

Fachbereich Erziehungswissenschaft und Psychologie  
der Freien Universität Berlin

## **The Two Towers**

**Social relevance and solid methods in applied positive psychology in the workplace**

**Dissertation**

zur Erlangung des akademischen Grades

Doktor der Philosophie (Dr. phil.)

Vorgelegt von

M.Sc.

Lorenz, Timo

Berlin, 26.01.2016

Erstgutachterin

Prof. Dr. Kathrin Heinitz

Zweitgutachter

Prof. Dr. Michael Eid

Disputation: 17.05.2016



## Abstract

Die Bewegung der positiven Psychologie, die mit dem Antritt von Martin Seligman als APA-Präsident 1998 neue Sichtweisen und Ideen in die Psychologie gebracht hat, beeinflusste in den letzten Jahren die Arbeits- und Organisationspsychologie durch ihren Fokus auf das subjektive Wohlbefinden. In der Arbeit soll ein zeitgemäßer Ansatz zur positiven Psychologie in der Arbeitswelt vorgestellt werden. Hierzu werden zwei Säulen – Methoden und soziale Relevanz – vorgeschlagen, die zum einen die möglichen Schwierigkeiten von Konstrukten der positiven Psychologie in Kulturvergleichen aufgreifen, sowie eine praxisnahe Ergebnisdarstellung propagieren. Andererseits greifen sie aber auch die Kritik auf, dass die positive Psychologie eine mögliche Hintertür zur Optimierung von Humankapital darstellen könnte. In drei Studien wird der vorgeschlagene Ansatz zur positiven Psychologie umgesetzt, wobei die Studien einen unterschiedlichen Schwerpunkt auf eine der jeweiligen Säulen setzen, und zugleich versuchen, beide Säulen in der Umsetzung zu integrieren. In der ersten Studie geht es um die Entwicklung eines Komposit-Fragebogens zur Erfassung von psychologischem Kapital, dessen theoretische Faktorstruktur sich in zwei deutschen Stichproben finden lässt und der durch eine nicht-berufsbezogene Item-Formulierung ein breiteres Einsatzgebiet erlaubt als der bisherige Standard- Fragebogen zur Erfassung von psychologischem Kapital, dem Psychological Capital Questionnaire (PCQ). In der zweiten Studie werden Hebammen, eine Berufsgruppe, die sich vor allem in Deutschland derzeit unter großem politischen Druck befindet, zu ihrem subjektiven Wohlbefinden befragt, wobei hier mögliche Zusammenhänge mit beruflichen Anforderungen und Ressourcen, sowie Resilienz und der Bedeutung der Arbeit im Fokus stehen. In der letzten Studie werden Menschen mit Autismus zu aufgetretenen Barrieren in Berufsbewerbungen und –alltag in autismus-spezifischer und nicht-spezifischer Anstellung interviewt. Weiterhin wurden Arbeits- und Lebenszufriedenheit und generelle Selbstwirksamkeit erhoben und zwischen den unterschiedlichen Gruppen von Menschen mit Autismus verglichen. Die Arbeit endet mit

einem finalen Kapitel, das mögliche generelle methodische Limitationen der Studien bespricht, gefolgt von praktischen und theoretischen Implikationen eines zeitgemäßen Ansatzes der positiven Psychologie in der Arbeitswelt, welcher die Integration von Methoden und sozialer Relevanz beinhaltet.

## Abstract

When Martin Seligman became APA president in 1998, the Positive Psychology movement gave new perspectives and ideas to the discipline of psychology. In the past several years, the movement's focus on subjective well-being has also influenced the field of work and organizational psychology. This dissertation aims to introduce a contemporary approach to Positive Psychology in the work place. In order to accomplish this, two pillars are proposed: solid methods and social relevance. These address the possible problems inherent in constructs of Positive Psychology with regards to cultural comparisons, and also advocate a practical approach to presenting results. Furthermore, these two pillars address the criticism that Positive Psychology might be a possible backdoor used to 'optimize' human capital. Three studies apply this proposed approach at Positive Psychology, with the individual studies focusing more on one of the two pillars, while at the same time attempting to implement both. The first study is devoted to developing a composite questionnaire for the ascertainment of psychological capital, the theoretical factorial structure of which can be found in two German samples and which allows for a more broad application by formulating items without occupational reference, unlike the standard questionnaire for the assessment of psychological capital, the Psychological Capital Questionnaire (PCQ). The second study surveys midwives, an occupational group currently under much political pressure especially in Germany, about their subjective well-being. The focus here is on a possible connection between occupational demands and resources as well as resilience and meaning of work. The third and final study set out to interview individuals with autism regarding occurred barriers in the process of job applications as well as everyday work. Both individuals in autism-specific as well as non-autism specific employment were interviewed. Job and life satisfaction as well as general self-efficacy were also surveyed and compared among the different groups of individuals with autism. This dissertation ends with a final chapter discussing possible general methodological limitations of the studies, followed by the practical and theoretical

implications of a contemporary approach to Positive Psychology in the work place that includes the integration of methods and social relevance.

## Table of content

<b>Chapter 1 – Introduction</b> .....	1
Changes in the world of work.....	2
Positive psychology and work.....	4
<i>Definitions of the terms of positive psychology in the workplace</i> .....	5
<i>The roots and emergence of positive psychology in the workplace</i> .....	8
<i>Criticism of positive psychology at the workplace</i> .....	10
A contemporary approach to positive psychology in the workplace.....	11
<i>The first pillar: Methods</i> .....	12
<i>The second pillar: Social relevance</i> .....	14
The upcoming chapters.....	15
References.....	17
<b>Chapter 2 - Measuring Psychological Capital:</b>	
<b>Construction and validation of the Compound PsyCap Scale (CPC-12)</b> ... ..	30
Abstract.....	31
Psychological Capital.....	32
Measuring Psychological Capital.....	34
Study 1.....	42
<i>Methods</i> .....	42
<i>Results</i> .....	44
Study 2.....	45
<i>Methods</i> .....	45
<i>Results</i> .....	48
Limitations.....	49
Discussion.....	49
<i>Future Directions</i> .....	50
References.....	52
Appendix.....	67

**Chapter 3 - Well-being and labor:**

<b>Do resilience and meaning of work buffer the job demands of midwives? .....</b>	<b>69</b>
Abstract.....	70
Introduction.....	71
Methods.....	74
<i>Participants and Procedure</i> .....	74
<i>Assessments and Measures</i> .....	75
<i>Data analysis</i> .....	77
Results.....	77
Limitations.....	78
Discussion.....	78
<i>Future Directions</i> .....	80
References.....	83

