondernemerschap) KC2: Creativity (Creativiteit)	TR3: **Activate** (Activeren) KC5: Initiative (Initiatief) KC6: Decisiveness (Besluitvaardigheid)
TR2: **Evaluate** (Evalueren) KC3: Problem analysis (Probleemanalyse) KC4: Judgment (Oordeelsvorming)	TR4: **Coordinate** (Coördineren) KC7: Planning and organising (Plannen en organiseren) KC8: Quality orientation (Kwaliteitsgerichtheid)
CONTROL	**COLLABORATE**
Emotional and social communicative competences ('sensing')	**Task oriented competences** ('acting')
TR5: **Check** (Controleren) KC9: Involvement (Betrokkenheid) KC10: Stress tolerance (Stressbestendigheid)	TR7: **Implement** (Implementeren) KC13: Leadership (Leidinggeven) KC14: Result orientation (Resultaatgerichtheid)
TR6: **Inspire** (Inspireren) KC11: Empathy (Inlevingsvermogen) KC12: Oral communication (Mondelinge vaardigheid)	TR8: **Inform** (Informeren) KC15: Networking (Netwerken) KC16: Customer orientation (Klantgerichtheid)

5.4.6. Step 6

Table 5.8 presents the compositional semantic relationships between the definition of each team role and the organisational effectiveness and organisational climate dimensions of the process-oriented and human-contribution approach of business strategy, elaborated in the four models of CVLM and each dealt with as a separate semantic field. The lexical key concept of the different compositional relationships is presented as underlined text. Studied from a lexical-semantic perspective, the team roles function as the junction between key competences and business strategy.

Table 5.8

The compositional semantic relationships between the team roles and business strategy

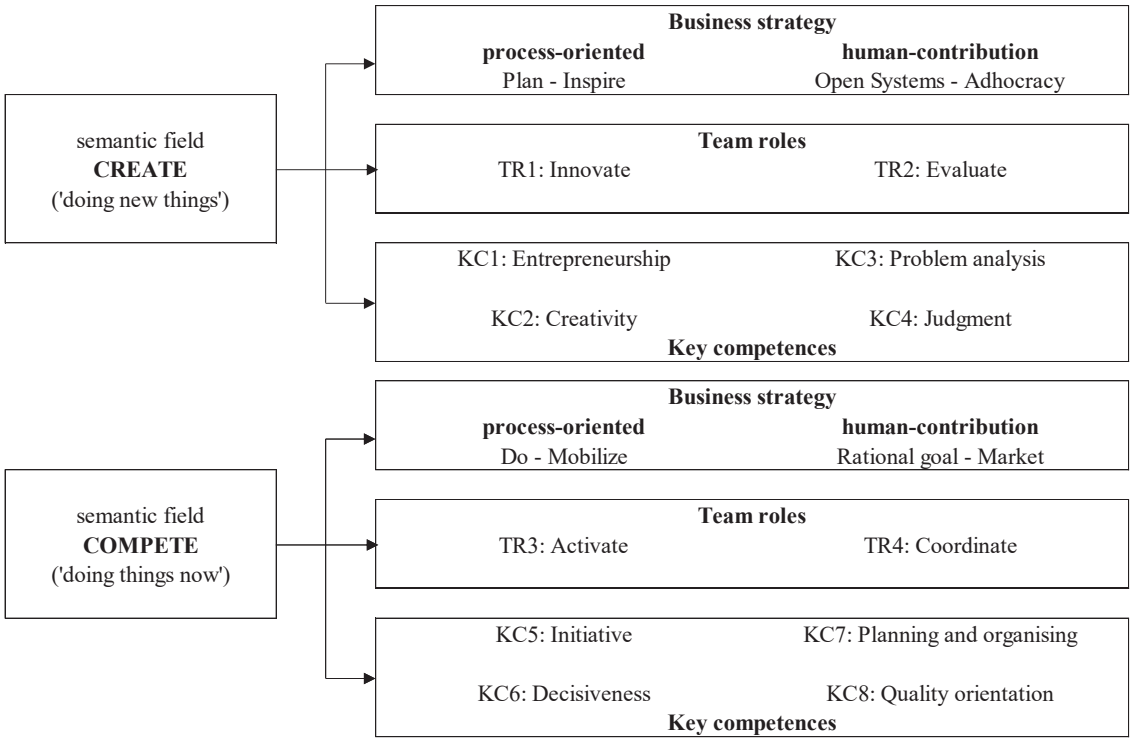
	Process-oriented approach	**Human-contribution approach**
semantic field **CREATE** ('doing new things')	**Plan - Inspire:** Identifying opportunities in order to generate new ideas.	**Open Systems - Adhocracy:** Working on growth in order to do things first.
	TR1: **Innovate** (Innoveren) Generates ideas and solves problems. ('creative, imaginative, free thinking')	TR2: **Evaluate** (Evalueren) Sees all options and judges accurately. ('sober, strategic, discerning')
	Process-oriented approach	**Human-contribution approach**
semantic field **COMPETE** ('doing things now')	**Do - Mobilise:** Effecting change in order to deploy and develop employee's capabilities.	**Rational goal - Market:** Working on productivity and efficiency in order to get the job done.
	TR3: **Activate** (Activeren) Has the drive to overcome obstacles. ('challenging, dynamic, thrives on pressure')	TR4: **Coordinate** (Coördineren) Clarifies goals and delegates effectively. ('mature, confident, identifies talent')
	Process-oriented approach	**Human-contribution approach**
semantic field **CONTROL** ('doing things right')	**Check - Appreciate:** Verifying the changes in order to discuss what is of real value.	**Internal process - Hierarchy:** Working on stability and control in order to do things right.
	TR5: **Check** (Controleren) Searches out errors, polishes and perfects. ('single-minded, selfstarting, dedicated')	TR6: **Inspire** (Inspireren) Listens and averts friction. ('cooperative, perceptive, diplomatic')
	Process-oriented approach	**Human-contribution approach**
semantic field **COLLABORATE** ('doing things that last')	**Act - Reflect:** Reacting on the effects in order to determin what to do with it.	**Human relations - Familiy:** Working on development in order to do things together.
	TR7: **Implement** (Implementeren) Turns ideas into actions and organises the work to be done ('practical, reliable, efficient')	TR8: **Inform** (Informeren) Explores opportunities and develops contacts. ('outgoing, enthusiastic, communicative')

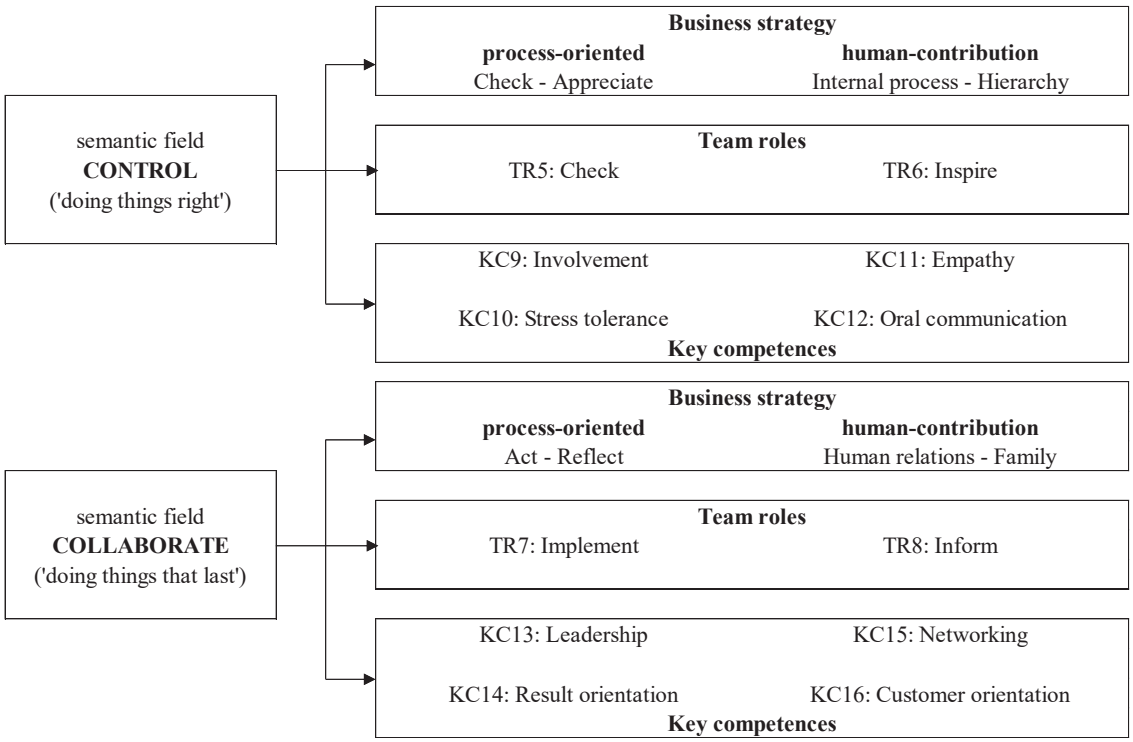
5.5. Conclusion of Study 1

As visualised in Table 5.9, this first study designed a framework of the function of team roles, defined in terms of work-related human activities, in the relationship between business strategy and key competences, using lexical semantics. A unique set of 16 key competences, derived from a series of Dutch competency frameworks, was introduced and ordered in the four models of the competing values leadership model (CVLM). Each key competence was expressed in a set of lexically corresponding personality facets of the five factor model (FFM) and work values of the universal values model (UVM). Then, a unique set of eight team roles, derived from the twofold character of the Belbin team roles, was lexically linked to the 16 corresponding key competences.

Table 5.9

The design of the framework of the function of team roles in the relationship between business strategy and key competences





In the first design step, the competences of the Dutch competency frameworks of Van Dongen (2003), ECLO (2004), Nieuwenhuis (2006) and Van Thiel (2008c) were ordered in a unique set of key competences, covering the lexical overlap in these frameworks. This study found that, by using lexical semantic techniques like synonym, hyponym, meronym, holonym and compositional semantic relationships, a set of 16 unique key competences, studied as separate semantic fields, can be composed.

In the second step, the set of key competences was lexically ordered in the four models of CVLM. The study showed that, by using compositional semantic relationships techniques, the core of the definition of each of the 16 key competences can be linked to the core of the definition of the organisational effectiveness and organisational climate dimensions of the process-oriented and human-contribution approach of business strategy, like elaborated in the four models of CVLM.

The third design step expressed the behaviouristic definition of the unique set of key competences in a set of lexically corresponding personality facets and work values. It appeared that by unravelling the definition of each key competence into sub-descriptions, it becomes possible to add the lexical similar personality facets and work values to each

sub-description. Therewith, the core of the definition of the key competence, described in outwardly skills, can be elaborated in underlying characteristics, known as attributes and attitudes that mutually comprise its definition.

In the fourth step the twofold character of the Belbin team roles was expressed in lexical similar team roles, defined in terms of work-related human activities. The study found that, by using compositional semantic relationships techniques, the core of the definition of the two sides of each Belbin team role, can be captured in corresponding team roles.

In the fifth step the unique set of key competences was lexically related to the team roles, defined in terms of work-related human activities. This study finds that, by using compositional semantic relationships techniques, team roles and key competences can be lexically linked.

In the sixth design step the team roles were lexically linked to the four CVLM models, representing the organisational effectiveness and organisational climate dimensions of the process-oriented and human-contribution approach of business strategy. The study finds compositional semantic relationships between team roles and the CVLM.

5.6. Study 2

In order to lay the foundation for a future assessment instrument for measuring the relationship between business strategy and key competences from an individual employee's starting point, a psychometric validation of the lexical-semantic elaboration of Study 1 is needed. It is expected that the reliability (is the measurement result repeatable?) and construct validity (can the test scores be used for the purpose of the test?) of the lexically designed framework of the function of team roles in the relationship between business strategy and key competences, as presented in Table 5.9, can be validated with factor analysis, or FA (Jöreskog, 1969; Thompson, 2004) and the multitrait multimethod matrix, or MTMM (Campbell and Fiske, 1959).

H_1: The lexically designed framework of the function of team roles in the relationship between business strategy and key competences can be validated with FA and MTMM.

5.6.1. Factor Analysis

Factor analysis (FA) is used to test whether the measure of a construct is consistent with the nature of that construct. As such, the objective of FA is to evaluate whether the data fits the a priori hypothesised measurement model, based on theory (Browne, 2001). In the present study, FA is conducted to test the lexical ordering of the set of unique key competences, or KC, derived from the lexical overlap in the competency frameworks of Van Dongen (2003), ECLO (2004), Nieuwenhuis (2006) and Van Thiel (2008c), in four clusters, representing the four models of the CVLM (Cameron et al., 2014). Next to this, FA is performed to test the ordering of team roles (TR) derived from Belbin (2010) and defined in terms of work-related human activities, in four clusters, representing the four models of the CVLM.

5.6.2. Multi Trait Multi Method Matrix

In the commonly used Standards for Educational and Psychological Testing (AERA, 2014), test scores are seen as measures of constructs. A construct is defined as a theoretical variable that must be inferred from multiple types of evidence. One of these evidences is the construct validity, viewed as the degree to which test scores measure a particular construct. Construct validity can be assessed as convergent validity, seen as the relationship between test scores and other measures of the same construct. And construct validity can be studied as discriminant validity, defined as the relationship between test scores and measures of different constructs. Convergent and discriminant validity evidence can be examined systematically using the multitrait multimethod matrix approach, or MTMM. This approach involves correlating test scores with other measures of the construct apparently measured by the test (monotrait correlations) as well as with measures of different constructs (heterotrait correlations). MTMM also involves similar measurement methods (monomethod correlations), different measurement methods (heteromethod correlations) and reliabilities of each measure. The joint consideration of all these correlations allows construct-relevant trait variance to be distinguished from construct-irrelevant method variance (Pitoniak & Sireci, 2002).

Campbell and Fiske (1959) named four criteria for evaluating a multitrait multimethod correlation matrix. The first criterion offers evidence of convergent validity and the second, third and fourth criteria offer evidence for discriminant validity. These four criteria are read as follows (Messick, 1989):

(1) correlations for the same trait measured with different constructs should be significantly different from zero and sufficiently large to encourage further examination of validity;
(2) each convergent validity (same trait measured with different methods) should be higher than the other correlations found in its row and column that measure different traits by different methods;
(3) convergent validities should be higher than correlations among different traits measured with the same method; and
(4) the pattern of correlations among traits should be the same both within a method and across methods.

In composing a MTMM, a correlation matrix is divided among variables in three categories: (1) relationships among the variables of the same origin (the validity diagonal), (2) relationships among variables using similar measuring instruments, and, (3) relationships that had neither characteristics nor methods in common (Campbell & Fiske, 1959; Byrne, 2006). This present study uses MTMM to evaluate the convergent and discriminant validity of the lexical-semantic elaboration of the key competences (KC) and team roles (TR) used in the lexically designed framework of the function of team roles in the relationship between business strategy and key competences, as presented in Table 5.9.

5.7. Methodology

5.7.1. Procedures and Participants

Following the lexical-semantic analyses, a validation study using FA and MTMM is conducted. To evaluate the outcomes, two procedures are used. The first is a factor analysis, the second procedure is a direct method to assess convergent and discriminant validity. The analyses are calculated on two different data sets, filled in by 164 participants. All participants completed both sets. The first data set consists of the 300-item Dutch personality test, or NPT (Van Thiel, 2008a) and the 140-item Dutch work values test, or NWT (Van Thiel, 2008b). The second data set consist of the 155-item Dutch competence test, named CT (Van Thiel, 2008c) and the 36-item Dutch group roles

test, named GT (Van Thiel, 2008d). Gender, age and educational level were reported. The average age of the 164 respondents (66 female, 98 male) was 42.2 years (SD=11.5). 54% of the respondents holds a vocational degree and 46% has an university degree.

5.7.2. Measures

5.7.2.1 Measurement of Personality Traits

For the measurement of personality traits, the Dutch personality test (NPT) was used. This measure is a Dutch translation, adaptation and extension of the international personality item pool (IPIP; Goldberg et al., 2006), and measures dimensions highly similar to those of the NEO PI-R, a widely used personality inventory (Costa and McCrae, 1985). The NPT measures the five personality factors of the FFM and their 30 underlying facets. Van Thiel (2008a) analysed the 300 items on a 5-point Likert scale, and carried out a Cronbach's alpha and factor analysis on a sample of 577 respondents in the Netherlands. The domain scales show internal reliabilities which range from .70 to .92.

5.7.2.2 Measurement of Work Values

Work values are measured with the Dutch work values Test (NWT). This test measures scales largely based on the universal values theory (Schwartz, 1992). Analysis of the 140 items of the NWT (Van Thiel, 2008b) on a 5-point Likert scale, Cronbach's alpha and factor analysis were carried out on a sample of 510 respondents in the Netherlands. The domain scales show internal reliabilities ranging from .74 to .92.