**Chapter 4 - Job barriers and autism:**

<b>Comparing job-related barriers and possible solutions in and outside of autism specific employment. ....</b>	<b>97</b>
Abstract.....	98
Introduction.....	99
<i>Autism</i> .....	99
<i>Autism Spectrum Condition and employment</i> .....	100
<i>Self-efficacy</i> .....	101
<i>Life and Job Satisfaction</i> .....	102
Methods.....	103
<i>Participants and procedure</i> .....	103
<i>Qualitative measures</i> .....	104
<i>Quantitative measures</i> .....	105
<i>Data analysis</i> .....	107
Results.....	108
<i>Qualitative results</i> .....	108
<i>Quantitative results</i> .....	110
Limitations.....	111
Discussion.....	111



References.....	118
Appendix.....	136
<b>Chapter 5 - General discussion and future directions.....</b>	<b>140</b>
Recapitulation.....	141
<i>Recapitulation chapter 2.....</i>	<i>141</i>
<i>Recapitulation chapter 3.....</i>	<i>142</i>
<i>Recapitulation chapter 4.....</i>	<i>143</i>
Methodological issues.....	144
<i>Cross-sectional designs.....</i>	<i>144</i>
<i>Common method variance.....</i>	<i>145</i>
<i>Validity.....</i>	<i>147</i>
Practical implications.....	147
Theoretical implications.....	149
<i>Model integration.....</i>	<i>149</i>
<i>Bayesian structural modeling.....</i>	<i>150</i>
<i>Resilience versus hardiness.....</i>	<i>151</i>
<i>The role of self-efficacy in inclusion.....</i>	<i>152</i>
Conclusion.....	152
References.....	154
Authors' contributions.....	163
Curriculum vitae.....	166
Erklärung.....	172

## List of tables

Table 2.1. – Descriptive statistics and inter-correlations for study 1 .....	63
Table 2.2. – Measurement for study 1 using MLM estimator.....	64
Table 2.3. – Descriptive statistics and inter-correlations for study 3.....	65
Table 3.1. – Summary of the bivariate correlations of all variables.....	95
Table 3.2. – Results of bootstrapped multiple regression models on subjective well-being...	96
Table 4.1. – Current employment of individuals with autism.....	127
Table 4.2. – Category system for responses concerning expected and occurred barriers.....	128
Table 4.3. – Category system for responses concerning solutions.....	129
Table 4.4. – Absolute and relative response frequency for participants without autism-specific job.....	130
Table 4.5. – Absolute and relative response frequency for participants with autism-specific job.....	131
Table 4.6. – General categories for expected problems, occurred problems and solutions in individuals with no autism-specific job vs. autism-specific job.....	132
Table 4.7. – Absolute and relative frequency of cross-questioning cases for participants without vs. with autism-specific job.....	133
Table 4.8. – Summary of the bivariate Bayesian correlations of all variables.....	134
Table 4.9. – Results Bayesian t-tests – non autism-specific employment vs. autism-specific employment.....	135

**List of figures**

Figure 1.1. – Proposed model by Luthans & Youssef (2007) for the relationship between POS and POB.....	6
Figure 1.2. – An integrated model of the terms used in positive psychology at the workplace.....	8
Figure 2.1. – Four (plus g-) factor measurement model for Psychological Capital.....	66
Figure 5.1. – Proposed model by Luthans & Youssef (2007) for the relationship between POS and POB.....	149
Figure 5.2. – An integrated model of the terms used in positive psychology at the workplace.....	150

# **Chapter 1**

## **Introduction**

## **Changes in the world of work**

Contemporary work is undergoing dramatic and rapid changes (Blustein, 2006; Blustein, 2008) or as Hameln (2002) pointed out – we have entered the age of revolutions in business concepts. Due to technological developments, change in the 21<sup>st</sup> century is no longer additive and linear; it is discontinuous, abrupt and non-linear. A company that misses a critical development may never catch up again, even if it is a respected brand making them as vulnerable as small start-ups (Cascio, 2010). While economic and societal change as well as instability in the “current times” have always been a topic (e.g., Daffern, 1960; LaPierre, 1958; Margulies & Wallace, 1973), there are some distinct differences to past times in this new world of work in the 21<sup>st</sup> century: The Internet, an aging population, globalization, and increasing diversity.

Maybe the most important factor of this change is the rise of the Internet (Friedman, 2006, 2009). This development led to a so called flat earth where work can be done from any place leading to global collaborations (Cascio, 2007) and changing possibilities for creativity and networking in areas such as research and development, software development or retail (Hof, 2005, June 20). This development revolutionized the rules of the working world as well as education (Cascio, 2010) – especially in the distinct contrast between areas with and without access to this new flat earth and its need for a supply of people with specific skills.

While the Internet led to a flat world, its workforce demographics changed rapidly. Due to low fertility rates, the developed western countries are expecting fewer younger and more older workers, thus leading to a need for skilled workers with the retirement of the baby boomer generation (Bloom, Canning, & Fink, 2010; Dychtwald, Erickson, & Morison, 2006; Lutz, Sanderson, & Scherbov, 2008). The flipside of this development are countries like China and India with a high fertility rate combined with a limited access to higher education and contemporary work skills (Cascio, 2010), leading to a low percentage of employable

people in high skill jobs combined with a seemingly inexhaustible possible lower-wage workforce for low skill jobs (Coy & Ewing, 2007).

While the manufacturing sector offshored most of its jobs to developing countries many former so-called white-collar jobs (e.g. bookkeepers, computer programmers, and designers) are now vulnerable to be offshored as well. According to Bardhan & Kroll (2003) the jobs with the following attributes are most likely to be targeted for offshoring:

- No face-to-face customer-servicing requirement
- High information content
- Work process is telecommutable and Internet enabled
- High wage differential with similar occupation in destination country
- Low setup barriers
- Low social networking requirement

This global movement of jobs results in an intense global competition of young workers as old structures of the classic white-collar workforce in industrialized countries are fading. At the same time higher education becomes more and more important to secure a sustained earning power (Cascio, 2010).

While the offshoring of jobs is one important aspect, it is also imperative to note that the jobs remaining in the industrialized countries are in need of high-skilled workers. Due to the high number of retirements by the baby-boomers there is a possible shortage of skilled workers (Dychtwald et al., 2006). To fill this shortage these countries need to utilize the abilities and talents of a diverse workforce (Barak, 2013). This changes the demographic features of most work organizations in Western countries from fairly homogeneous – Caucasian and male workforce - in the 20<sup>th</sup> century (Williams & O'Reilly, 1998) to an (much

needed) inclusion of marginalized and disadvantaged groups, especially women, people of color, sexual minorities and people with disabilities (Fassinger, 2008).

It is clear that the change in workforce demographics itself lead to two important changes:

The offshoring of jobs and the increasing diversity in the developed countries.

Agreeing with Cascio and Aguinis (2008) on important research directions for a contemporary industrial and organizational psychology such as globalization, work intensification, and increasing diversity - this work will put a focus on the possible benefits of positive psychology in the workplace towards these challenges.

### **Positive psychology and work**

Positive psychology in the workplace – sparked by the movement of positive psychology in the broader field of psychology (Seligman & Csikszentmihalyi, 2000) – is an umbrella term for a wide range of other umbrella terms (Mills, Fleck, & Kozikowski, 2013) such as Positive Organizational Behavior (POB) or Positive Organizational Scholarship (POS). As the neoclassical economic approach is no longer sufficient to create sustainable sources for a distinctive advantage (Kraaijenbrink, Spender, & Groen, 2010) by “just fixing” things or accumulating traditional resources, including economical or intellectual capital (Luthans, Youssef-Morgan, & Avolio, 2015), a more dynamic and idiosyncratic approach that can respond to rapid changes and build sustainable resources is needed (Barreto, 2010; Teece, 2009). Positive psychology in the workplace became of special interest because of its possibility for a sustainable edge leading to an advantage in this competition by refocusing on what is right and on building strengths thus creating sustainable resources (Luthans & Youssef, 2007).

In a first step, I will define the umbrella terms of positive psychology in the workplace followed by a discussion of the roots and history of this movement.

## **Definitions of the terms of positive psychology in the workplace**

***Positive organizational scholarship.*** POS is a conceptual framework for integrating positive psychology research into organizations (Cameron & Spreitzer, 2012b). It is defined as

The study of that which is positive, flourishing, and life giving in organizations. Positive refers to the elevating processes and outcomes in organizations. Organizational refers to the interpersonal and structural dynamics activated in and through organizations, specifically taking into account the context in which positive phenomena occur. Scholarship refers to the scientific, theoretically derived, and rigorous investigation of that which is positive on organizational settings (Cameron & Caza, 2003, p. 731).

Its umbrella covers a wide area of domains and phenomena that occur in organizational contexts such as positive relationships, positive human resource practices, positive leadership and change (Cameron & Spreitzer, 2012a), and is even expanding to sustainability (Hoffman & Haigh, 2012) and economic models (Godfrey, 2012). Luthans & Youssef (2007) state that its focus is on the macro-level – the organization itself.

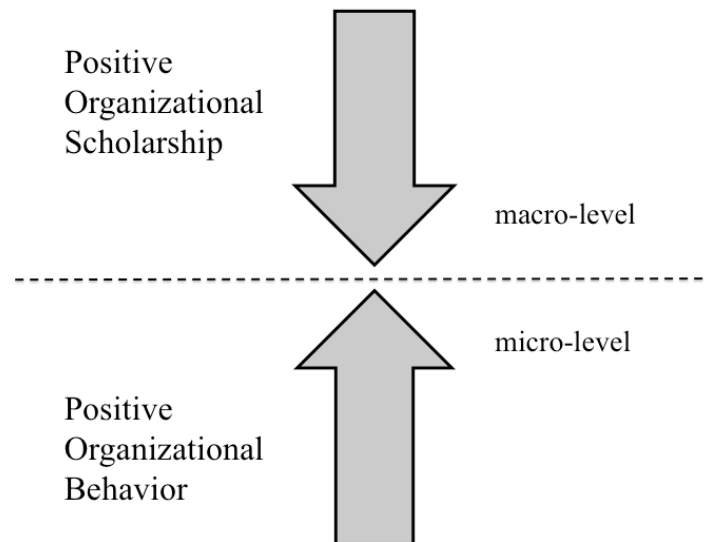
***Positive organizational behavior.*** While POS concentrates on an organizational point of view POB is setting its spotlight on the behavior of individuals (Luthans, 2002a, 2002b) and is defined as

the study and application of positively oriented human resource strengths and psychological capacities that can be measured, developed, and effectively managed for performance improvement in today's workplace (Luthans, 2002b, p.59).

For a construct to be included in POB it must be positive, must have a theoretical foundation, and valid measures (Luthans & Youssef, 2007). The classical construct associated with POB is psychological capital (PsyCap) – a g-factor construct including hope, self-efficacy, resilience and optimism (Luthans, Luthans, & Luthans, 2004; Luthans, Youssef, &



Avolio, 2006). While Luthans & Youssef (2007) see the focus of POS on the macro-level, they state that POB is focusing on the micro-level – the individuals in organizations.



*Figure 1.1.* Proposed model by Luthans & Youssef (2007) for the relationship between POS and POB.

While POS and POB could be named as the main components of positive psychology in the workplace, there are more concepts that are worth discussing to differentiate this field of psychology to become a more holistic picture.

***Positive occupational health psychology.*** Positive occupational health psychology (POHP) takes the classical approach of occupational health psychology - which concerns itself with the application of psychology to improve the quality of work life, and to protect and improve the safety, health, and well-being of workers (Leka & Houdmont, 2010) - and integrates a positive oriented wellness approach (Bakker & Derks, 2010). It is defined as

the study and application of optimal functioning in the workplace. It promotes occupational health and flourishing, and examines how positive phenomena (context, personal resources) can be used to protect against occupational risks (Bakker & Derks, 2010, p. 201).

POHB has overlapping parts with POB in the use of constructs such as PsyCap and engagement (Bakker & Derks, 2010; Shimazu & Schaufeli, 2009) but goes beyond with approaches to job crafting and job design with the focus on health and well-being of the worker (Bakker & Derks, 2010).

***Positive occupational psychology.*** Lastly, positive occupational psychology (POP) is a new concept entering the field. So far, there is no clear definition to it. It has a partial overlap with POB and POHP. It overlaps with POB insofar that it focusses on positive psychological capacities of the individual and their effects on the performance of the individual at the workplace but goes beyond the state-only approach of POB (Luthans, 2002a, 2002b) and includes workplaces outside of organizations, e.g. self-employed individuals. It overlaps with POHB due to its focus on health and well-being of the working individual. Further, it goes beyond the two other concepts by a positive approach to classical occupational psychology topics such as design of work environments and job analysis, personnel selection and assessment, motivation and career development (Chmiel, 2011; Ulich, 2011).