5.7.2.3. Measurement of Competences

Competences are measured with the Dutch competence test (CT). The questionnaire measures 16 key competences, derived from the overlap in multiple Dutch competence models. Analysis of the 155 items on a 5-point Likert scale, Cronbach's alpha and factor analysis were carried out on a sample of 750 respondents in the Netherlands (Van Thiel, 2008c). The domain scales show internal reliabilities that range from .82 to .91. In conducting the MTMM, the present paper labels these competences as follows:

CT1: *sensitivity* (opmerken);
CT2: *initiative* (initiatief nemen);
CT3: *problem analysis* (analyseren);
CT4: *decisiveness* (beslissen);

CT5: *creativity* (creëren);
CT6: *planning and organising* (plannen en organiseren);
CT7: *tenacity* (volhouden);
CT8: *behavioural flexibility* (flexibel reageren);
CT9: *stress tolerance* (functioneren onder spanning);
CT10: *oral communication* (mondeling communiceren);
CT11: *written communication* (schriftelijk communiceren);
CT12: *loyalty* (helpen);
CT13: *networking* (netwerken);
CT14: *management control* (controleren);
CT15: *leadership* (leidinggeven);
CT16: *self-development* (zelfsturing en –ontwikkeling).

5.7.2.4. Measurement of Team Roles

Team roles are measured with the ipsative Dutch group roles test, or GT (Van Thiel, 2008d). The test measures ranking scores based on the Belbin team roles (Belbin, 2010). The test determines the personal preference of a respondent, for which no norm group is necessary. Because of the ipsative format, sometimes called a 'forced choice' scale, in which respondents compare two or more options and have to pick the one they prefer most, no internal consistency reliability can be determined (Chan, 2003). Making the team roles applicable for conducting the MTMM, they are labelled as follows:

GT1: *implementer* (bedrijfsman);
GT2: *resource investigator* (brononderzoeker);
GT3: *team worker* (groepswerker);
GT4: *monitor* (monitor);
GT5: *plant* (plant);
GT7: *shaper* (vormer);
GT8: *coordinator* (voorzitter);
GT9: *completer finisher* (zorgdrager).

The team role specialist (specialist) is excluded from the study, since this role is mainly characterised by the amount of expertise of a specific discipline rather than by personality characteristics (Belbin, 2010b).

5.7.3. Analyses

In this second study, the reliability and construct validity of the lexical-semantic relationships within the framework, designed in Study 1, is evaluated. Therefore, this chapter continues with conducting both factor analyses and correlation analyses. Based on two different data sets – personality facets and work values on the one hand and competences and team roles on the other hand – two procedures are conducted. The first procedure consists of two FA's. One is composed to test the lexical ordering of the set of unique key competences (KC) derived from the lexical overlap in the competency frameworks of Van Dongen (2003), ECLO (2004), Nieuwenhuis (2006) and Van Thiel (2008c), in four clusters, representing the four models of the CVLM. The second factor analysis is composed to test the ordering of team roles (TR) in four clusters, representing the four models of the CVLM.

Then, a MTMM is composed to assess the convergent and discriminant validity of both the key competences (KC) and the team roles (TR). Firstly, the convergent validity of the relationship between the key competences and their lexical corresponding competences of the Dutch competence test (CT) is tested. Secondly, the convergent validity of the relationship between the key competences and their lexical corresponding team role derived from the Belbin team roles is evaluated. Thirdly, the convergent validity of the relationship between the key competences, and their lexical corresponding group role (GT) of the Dutch group roles test is evaluated. As fourth, the convergent validity of the relationship between the set of competences of the Dutch competence test and their lexical corresponding team roles is studied. As fifth, the convergent validity of the relationship between the set of team roles and their lexical corresponding group role, of the Dutch group roles test is evaluated. Finally, the convergent validity of the relationship between the set of competences of the Dutch competence test and their lexical corresponding group role, of the Dutch group roles test is tested.

5.8. Results

5.8.1. Factor Analysis

Table 5.10 shows the results of the factor analysis (FA) (KMO = 0.798, Bartlett's Test of Sphericity $p<0.05$, Sig. 0,000) of the set of 16 key competences (KC) dealt with as separate semantic fields and derived from the corresponding personality facets of the NPT and the work values of the NWT, as demonstrated in Table 5.4. The factor analysis results in four clusters of each four key competences, which confirms the lexical ordering of the set of unique key competences in four groups, representing the models of the CVLM as illustrated in Table 5.2 and presented in Table 5.3.

Table 5.11 shows the results of the FA (KMO = 0.618, Bartlett's Test of Sphericity $p<0.05$, Sig. 0,000) of the set of eight team roles (TR) derived from the combinations of key competences. The factor analysis results in three significant clusters of team roles. The two models 'create' and 'compete' of the CVLM show overlap. Therewith the ordering of team roles, derived from the Belbin team roles and defined in terms of work-related human activities, in four clusters representing the four models of the CVLM (Cameron et al., 2014), is partly confirmed by the factor analysis.

Table 5.10

FA of the key competences, or KC

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.798
Bartlett's Test of Sphericity	Approx. Chi-	15,133.413
	df	120
	Sig.	0.000

Rotated Component Matrix[a]

	Component			
	1	2	3	4
KC1: Entrepreneurship (Ondernemerschap)		**0.854**		
KC2: Creativity (Creativiteit)		**0.915**		
KC3: Problem analysis (Probleemanalyse)		**0.906**		
KC4: Judgment (Oordeelsvorming)		**0.868**		
KC5: Initiative (Initiatief)	**0.840**			
KC6: Decisiveness (Besluitvaardigheid)	**0.947**			
KC7: Planning and organising (Plannen en organiseren)	**0.883**			
KC8: Quality orientation (Kwaliteitsgerichtheid)	**0.894**			
KC9: Involvement (Betrokkenheid)			**0.926**	
KC10: Stress tolerance (Stressbestendigheid)			**0.957**	
KC11: Empathy (Inlevingsvermogen)			**0.913**	
KC12: Oral communication (Mondelinge vaardigheid)			**0.899**	
KC13: Leadership (Leidinggeven)				**0.892**
KC14: Results orientation (Resultaatgerichtheid)				**0.897**
KC15: Networking (Netwerken)				**0.830**
KC16: Customer orientation (Klantgerichtheid)				**0.887**

Extraction Method: Principal Component Analysis.

a. Rotation converged in 24 iterations.

Table 5.11

FA of the team roles, or TR

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.618
Bartlett's Test of Sphericity	Approx. Chi-	5,283.742
	df	28
	Sig.	0.000

Rotated Component Matrix[a]

	Component		
	1	2	3
TR1: Innovate (Innoveren)	**0.785**		
TR2: Evaluate (Evalueren)	**0.744**		
TR3: Activate (Activeren)	**0.944**		
TR4: Coordinate (Coördineren)	**0.940**		
TR5: Check (Controleren)			**0.951**
TR6: Inspire (Inspireren)			**0.923**
TR7: Implement (Implementeren)		**0.913**	
TR8: Inform (Informeren)		**0.915**	

Extraction Method: Principal Component Analysis.

a. Rotation converged in 5 iterations.

Table 5.12 presents the reliability, seen as Cronbach's alpha (α), of the 16 key competences (KC) and the eight team roles (TR). The 16 key competences, built on their corresponding personality facets and work values as demonstrated in Table 5.4, show strong reliabilities with an average Cronbach's alpha of 0.798 within a range of [0.745 – 0.855]. The eight team roles, seen as the combination of two underlying key competences, show strong reliabilities with an average Cronbach's alpha of 0.811 within a range of [0.777 – 0.839].

Table 5.12

The reliability, seen as Cronbach's alpha (α), of the 16 key competences, or KC, and the eight team roles, or TR

construct	**α**	**construct**	**α**
KC1	0.820	TR1	0.824
KC2	0.799	TR2	0.797
KC3	0.745	TR3	0.831
KC4	0.787	TR4	0.829
KC5	0.855	TR5	0.777
KC6	0.835	TR6	0.778
KC7	0.834	TR7	0.839
KC8	0.801	TR8	0.816
KC9	0.780		
KC10	0.788		
KC11	0.764		
KC12	0.797		
KC13	0.761		
KC14	0.798		
KC15	0.764		
KC16	0.837		

5.8.2. MTMM

Table 5.13 presents the correlation matrix of the relationships between the key competences (KC) and the competences of the Dutch competence test (CT). The validity diagonal is represented by bolded numbers and shows convergent validity. The rest of the numbers (off-validity diagonal) represent discriminant validity. The correlations in the validity diagonal should be higher than any correlations in the off-validity diagonal in the same column (Byrne, 2010).

In total 11 of the 16 key competences show sufficient construct validity when correlated with their corresponding competence with approximately 2.4 higher correlations in the off-validity diagonal than in the validity diagonal:

KC4: judgment has nine higher correlations in the off-validity diagonal than in the validity diagonal;

KC6: decisiveness and KC8: quality orientation, both have 12 higher correlations in the off-validity diagonal than in the validity diagonal;

KC10: stress tolerance has seven higher correlations in the off-validity diagonal than in the validity diagonal;

KC13: leadership has 13 higher correlations in the off-validity diagonal than in the validity diagonal.

Table 5.13

The correlation matrix of the relationships between KC and CT

	KC1	KC2	KC3	KC4	KC5	KC6	KC7	KC8	KC9	KC10	KC11	KC12	KC13	KC14	KC15	KC16	
CT16	**0.650**	0.633	0.617	0.661	0.681	0.451	0.608	0.614	0.450	0.503	0.404	0.463	0.512	0.521	0.419	0.373	
CT5	0.625	**0.626**	0.558	0.616	0.61	0.511	0.616	0.569	0.293	0.408	0.352	0.442	0.343	0.303	0.35	0.133	*
CT3	0.661	0.613	**0.568**	0.667	0.716	0.514	0.634	0.680	0.440	0.539	0.391	0.505	0.454	0.453	0.39	0.306	
CT14	0.542	0.529	0.552	**0.609**	0.635	0.322	0.518	0.520	0.615	0.584	0.566	0.571	0.544	0.600	0.411	0.472	
CT2	0.760	0.692	0.627	0.721	**0.743**	0.546	0.687	0.650	0.409	0.536	0.425	0.545	0.478	0.466	0.468	0.292	
CT4	0.672	0.618	0.578	0.642	0.592	**0.311**	0.494	0.497	0.326	0.404	0.269	0.366	0.514	0.517	0.388	0.422	
CT6	0.645	0.597	0.561	0.670	0.715	0.483	**0.632**	0.661	0.472	0.570	0.412	0.523	0.492	0.495	0.403	0.336	
CT11	0.497	0.507	0.503	0.559	0.513	0.290	0.423	**0.489**	0.471	0.504	0.400	0.451	0.445	0.458	0.333	0.362	
CT12	0.569	0.563	0.59	0.627	0.578	0.251	0.475	0.462	**0.556**	0.501	0.557	0.543	0.707	0.715	0.58	0.597	
CT9	0.596	0.535	0.436	0.553	0.602	0.421	0.576	0.549	0.305	**0.510**	0.252	0.464	0.382	0.331	0.367	0.219	
CT1	0.490	0.506	0.557	0.562	0.53	0.322	0.455	0.470	0.456	0.418	**0.501**	0.463	0.567	0.549	0.464	0.419	
CT10	0.634	0.598	0.586	0.656	0.661	0.415	0.575	0.587	0.509	0.569	0.519	**0.594**	0.582	0.568	0.524	0.436	
CT15	0.637	0.553	0.485	0.581	0.722	0.657	0.698	0.689	0.348	0.523	0.387	0.542	**0.358**	0.326	0.403	0.134	*
CT7	0.621	0.596	0.54	0.646	0.575	0.226	0.476	0.460	0.414	0.454	0.327	0.429	0.586	**0.591**	0.449	0.499	
CT13	0.543	0.482	0.409	0.504	0.616	0.541	0.610	0.578	0.359	0.490	0.427	0.587	0.397	0.332	**0.514**	0.188	*
CT8	0.658	0.614	0.564	0.655	0.713	0.496	0.669	0.637	0.448	0.575	0.450	0.590	0.558	0.513	0.565	**0.349**	

* non significant at the 0.05 level (2-tailed).

Table 5.14 presents the correlation matrix of the relationships between the key competences (KC) and the team roles (TR). When relating the 16 key competences to the 8 team roles, each lexically built on two of the set key competences, strong construct validity is found.

KC5: initiative, shows a slightly stronger correlation with TR4: coordinate (r = 0.963) than with its expected TR3: activate (r = 0.953);

KC16: customer orientation, shows a marginal stronger correlation with TR7: implement (r = 0.944) than with its foreseen TR8: inform (r = 0.927).

Table 5.14

The correlation matrix of the relationships between KC and TR

	KC1	KC2	KC3	KC4	KC5	KC6	KC7	KC8	KC9	KC10	KC11	KC12	KC13	KC14	KC15	KC16
TR1	**0.991**	**0.991**	0.909	0.936	0.763	0.520	0.702	0.675	0.438	0.531	0.473	0.539	0.587	0.570	0.529	0.430
TR2	0.907	0.950	**0.984**	**0.985**	0.743	0.429	0.638	0.659	0.601	0.589	0.595	0.579	0.671	0.687	0.536	0.577
TR3	0.711	0.631	0.553	0.668	**0.953**	**0.950**	0.970	0.963	0.457	0.670	0.495	0.659	0.326	0.275	0.425	0.064 *
TR4	0.728	0.658	0.583	0.708	0.963	0.905	**0.986**	**0.985**	0.519	0.729	0.539	0.700	0.390	0.329	0.469	0.132 *
TR5	0.497	0.498	0.569	0.644	0.69	0.428	0.614	0.659	**0.968**	**0.963**	0.883	0.914	0.599	0.624	0.527	0.542
TR6	0.518	0.517	0.580	0.606	0.675	0.468	0.639	0.625	0.889	0.898	**0.97**	**0.972**	0.662	0.625	0.688	0.528
TR7	0.565	0.599	0.686	0.674	0.506	0.060 *	0.363	0.353	0.683	0.519	0.69	0.586	**0.982**	**0.986**	0.804	0.944
TR8	0.500	0.534	0.617	0.590	0.438	0.032 *	0.321	0.295	0.645	0.487	0.686	0.602	0.965	0.937	**0.891**	**0.927**

* non significant at the 0.05 level (2-tailed).

Table 5.15 presents the correlation matrix of the relationships between the key competences (KC) and the group roles of the ipsative Dutch group roles test (GT). Linking the key competences with the team roles, measured with the ipsative Dutch Group roles test, results in construct validity for five of the 16 key competences:

KC6: decisiveness/GT7: shaper (r = 0.192);

KC7: planning and organising/GT8: coordinator (r = 0.209);

KC8: quality orientation/GT8: coordinator (r = 0.163);

KC11: empathy/GT3: team worker (r = 0.166);

KC15: networking/GT2: resource investigator (r = 0.355).

Table 5.15

The correlation matrix of the relationships between KC and GT

	KC1	KC2	KC3	KC4	KC5	KC6	KC7	KC8	KC9	KC10	KC11	KC12	KC13	KC14	KC15	KC16
GT5	**0.123** *	**0.149** *	0.102 *	0.082 *	-0.030 *	0.085 *	0.023 *	0.013 *	-0.121 *	-0.021 *	-0.079 *	-0.026 *	-0.078 *	-0.138 *	-0.068 *	-0.156
GT4	0.054 *	-0.004 *	**-0.040** *	**0.025** *	0.077 *	0.117 *	0.062 *	0.128 *	-0.040 *	-0.012 *	-0.122 *	-0.077* *	-0.098 *	-0.055 *	-0.104 *	-0.069 *
GT7	0.190	0.122 *	0.059 *	0.078 *	**0.148** *	**0.192**	0.177	0.094 *	-0.096 *	-0.064 *	-0.015 *	-0.020 *	-0.010 *	-0.001 *	-0.096 *	-0.076 *
GT8	0.201	0.171	0.136 *	0.109 *	0.209	0.172	**0.209**	**0.163**	0.030 *	0.108 *	0.101 *	0.164	0.120 *	0.086 *	0.198	0.041 *
GT9	-0.263	-0.193	-0.128 *	-0.161	-0.185	-0.217	-0.193	-0.163	**-0.005** *	**-0.129** *	-0.065 *	-0.187	-0.111 *	-0.070 *	-0.197	-0.013 *
GT3	-0.178	-0.110 *	-0.001 *	-0.057 *	-0.148 *	-0.345	-0.191	-0.179	0.201	0.044 *	**0.166**	**0.052** *	0.244	0.249	0.176	0.346
GT1	-0.054 *	-0.108 *	-0.142 *	-0.037 *	0.043 *	0.074 *	0.019 *	0.076 *	-0.003 *	0.081 *	-0.075 *	-0.011 *	**-0.083** *	**-0.071** *	-0.082 *	-0.089 *
GT2	0.267	0.244	0.230	0.185	0.204	0.227	0.232	0.156	0.145 *	0.180	0.288	0.312	0.235	0.178	**0.355**	**0.142** *

* non significant at the 0.05 level (2-tailed).

Table 5.16 presents the correlation matrix of the relationships between the competences of the Dutch competence test (CT), and the team roles (TR). Linking the competences to the team roles, results in sufficient construct validity for all of the 16 competences, with on average 3.1 higher correlations in the off-validity diagonal than in the validity diagonal within a range of [0 – 7].