Combining all these terms, I propose the following model to integrate the relationships of them:

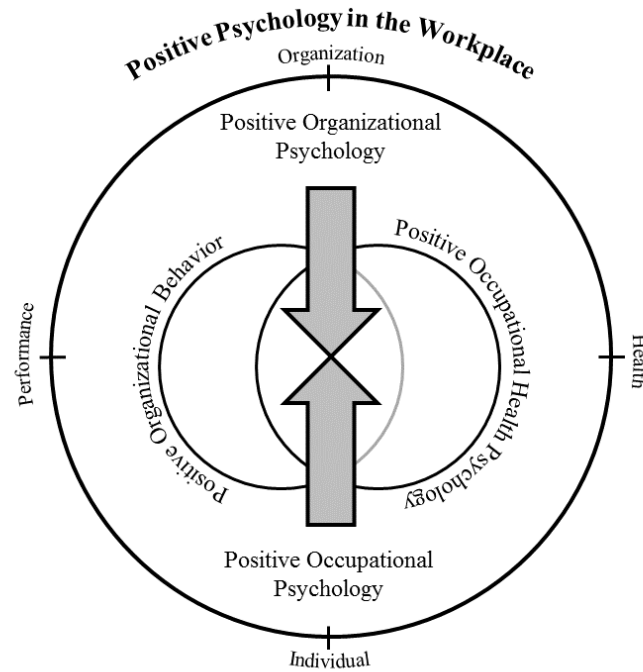


Figure 1.2. An integrated model of the terms used in positive psychology at the workplace

Now that we have a common understanding of the terms under the umbrella of positive psychology in the workplace – the next step is to understand the roots and emergence of the movement and its differences to other fields of psychology.

### **The roots and emergence of positive psychology in the workplace**

The agenda of the positive psychology movement was to shift the emphasis from a deficit, disorder, and languishing oriented psychology that emerged after World War II (Linley, 2009) towards a strength, and flourishing oriented psychology (Diener, 2009b; Seligman & Csikszentmihalyi, 2000). In this context, the psychology of the workplace stands out. While negative phenomena had been part of work and organizational psychology, especially stress, injustice or alienation (Weber, 1997), they were not dominant in this field – in fact, organizational decline was not introduced in research until 1980 (Whetten, 1980).

There is a history of interest in positive variables and constructs in work and organizational psychology: A close relationship to the humanistic psychology and motivational theories (Allport, 1955; Maslow, 1965, 1968), the approach to change and development (Bennis, 1963, 1969), positive and prosocial concepts, e.g. organizational citizenship behavior (Batson, 1994; Organ, 1988), interest in job satisfaction (e.g., Smith, Kendall, & Hulin, 1969), and well-being in the workplace (e.g., Warr, Cook, & Wall, 1979). Yet even with these approaches the dominating outcomes, variables of interest were often profitability, economical efficiency (Ghoshal, 2005) and problem solving (Davis & Marquis, 2005).

The positive psychology movement and its momentum in the early 21<sup>st</sup> century (e.g., Fredrickson, 2001; Lopez & Snyder, 2002; Seligman & Csikszentmihalyi, 2000; Sheldon & King, 2001) had a clear impact on work and organizational psychology. This spark of new thoughts led to an interest in new variables, e.g. compassion and forgiveness (Cameron & Caza, 2002), thriving (Spreitzer, Sutcliffe, Dutton, Sonenshein, & Grant, 2005), and flourishing (Fredrickson & Losada, 2005), areas such POS (Cameron, Dutton, & Quinn, 2003) or POB (Luthans, 2002a, 2002b), an interest in well-being at work (e.g., Day, Kelloway, & Hurrell Jr, 2014; Harter, Schmidt, & Keyes, 2003; Van Veldhoven & Peccei, 2014). Thus we can rightfully say that a new field diverged from classical and mainstream research in this field of psychology influenced by the general field of positive psychology (Meyers, van Woerkom, & Bakker, 2013; Mills et al., 2013; Rusk & Waters, 2013).

As this movement in work and organizational (mostly) psychology does not seek “the positive” for its own sake but to improve efficiency – e.g. with a “270% return on investment” (Luthans, Youssef, & Avolio, 2007, p.18) for a PsyCap intervention - and a competitive and sustainable resource (Luthans & Youssef, 2007) the criticism was not far behind.

## **Criticism of positive psychology at the workplace**

The criticism of positive psychology can be subdivided into three main directions a) the ignorance of negative emotions (Ehrenreich, 2009; Hackman, 2009), b) the adoption of an elitist viewpoint and emotional capitalism (Ehrenreich, 2010; Fineman, 2006; Illouz, 2007), and c) the construction of an optimized human (Warren, 2010).

The first criticism states the point that positive psychology in the workplace ignores the impact of negative emotions and celebrates Pollyannaishness during hard times and problems (Ehrenreich, 2009; Hackman, 2009). Harsh as this criticism is, it is easily refuted as positive outcomes and the development of a positive identity under hard conditions or trauma is part of the positive psychology at work research. Therefore, a part of the research focusses on the investigation of positive processes and outcomes in negative phenomena. (Cameron & Lavine, 2006; Powley & Cameron, 2006; Weick, 2006). Furthermore, King, Eells, & Burton (2004) see the importance of negative events to achieve what they call maturity and Luthans et al. (2004) see resilience, a construct that can only flourish by exposure to stress and challenging events, as part of their psychological capital.

The second criticism is that positive psychology in the workplace is favoring a corporatist worldview by being profit-oriented, enforcing unequal employment (Ehrenreich, 2010; Fineman, 2006) and emotional capitalism, which is defined as

a broad, sweeping movement in which affect is made an essential aspect of economic behavior and in which emotional life – especially that of the middle classes – follows the logic of economic relations and exchange (Illouz, 2007, p.5).

In a short conclusion, the core of this criticism is the question “Positive for whom?”. But exactly this question is the weakness of this criticism as the aim of the positive psychology in the workplace is a benefit for workers, managers and organizations (Donaldson & Dollwet, 2013; Heaphy & Dutton, 2008), across classes (Cameron et al., 2003; Fletcher,

1998) and across different cultures (Diener, 2009a; Veenhoven, 1996, 2005). One could argue that the advantage might be higher for the corporation vs. the worker or that managers might benefit more than the workers but this would lead to a non-answerable argument because it would be impossible and fruitless to compare the return on investment with the rise of subjective or psychological well-being.

The third criticism sees - in harsh words - a “tyranny of wellness in the therapeutic organization” (Warren, 2010, p.318) or the construction of a sick person versus an optimized human being. This is maybe the gravest criticism as it accuses the movement of positive psychology in the workplace to open a new category of “the optimized human” beyond the classical clinical view of a sick and a healthy person in the disguise of being positive (Illouz, 2007; Warren, 2010). This argument is not an easy one to refute. Its strength is to remind us as researchers and practitioners in the field of positive psychology that this movement should not be about the optimization of humans (especially not on a top down order) and that its core should be research of social relevance to the benefit of our fellow human beings. Given the possibility of abuse, the criticism of the field may not be to our liking but is a necessary reminder to stay alert.

### **A contemporary approach to positive psychology in the workplace**

A contemporary approach to positive psychology in the workplace should be aware of new developments in the field as well as in adjacent fields such as methodological and economic developments, and the zeitgeist of the society. It must also be aware of and keep in mind the critical objections discussed above. The combination of these different puzzle pieces is important to minimize the researcher-practitioner gap, strengthen the results of the research, and to value the individuals’ benefit over the return on investment. For this approach, I argue that a contemporary approach must stand on two solid pillars – methods and social relevance.

The rest of this introduction will spotlight these two pillars and their relevance to the upcoming studies.

### **The first pillar: Methods**

During the last years, the field of psychology has seen debates on methodological approaches – from articles on important topics such a training of young academics (Aiken, West, & Millsap, 2008; Kline, 2009), calls for advancement in planning and reporting of studies (e.g., Aguinis & Edwards, 2014; Aguinis, Pierce, Bosco, & Muslin, 2009; Aguinis & Vandenberg, 2014; Aguinis et al., 2010; Antonakis, Bendahan, Jacquart, & Lalive, 2010; Brutus, Aguinis, & Wassmer, 2013) to broader discussions on the relevance of the classical frequentist approach (Andraszewicz et al., 2014; Cumming, 2013; Dienes, 2011; Kline, 2013; John Kruschke, Aguinis, & Joo, 2012). While these are important steps, the advances seem to disseminate slowly into the field given the methodological comfort zones of researchers (Aguinis et al., 2009), the strong belief in statistical myths and urban legends (Lance & Vandenberg, 2009) or the complication of programming statistical analysis such as Bayesian analysis, even given tutorials (John Kruschke, 2010; Lee & Wagenmakers, 2014). Given these barriers I would like to propose three simple steps that are easy to implement and should improve the quality of papers: a) the inclusion of a data analysis section in the method section, b) the evaluation of measurement models using confirmatory factor analysis when importing scales from a different culture, and c) the use of a customer friendly reporting of the results. I included my suggestions into the studies in the upcoming chapters.

***Inclusion of a data analysis section.*** The inclusion of a data analysis section as a subsection of the method section establishes transparency. While this idea is supported by some authors (Hancock & Mueller, 2010; Kline, 2009), it is too often missing in peer-reviewed papers, leading to an incomplete understanding of the appropriateness of data analyses or any check of prerequisites. While one could assume that prerequisites were tested

in peer-reviews, assumptions are a slippery ground for scientific conclusion while rigorous reporting should lead to a solid one, i.e. for the decision to make use of robust estimation in confirmatory factor analysis to adjust for non-normal distributions of the variables (Finney & DiStefano, 2013). In addition to transparency, this section can be used to transport information and decisions on techniques that are not standard or widely known in the field (Kline, 2009). I used the data analysis section exactly this way in chapter 4 to inform on our decisions regarding the Bayesian data analysis and to introduce concepts used in this type of data analysis for the reader.

*Evaluation of measurement models.* The evaluation of measurement models using i.e. confirmatory factor analysis is crucial, especially when we are importing scales from a different culture setting because we are making the critical assumption that the scale is measuring the same construct (Chen, 2008). This is an important step in the field of psychology, since researchers cannot assume that a construct measured by a scale does this automatically with the same normative understanding of its origin culture. While some are seemingly stable across different cultures, i.e. well-being and optimism (for an overview, see Pedrotti, Edwards, & Lopez, 2009) others are unstable, at least in their factorial structure. A good example for this instability is the Values in Action (VIA) and the Structured Interview (VIA-IS, Peterson & Seligman, 2004) with its 6-factor structure in the original version used in the United States. While a similar factorial structure could be found in the German version of the VIA-IS (Ruch et al., 2010), this is not the case in cross-cultural comparisons where researchers found not a single consistent factor structure across different populations. They found very different solutions - from a single-factor solution in an Indian adaptation in Hindi to a different five-factor structure in an Indian adaptation in English (Choubisa & Singh, 2011; Singh & Choubisa, 2010).



Another construct used in different cultures is PsyCap (Luthans et al., 2004) with mixed results regarding the factorial structure of the Psychological Capital Questionnaire (PCQ, Dawkins, Martin, Scott, & Sanderson, 2013). Ignoring different cultural backgrounds and differences in corporate cultures resulting in problems with item wordings of the PCQ (e.g. “I feel confident in representing my work area in meetings with management.”) the scale is often used without the report of any confirmatory factor analysis (e.g., Dadras, Smakotin, & Moser, 2015).

*Customer friendly reporting.* In this last topic I agree with Aguinis et al. (2010) in a call for customer-centric reporting with a practical impact in mind. This approach is a call to address the ongoing concerns of a science-practitioner gap. An important step is the reporting and discussion of effect sizes compared to statistical significance in case of large samples when even small effects become statistically significant. Further it is important to put the results into context (Cortina & Landis, 2009) discussing if the results are big enough to matter or how they matter for that field of practice. For this reason, researchers should consult practitioners from the field to make results more accessible to this target audience, even using special reports with relatable key results and community websites and blogs beyond the paper.

I firmly believe that a solid foundation of methods, and thus our first pillar, is of special importance for a contemporary approach to positive psychology in the workplace. It is important for the interpretation and validity of the results as well as symbolizing a clear line between scientific research and the huge amount of self-help and layperson books in this field.

### **The second pillar: Social relevance**

Social relevance should be a second pillar of a contemporary approach to positive psychology in the workplace given the changes in the workplace of our time. Stress and job intensification (Bhagat, Segovis, & Nelson, 2012) as well as precarious employment (Kalleberg, 2009; Quinlan, Mayhew, & Bohle, 2001; Vosko, Zukewich, & Cranford, 2003)

are on the rise globally. While the classical fields of psychology in the workplace, e.g. performance and leadership are important, I believe that it is time to focus on social questions of inclusion and diversity using positive psychology as a possible approach to this topic. The inclusion of marginalized and disadvantaged groups, especially women, people of color, sexual minorities and people with disabilities (Fassinger, 2008) is an important topic of social relevance in our time because it is not as advanced as one may believe or as it should be.

I believe that this second pillar of our contemporary approach to positive psychology in the workplace is as important as the first one. It tries to integrate the criticism by Warren (Warren, 2010) and Ilouz (2007) from above thus setting a focus on topics where positive psychology can be of support and help for target groups to build resources in face of hard times or to overcome barriers. With that goal in mind, I am hoping to present you, the reader, the studies of this work in the three upcoming chapters that are rooted in the positive psychology in the workplace movement, resting on the two pillars of our contemporary approach.

### **The upcoming chapters**

The following chapters consist of three studies. The study in chapter 2 builds on our recommendations for the evaluation of measurement models. It takes into account the mixed results regarding the factorial structure of the Psychological Capital Questionnaire (Dawkins et al., 2013) and focus on constructing a German and corporate culture- and context-free version of a compound scale measuring PsyCap.

With regards to social relevance, we focused our research in chapter 3 on an occupational group almost entirely consisting of women – midwives. This occupational group is - aside from understaffing, inadequate income, shift-work, insufficient time for women and for completing their duties (Ball, Curtis, & Kirkham, 2002; Glass, 2009; Knezevic et al., 2011) - under a special kind of stress in Germany. They faced a 56% increase in 2010 and

another 15% increase in 2012 in the costs for professional indemnity, while the mean working hours went up as well (Albrecht, Loos, Sander, & Schliwen, 2012). As the protest by midwives is ongoing we wanted to explore how resilience and meaning of work have an influence on the subjective well-being of these (almost mostly) women.