Table 5.16

The correlation matrix of the relationships between CT and TR

	TR1	TR2	TR3	TR4	TR5	TR6	TR7	TR8
CT16	**0.648**	0.649	0.600	0.620	0.494	0.448	0.525	0.430
CT5	**0.630**	0.596	0.595	0.603	0.362	0.412	0.327	0.250
CT3	0.643	**0.628**	0.651	0.666	0.509	0.464	0.461	0.378
CT14	0.541	**0.591**	0.506	0.525	0.621	0.584	0.584	0.488
CT2	0.732	0.685	**0.676**	0.678	0.491	0.501	0.479	0.408
CT4	0.651	0.619	**0.474**	0.502	0.378	0.329	0.523	0.450
CT6	0.627	0.626	0.636	**0.655**	0.539	0.484	0.500	0.402
CT11	0.507	0.539	0.428	**0.462**	0.507	0.440	0.459	0.384
CT12	0.572	0.618	0.444	0.476	**0.550**	0.568	0.723	0.644
CT9	0.571	0.502	0.533	0.570	**0.420**	0.373	0.361	0.318
CT1	0.503	0.568	0.458	0.469	0.452	**0.497**	0.567	0.480
CT10	0.622	0.632	0.571	0.589	0.560	**0.576**	0.585	0.522
CT15	0.600	0.541	0.722	0.703	0.453	0.481	**0.346**	0.280
CT7	0.615	0.603	0.423	0.475	0.450	0.391	**0.598**	0.525
CT13	0.517	0.466	0.608	0.602	0.442	0.524	0.370	**0.370**
CT8	0.642	0.619	0.639	0.663	0.530	0.539	0.542	**0.492**

Table 5.17 presents the correlation matrix of the relationships between the team roles, or TR, and the group roles of the Dutch group roles test, or GT. Relating the eight lexically composed team roles, with the eight team roles, measured with the ipsative Dutch Group roles test, results in construct validity for three of the eight team roles:

TR3: activate/GT7: shaper (r = 0.185);

TR4: coordinate/GT8: coordinator (r = 0.189);

TR8: inform/GT2: resource investigator (r = 0.266).

Table 5.17

The correlation matrix of the relationships between TR and GT

	TR1	TR2	TR3	TR4	TR5	TR6	TR7	TR8
GT5	**0.136** *	0.092 *	0.031 *	0.019 *	-0.077 *	-0.052 *	-0.112 *	-0.130 *
GT4	0.027 *	**-0.006** *	0.099 *	0.095 *	-0.023 *	-0.100 *	-0.076 *	-0.088 *
GT7	0.156	0.070 *	**0.185**	0.141 *	-0.084 *	0.005 *	0.004 *	-0.004 *
GT8	0.189	0.125 *	0.195	**0.189**	0.072 *	0.137 *	0.105 *	0.128 *
GT9	-0.230	-0.148 *	-0.210	-0.181	**-0.072** *	-0.134 *	-0.092 *	-0.109 *
GT3	-0.146 *	-0.029 *	-0.263	-0.189	0.129 *	**0.107** *	0.251	0.297
GT1	-0.081 *	-0.090 *	0.065 *	0.047 *	0.043 *	-0.040 *	**-0.078** *	-0.096 *
GT2	0.258	0.210	0.222	0.197	0.170	0.309	0.209	**0.266**

* non significant at the 0.05 level (2-tailed).

Table 5.18 presents the correlation matrix of the relationships between the competences of the Dutch competence test (CT) and the group roles of the Dutch group roles test (GT). The correlations between the competences and the team roles shows construct validity for five of the competences:

CT2: initiative/GT7 shaper (r = 0.232);

CT5: creativity/GT5 plant (r = 0.208);

CT6: planning and organising/GT8 coordinator (r = 0.196);

CT9: stress tolerance/GT9: completer finisher (r = 0.254);

CT11: written communication/GT8: coordinator (r = 0.189).

Table 5.18

The correlation matrix of the relationships between CT and GT

	CT16	CT5	CT3	CT14	CT2	CT4	CT6	CT11	CT12	CT9	CT1	CT10	CT15	CT7	CT13	CT8
GT5	**-0.009** *	**0.208**	-0.051 *	-0.090 *	0.012 *	-0.028 *	-0.027 *	-0.165	-0.063 *	0.010 *	-0.083 *	-0.067 *	0.044 *	-0.068 *	-0.037 *	0.009 *
GT4	0.064 *	-0.151 *	**0.115** *	**0.046** *	0.086 *	0.110 *	0.084 *	0.146 *	-0.063 *	0.017 *	0.010 *	0.048 *	0.084 *	0.033 *	-0.072 *	-0.009 *
GT7	0.078 *	0.280	0.089 *	0.036 *	**0.232**	**0.027** *	0.087 *	-0.036 *	0.083 *	0.004 *	0.117 *	0.106 *	0.213	0.013 *	0.211	0.128
GT8	0.218	0.141 *	0.216	0.163	0.237	0.168	**0.196**	**0.189**	0.169	0.241	0.085 *	0.220	0.236	0.198	0.221	0.221
GT9	-0.108 *	-0.187	-0.209	-0.044	-0.248	-0.163	-0.200	-0.156	**-0.133** *	**0.254**	-0.097 *	-0.220	-0.318	-0.142 *	-0.324	-0.278
GT3	-0.079 *	-0.154	-0.126 *	0.007 *	-0.187	-0.089 *	-0.111 *	0.031 *	0.094 *	-0.066 *	**0.102** *	**-0.025** *	-0.218	-0.016 *	-0.025 *	-0.010 *
GT1	-0.044 *	-0.207	-0.001 *	-0.029 *	-0.048 *	0.002 *	0.059 *	0.026 *	-0.067 *	0.009 *	-0.127 *	-0.044 *	**-0.008** *	**-0.045** *	-0.083 *	-0.006 *
GT2	0.048 *	0.194	0.082 *	0.010 *	0.194	0.136 *	0.062 *	0.065 *	0.185	0.140 *	0.104 *	0.206	0.214	0.092 *	**0.318**	**0.177**

* non significant at the 0.05 level (2-tailed).

5.9. Conclusion of Study 2

To lay the foundation for a future assessment instrument to measure the relationship between business strategy and key competences, the current study performed a psychometric validation of the lexically conducted framework of study 1. It was expected that the framework, as presented in Table 5.9, can be validated with factor analysis, or FA, and a multitrait multimethod matrix, or MTMM. Thereto, a series of nine analyses were conducted.

A first FA of the set of 16 key competences (KC) resulted in four clusters of each four key competences, derived from the lexical overlap in the competency frameworks of Van Dongen (2003), ECLO (2004), Nieuwenhuis (2006) and Van Thiel (2008c).With this, the study finds support for the lexical ordering of key competences in four semantic networks, representing the four models of the CVLM.

A second FA of the set of eight team roles (TR), derived from the Belbin team roles and defined in terms of work-related human activities, resulted in three clusters of team roles. It appeared that the first two models of the CVLM, 'create' and 'compete', showed overlap. However, the comparable strength of the factor loadings of .785 and .744 for TR1: innovate (innoveren) and TR2: evaluate (evalueren) on the one hand and .944 and .940 for TR3: activate (activeren) and coordinate (coördineren) on the other hand, seem to suggest that these are two different clusters. This implies that the team roles can also be divided into the four models.

The FA does not indicate what the found clusters of competences and team roles represent. However, Study 1 in this chapter shows substantive evidence for the classification of competences and team roles in the four CVLM models. These results are confirmed by the lexical models found earlier in Chapter 2 and 3, and the regression models between personality facets and work values found in Chapter 4. This provides solid and empirical evidence for the interpretation of the clusters that arise from the FA as embodiments of the CVLM models.

For both the 16 key competences and the 8 team roles, strong reliability in terms of Cronbach's alpha (α) was found. The key competences show an average α of 0.798 within a range of [0.745 – 0.855]. The team roles present an average α of 0.811 within a range

of [0.777 – 0.839]. According to the Dutch Committee on Tests and Testing (COTAN), a Cronbach's alpha of .8 or higher indicates a high reliability and is required for selection assessment tools (Evers et al., 2010). Therefore, both the composition of the key competences in underlying personality facets and work values, and the composition of the team roles out of the combination of two key competences, can be measured in a reliable way. A nuance should be made for the team roles, since the increase in the number of combined personality facets and work values behind the team role, in itself contributes to the reliability coefficient.

A correlation matrix of the relationships between the set of unique key competences and their lexical corresponding competences of the Dutch competence test shows significant convergent validity for separate parts of the different studied relationships. In total 11 of the 16 key competences show sufficient construct validity with their corresponding competences. The first model of the CVLM 'create' shows significant construct validity for three of the four key competences, with the exception of KC4: judgment (oordeelsvorming). The model 'compete' delivers significant construct validity for two of the four key competences. The construct validity is less evident than expected for KC6: decisiveness (besluitvaardigheid) and KC8: quality orientation (kwaliteitsgerichtheid). 'Control', the third model of the CVLM, shows significant construct validity for three of the four key competences. The construct validity of KC10: stress tolerance (stressbestendigheid), lags behind to some extent. Within the fourth model 'collaborate', the construct validity of the key competence KC13: leadership (leidinggeven) is less strong than expected. Although in general, for 69% of the key competences significant convergent validity is found for the relationships with their corresponding competences, a certain reservation should be made. On average, 5.2 correlations per key competence within a range of [0 – 14] found in the columns, and 6.0 correlations within a range of [0 – 15] found in the rows, are higher than the tested convergent validity per key competence. Even though this looks remarkable, it should be noted that the key competences are built on a large set of mutual associations between personality facets and work values. Therefore, since the correlations differ significantly from zero, and the different found correlations show the same pattern, the composition of the key competences in underlying personality facets and work values seems to be confirmed for 69% of the key competences.

A correlation matrix of the relationships between the set of unique key competences (KC) and their lexical corresponding team role (TR) shows significant convergent validity for all of the eight team roles. Only the team roles TR4: coordinate (coördineren) and TR7: implement (implementeren) both have one correlation found in the columns that are a fraction higher than the tested convergent validity per team role. This supports the lexical ordering of key competences in team roles.

Another MTMM, between the set of unique key competences (KC) and the group roles of the Dutch group roles test (GT), shows some construct validity for five of the 16 key competences. Since these correlations are on average 0.217 within a range of [0.163 – 0.355], this is not a strong evidence. The study presents a series of unexpected other strong correlations between key competences and group roles. This seems to suggest that the team roles (TR), derived from Belbin (2010) are, by their nature, composed differently than the group roles (GT), that arise out of an ipsative measurement of individual preferences.

The correlation matrix of the relationships between the Dutch competence test (CT) with their lexical corresponding team roles (TR), shows significant convergent validity for all of the 16 competences. However, on average, 1.9 correlations per team role within a range of [1 – 4] found in the columns, and 3.3 correlations within a range of [0 – 7] found in the rows, are higher than the tested convergent validity per team role. This is in line with the correlations found between the key competences (KC) and the competences (CT), which strengthens the lexical ordering of the key competences (KC) and the team roles (TR).

A MTMM of the relationships between the set of team roles (TR) and their lexical corresponding group roles (GT), show some convergent validity for three of the eight team roles. Since these correlations are on average 0.213 within a range of [0.185 – 0.266] this is not a very strong evidence. Besides, on average 1.33 correlations found in the columns and 0.67 correlations found in the rows are a fraction higher than the expected convergent correlations per team role. This seems to confirm the above mentioned suggestion that the team roles derived from Belbin (2010) are, by their nature, composed differently than the group roles, that arise out of the ipsative Dutch group roles test (Van Thiel, 2008d).

A final correlation matrix of the relationships between the set of competences of the Dutch competence test (CT) with their lexical corresponding group role of the Dutch group roles test (GT), shows significant convergent validity of on average 0.216 within a range of [0.189 – 0.254] for only three of the 16 competences.

Summarised, the relationships between KC and CT, KC and TR and CT and TR all show on average significant convergent validity. The relationships between KC and GT, between TR and GT, and between CT and GT show discriminant validity. Therefore, with the exclusion of KC4: judgment (oordeelsvorming), KC6: decisiveness (besluitvaardigheid), KC8: quality orientation (kwaliteitsgerichtheid), KC10: stress tolerance (stressbestendigheid) and KC13: leadership (leidinggeven), the different tested relationships confirm the lexically designed framework of the function of team roles in the relationship between business strategy and key competences, as presented in Table 5.9.

5.10. General Discussion and Recommendations

5.10.1. Discussion and Limitations of the Study

One of the complexities in aligning the specific business strategy of an organisation with the characteristics and qualities of its present and future employees, is the twofold way of approaching this case. On the one hand the integral organisation's perspective, and on the other hand the individual employee's perception. This study suggested that in order to match both approaches, a combinative construct needs to be introduced. This was found in team roles, built on the twofold character of the original Belbin team roles. The results indicate that, both from a lexical-semantic perspective as well as from a psychometric point of view, team roles function as the junction in the relationship between business strategy and key competences. With this, the study is expected to contribute to introducing a more uniform and standardised interpretation of the many existing competency frameworks in both the management development sector as well as in the organisational and occupational literature (Kandula, 2013). In order to prepare the development of a future measurement instrument, this study provided in a framework of personality facets and work values that jointly comprise a set of unique key competences.

Therewith, the function of team roles in the relationship between business strategy and key competences, can be measured using questionnaires built on the five factor model (FFM; Costa & McCrae, 1985) and on the universal values model (UVM; Schwartz, 1992). This contributes to a joint application of the intrinsic and extrinsic components of a unique set of key competences, suggested by both Weiner (2001) and Parks and Guay (2009).

Before turning to the recommendations and implications of this study, there are some limitations to take into account. Methodically unravelling the different lexical-semantic relationships, seen as a type of heuristic analysis, is operated partly on the basis of interpreting text corpuses. This entails that within the present study, other existing lexical-semantic relations, that might negate the findings, may have been overlooked. However, the relatively high discriminant validities between KC and GT, TR and GT, and CT and GT in contradiction to the strong convergent validities between the other combinations (KC and CT, KC and TR, and CT and TR) seem to confirm the lexical-semantic framework of Study 1, since the construct GT does not seem to fully comply with the other constructs in this study. Redoing the lexical-semantic analysis through a Delphi research, conducted by an expert group (Rowe & Wright, 2001), might contribute to a further confirmation of the expected deviances of the construct GT pertaining to the other constructs.

Even though a number of questions remain unanswered, the present study shows strong similarities between the lexical elaboration on the one hand and the psychometric evaluation on the other hand. For only five of the 16 key competences (KC), the construct validity remains a little diffuse. Taking into account that the model is built on a large set of mutual associations, this seems to be enough evidence for the central assumption that team roles function as the junction in the relationship between business strategy and key competences.

5.10.2 Recommendations and Implications

This study provided in both a lexical-semantic and a psychometric analysis of the relationship between business strategy and key competences, in which team roles act as their junction. Throughout the study, multiple consecutive associations were made. Furthermore, in psychometrically evaluating the lexical assumptions, the study used

questionnaires from one author, Van Thiel, that were developed consecutively. Both the amount of associations as well as the train of thoughts behind the combination of these external instruments, might have partly influenced the outcomes. Next to this, there are little comparative studies that substantiate the diverse associations within the present findings. Therefore, it is recommended to repeat the study, using both an expert group and different questionnaires for measuring personality characteristics.

In building the different lexical associations, in many cases compositional entailment relationships were needed in linking the different used constructs. Due to its attempt to elucidate longer utterances, entailment is seen as a semantic relation with a strong kind of implication (Yule, 1996). To further underpin the outcomes of the present study, it is recommended to use statistical natural language processing techniques like found in the Natural Language Toolkit (Bird et al., 2009). This addition might contribute to elucidate the entailment relationships in more one-on-one lexical relationships.

In sum, the present study shows that, through conducting both lexical-semantic and psychometric analyses, team roles, defined in terms of work-related human activities, function as the junction in the relationship between business strategy (representing the integral organisational perspective) and key competences (rendering the individual employee perspective). These findings may contribute to a more precise alignment of the organisation and its workers in a way that turns employees in ambassadors while contributing to the organisation’s purpose.

Chapter 6

Expert Evaluation of the Systems-Oriented Talent Management Model

This chapter analytically evaluates the initial design of STM and the three diagrams of the STM-scan. Semi-structured interviews were held with a panel of talent management experts, who have several years of experience with STM. Their appreciation was studied along the four levels of the Kirkpatrick evaluation model (satisfaction, outcomes, usages and returns). Jointly, this provides insight in the utility of the initial model and parts of the proposed improvements that emerged from the studies in Chapter 2 until Chapter 5. In general, the experts perceive the initial STM as a model that provides objectivity and detailed information on the match between the test taker and its environment. This contributes to sharpening the client question and speeding up the intervention process. However, the reading and interpretation of the different relationships within STM, is perceived as diffuse and difficult. The ambiguous definitions of some of the STM constructs, result in an increased risk of misinterpretations of the outcomes. Practice shows that the STM model brings the desired information to the table, which the test professional complements with the appropriate and required interventions. With this, the previous positive evaluations are supported, with noted that the interpretation of STM in practice is seen as complex.

6.1. Introduction

6.1.1. Problem Situation and Purpose of the Study

The initial best practices oriented systems-oriented talent management (STM) model and its elaboration into three experimental STM-scan diagrams (Brouwer, 2012) has been used for over 1,000 different talent management assignments within numerous Dutch companies.