Chapter 4 is also devoted to social relevance: we set our spotlight on possible barriers in the job application process as well as in the job itself for individuals with autism. Our approach in this chapter is based on the theory of neurodiversity, which considers autism a regular variant of the human brain (Armstrong, 2013; Jaarsma & Welin, 2012; Kapp, Gillespie-Lynch, Sherman, & Hutman, 2013). We decided to approach this topic on the grounds of this theoretical basis, as it is a point of view of respect and highly compatible with the “spirit” of positive psychology.

The inclusion of people with disabilities is an important research angle, since, as compared to gender and race, there are only a few articles focusing on this target group (c.f., Coletta & Bruyère, 2011). Although most working-aged people with disabilities express a desire to work and join the workforce (Bruyere, Erickson, & VanLooy, 2004), unemployment in this group is at a high rate (Yelln & Trupin, 2003) as well as chances of involuntary job loss, part-time, and part-year employment (Fassinger, 2008; Yelln & Trupin, 2003). Different disabilities have a severe influence on the employment rate, e.g. 70% of blind or visually impaired people (Yelln & Trupin, 2003) and 55% of individuals with Asperger’s Syndrome (Lorenz & Heinitz, 2014) face unemployment.

Returning to the first pillar and our recommendation for customer-friendly reporting, we consulted practitioners from the field to make our results of the studies in chapters 3 and 4 more accessible to target audiences for applied research. Instead of merely publishing the paper, we made sure to prepare special reports in a comprehensible manner, including

community websites, community-specific publications, and blogs. In doing so, we will be more able to reach the individuals involved in the field.

## References

- Aguinis, H., & Edwards, J. R. (2014). Methodological wishes for the next decade and how to make wishes come true. *Journal of Management Studies*, 51(1), 143-174.
- Aguinis, H., Pierce, C. A., Bosco, F. A., & Muslin, I. S. (2009). First decade of organizational research methods: Trends in design, measurement, and data analysis topics. *Organizational Research Methods*, 12(1), 69-112.
- Aguinis, H., & Vandenberg, R. J. (2014). An ounce of prevention is worth a pound of cure: Improving research quality before data collection. *The Annual Review of Organizational Psychology and Organizational Behavior*, 1(1), 569-595.
- Aguinis, H., Werner, S., Abbott, J. L., Angert, C., Park, J. H., & Kohlhausen, D. (2010). Customer-centric science: reporting significant research results with rigor, relevance, and practical impact in mind. *Organizational Research Methods*, 13(3), 515-539.
- Aiken, L. S., West, S. G., & Millsap, R. E. (2008). Doctoral training in statistics, measurement, and methodology in psychology: Replication and extension of Aiken, West, Sechrest, and Reno's (1990) survey of PhD programs in North America. *American Psychologist*, 63(1), 32.
- Albrecht, M., Loos, S., Sander, M., & Schliwen, A. (2012). *Versorgungs- und Vergütungssituation in der außerklinischen Geburtshilfe [The medical care and salary situation in ambulatory obstetrics]*. Berlin, GER: IGES Institut GmbH.
- Allport, G. W. (1955). *Becoming*. New haven, CT: Yale University Press.
- Andraszewicz, S., Scheibehenne, B., Rieskamp, J., Grasman, R., Verhagen, J., & Wagenmakers, E.-J. (2014). An introduction to bayesian hypothesis testing for management research. *Journal of Management*, 41(2), 521-543.
- Antonakis, J., Bendahan, S., Jacquart, P., & Lalive, R. (2010). On making causal claims: A review and recommendations. *The Leadership Quarterly*, 21(6), 1086-1120.

- Armstrong, T. (2013). *Neurodiversity: Discovering the extraordinary gifts of autism, ADHD, dyslexia, and other brain differences*. Cambridge, UK: Da Capo Press.
- Bakker, A. B., & Derks, D. (2010). Positive occupational health psychology. In S. Leka & J. Houdmont (Eds.), *Occupational health psychology* (pp. 194-224). Hoboken, NJ: John Wiley.
- Ball, L., Curtis, P., & Kirkham, M. (2002). *Why do midwives leave?* London, UK: Royal College of Midwives.
- Barak, M. E. M. (2013). *Managing diversity: Toward a globally inclusive workplace*. Thousand Oaks, CA: Sage Publications.
- Bardhan, A., & Kroll, C. A. (2003). *The new wave of outsourcing*. Fisher Center for Real Estate & Urban Economics Research Report Series. Fisher Center for Real Estate and Urban Economics. UC Berkeley, CA. Retrieved from <http://escholarship.org/uc/item/02f8z392>
- Barreto, I. (2010). Dynamic capabilities: A review of past research and an agenda for the future. *Journal of Management*, 36(1), 256-280.
- Batson, C. D. (1994). Why act for the public good? Four answers. *Personality and Social Psychology Bulletin*, 20(5), 603-610.
- Bennis, W. G. (1963). A new role for the behavioral sciences: Effecting organizational change. *Administrative Science Quarterly*, 8(2), 125-165.
- Bennis, W. G. (1969). *Organization development: Its nature, origins, and prospects*. Reading, MA: Addison Wesley.
- Bhagat, R. S., Segovis, J. C., & Nelson, T. A. (2012). *Work stress and coping in the era of globalization*. New York, NY: Routledge.
- Bloom, D. E., Canning, D., & Fink, G. (2010). Implications of population ageing for economic growth. *Oxford Review of Economic Policy*, 26(4), 583-612.

- Blustein, D. (2006). *The psychology of working: A new perspective for career development, counseling, and public policy*. Mahwah, NJ: Erlbaum.
- Blustein, D. L. (2008). The role of work in psychological health and well-being: A conceptual, historical, and public policy perspective. *American Psychologist*, 63(4), 228.
- Brutus, S., Aguinis, H., & Wassmer, U. (2013). Self-reported limitations and future directions in scholarly reports: Analysis and recommendations. *Journal of Management*, 39(1), 48-75.
- Bruyere, S. M., Erickson, W. A., & VanLooy, S. (2004). Comparative study of workplace policy and practices contributing to disability nondiscrimination. *Rehabilitation Psychology*, 49(1), 28.
- Cameron, K., & Caza, A. (2002). Organizational and leadership virtues and the role of forgiveness. *Journal of Leadership & Organizational Studies*, 9(1), 33-48.
- Cameron, K. S., & Caza, A. (2003). Contributions to the discipline of positive organizational scholarship. *American Behavioral Scientist*, 47(6), 731-739.
- Cameron, K. S., Dutton, J. E., & Quinn, R. E. (2003). *Positive organizational scholarship: Foundations of a new discipline*. San Francisco, CA: Berrett-Koehler.
- Cameron, K. S., & Lavine, M. (2006). *Making the impossible possible: Leading extraordinary performance--the Rocky Flats story*. San Francisco, CA: Berrett-Koehler.
- Cameron, K. S., & Spreitzer, G. M. (2012a). *Oxford Handbook of Positive Organizational Scholarship*. New York, NY: Oxford University Press.
- Cameron, K. S., & Spreitzer, G. M. (2012b). What is positive about Positive Organizational Scholarship. In K. S. Cameron & G. M. Spreitzer (Eds.), *Oxford Handbook of Positive Organizational Scholarship* (pp. 3-13). New York, NY: Oxford University Press.

- Cascio, W. F. (2007). Evidence-based management and the marketplace for ideas. *Academy of Management Journal*, 50(5), 1009-1012.
- Cascio, W. F. (2010). The changing world of work. In P. A. Linley, S. Harrington, & N. Garcea (Eds.), *Oxford handbook of positive psychology and work* (pp. 13-23). New York, NY: Oxford University Press.
- Cascio, W. F., & Aguinis, H. (2008). Research in industrial and organizational psychology from 1963 to 2007: changes, choices, and trends. *Journal of Applied Psychology*, 93(5), 1062-1081.
- Chen, F. F. (2008). What happens if we compare chopsticks with forks? The impact of making inappropriate comparisons in cross-cultural research. *Journal of Personality and Social Psychology*, 95(5), 1005.
- Chmiel, N. (2011). *An introduction to work and organizational psychology: A European perspective*. Oxford, UK: Blackwell Publishing.
- Choubisa, R., & Singh, K. (2011). Psychometrics Encompassing VIA-IS: A Comparative Cross Cultural Analytical and Referential Reading. *Journal of the Indian Academy of Applied Psychology*, 37(2), 325-332.
- Coletta, A., & Bruyère, S. M. (2011). Disability and employment: New directions for industrial and organizational psychology. In S. Zedeck (Ed.), *APA handbook of industrial and organizational psychology, Vol 1: Building and developing the organization*. *APA Handbooks in Psychology* (pp. 473-503). Washington, DC: American Psychological Association.
- Cortina, J. M., & Landis, R. S. (2009). When small effect sizes tell a big story, and when large effect sizes don't. In C. E. Lance & R. J. Vandenberg (Eds.), *Statistical and methodological myths and urban legends: Doctrine, verity and fable in the organizational and social sciences* (pp. 287-308). New York, NY: Routledge.
- Coy, P., & Ewing, J. (2007, April 9). Where are all the workers? *Business Week*, pp. 28-31.



- Cumming, G. (2013). The new statistics why and how. *Psychological Science*, 25(1), 7-29.
- Dadras, M., Smakotin, A., & Moser, K. (2015). *Incremental power of Psychological Capital and its effect on career success*. Paper presented at the 17th EAWOP Conference, Oslo, Norway.
- Daffern, G. N. (1960). *Management development in a changing world*. New York, NY: Simmons-Boardman Pub. Corp.
- Davis, G. F., & Marquis, C. (2005). Prospects for organization theory in the early twenty-first century: Institutional fields and mechanisms. *Organization Science*, 16(4), 332-343.
- Dawkins, S., Martin, A., Scott, J., & Sanderson, K. (2013). Building on the positives: A psychometric review and critical analysis of the construct of psychological capital. *Journal of Occupational and Organizational Psychology*, 86(3), 348-370.
- Day, A., Kelloway, E. K., & Hurrell Jr, J. J. (2014). *Workplace well-being: How to build psychologically healthy workplaces*. Oxford, UK: John Wiley & Sons.
- Diener, E. (2009a). *Culture and subjective well-being*. Champaign, IL: Springer.
- Diener, E. (2009b). Positive Psychology: Past, Present, and Future. In S. J. Lopez & C. R. Snyder (Eds.), *Oxford handbook of positive psychology*. New York, NY: Oxford University Press, Inc.
- Dienes, Z. (2011). Bayesian versus orthodox statistics: Which side are you on? *Perspectives on Psychological Science*, 6(3), 274-290.
- Donaldson, S. I., & Dollwet, M. (2013). Taming the waves and wild horses of positive organizational psychology. *Advances in Positive Psychology*, 1, 1-21.
- Dychtwald, K., Erickson, T. J., & Morison, R. (2006). *Workforce crisis*. Boston, MA: Harvard Business School Press.
- Ehrenreich, B. (2009). *Bright-sided: How the relentless promotion of positive thinking has undermined America*. New York, NY: Metropolitan Books.

- Ehrenreich, B. (2010). *Smile or die: How positive thinking fooled America and the world*. London, UK: Granta Publications.
- Fassinger, R. E. (2008). Workplace diversity and public policy: challenges and opportunities for psychology. *American Psychologist*, *63*(4), 252-268.
- Fineman, S. (2006). On being positive: Concerns and counterpoints. *Academy of Management review*, *31*(2), 270-291.
- Finney, S. J., & DiStefano, C. (2013). Non-normal and categorical data in structural equation modeling. In G. R. Hancock & R. O. Mueller (Eds.), *Structural equation modeling: A second course* (pp. 269-314). Charlotte, NC: Information Age Publishing.
- Fletcher, J. K. (1998). Relational practice: A feminist reconstruction of work. *Journal of Management Inquiry*, *7*(2), 163-186.
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, *56*(3), 218-226.
- Fredrickson, B. L., & Losada, M. F. (2005). Positive affect and the complex dynamics of human flourishing. *American Psychologist*, *60*(7), 678-686.
- Friedman, T. (2006). *The world is flat [updated and expanded]: A brief history of the twenty-first century*. New York, NY: Farrar, Straus, and Giroux.
- Friedman, T. (2009). *Hot, Flat and Crowded—Release 2.0*. New York, NY: Picador.
- Ghoshal, S. (2005). Bad management theories are destroying good management practices. *Academy of Management Learning & Education*, *4*(1), 75-91.
- Glass, N. (2009). An investigation of nurses' and midwives' academic/clinical workplaces: A healing model to improve and sustain hope, optimism, and resilience in professional practice. *Holistic Nursing Practice*, *23*(3), 158-170.
- Godfrey, P. C. (2012). Strange bedfellows: Homo economicus and positive organization scholarship. In K. S. Cameron & G. M. Spreitzer (Eds.), *Oxford Handbook of Positive Organizational Scholarship* (pp. 979-988). New York, NY: Oxford University Press.