For example, the STM-scan was conducted in a case where a jeweller wanted to hand over his business to the manager of the shop. For the jeweller this meant letting go of what he had built up for years, for the manager this meant gaining new responsibilities. The STM helped to determine the natural workstyle of both parties and clarified the factors they found most important during the transfer. This resulted in a step by step outline of how the jeweller and the shop manager could shift gradually into their new roles and how they could best communicate with each other during this process. Another example is the use of the STM-scan to research the potential of trainees in a company in the financial sector. Immediately after they were hired, the trainees took the STM to identify the points of development within their new function. Based on the outcomes, they got targeted coaching to support their progress. A third example is a case in which a medium sized construction company formed a new management team after finishing an organisational restructure. The STM-scan was used to visualise the strengths and weaknesses of each team member separately and of the team as a whole. This was a run-up for a change program in which all the members took up their best fitting job responsibilities.

Feedback from both clients and candidates show satisfied customers throughout the years. Even though this is promising, in order to test whether the initial STM-scan (Brouwer, 2012) meets the requirements of an evidence based testing instrument, its reliability, defined as the extent to which the calculated test score is repeatable, its validity, known as the extent to which the test scores are usable for the purpose of the test, and its utility, defined as the return or output on the use of the instrument (Furr and Bacharach, 2014) needs to be evaluated. In Chapter 2 until Chapter 5, the reliability and construct validity of the human characteristics personality facets, work values, competences and team roles used in the composition of the three initial STM diagrams, as presented in Chapter 1,

were studied. The present chapter aims to add analytical evidence to STM. It therefore studies the utility of the initial model and parts of the proposed adaptions for a renewed STM blueprint found in the previous chapters, by using semi-structured interviews. The interviews were built on the evaluation model of Kirkpatrick (1998) and conducted with at a panel of four experienced talent management experts, that have been working with the initial STM for several years.

6.2. Theoretical Framework

6.2.1. The Kirkpatrick Evaluation Model

Kirkpatrick (1998) developed a model to evaluate learning interventions and human resource development programs. The results or outcomes of a training or intervention are measured on the basis of four levels of evaluation. These levels are known as: (1) evaluation of the satisfaction, (2) evaluation of the outcomes, (3) evaluation of the usages, and, (4) evaluation of the returns. The first level evaluates to what extent the users are satisfied with the content of the initial best practices oriented STM model and its elaboration into three STM-scan diagrams. It examines how the mixture of the different constructs and their interrelations within the model are appreciated by both the test takers and the test professionals. Supplementary, the proposed effects of the future implementation of a series of improvements found in the Chapters 2 until 5, are examined as well. At the second level, an evaluation is made of the outcomes of STM, in terms of newly acquired insights for both the test takers and the test professionals. The third level evaluates to what extent STM is usable in the work field of both the test takers and the test professionals. It evaluates the range and the scope of the model. The fourth level focusses on the final results of applying STM. With this, it evaluates how well the model contributes to a previously desired change or improvement in the test taker's performance. It is hypothesized that the appreciation of the four levels of evaluation by the panel of talent management experts jointly provides analytical evidence for the utility of STM.

H_1: The appreciation of the four levels of evaluation by the panel of talent management experts, jointly provides analytical evidence for the utility of STM.

6.3. Methodology

6.3.1. Procedures and Participants

In the present chapter, the utility of the initial STM model and its elaboration into three STM-scan diagrams is studied using semi-structured interviews with a panel of four talent management experts who have several years of experience with the STM. The first expert ($E_{1)}$ is a certified and self-employed STM career coach since 2012, the second (E_2) is a certified and self-employed STM HRD consultant since the year 2012, the third (E_3) is a certified STM business coach of a Dutch employment agency in the banking sector since 2014, and the fourth expert (E_4) is a certified STM recruiter of the same Dutch employment agency since 2012.

The interviews were held in November 2016 and lasted between 65 to 85 minutes each. The interview script was built along the line of the four levels of the Kirkpatrick evaluation model (1998) which entails judgments on the satisfaction, outcomes, usages and returns of the model within the field of talent management.

6.3.2. Analyses

The interview followed the four levels of the Kirkpatrick evaluation model. All levels were specified in two detailing fragments, following the four scales of the questionnaire for professional training evaluation, or Q4TE, that study short-term as well as long-term training outcomes (Grohmann and Kauffeld, 2013). The first level: (1) satisfaction, was built on the reaction scale of the Q4TE, and studied by asking (1.1) how the expert values the representation of the different relationships in the initial STM as well as a valuation of the proposed effects of the future implementation of a series of improvements found in the Chapters 2 until 5, and (1.2) how the expert appreciates the clarity of these existing and proposed relationships. The second level: (2) outcomes, built on the learning scale of the Q4TE, was investigated by asking (2.1) what new insights the use of the STM gives to the test taker, and (2.2) what new insights the use of the STM gives to the test professional. The third level: (3) usages, derived from the behaviour scale of the Q4TE, was divided in (3.1) the valuation of the way the client situation can be translated to a standard in STM, and (3.2) the kind of talent management questions STM is suitable for. The last level: (4) returns, built on the results scale of the Q4TE, was studied by asking (4.1) which insights arise from STM and which insights emanate from the qualities of the

test professional, and (4.2) which returns arise from STM and which returns are provided by the test professional.

After permission of the experts, their judgments on the four levels of the Kirkpatrick evaluation model were collected through recording the individual semi-structured interviews. The interviews were transcribed verbally and analysed threefold. At first, through open coding, fragments of the interview results were assigned to labels. Through axial coding, the different fragments were studied on similarities and opposites. Then, through selective coding, the opinions of the panel members were summarized along eight sub labels of the four levels of Kirkpatrick. This resulted in the analytical appraisal of the STM model and the thereof derived testing instrument.

6.4. Results

Table 6.1 presents an overview of the results of the semi-structured interviews with the four talent management experts.

Table 6.1

Results of the semi-structured interview

1.	1.1	E_1	+:	Personality facets and competences give confirmation and recognition for test taker.
				The division of competences into roles is logical.
				Work values are powerful in relation to personality facets and competences.
			- :	Competences are interpreted differently by test takers.
				Team roles need extra explanation for the test taker.
		E_2	+:	The strength of both individual and team reports.
				Personality facets clarify the scores on competences and team roles.
				Grouping of competences in team roles in the PDCA-cycle.
				Measuring culture/work values is a unique selling point in my sales process as HRD consultant.
			- :	Explanation of outcomes is crucial before spreading the STM report.
				Classification of competences in team roles is not always clear.

		E_3	+:	Personality facets give a precise description of the test taker's identity. Relationship between competences, team roles and work process is powerful.
			- :	Diverse associations within one model makes STM a complex model. Personal work values are not clearly related to company values.
		E_4	+:	Personality facets give a detailed image of a test taker's character. Summarizing behaviour in a set of key competences is agreeable and useful.
			- :	My own interpretation of a competence sometimes differs from the STM definition. Translating work values to a specific organisational culture is more confusing to me.
	1.2	E_1	+:	Objectivity increases the receptiveness of the outcomes.
			- :	Differences in interpretation of terms (explanation is necessary in order to understand).
		E_2	+:	Integration of personality, work values and business environment in one instrument. Objectivity prevents a 'he said, he said' discussion.
			- :	Complexity in interpreting team roles.
		E_3	+:	The depth in the diverse associations between the different constructs in one instrument.
			- :	The risk of different interpretations of behavioural terms (competences).
		E_4	+:	The joint approach of the different models provide in a very detailed image of the test taker's qualities in relation to a specific work environment.
			- :	Reading and interpreting the different models is complex and difficult.
2.	2.1	E_1	+:	It provides in understanding of talents and motives. It gives insight in actual and potential match with a specific work environment.
		E_2	+:	It makes clear which are patterns in personality and behaviour. It increases awareness.
		E_3	+:	It brings focus to the core of the client question. It shows in depth how the test taker as a human being is put together.
		E_4	+:	The selection process provides in a sustainable match at different levels.

				The selection report is amplified with a direction for a personal development plan.
	2.2	E_1	+:	It sharpens the coach question. It speeds up the coaching process. It makes latent strengths and weaknesses visible.
		E_2	+:	It gives quick acceptance. It gives acceleration of insight.
		E_3	+:	It helps me to fathom the test taker. It helps me to test my own perception to the testing results.
		E_4	+:	It gives detailed insight in the test taker. It accelerates the selection process.
3.	3.1	E_1	+: - :	The core of the question can be quickly captured thanks to the division of competences in team roles and in the work process. The difficulty of the concepts entails the risk of a personal interpretation.
		E_2	+: - :	The detailing in personality/work process versus work values/work process. Some competences seem to fit in more than one team role and work process phase.
		E_3	+: - :	The smaller the client question, the more specific the standard can be chosen. The ordering of competences in team roles not always seems to be unequivocal.
		E_4	+: - :	By starting with the work process and the team roles, a specific job profile can be properly translated into competences (outside-in). A less demarcated job profile in a smaller company is difficult to translate to a STM standard.
	3.2	E_1	+:	Work-related issues, career, job selection, personal leadership.
		E_2	+:	Team assessments, culture change programs, job selection, change management.
		E_3	+:	Job selection, career coaching, team development, less suitable for culture programs.

		E_4	+:	Job selection, career coaching, team assessments, less suitable for change programs.
4.	4.1	E_1	+:	STM provides insight, the professional ensures integer use.
		E_2	+:	STM provides insight, the professional directs the communication process.
		E_3	+:	STM gives a transparent, impartial image of strengths and weaknesses. The professional creates connection to colleagues and the practice of the work environment.
		E_4	+:	STM gives an image of strengths and weaknesses. The professional interprets the outcomes and applies them in a specific work environment.
	4.2	E_1	+:	STM brings latent information to the table, the professional ensures an appropriate intervention.
		E_2	+:	STM speeds up the gaining of insight, the professional adds value to the outcomes by applying it in practice (factuality versus influencing).
		E_3	+:	STM visualises the test taker in the context of his/her work environment, the professional adds to this the required intervention program.
		E_4	+:	STM prevents failure costs in the selection process, the professional wields a qualitative and a distinctive selection policy including a development plan.

6.4.1. Satisfaction

As can be read in Table 6.1, the four experts all have a positive opinion concerning how well and detailed the personality profiles of the first initial STM-scan diagram, based on 24 personality facets of the FFM, represent the true character of test takers. They indicate that it helps them to get a clear image of their clients, which matches the impression they get in the contact and conversations with them. Furthermore, the experts indicate that the test takers recognise themselves in the personality profiles as well. According to the business coach (E_3), the classification of the personality profiles within the four steps behind the business purpose (idea – plan – form - action) helps “to make the connection

between personality and the workplace, and […] to visualise where the contradictions are." However, the experts note that this categorisation makes the profiles complex to read, and it is therefore necessary to give their clients an interpretation and explanation of the outcomes. Without this, as stated by the career coach (E_1), "a test taker cannot tell his partner in the evening at home on the couch what the results were. That requires insight."

The experts' opinions on the work values, elaborated in the second initial STM diagram, are divided. The career coach (E_1) and the HRD consultant (E_2) think the arrangement of the work values within the four culture types (ambition type – relationship type – balance type – autonomy type) and corresponding fundamental attitudes (I – We – Task – Human) is powerful. "Especially for selection questions," says the career coach. "You can look closely at what your values contribute to the organisation and, vice versa, what you need from the organisation to thrive." The HRD consultant agrees that this is a good way to link human work values to the organisational culture, which according to him "largely determines whether or not someone fits into that organisation." The business coach (E_3) and the recruiter (E_4) find it more difficult to lay the relationship between work values and the culture within an organisation. They call it intuitive and coarse and feel that this second part of the STM-scan is less strong than the first.

In the third initial STM-scan diagram, the 24 personality facets are converted into a set of 24 competences. These competences are then grouped into eight work-related team roles, which are arranged in the four central steps of the primary business purpose. The experts indicate that they find it difficult to interpret the definitions behind the competences and the team roles. They are perceived as ambiguous and therefore can be explained in multiple ways. The business coach (E_3) tells that this makes it harder for him to clarify this relationship to clients, which sometimes leads to discussions.

In the initial STM, personality facets are clustered into a set of competences, and these competences are accommodated into team roles. Apart from that, work values are arranged in different culture types. A proposed improvement, which emerged from the studies in the earlier chapters of this dissertation, is to combine the personality facets and work values of the first and second STM diagram in a way that they jointly form the basis for competences and team roles of the third diagram, whereas the human characteristics

of all three diagrams are divided in the same four steps behind the business purpose. The experts dissent on this adjustment. The career coach (E_1) and the HRD consultant (E_2) think it is better to keep the personality and work values separate. According the HRD consultant, personality concerns stable characteristics, whereas work values measure something that is more prone to change. “That will make things very complicated, […] because you combine something fixed with something flexible.” The business coach (E_3) states that is precisely why it is necessary to make a combination of the two. “In that way, you will get an explanation from out of the person, about why that environment is so important to him or her. Currently this is explained on the basis of work values, which has more to do with where you stand right now, while the personality traits are more unique, more fixed.” The recruiter (E_4) also thinks it could be a good thing to combine both diagrams, but he states that in order for this to work, the new model should not become too complex.

6.4.2. Outcomes

All experts agree that the STM helps to give them insight in and understanding of individual talents in relation to a specific work environment. The recruiter (E_4) explains that the foremost value of STM lies in getting a sharp image of someone's qualities in a short amount of time. “And when you have a clear picture of what is needed [within the organisation], you can quickly come to the conclusion whether or not it is a fit.” This accelerates the intervention process, says the career coach (E_1): “I dare to say that it saves me at least a few appointments in a coach assignment.”

By filling out the STM, test takers themselves get a thorough insight in their talents, motives and patterns in their personality and behaviour as well. To which extend someone acts on this knowledge differs per person, according to the HRD consultant (E_2) and the recruiter (E_4). Possible outcomes could be a shift in ambition or the direction an employee had in mind for his or her career. Self-esteem is also an important outcome states the career coach (E_1): “Because everything is labelled in a positive way, people get insight in what they do best.”

6.4.3. Usages

The evaluation of the third level (usages) illustrates that by using the STM, the underlying questions of clients can be captured in competences and team roles, that stem from

personality facets. However, the experts note that in some situations it is difficult to choose the required set of competences and team roles. Especially, as both the career- (E_1) and business coach (E_3) state, in small organisations where employees have to fulfil a combination of different tasks and functions. Furthermore, some competences seem to fit in more than one team role and more than one of the steps behind the business purpose. This increases the risk of individual interpretation of the outcomes.

According to the experts, the STM is applicable in a wide range of situations. Although they have slightly different opinions about the extent to which the assessment instrument can be used in the various circumstances, the experts all agree it can be a valuable tool in job selection, team assessments, change management, career coaching and culture programs.

6.4.4. Returns

All experts assent that the STM can provide insight into individuals, teams and organisations and gives a clear image of their strengths and weaknesses. It makes it possible to look at people "for who they are, and not for what they show," says the business coach (E_3). This helps both the test taker and the test professional to more quickly find detailed answers to talent management questions. "That is often what is most important for clients that make use of the STM: they want to achieve their goals as effectively as possible. […] Ultimately, organisations hire people to realise something, not just because they like to employ people," notes the HRD consultant (E_2).

However, according to the experts, the outcome of the STM in itself is not sufficient. The test professional has to interpret the results to make a connection with the practice of the work environment. The assessment instrument brings the anticipated information to the table and the test professional ensures the appropriate and required interventions are deployed.

6.5. Conclusion, Discussion and Recommendations

6.5.1. Conclusion

This chapter analytically evaluated the design of the of the initial STM-scan as introduced in Chapter 1 and parts of the proposed adaptions found in Chapters 2 until 5. Hypothesis 1 suggests that the appreciation of the four levels of evaluation by the panel of talent management experts, jointly provides analytical evidence for the utility of STM.

The first level (satisfaction) shows that the experts are unanimous in their opinions that the rendering of the relationships between both poles of the personality facets and the four central steps behind the business purpose is a strong and usable element of STM. Concerning the work values, the experts can be divided in two groups. According to the career coach (E_1) and the HRD consultant (E_2), the rendering of the relationship between work values and organisational culture and its corresponding fundamental attitudes is strong and a unique selling point. According to the business coach (E_3) and the recruiter (E_4), applying this relationship is more difficult and sometimes confusing. The proposed improvement of lexically ordering work values in a same kind of representation of the business purpose, as applied in the first STM diagram, and thereby combining personality and work values as the basis for competences and team roles, received mixed reaction. The interpretation of the definitions behind the set of 24 competences and eight team roles is perceived as more difficult and less uniform. The experts agree in their opinions on the usability of the team roles as the junction in the relationship between the steps behind the business purpose and competences. They all state that the ordering of competences in team roles within the elaboration of the business purpose is useful and logical. In general, STM is perceived as a model that provides objectivity and detailed information on the match between the test taker and its environment. The reading and interpretation of the different relationships within STM, is seen as rather complex and difficult.

The second level (outcomes) shows that the experts all agree that the STM provides insight, understanding and awareness of individual qualities in relation to a specific business environment. This contributes to sharpening the client question and speeding up the intervention process. Evaluating the third level (usages) shows that STM helps to capture and translate the core of a client question in a measurable standard of competences and culture types that, within STM, is automatically converted into the set of underlying

personality facets and work values. However, it is noted that choosing the specifically needed set of competences and team roles is more complex when the job profiles are wider and clients have smaller companies. Using the outcomes in the consecutive intervention sometimes results in undesired misinterpretations of definitions of the different STM constructs. The four experts all emphasize the range and scope of STM. In practise, it is used within the full talent management cycle of selecting, developing and promoting both individuals and teams, including organisational culture and change programs.

The fourth level (returns) reaffirms that the use of STM provides insight and gives a transparent image of strengths and weaknesses. This helps both the test taker and the test professional to more quickly find more detailed answers to talent management questions. Practice shows that STM brings the desired information to the table, which the test professional complements with the appropriate and required interventions. With this, hypothesis 1 is supported, with noted in this connection that the use of STM in practice is seen as rather complex and difficult. It is suggested that a further detailing of the assumed relationships between business purpose and human talent is required in order to reduce the number of misinterpretations.

6.5.2. Discussion and Limitations of the Study

Before turning to the recommendations and implications of this study, there are some limitations to take into account. The STM model is designed as an accumulation of associations. In general it is said that the more associations are needed to establish a relationship, the less strong the construct validity of that relationship becomes (Furr & Bacharach, 2014). In the analytical evaluation stage, it is seen that the interpretation of higher-order constructs by the experts is experienced as more complex and less uniform. At the same time, the classification of the human characteristics within the four central steps behind the business purpose (idea – plan – form – action), is perceived as uniform, logical and agreeable. Suggestions concerning the proposed improvement of lexically ordering work values in a same kind of representation of the business purpose, as applied in the first initial STM diagram, is received with dissent. Two of the experts think it a good idea to combine personality and work values as a basis for competences and team roles, provided that the model doesn't become too complex to understand. The other two experts state it is better to keep this separate.

A second limitation of the study is that the analytical evaluation stage was limited to an interview of four experts, but they were extensively interviewed along the four levels of evaluation (Kirkpatrick, 1998). All experts already worked with STM in practice for a long time. By using verbatim transcriptions in the analysis, this study remained close to reality in the processing and analysis of the interviews. This increased the reliability of the analytical evaluation.

Summarised, the evaluation of the four levels of Kirkpatrick shows that all levels (satisfaction, outcomes, usages and returns) are positively valuated, with noted that the use of the initial STM-scan in practice is seen as rather complex and difficult.

6.5.3. Recommendations and Implications

Since the interviewed experts perceive the interpretation of the definitions behind the competences and team roles as rather difficult and less uniform, it is recommended to diminish the complexity and amount of the different terms used in the initial STM-scan. More specific, it is recommended to relate all the different human characteristics (personality facets, work values, competences and team roles) to the same managerial visualisation of the business purpose. The interviewed experts also note that it is complex to directly link work values to the core elements of the organisational culture. Therefore, a second recommendation is to represent a more distinct relationship between individual work values and the organisational culture elements of the visualisation of business purpose. A first step could be to further integrate personality facets and work values in the same four-step model (idea – plan – form – action) that represents the business purpose. A second step might be to diminish the number of competences, by reducing this to a set of key competences that refer to a wider set of synonym. This might contribute to reducing the number of misinterpretations of the translation of the assessment standard into the best corresponding competences and team roles. A subsequent recommendation is to present a more detailed insight in the composition of the formulas used in the calculation of the scores on competences and team roles. This might further contribute to reduce misinterpretations. A periodic repeat of the interviews with certified STM experts can also contribute to a further improvement of the satisfaction, outcomes, usages and returns of the STM-scan test instrument. Furthermore, STM experts should be more intensively and permanently trained in the use of STM through which they maintain their STM certificate.

Chapter 7

The Design of the Renewed Evidence-Based Systems-Oriented Talent Management Model[4]

Within the field of talent management, it is common to make use of assessments in order to select and appoint the best fitting human talent at the right moment and for the right time. Characteristic for current assessment instruments is that they solely map the human characteristics side of the match between the organisation and its worker. To enable the future bridging of the gap between psychological questionnaires for testing human characteristics and models for unravelling managerial building blocks, this dissertation introduced the initial systems-oriented talent management model, or STM, and the three assessment instrument STM-scan diagrams constructed on this model. In this final chapter, a renewed version of the three initial diagrams model is presented, based on the results of the studies in the previous chapters. The management building blocks framework and the systems theory are used to elaborate the interrelations within the new model. This provides a renewed way of linking human talent to the core elements of the organisation's purpose. With this, the study contributes to achieving a more sustainable match between the organisation and its employees, that is able to move along with a constantly adaptation of the business strategy and the associated changes in the team compositions and tasks.

[4] A first prototype of the renewed evidence-based systems-oriented talent management model was presented at the European Association for Test Publishers conference in Budapest, September 25, 2014.

7.1. Introduction

7.1.1. Problem Situation and Purpose of the Study

Within the field of talent management, it is common to select employees by conducting assessments. Measuring talents and predicting the success rate is a valuable way to select potentials and to prevent mismatches (Schoonman, 2013). This procedure is founded in psychometric testing techniques, defined as systematic and standardised procedures for evoking a sample of responses from a candidate. These responses can be used to assess one or more psychological characteristics by comparing the results of the candidate with those of a representative sample of an appropriate population (Smith & Robertson, 1986). Although the field is equipped with many reliable and valid test instruments, it is surprising that the majority of these measures solely map the human characteristics side of the match between the organisation and its worker. This is done by either identifying inner characteristics ('attributes and/or attitudes') or diagnosing visible behaviour and skills ('abilities'; McDonnell & Collings, 2011). Together with intelligence quotient tests (IQ) that measure cognitive capabilities, these attributes, attitudes and abilities are presumably the strongest predictors for success or failure (Schmidt & Hunter, 1998; Schmidt, Oh, & Shaffer, 2016).

In addition to these instruments that measure people's inner and/or visible characteristics, the field of management science designed different models to represent an organisation as a mixture of jointly interacting management building blocks (Galbraith, 2002; Hendricks & Singhal, 1996; Tillema & Markerink, 2006; Nieuwenhuis, 2006). Even though this resulted in clear managerial constructs that, from their nature, could potentially be measured as well, there is no known psychometric test instrument available that links human characteristics to these specific building blocks within one and the same underlying model.

Due to the lack of an assessment instrument that links the talents and motives of (potential) employees to the strategy and purpose of the organisation, HR consultants and other assessors have to depend on their own knowledge and expertise in psychology and business administration to make this connection (Cable & Yu, 2007; Van Beirendonck. 2010). In practice, this is a difficult task, which often results in reliable and valid measures of a person's qualities and potentials, but a limited match between those characteristics

and the organisation. Vice versa, HR consultants also face difficulties in indicating exactly what the organisation is really looking for in terms of human qualities. Not rarely this leads to broad, and sometimes contradictory, organisational strategy and culture models and individual function and competence profiles. Who doesn't know the mission statements or demonstrations of core values in which both staff and clients hardly recognise themselves? And who hasn't seen the vacancies in which the preferred candidate is a result-oriented go getter who is independent, but also works well in teams, and is not only flexible but also meticulous?

Because of this, the long-term results of strategy and culture change programs and recruitment and selection procedures often are unsatisfactory. While at short-term, there seems to be a match between the employee and the organisation, problems arise when the job content is adjusted or the organisation changes. As a solution, companies often opt for top-down management interventions and short employment contracts or onboarding, which is a period in which employees learn the knowledge, skills and behaviours to be effective in the renewed organisational context or in their new function, to first check whether it really works. As a result, the organisation is confronted with high costs and both parties might end up disappointed.

To bridge the gap between psychological questionnaires that test human characteristics and models that unravel managerial blocks, in the year 2012 the initial best practices oriented systems-oriented talent management (STM) model and its elaboration into three initial STM-scan diagrams (Brouwer, 2012) was introduced. STM is seen as a joint approach of both the organisation's managerial constructs and the employee's characteristics. Multiple intermediate evaluations established that this initial version of STM was experienced as a helpful assessment instrument for answering talent management questions regarding adoption and/or adjustment of corporate strategy and culture, recruiting and selecting new personnel, coaching and developing employees, and, outplacement and career advice to employees.

Since the initial best practices oriented design of STM is not necessarily similar to an evidence-based STM, this dissertation used a series of qualitative and quantitative research methods in order to (re)design and validate the initial STM. This concluding chapter introduces the design of the renewed evidence-based STM model and its

elaboration in three renewed STM diagrams, that could take the place of the initial three diagrams as introduced in Chapter 1. The management building blocks framework (MBBF; Nieuwenhuis, 2006) and the systems theory (Katz & Kahn, 1966; Meadows, 2008) are used to elaborate the interrelations within the new STM model. This provides a renewed way of linking human talent to the core elements of the organisation's purpose (Barile, 2006; Barile, 2008; Mele, Pels, & Polese, 2010), and is assumed to result in a fit at the level of a joint corporate and personal identity instead of at the level of a specific job profile that in this rapidly changing world is subject to continuous alteration.

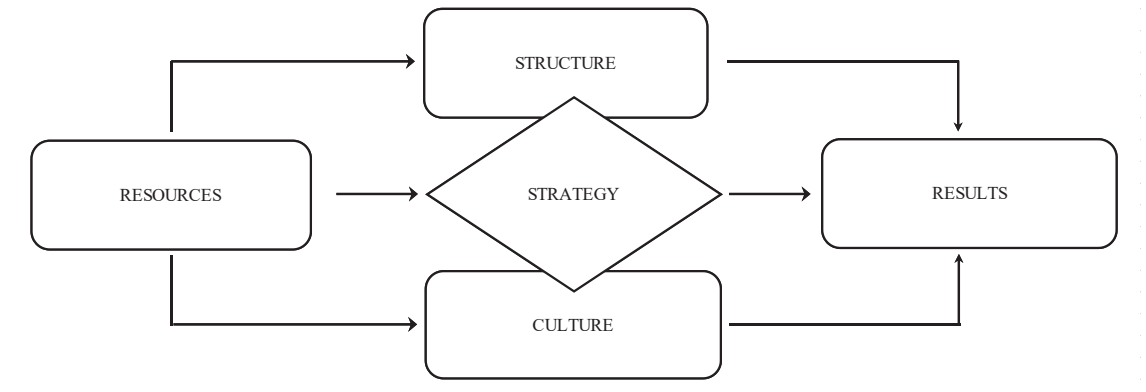
7.2. Theoretical Framework

7.2.1. The Management Building Blocks Framework

Within the field of management science there are different models for representing an organisation as a dynamic and a constantly adapting organism. Widely recognised models are the 7S model (Peters & Waterman, 1998), the Star Model (Galbraith, 2002) and the European Foundation for Quality Management (EFQM) excellence model (Hendricks & Singhal, 1996) with its application for the Dutch market in the INK (Instituut Nederlandse Kwaliteit) management model (Tillema & Markerink, 2006). As visualised in Figure 7.1, a common feature in these models is the use of a set of five management building blocks that jointly interact as a value chain, describing the composition of and joint interactions within the primary business process. This value chain is defined as the management building blocks framework, or MBBF (Nieuwenhuis, 2006).

Figure 7.1

The management building blocks framework, or MBBF (Nieuwenhuis, 2006)



Studying the MBBF from a managerial context, the first building block, structure, is seen as organisational structure. This defines the way activities such as task allocation, coordination and supervision are directed towards the achievement of organisational aims (Pugh, 1990). Structure affects organisational actions towards reaching the organisation's purpose in two ways: (1) it provides the foundation on which operating procedures and routines rest, and, (2) it determines which individuals get to participate in which decision-making processes, and to what extent their actions shape the organisation's purpose (Jacobides, 2007). The second building block, culture, is seen as organisational culture and defined as a set of shared mental assumptions that guide interpretation and action in organisations by prescribing appropriate behaviour for various situations (Ravasi & Schultz, 2006). This set of shared assumptions gets tangible in the organisation's climate, which is the shared meaning organisational members attach to the events, policies, practices and procedures they experience and the behaviours they see being rewarded, supported and expected (Ehrhart et al., 2014). Whereas organisational culture represents the predefined and desired image, the organisational climate embodies the actual present identity. The third building block, strategy, defined as business strategy, is known as the formulation and implementation of the organisation's purpose and initiatives taken by its employees on behalf of its stakeholders (Nag et al., 2007). According to Wit and Meyer (2011), business strategy consists of two dimensions: (1) the strategy process, expressed in the amount of effectiveness of the organisation design, and (2) the strategy content, measured from the outcome of its employees contribution. For the execution of the organisation's purpose, an organisation needs the best fitting human talent, represented in the fourth building block, resources. The effect of this execution is visualised in the interaction between strategy, consisting of structure and culture, and the building block resources. Its outcome is expressed in the fifth building block of the MBBF, results. Elucidating the relationship between the organisation's purpose and human talent in order to find ways to gain the desired results, applies for a systems-oriented view on the composition of and joint interactions between these five management building blocks, as found in the systems theory.

7.2.2. Systems Theory

Systems theory is an interdisciplinary theory about every system in nature, society and many scientific domains, as well as a framework with which phenomena can be investigated from a holistic approach (Capra, 1997). It compasses a wide field of research

with different conceptualisations and areas of focus. Katz and Kahn (1966) applied the concept of systems theory to the field of organisations. Studied from its managerial context, the systems theory is a theoretical perspective that analyses the organisation seen as a whole and not as simply the sum of its elementary parts (Meadows, 2008). In this, every organisation is seen as a group of interconnected and interrelated parts that jointly perform the organisation's purpose and that, mutually, are related to other organisations in its environment (Barile, 2006; Barile, 2008; Mele et al., 2010).

From this perspective, the MBBF can be seen as a sub-system of five interrelated constructs. In order to design a model to align these constructs, the present study continues with a systems-oriented elaboration of the different interrelations between the five building blocks, studied from both their position in and contribution to the MBBF. This results in the design of the renewed evidence-based STM model and its elaboration in three renewed STM diagrams, that can take the place of the initial three diagrams as introduced in Chapter 1.

7.3. Evidence-Based Systems-Oriented Talent Management

Looking at the MBBF (Figure 7.1) from a systems-oriented perspective reveals three different paths between the building blocks resources and results. The first runs from resources via structure to results. The second path runs from resources via culture to results, and the third goes from resources via the higher order construct strategy towards results. The joint approach of these three paths forms the central idea behind the renewed STM. In this way, STM aligns human talent, found in the block resources, with the organisation's purpose, found in the three blocks structure, culture and strategy, in order to achieve the predefined results.

7.3.1. Path 1: Structure

As explained in detail in Chapter 2, organisational structure is elaborated into organisational effectiveness, defined as the efficiency with which an organisation is able to meet its objectives. It is about every employee doing what he or she does best. The main measure of organisational effectiveness for a business is generally expressed in terms of how well achieved results compare with predefined goals (Pedraza, 2014).

Perceived from its position within the MBBF, organisational effectiveness is linked to the organisation's focus and the way the organisation is structured to achieve its goals (Yu & Wu, 2009). This is related to the foundation of organisational structure (Pugh, 1990). Approached from its contribution to the MBBF, Mitchell (2012) sees organisational effectiveness as a logic model that specifies how resources produce activities and output, which in turn will lead to outcomes. This is associated to the decision-making processes of organisational structure (Jacobides, 2007).

In order to design the first path of the MBBF, the interaction between the building blocks resources and structure needs to be unravelled. The interplay between resources and structure leads to a specific outcome, seen as the building block results. Since organisational effectiveness is considered as the effectuation of organisational structure, a same type of resources element is required in order to study their interconnection. As explained in detail in Chapter 2, this is found in underlying personality facets of the five factor model, or FFM (Costa & McCrae, 1985).

7.3.2. Path 2: Culture

As studied in Chapter 3, organisational culture can be approached from both an integral and an individual perspective. Whereas organisational culture defines the values and behaviours an organisation requests from its employees, organisational climate focuses on the employees' actual experiences and the attitudes or workstyles they see being rewarded and encouraged by the company (Ehrhart et al., 2014). Organisational culture represents the organisation's demonstrated image from the outside-in, found in the building block culture, and organisational climate embodies its actual present identity from the inside-out, linked to the building block resources.

In studying its position in and contribution to the MBBF, organisational climate can be delineated from both a strategic approach and from a molar approach. The first, strategic, regards organisational climate as the individual perception and representation of the work environment, focusing on a specific outcome (Kuenzi & Schminke, 2009; Gimenez-Espin et al., 2013). The second, molar, concentrates on capturing the generic sense of the experiences people have at work (Schneider & Reichers, 1983). Jointly, the strategic and molar approach convert organisational climate into a construct that represents both the

position (Ravasi & Schultz, 2006) and the contribution (Ehrhart et al., 2014) of the building block organisational culture of the MBBF.

To design the relationship of organisational climate with human talent, a comparable human characteristic is needed as a resource. As explained in Chapter 3, this is found in work values of the universal values model, or UVM (Schwartz, 1992), which represents human motives and beliefs that emanate from the same origin.

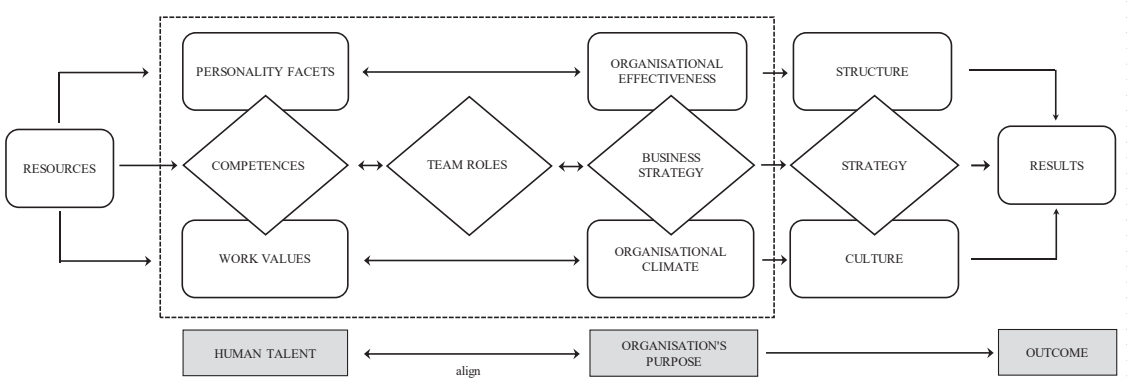
7.3.3. Path 3: Strategy

As dealt with in Chapter 5, business strategy, studied from an integral organisational perspective, dissects the organisation's purpose in organisational effectiveness and organisational climate. Within the MBBF, the two building blocks structure and culture jointly form their higher-order building block strategy. Whereas business strategy is seen as the execution of these two constructs, a same way of composing the building block resources is needed in order to study their interconnection. As explicated in Chapter 5, this was found in the concept of competences, which is the combination of personality facets of the FFM and work values of the UVM. To link the individual competences to the integral business strategy, a higher-order construct, consisting of both a business strategy and a competence element, is required. This was found in the theory of team roles (Belbin, 2010).

The different relationships between the STM elements and the building blocks are presented in Figure 7.2. The three above mentioned paths from resources to results have been elaborated in the three renewed STM diagrams (Figure 7.3, 7.4 and 7.5).

Figure 7.2

The relationships between the STM elements and the five building blocks of the MBBF



7.4. Renewed STM Diagrams

7.4.1. Renewed STM Diagram 1: Aligning Organisational Structure and Human Talent

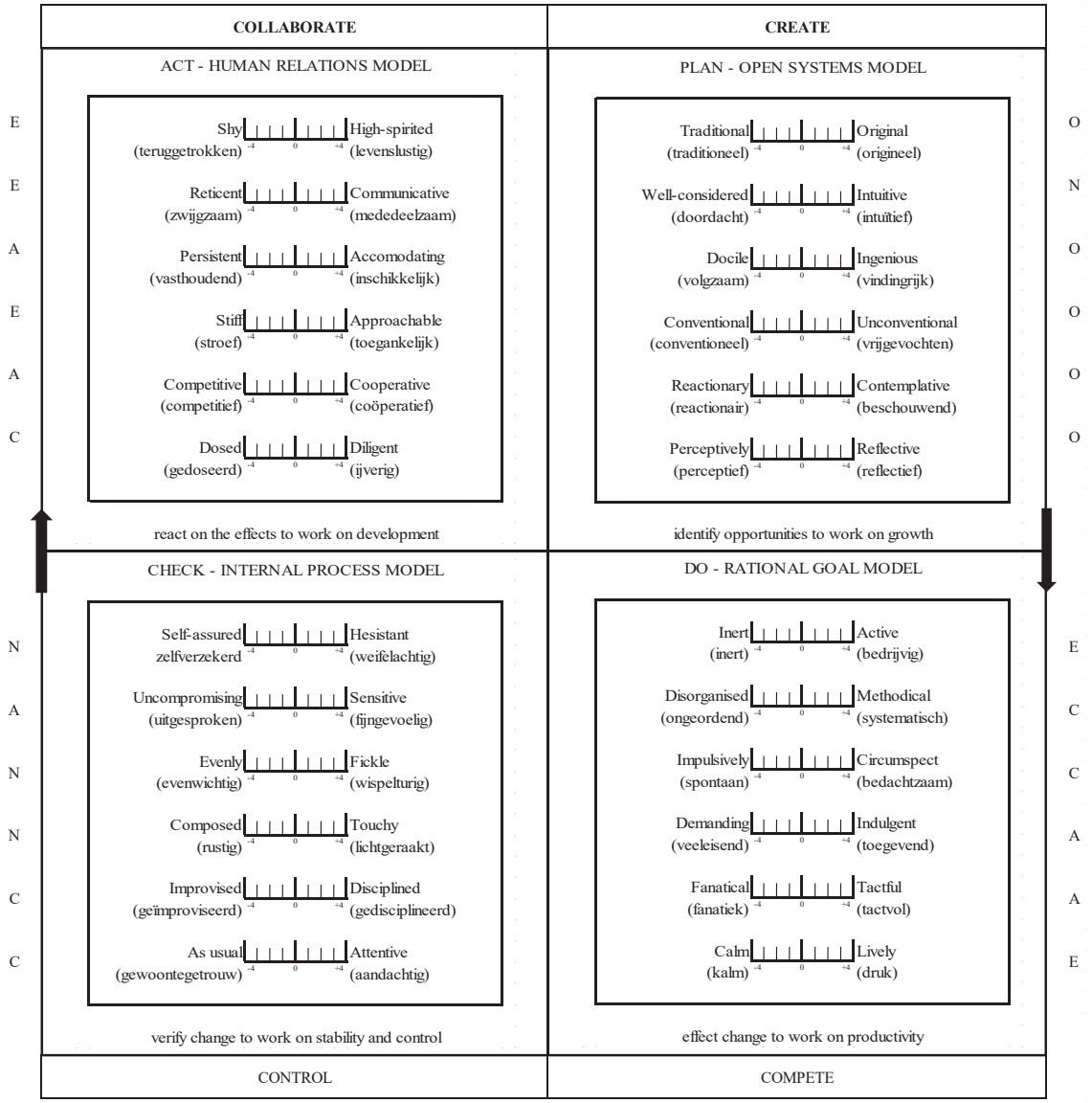
Figure 7.3 presents the renewed version of the first STM diagram, which elaborates the systems-oriented interplay between the building blocks structure and resources of the MBBF in the relationship between organisational effectiveness and personality facets. The building block structure, seen as organisational structure, becomes tangible in the construct organisational effectiveness. Its position, dealt with as one of the management processes within the MBBF, is elaborated in the PDCA-cycle (Deming, 1986). Its contribution to the building block results becomes tangible in the four models of the competing values framework, or CVF (Quinn & Rohrbaugh, 1983). The corresponding personality facets emerged from the translation of the bipolar AB5C facets (Hofstee, De Raad, & Goldberg, 1992; Johnson, 1994) of each five factor personality facet (Costa & McCrae, 1985) into its Dutch non-normative and work related synonyms and antonyms, derived from the Dutch Idioticon of Personality (De Raad & Doddema, 2006). The interconnections between the management cycle of organisational effectiveness and the lexical corresponding personality facets is grafted in the four models of the competing values leadership model, or CVLM (Cameron et al., 2014). Through this, the first

renewed diagram is a representation of the individual aptitude for the different phases of organisational effectiveness.

Making this diagram applicable as a testing instrument, the sum score of each underlying five factor personality facet, measured with a five factor personality questionnaire such as the NPT (Van Thiel, 2008a) can be calculated as the sum of the raw scores on the set of corresponding items on a five-point Likert scale of that specific personality facet. The sum score then can be converted into the standardised Z-score on a bandwidth of -4 until +4, comparable to the range of -4σ until +4σ, defined as four standard deviations from the mean within a normal distributed sample. In this way it is possible to visualise the individual score between the two opposite facets. For example, the facet original, derived from the factor openness, and measured with a five factor test, is built on ten items with a raw sum score between 10 and 50. If a candidate has a raw score of 28 points, this results in a standardised Z-score of 2.23, which. implies that the individual score bandwidth on the synset traditional versus original is (-4.00 + 2.23) = -1.77 until (-1.77 + 4.00) = 2.23. This means that the candidate has a somewhat higher aptitude for original (2.23/4.00 = 0.56) than for traditional (-1.77/-4.00 = 0.44).

Figure 7.3

Renewed STM diagram 1: the alignment of organisational structure and human talent, elaborated in the relationship between organisational effectiveness and personality facets



Like elaborated in Chapter 2, the four CVLM models each consist of six synsets of two opposite personality facets, derived from the FFM. Figure 7.3 shows that the first model ‘create’ consists of five synsets of the factor openness and one synset of the factor neuroticism (well considered versus intuitive). The second model ‘compete’ consists of two synsets of the factor extraversion (inert versus active and calm versus lively) and two

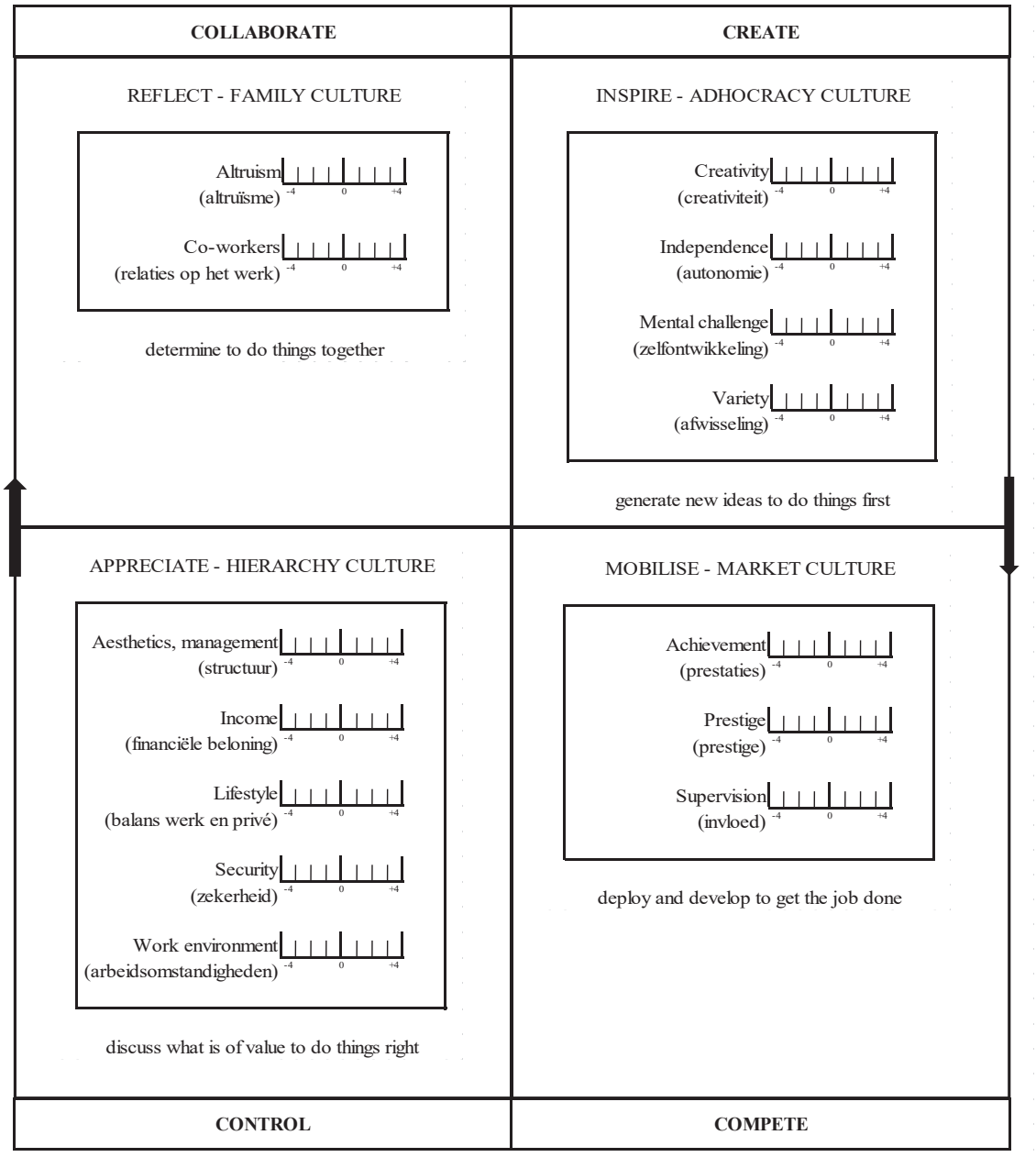
synsets of the factor conscientiousness (disorganised versus methodical and impulsively versus circumspect). The last two synsets of 'compete' were derived from the factor agreeableness. The model 'check' consists of one synset of the factor agreeableness (uncomprised versus sensitive) and of two synsets of the factor conscientiousness (improvised versus disciplined and as usual versus attentive). The other three synsets were derived from the factor neuroticism. 'Collaborate', the fourth model, consists of one synset derived from conscientiousness (dosed versus diligent) and of two synsets from agreeableness (persistent versus accommodating and competitive versus cooperative). The other three synsets were derived from extraversion. On average, each of the four models is built on facets of three factors of the FFM. This ordering of personality facets in four models was also confirmed by the stepwise multiple linear regression analyses, predicting the work values with the personality facets, as conducted in Chapter 4.

7.4.2. Renewed STM Diagram 2: Aligning Organisational Culture and Human Talent

Figure 7.4 presents the renewed version of the second STM diagram. It visualises the elaboration of the systems-oriented interplay between the building blocks culture and resources of the MBBF in the relationship between organisational climate and work values, as studied in Chapter 3. The building block culture becomes tangible in the construct organisational climate. Its function, seen as the motivational aspects behind the management cycle of organisational effectiveness, is elaborated in the IMAR-cycle (INK, 2008). Its impact on the building block results gets tangible in the four models of the organisational culture assessment instrument, or OCAI (Cameron & Quinn, 2011). The corresponding work values emerged from the UVM. The interconnections between the management cycle of organisational climate and the lexical corresponding work values are also grafted in the four models of the CVLM. With this, the second renewed diagram is an illustration of the individual affinity with the different phases of organisational climate.

Figure 7.4

Renewed STM diagram 2: the alignment of organisational culture and human talent, elaborated in the relationship between organisational climate and work values



Making this diagram applicable as a testing instrument, the sum score of each work value, measured with a universal values questionnaire such as the NWT (Van Thiel, 2008b), calculated as the sum of the raw scores on the set of corresponding items on a five-point Likert scale of that specific work value. The sum score can then be converted into the

standardised Z-score on a bandwidth of -4 until +4, comparable to the range of -4σ until +4σ. This makes it possible to visualise the individual score on that specific work value. For example, the work value independence, measured with a universal values test, is built on eight items with a raw sum score between 8 and 40. If a candidate has a raw score of 23 points, this results in a standardised Z-score of 0.53. This implies that the individual score bandwidth on the work value independence runs from [-4.00 until 0.53], which means that the candidate has a slightly more than average affinity with independence (4.53/8.00 = 0.57).

As elaborated in Chapter 3, the four CVLM models each consist of a set of work values, comparable to the clustering of work values found in earlier research (Zytowski, 2006; Van Thiel, 2008b). This ordering of work values in four models was also confirmed by the stepwise multiple linear regression analyses, predicting the work values with the personality facets, as conducted in Chapter 4.

7.4.3. Renewed STM Diagram 3: Aligning Business Strategy and Human Talent

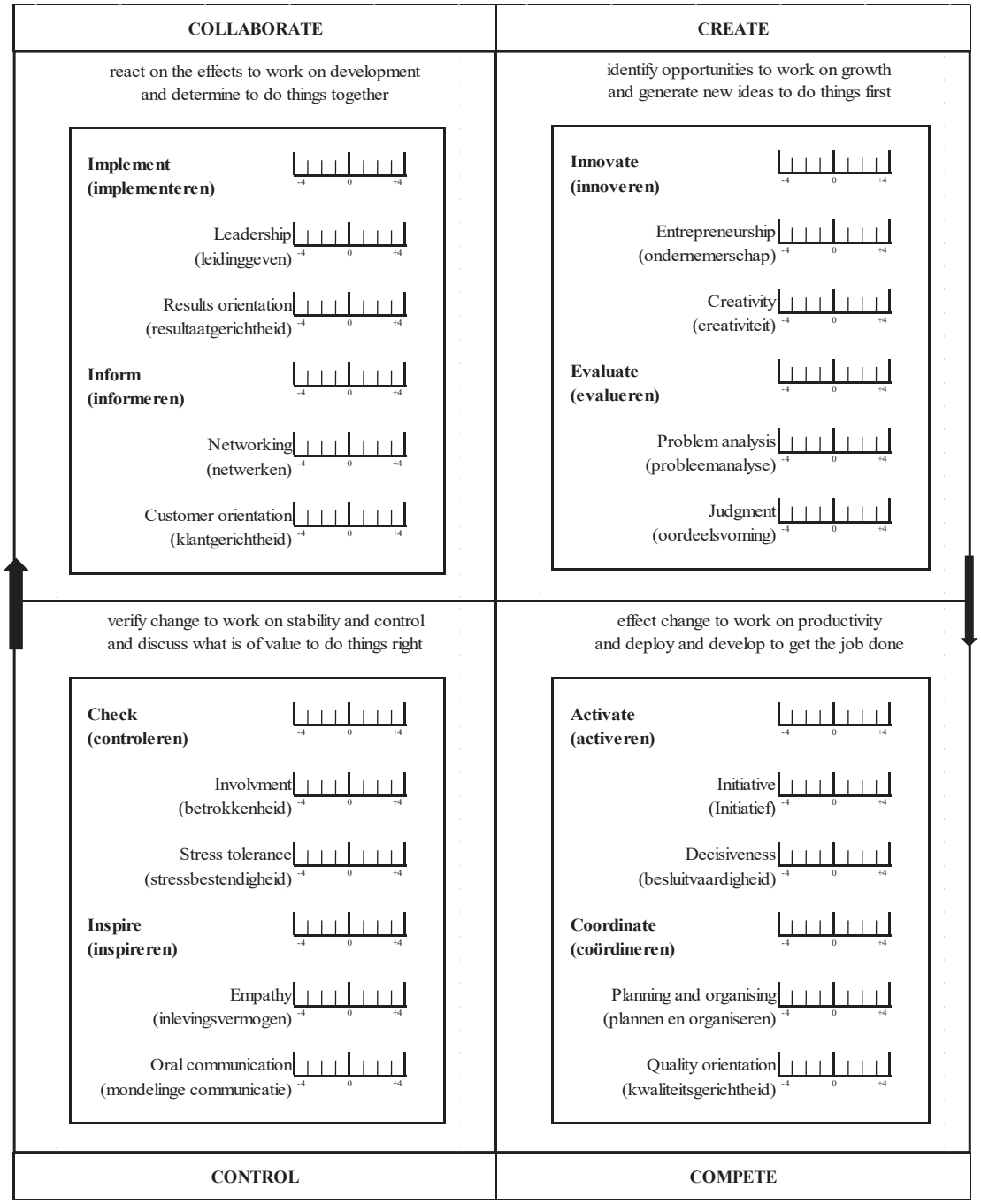
Figure 7.5 presents the renewed version of the third STM diagram, showing the elaboration of the systems-oriented interplay between the building blocks strategy and resources of the MBBF in team roles as the junction in the relationship between business strategy and competences. The building block strategy is viewed as the joint process-oriented and human-contribution approach of both organisational effectiveness and organisational climate. The former, known as the process dimension of strategy, is elaborated in the combination of the PDCA-cycle and the IMAR-cycle. The latter, defined as the contribution of strategy to the building block resources, becomes visible in the combination of the four models of the CVF and the OCAI. The corresponding competences emerged from the combination of underlying personality facets of the FFM and work values of the UVM, representing the attribute- and attitude elements of the competence. The individual competences and the integral business strategy, are linked through the higher-order construct of team roles, that consists of both a business strategy and a competence element. As shown in the first two renewed STM diagrams (Figure 7.3 and 7.4), the interconnections between the management cycle of business strategy and the lexical corresponding competences are grafted in the four models of the CVLM. With this, the third renewed STM diagram is an illustration of the individual contribution to the different phases of the business strategy.

To make this diagram applicable as a testing instrument, the sum score of each competence can be calculated as the sum of the raw scores on the set of corresponding underlying personality facets, measured with a five factor personality questionnaire, and work values, measured with a universal values questionnaire, on a five-point Likert scale. This sum score is converted into the standardised Z-score on a bandwidth of -4 until +4, comparable to the range of -4σ until +4σ, defined as four standard deviations from the mean within a normal distributed sample. In this way it is possible to visualise the individual score on that specific competence. The sum score on each team role is the average of the standardised sum score of the two underlying competences. For example, the competence creativity is built on the three personality facets reflective, original and ingenious and on the four work values mental challenge, creativity, independence and variety. This, for instance, results in an average standardised Z-score of 1.75, which implies that the individual score bandwidth of the candidate on the competence creativity runs from [-4.00 until 1.75]. This means that the candidate has an aptitude of (5.75/8.00 = 0.72) for creativity. If, for example, the average standardised Z-score for the competence entrepreneurship was 0.52, then the candidate would have an aptitude of (5.75 + 4.52)/2 = 5.14/8.00 = 0.64 for the team role innovate.

As introduced in Chapter 5, the four CVLM models each consist of two team roles that are both built on two competences. Each competence is constructed on a set of underlying personality facets and work values. This classification of competences and team roles was confirmed by both the lexical-semantic analyses and the stepwise multiple linear regression analyses, predicting the work values with the personality facets, as conducted in the previous chapters of this dissertation.

Figure 7.5

Renewed STM diagram 3: the alignment of business strategy and human talent, elaborated in team roles as the junction in the relationship between business strategy and competences



7.5. Conclusion, Discussion and Recommendations

7.5.1. Conclusion

This concluding chapter of the dissertation introduced the design of the renewed evidence-based STM model and its elaboration in three renewed STM diagrams, that could take the place of the initial three diagrams as introduced in Chapter 1. The management building blocks framework (MBBF; Nieuwenhuis, 2006) and the systems theory (Katz & Kahn, 1966; Meadows, 2008) were used to elaborate the interrelations within the new STM model. This provided in a renewed way of linking human talent to the core elements of the organisation's purpose (Barile, 2006; Barile, 2008; Mele et al., 2010), and is assumed to create a fit at the level of a joint corporate and personal identity instead of at the level of a specific job profile that in our ever changing world is subject to continuous alteration. This dissertation results in the design and validation of the renewed evidence-based systems-oriented talent management model (STM) and its elaboration in three renewed STM diagrams.

The first renewed and bilingual STM diagram (Figure 7.3) is seen as an improved and evidence-based version of the initial 2012 version of the first Dutch STM-scan diagram, as introduced in Figure 1.3. In both versions, the 24 personality facets are lexically derived from the 24 FFM labels including their lexical antonym. Whereas in the initial 2012 version, the antonyms were directly derived from a lexicon, the antonyms in the renewed version were derived from the list of characteristics describing both poles of each of the five factor personality facets, as documented in the Dutch 'Idioticon of Personality' (De Raad & Doddema-Winsemius, 2006). In the initial 2012 version, the 24 personality facets and their antonyms were clustered in the four steps of the primary business process that stem from the business purpose (idea – plan – form – action). This ordering of facets was iteratively built, based on intermediate evaluations in practice. In the renewed version of the first diagram, business purpose is further detailed in the content- and contribution side of organisational effectiveness, by lexical-semantically linking the four steps of the PDCA cycle to the four models of the CVF. Jointly, they converge in the four models of CVLM. This operationalisation of the construct organisational effectiveness is considered the effectuation of the building block 'structure' found in the MBBF. The lexical-semantic linking of this block to the

personality facets through the optimal path similarity results in the first path that runs from resources through structure to results.

The second renewed STM diagram (Figure 7.4) is introduced as an improved and evidence-based version of the initial 2012 version of the second STM-scan diagram, as presented in Figure 1.4. In both versions, the work values are lexically derived from the UVM and clustered in four higher-order culture types. In the initial 2012 version, this resulted in four culture types with four corresponding fundamental attitudes, representing an individual's social orientation. Each culture type and its fundamental attitude consisted of three underlying work values. Within the renewed version, the work values were clustered in higher-order culture types, similar to the ordering of work values of Schwartz (1992), Ros et al. (1999), Zytowski (2006), Daehlen (2008), and Van Thiel (2008b). In the renewed version of the second diagram, business purpose is further detailed in the content- and contribution side of organisational climate, by lexical-semantically linking the four steps of the IMAR cycle to the four models of the OCAI. Jointly, they converge in the four models of CVLM. This operationalisation of the construct organisational climate is considered the effectuation of the building block culture found in the MBBF. The lexical-semantic linking of this block with the work values through the optimal path similarity results in the second path that runs from resources through culture to results.

The third renewed STM diagram (Figure 7.5) is presented as an improved and evidence-based version of the initial 2012 version of the third STM-scan diagram, as shown in Figure 1.5. In the initial 2012 version, the 24 personality facets and their antonyms of the first STM diagram were used to calculate the amount of disposition for a series of 24 competences. Each competence was built on a combination of three of the 24 personality facets measured in the first STM diagram. The 24 competences were clustered in eight team roles, each consisting of three competences. The competences and team roles were clustered in the four steps of the primary business process that stem from the business purpose. Within the renewed version of the third STM diagram, combinations of both personality facets (first diagram) and work values (second diagram) are used to calculate the amount of disposition for a series of 16 key competences. The algorithms of combinations of personality facets and work values per key competence are confirmed by both the lexical-semantic classification, found in Chapter 2 and Chapter 3, and the linear regression models found in Chapter 4. Each of the 16 key competences is related

to a series of lexical-semantic synonyms found in existing competency frameworks (Table 5.1). The 16 key competences are clustered in eight team roles, each consisting of two key competences. In the renewed version of the third diagram, business purpose is further detailed in the process-oriented and human-contribution approach of business strategy. The process-oriented approach is dealt with as the content side of both organisational effectiveness and organisational climate, found in the lexical similarities between PDCA and IMAR. The human-contribution approach is seen as the contribution side of both organisational effectiveness and organisational climate, found in the lexical similarities between CVF and OCAI. Jointly, these two approaches of business strategy converge in the four models of CVLM. This operationalisation of the construct business strategy is considered the effectuation of the building block strategy found in the MBBF. The reliability and construct validity of the linking of the competences and team roles to the four models of CVLM is confirmed by lexical-semantic analyses, factor analyses and multitrait multimethod matrixes as presented in Chapter 5. With this, the renewed versions of the STM diagrams contribute in more detail to the alignment of the organisation and its employee.

The analytical evaluation of the design of the initial STM-scan, as introduced in Chapter 1, and parts of the proposed adaptions found in Chapters 2 until 5, show that the appreciation of the four levels of Kirkpatrick (satisfaction - outcomes - usages - returns) by the panel of talent management experts, jointly provide evidence for the utility of STM. However, all four experts noted that the use of the initial STM-scan in practice is rather complex and difficult. As seen in the renewed STM diagrams (Figure 7.3, 7.4 and 7.5), these improved versions contribute to a decrease in both the complexity and amount of the different terms used in the initial STM-scan.

All in all, the design and validation of the renewed STM contributes to a sharp and objective picture of the match between people and the organisation, by linking human characteristics to managerial building blocks. The three renewed STM diagrams jointly make up a potential new version of the systems-oriented assessment instrument STM-scan. In completing a five factor personality test, such as the NPT and an universal values inventory, like the NWT, the individual contribution to the four models of organisational effectiveness, organisational climate and business strategy can be measured and reported

in the three renewed STM diagrams that jointly represent three alignment paths between resources, the organisation and its intended results.

7.5.2. Discussion and Limitations of the Study

Before turning to the recommendations and implications of this study, there are some limitations to take into account. The renewed evidence-based systems-oriented talent management model is built on three different paths between the building blocks resources and results, found in the MBBF (Nieuwenhuis, 2006). Therefore, the intermediate building blocks structure, culture and strategy are theoretically linked to organisational effectiveness, organisational climate and business strategy, as elaborated in the previous chapters of this dissertation. The building block resources is detailed in personality facets, work values, competences and team roles. The different relationships, found in the three paths between resources and results are partly established on the basis of interpreting different text corpuses. This could imply that other existing lexical-semantic relations, that might argue against the present used relations, may have been overlooked. However, since the majority of the lexical-semantic relationships are empirically substantiated by stepwise multiple regression analyses, factor analyses and multitrait multimethod matrixes, this supports the reliability and construct validity of the renewed STM diagrams.

A second limitation of this concluding study is that the renewed STM diagrams so far have not yet been operationalised in a new version of the STM-scan assessment instrument. Although, in the interviews, the experts were indirectly asked their opinion on parts of the proposed adaptions, the utility of the renewed STM diagrams could not yet have been evaluated, based on practical experience. A third limitation is that the renewed STM diagrams are not yet empirically compared with other instruments for strategic talent management.

Summarised, throughout this dissertation, the design and validation of the renewed systems-oriented talent management model arose out of a thorough evaluation of the context, preconditions and critical success factors, found in the best-practice oriented design of the initial STM-scan (Brouwer, 2012). Together with the evaluation of the internal consistency reliability, construct validity and utility throughout the previous

chapters, the findings of this dissertation support the evidence-based character of the renewed STM, as presented in this concluding chapter.

7.5.3. Recommendations and Implications

The renewed STM revealed that the systems-oriented interplay between the organisation's purpose and its human talent becomes tangible in team roles as the junction in the relationship between business strategy and competences. This interplay is detailed in three paths that run between the managerial blocks resources and results of the MBBF. Each path represents an individual relationship between specific human characteristics of the human talent and corresponding elements of the business purpose. The different studies of this dissertation showed that these relationships can be measured by any five factor questionnaire to measure the personality facets (Costa & McCrae, 1985) and any universal work values questionnaire to measure the work values (Schwartz, 1992). Therefore it is recommended to develop and implement a renewed version of the initial STM-scan assessment instrument. To improve the readability and user-friendliness of the renewed STM diagrams, it is recommended to invest in graphic design. Since effective test development requires a systematic, well-organised approach to ensure sufficient validity evidence to support the proposed inferences from the test scores, it is recommended to use the 12-steps test development framework of Downing and Haladyna (2009), in order to implement the renewed STM diagrams. Part of this development process should be the additional training of the present STM experts and the implementation of a periodic evaluation cycle of the psychometric quality and utility of the renewed assessment instrument.

Another recommendation concerns the starting point of the measurement. In its current composition, the renewed STM model is filled with the test results of an individual's scores on a set of human characteristics, which lies the relationship with the management building blocks of the MBBF. In addition, the field of management science has introduced different inventories for measuring a combination of these management building blocks (Cameron & Quinn, 2011; Cameron et al., 2014). An interesting follow-up study would be to investigate whether the STM model can also be measured the other way around by predicting human characteristics with the help of a managerial inventory. The present studies have laid the foundation for this follow-up research.

Concluding, this dissertation showed that the design and validation of the renewed evidence-based STM model and its elaboration in three renewed STM-diagrams contributes to the future bridging of the gap between psychological questionnaires for testing human characteristics and models for unravelling managerial building blocks. The different design and validation studies of this dissertation confirmed that this results in achieving a more sustainable and age-dependent match between the organisation's rationale and a person's innate individual character. Therewith, the study joined the debate on how adaptive enterprises ought to be organised these days and how to give shape to the corresponding upscaling that is required of their talent management experts.

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Summary

In the year 2012, the initial systems-oriented talent management (STM) model was introduced as a method for aligning business purpose and human talent both psychologically and from a managerial perspective (Brouwer, 2012). The STM model was elaborated into an online assessment instrument, named STM-scan. The test instrument generates three diagrams on the relationship between business purpose and human talent. The diagrams themselves are complemented with the results of a five factor personality test and an universal values test. The different human qualities then are arranged in a business model in which four central steps in the primary business process are visualised. This results in a representation of the precise match between personal qualities and the working environment.

The initial STM-scan has been used over 1,000 times as talent management instrument. Multiple intermediate evaluations affirmed that clients and candidates are satisfied with both the instrument's application possibilities and the insights provided by the instrument. This raised the question of whether the composition and configuration of the initial STM can also be scientifically substantiated based on the literature. Furthermore, there is a question of whether the STM-scan meets two of the key criteria of the COTAN review system (Evers et al., 2010), i.e. reliability and validity. Finally, there is the question of what can be asserted about STM's utility. Consequently, this dissertation is a design and validation study of the systems-oriented talent management model.

Chapter 2 studies the lexical-semantic relationship between organisational effectiveness and personality facets. This study finds that organisational effectiveness can be elaborated in the lexical-semantic association between the four steps of the PDCA-cycle (Deming, 1986) and the four models of the competing values framework (CVF; Quinn & Rohrbaugh, 1983). The lexically corresponding personality facets emerge from the translation of the bipolar AB5C facets (Hofstee et al., 1992; Johnson, 1994) of each five factor personality facet (Costa & McCrae, 1985) into its Dutch non-normative and work related synonym and antonym, derived from the Dutch idioticon of personality (De Raad & Doddema, 2006). The lexical-semantic interconnections between organisational effectiveness and personality facets can be grafted in the four overlying models of the

competing values leadership model (CVLM; Cameron et al., 2014) With these results, the initial first STM-scan diagram can be improved.

In **Chapter 3** the lexical-semantic relationship between organisational climate and work values is studied. This chapter shows that organisational climate, seen as the motivational and cultural aspects behind the organisational effectiveness, can be elaborated in the lexical-semantic relationships between the four steps of the IMAR-cycle (INK, 2008) and the four models of the organisational culture assessment instrument (OCAI; Cameron & Quinn, 2011). The lexically corresponding work values emerge from the universal values model (UVM; Schwartz, 1992). The lexical-semantic interconnections between organisational climate and work values can also be grafted in the four overlying models of the CVLM. These findings lead to enhancements for the second initial STM-scan diagram.

Chapter 4 studies the relationships between the personality facets of the first and the work values of the second initial diagram. Previous research on their associations show limited agreement. In order to clarify, this chapter investigates their association on a personality facet level. Work values are differentiated in intrinsic and extrinsic factors. Furthermore, this chapter adds the role of age to the association. Earlier studies on traits, values and the influence of age on their development and relationships are reviewed. Then the moderating influence of age in the association between facets of the five factor model and work values of the universal values model of 465 Dutch bankers is studied. The results elucidate the relationships between personality facets and work values and the role of age in these associations. Considering this in personnel selection might contribute to sustainable employability of the young as well as the older worker. Therewith, the study contributes to the debate of ageing in recruitment and selection.

Chapter 5 uses both qualitative and quantitative research methods to introduce the blueprint of a renewed version of the initial third STM-scan diagram. This study shows that business strategy is seen as the combination of the process-oriented and human-contribution approach of both organisational effectiveness and organisational climate. The former approach can be elaborated in the lexical-semantic relationships between the four steps of both the PDCA-cycle and the IMAR-cycle. The latter approach can be elaborated in the lexical-semantic associations between the four models of the CVF and

the OCAI. The lexically corresponding key competences emerge from the combination of underlying personality facets and work values. In order to lexically link key competences to business strategy, this study finds that team roles, built on both a business strategy and a competences approach, function as their junction. Within the renewed version of the third initial STM-scan diagram, the results of the chapters 2, 3 and 4 are combined in a set of key competences and team roles, that both are composed of a combination of personality facets (Chapter 2) and work values (Chapter 3) and ordered in a more detailed elaboration of a managerial representation of the organisation.

Subsequently, Chapter 5 researches the reliability and validity of the renewed initial third STM-scan diagram. Factor analyses (FA) show that the key competences, built upon the underlying personality facets and work values, show strong internal consistency reliabilities with an average Cronbach's alpha of 0.798 within a range of [0.745 – 0.855]. Furthermore, the FA results in four clusters of each four competences, which supports the lexical-semantic classification of the key competences in the four models of the CVLM. The construct validity is evaluated as the convergent and discriminant validity of the competences, derived from a multitrait multimethod matrix (MTMM). The study finds an average correlation with lexical corresponding competences of 0.538 within a range of [0.311 – 0.743]. With this, the study finds empirical support for the lexical-semantic composition and classification of the key competences. The team roles, each built upon a combination of two underlying key competences, show strong internal consistency reliabilities with an average Cronbach's alpha of 0.811 within a range of [0.777 – 0.839]. The FA results in three clusters of respectively four, two and two competences. The clustering of key competences in four factors is partly confirmed by the clustering of the overlying team roles. The correlations derived from the MTMM, show construct validity for three of the eight team roles. With this, study finds partly empirical support for the lexical-semantic composition and classifying of the team roles.

Chapter 6 presents the results of a series of interviews held with a panel of experts certified for the initial STM-scan. Their appreciation was studied along the four evaluation levels of Kirkpatrick (1998). Jointly this provides analytical evidence for the utility of the initial STM model and parts of the proposed improvements that emerged from Chapters 2 through 5. The first level (satisfaction) shows that in general, STM is perceived as a model that provides objective and detailed information on the match

between the test taker and its environment. However, the reading and interpretation of the different relationships within STM, are seen as rather complex and difficult. On a proposed improvement to let the personality facets and work values jointly form the basis for key competences and team roles, the experts dissent. The second level (outcomes) shows that the experts all agree that the use of the STM model provides insight in, understanding of and awareness of individual qualities in relation to a specific business environment. The evaluation of the third level, usages, shows that the STM-scan can be used in a wide range of talent management practices, such as the selection and development of individuals and teams, and strategy and culture programs. The fourth level (returns) reaffirms that the use of the STM model helps both the test taker and the test professional to more quickly find more detailed answers to talent management questions. Practice shows that the STM model brings the desired information to the table, which the test professional complements with the appropriate and required interventions.

Chapter 7 presents the renewed STM model in which the systems-oriented interplay between the organisation's purpose and human talent becomes tangible in team roles that function as the junction in the relationship between business strategy and key competences. This is detailed in three paths that run between the managerial blocks 'resources' and 'results' of the MBBF (Nieuwenhuis, 2006). Each path represents an individual relationship between specific characteristics of the human talent and corresponding elements of the business purpose.

The renewed evidence-based STM model and its elaboration in three renewed STM diagrams, contributes to the future bridging of the gap between psychological questionnaires for testing human characteristics and models for unravelling managerial building blocks. The different design and validation studies in this dissertation confirmed that this contributes to achieving a more sustainable and age-dependent match between the organisation's rationale and a person's innate individual character. Therewith, the study joined the debate on how an adaptive enterprise ought to be organised these days and how to give shape to the corresponding upscaling that is required of their talent management experts.

Samenvatting (Summary in Dutch)

In het jaar 2012 werd het initiële systeemgericht talent management (STM) model geïntroduceerd als een methode voor het bedrijfskundig en psychologisch verbinden van bedrijfsdoel en menselijk talent (Brouwer, 2012). Het STM model werd uitgewerkt in een online assessment instrument, genaamd STM-scan. Het testinstrument genereert drie diagrammen omtrent de relatie tussen bedrijfsdoel en menselijk talent. De diagrammen worden gevuld met testresultaten van een vijf factoren persoonlijkheidstest en een universele waardentest. De verschillende menselijke kwaliteiten worden vervolgens gerangschikt in een organisatiemodel waarin vier centrale stappen uit het primaire bedrijfsproces zijn gevisualiseerd. Dit resulteert in een weergave van de precieze match tussen persoonlijke kwaliteiten en de bedrijfsomgeving.

De initiële STM-scan is meer dan 1.000 keer ingezet als talent management instrument. Meerdere tussentijdse evaluaties hebben bevestigd dat opdrachtgevers en kandidaten tevreden zijn met zowel de toepassingsmogelijkheden van het instrument als met de inzichten die het instrument geeft. Hierdoor ontstond de vraag of de opbouw van de initiële STM ook wetenschappelijk kan worden onderbouwd op basis van de literatuur. Daarnaast is de vraag of de STM-scan voldoet aan de eisen van twee van de centrale criteria uit het COTAN beoordelingssysteem (Evers et al., 2010), zijnde betrouwbaarheid en validiteit. Ten slotte is er de vraag wat kan worden gezegd over de utiliteit van STM. Dientengevolge is dit proefschrift een ontwerp- en validatiestudie van het systeemgericht talent management model.

Hoofdstuk 2 bestudeert de lexicaal-semantische relatie tussen organisatie-effectiviteit en persoonlijkheidsfacetten. Uit de studie volgt dat organisatie-effectiviteit kan worden uitgewerkt in de lexicaal-semantische associatie tussen de vier stappen van de PDCA cyclus (Deming, 1986) en de vier modellen van het concurrerende waardenmodel (Quinn & Rohrbaugh, 1983). De daarbij lexicaal corresponderende persoonlijkheidsfacetten komen voort uit de vertaling van de bipolaire AB5C facetten (Hofstee et al., 1992; Johnson, 1994) van elk vijf factoren persoonlijkheidsfacet (Costa & McCrae, 1985) in een Nederlandstalig waardevrij en werkgerelateerd synoniem en antoniem, afgeleid van het Nederlandstalige idioticon van de persoonlijkheid (De Raad & Doddema, 2006). De lexicaal-semantische relaties tussen organisatie-effectiviteit en persoonlijkheidsfacetten

kunnen worden geënt in de vier overkoepelende modellen van het concurrerende waarden leiderschapsmodel (Cameron et al., 2014). Met behulp van deze uitkomsten kan het eerste initiële STM-scan diagram worden verbeterd.

In **hoofdstuk 3** wordt de lexicaal-semantische relatie tussen organisatieklimaat en werkwaarden bestudeerd. Dit hoofdstuk laat zien dat organisatieklimaat, beschouwd als de motiverende en culturele aspecten achter de organisatie-effectiviteit, kan worden uitgewerkt in de lexicaal-semantische associatie tussen de vier stappen van de IMAR cyclus (INK, 2008) en de vier modellen van het organisatiecultuur assessment instrument (Cameron & Quinn, 2011). De lexicaal corresponderende werkwaarden komen voort uit het universele waardenmodel (Schwartz, 1992). De lexicaal-semantische relaties tussen organisatieklimaat en werkwaarden kunnen eveneens worden geënt in de vier overkoepelende modellen van het concurrerende waarden leiderschapsmodel (Cameron et al., 2014). Deze uitkomsten leiden tot verbeteringen voor het tweede initiële STM-scan diagram.

Hoofdstuk 4 onderzoekt de relatie tussen persoonlijkheidsfacetten van het eerste STM-scan diagram en werkwaarden van het tweede STM-scan diagram. Eerdere studies naar deze relatie laten weinig overeenstemming zien. Om dit op te helderen, onderzoekt dit hoofdstuk de associatie op het niveau van persoonlijkheidsfacetten. Werkwaarden worden ingedeeld in intrinsieke en extrinsieke factoren. Daarnaast voegt dit hoofdstuk de rol van leeftijd toe aan de associatie. Eerdere studies naar eigenschappen en waarden en de invloed van leeftijd op de ontwikkeling van beide eigenschappen en hun onderlinge relatie worden besproken. Daarna wordt de modererende invloed van leeftijd op de associatie tussen facetten van het vijf factoren model en werkwaarden van het universele waardenmodel van 465 Nederlandse bankiers onderzocht. De resultaten verduidelijken de relatie tussen persoonlijkheidsfacetten en werkwaarden en de rol van leeftijd op deze associatie. Met het oog op personeelsselectie, kunnen deze inzichten bijdragen aan de duurzame inzetbaarheid van zowel de jongere als de oudere medewerker. Daarmee draagt deze studie bij aan het debat over leeftijdsbewuste werving en selectie.

Hoofdstuk 5 gebruikt zowel kwalitatieve als kwantitatieve onderzoeksmethoden om de blauwdruk van de hernieuwde versie van het derde initiële STM-scan diagram te introduceren. Deze studie toont aan dat bedrijfsstrategie kan worden gezien als de

combinatie van de procesgerichte en mensgerichte benadering van zowel organisatie-effectiviteit als organisatieklimaat. De eerste benadering kan worden uitgewerkt in de lexicaal-semantische relatie tussen de vier stappen van de PDCA cyclus en de IMAR cyclus. De tweede benadering kan worden uitgewerkt in de lexicaal-semantische relatie tussen de vier modellen van het concurrerende waardenmodel en het organisatiecultuur assessment instrument. De lexicaal corresponderende kerncompetenties komen voort uit de combinaties van onderliggende persoonlijkheidsfacetten en werkwaarden. De studie toont aan dat, om de kerncompetenties lexicaal te kunnen linken aan bedrijfsstrategie, teamrollen (gebouwd op zowel een bedrijfsstrategie als competentie benadering,) functioneren als het verbindingspunt tussen beide. In de hernieuwde versie van het derde initiële STM-scan diagram, worden de resultaten uit de hoofdstukken 2, 3 en 4 gecombineerd in een set kerncompetenties en teamrollen, die beide bestaan uit een combinatie van persoonlijkheidsfacetten (Hoofdstuk 2) en werkwaarden (Hoofdstuk 3) en kunnen worden geordend in een meer gedetailleerde uitwerking van de bedrijfskundige weergave van de organisatie.

Vervolgens onderzoekt hoofdstuk 5 de betrouwbaarheid en de validiteit van de hernieuwde versie van het derde initiële STM-scan diagram. Factoranalyse laat zien dat de kerncompetenties, gebouwd op de onderliggende persoonlijkheidsfacetten en werkwaarden, een sterke interne consistentie betrouwbaarheid hebben met een gemiddelde Cronbach's alpha van 0.798 in een bandbreedte van [0.745 – 0.855]. Verder resulteert de factoranalyse in vier clusters van elk vier competenties, wat daarmee de lexicaal-semantische ordening van kerncompetenties in de vier modellen van het concurrerende waarden leiderschapsmodel ondersteunt. De constructvaliditeit is geëvalueerd als de convergente en discriminerende validiteit, afgeleid van de multitrek multimethode matrix (MTMM). De studie vindt een gemiddelde correlatie tussen de kerncompetenties en lexicaal corresponderende competenties van 0.538 in een bandbreedte van [0.311 – 0.743]. Daarmee vindt de studie empirisch bewijs voor de lexicaal-semantische samenstelling en indeling van de kerncompetenties. De teamrollen, gebouwd op combinaties van twee kerncompetenties, hebben eveneens een sterke interne consistentie betrouwbaarheid met een gemiddelde Cronbach's alpha van 0.811 in een bandbreedte van [0.777 – 0.839]. De factoranalyse resulteert in drie clusters van respectievelijk vier, twee en twee kerncompetenties. De correlaties, afgeleid van de MTMM, tonen constructvaliditeit aan voor drie van de acht teamrollen. Daarmee vindt

deze studie gedeeltelijk empirisch bewijs voor de lexicaal-semantische samenstelling en indeling van de teamrollen.

Hoofdstuk 6 presenteert de uitkomsten van een serie interviews met een panel van experts die zijn gecertificeerd in de initiële STM-scan. Hun waardering werd onderzocht langs de vier niveaus van Kirkpatrick (1998), die gezamenlijk analytisch bewijs leveren voor de utiliteit van het initiële STM model en onderdelen van de voorgestelde verbeteringen die volgen uit de hoofdstukken 2 tot en met 5. Het eerste niveau (tevredenheid) laat zien dat STM in het algemeen wordt ervaren als een model dat objectieve en gedetailleerde informatie geeft over de match tussen de kandidaat en zijn of haar omgeving. Echter, de leesbaarheid en interpretatie van de verschillende relaties binnen STM, worden als nogal complex en moeilijk ervaren. De experts verschillen van mening over de voorgestelde verbetering om persoonlijkheidsfacetten en werkwaarden gezamenlijk de basis van de kerncompetenties en werkwaarden te laten vormen.. Het tweede niveau (uitkomsten) laat zien dat alle experts het met elkaar eens zijn dat het gebruik van STM voorziet in inzicht, begrip en bewustwording van individuele kwaliteiten in relatie tot een specifieke bedrijfsomgeving. De evaluatie van het derde niveau, gebruiksmogelijkheden, laat zien dat de STM-scan gebruikt kan worden voor een breed scala aan talent management toepassingen, zoals de selectie en ontwikkeling van individuen en teams, en strategie en cultuurprogramma's. Het vierde niveau (rendement) bevestigt dat het gebruik van het STM model zowel de kandidaat als de professional helpt om sneller meer gedetailleerde antwoorden op talent management vraagstukken te vinden. De praktijk laat zien dat het STM model de gewenste informatie ter tafel brengt, waar de professional de bijpassende interventie aan toevoegt.

Hoofdstuk 7 presenteert het hernieuwde STM model waarin de systeemgerichte wisselwerking tussen het bedrijfsdoel en menselijk talent tastbaar wordt in teamrollen die functioneren als het verbindingspunt tussen bedrijfsstrategie en kerncompetenties. Dit wordt gedetailleerd in drie paden die lopen tussen de managementbouwstenen 'bronnen' en 'resultaten' uit het managementbouwstenen model (MBBF; Nieuwenhuis, 2006). Elk pad is een weergave van de individuele relatie tussen specifieke karakteristieken van het menselijk talent en corresponderende elementen van het bedrijfsdoel.

Het hernieuwde, evidence-based, STM model en haar uitwerking in drie hernieuwde STM diagrammen, draagt bij aan de toekomstige overbrugging van de kloof tussen psychologische vragenlijsten voor het testen van menselijke eigenschappen en modellen voor het ontrafelen van managementbouwstenen. De verschillende ontwerp en validatiestudies van dit proefschrift bevestigen dat dit bijdraagt aan het bereiken van een meer duurzame en leeftijdsbewuste match tussen de bestaansreden van de organisatie en iemands aangeboren individuele karakter. Daarmee mengt deze studie zich in het debat over hoe vandaag de dag een adaptieve organisatie georganiseerd zou moeten zijn en hoe er vorm gegeven kan worden aan de corresponderende opschaling die van talent management experts wordt gevraagd.

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Toen ik in het jaar 2006 de eerste versie van STM schetste, kon ik nog niet vermoeden dat dit uiteindelijk zou resulteren in dit proefschrift. Na meerdere jaren met STM in de praktijk te hebben gewerkt, kwam ik via mijn promotieonderzoek in een hele nieuwe omgeving terecht. Waar ik in mijn eerdere jaren als productontwikkelaar en consultant vooral intuïtief en iteratief te werk ging, daar vroeg deze voor mij nieuwe omgeving om een empirische benaderingswijze. Dit betekende dat ik bewust afstand moest nemen van mijn product en haar praktijk. Een objectieve en onafhankelijke benadering was nodig bij het inkaderen van STM in een passende onderzoeksopzet. Ik ben Henk Kelder en Michel Strikker zeer erkentelijk dat zij mij deze ruimte gaven, waarmee zij de beginperiode van mijn promotieonderzoek mede mogelijk hebben gemaakt.

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Curriculum Vitae

Arnold Brouwer was born on September 10, 1973 in Westerbork, the Netherlands. He holds a bachelor's degree (BA) in business economics and a master's degree (MSc) in management sciences with a specialisation in strategic human resource management.

Arnold started his career in 1997 as a consultant business lender at a major bank, followed by a job as a ICT sales consultant. From 2003 to 2014, he worked as a consultant and product developer for the HRM practice. This combination of disciplines resulted in the origin of a unique and multiform eye for the place and role of HRM within organisations. During that period, Arnold developed the STM model and the online assessment instrument STM-scan. Establishing his own company, he developed a palette of strategic HRM intervention programs based on STM. In collaboration with his network of certified STM professionals, Arnold helped many organisations answer questions regarding the adoption and/or adjustment of corporate strategy and culture, recruiting and selecting new personnel, coaching and developing employees, outplacement and career advice, development of teams and succession planning.

In 2014, Arnold joined the Research Center for Examinations and Certifications (RCEC) as an external PhD candidate and assessment expert. Besides, Arnold was one of the external psychometric experts of the Dutch Expertgroep Toetsen Primair Onderwijs. In addition, he worked as a guest lecturer for the department of Research Methodology, Measurement and Data Analysis at the University of Twente.

As of January 1, 2018, RCEC became the independent expertise centre for securing and advancing the quality of examination. On that date, Arnold took up the post of owner/director of RCEC, whereas Stichting Cito and the University of Twente stepped down as owner and administrator. The collaboration between the three parties was then reorganised in such a way that RCEC is now able to support the field as an independent, scientific and international expertise centre.