- Hackman, J. R. (2009). The perils of positivity. *Journal of Organizational Behavior*, 30(2), 309-319.
- Hamel, G. (2002). *Leading the revolution: How to thrive in turbulent times by making innovation a way of life*. Boston, MA: Harvard Business School Press
- Hancock, G. R., & Mueller, R. O. (2010). *The reviewer's guide to quantitative methods in the social sciences*. New York, NY: Routledge.
- Harter, J. K., Schmidt, F. L., & Keyes, C. L. (2003). Well-being in the workplace and its relationship to business outcomes: A review of the Gallup studies. In C. L. M. Keyes & J. Haidt (Eds.), *Flourishing: Positive psychology and the life well-lived* (pp. 205-224). Washington, DC: American Psychological Association.
- Heaphy, E. D., & Dutton, J. E. (2008). Positive social interactions and the human body at work: Linking organizations and physiology. *Academy of Management review*, 33(1), 137-162.
- Hof, R. D. (2005, June 20). The power of us. *Business Week*, pp. 74-82.
- Hoffman, A. J., & Haigh, N. (2012). Positive deviance for a sustainable world: Linking sustainability and positive organizational scholarship. In K. S. Cameron & G. M. Spreitzer (Eds.), *Oxford Handbook of Positive Organizational Scholarship* (pp. 953-964). New York, NY: Oxford University Press.
- Illouz, E. (2007). *Cold intimacies: The making of emotional capitalism*. London, UK: Polity Press.
- Jaarsma, P., & Welin, S. (2012). Autism as a natural human variation: Reflections on the claims of the neurodiversity movement. *Health Care Analysis*, 20(1), 20-30.
- Kalleberg, A. L. (2009). Precarious work, insecure workers: Employment relations in transition. *American Sociological Review*, 74(1), 1-22.
- Kapp, S. K., Gillespie-Lynch, K., Sherman, L. E., & Hutman, T. (2013). Deficit, difference, or both? Autism and neurodiversity. *Developmental Psychology*, 49(1), 59-71.

- King, L. A., Eells, J. E., & Burton, C. M. (2004). The good life, broadly and narrowly considered. In P. A. Linley & S. Roberts (Eds.), *Positive psychology in practice*. Chichester, UK: Wiley.
- Kline, R. B. (2009). *Becoming a behavioral science researcher: A guide to producing research that matters*. New York, NY: Guilford Press.
- Kline, R. B. (2013). *Beyond significance testing: Statistics reform in the behavioral sciences*. Washington, DC: American Psychological Association.
- Knezevic, B., Milosevic, M., Golubic, R., Belosevic, L., Russo, A., & Mustajbegovic, J. (2011). Work-related stress and work ability among croatian university hospital midwives. *Midwifery*, 27(2), 146-153.
- Kraaijenbrink, J., Spender, J.-C., & Groen, A. J. (2010). The resource-based view: A review and assessment of its critiques. *Journal of Management*, 36(1), 349-372.
- Kruschke, J. (2010). *Doing Bayesian data analysis: A tutorial introduction with R*. Oxford, UK: Academic Press.
- Kruschke, J., Aguinis, H., & Joo, H. (2012). The time has come Bayesian methods for data analysis in the organizational sciences. *Organizational Research Methods*, 15(4), 722-752.
- Lance, C. E., & Vandenberg, R. J. (2009). *Statistical and methodological myths and urban legends: Doctrine, verity and fable in the organizational and social sciences*. New York, NY: Routledge.
- LaPierre, C. (1958). Technological change: What will it mean for management. In D. Fenn (Ed.), *Management in rapidly changing economy* (pp. 27-38). New York, NY: McGraw-Hill.
- Lee, M. D., & Wagenmakers, E.-J. (2014). *Bayesian cognitive modeling: A practical course*. New York, NY: Cambridge University Press.

- Leka, S., & Houdmont, J. (2010). An introduction to occupational health psychology. In S. Leka & J. Houdmont (Eds.), *Occupational health psychology* (pp. 1-30). Hoboken, NJ: John Wiley.
- Linley, P. A. (2009). Positive Psychology (history). In S. J. Lopez (Ed.), *The Encyclopedia of Positive Psychology* (pp. 742-746). Chichester, UK: Blackwell Publishing Ltd.
- Lopez, S. J., & Snyder, C. R. (2002). *Oxford handbook of positive psychology*. Oxford, UK: Oxford University Press.
- Lorenz, T., & Heinitz, K. (2014). Aspergers–Different, not less: Occupational strengths and job interests of individuals with Asperger's Syndrome. *PloS one*, 9(6).
- Luthans, F. (2002a). The need for and meaning of positive organizational behavior. *Journal of Organizational Behavior*, 23(6), 695-706.
- Luthans, F. (2002b). Positive organizational behavior: Developing and managing psychological strengths. *The Academy of Management Executive*, 16(1), 57-72.
- Luthans, F., Luthans, K. W., & Luthans, B. C. (2004). Positive psychological capital: Beyond human and social capital. *Business Horizons*, 47(1), 45-50.
- Luthans, F., Youssef-Morgan, C. M., & Avolio, B. J. (2015). *Psychological Capital and Beyond*. New York, NY: Oxford University Press.
- Luthans, F., & Youssef, C. M. (2007). Emerging positive organizational behavior. *Journal of Management*, 33(3), 321-349.
- Luthans, F., Youssef, C. M., & Avolio, B. J. (2006). *Psychological capital: Developing the human competitive edge*. New York, NY: Oxford University Press.
- Luthans, F., Youssef, C. M., & Avolio, B. J. (2007). *Psychological capital: Investing and developing positive organizational behavior*. London, UK: Sage.
- Lutz, W., Sanderson, W., & Scherbov, S. (2008). The coming acceleration of global population ageing. *Nature*, 451(7179), 716-719.

- Margulies, N., & Wallace, J. (1973). *Organizational change: Techniques & applications*. Glenview, IL: Good Year Books.
- Maslow, A. (1965). *Eupsychian management*. homewood, IL: Irwin-Dorsey.
- Maslow, A. (1968). *Toward a psychology of being*. New York, NY: Van Nostrand.
- Meyers, M. C., van Woerkom, M., & Bakker, A. B. (2013). The added value of the positive: A literature review of positive psychology interventions in organizations. *European Journal of Work and Organizational Psychology*, 22(5), 618-632.
- Mills, M. J., Fleck, C. R., & Kozikowski, A. (2013). Positive psychology at work: A conceptual review, state-of-practice assessment, and a look ahead. *The Journal of Positive Psychology*, 8(2), 153-164.
- Organ, D. W. (1988). *Organizational citizenship behavior: The good soldier syndrome*. Lexington, MA: Lexington Books.
- Pedrotti, J. T., Edwards, L. M., & Lopez, S. J. (2009). Positive psychology within a cultural context. In S. J. Lopez & C. R. Snyder (Eds.), *Oxford handbook of positive psychology* (pp. 49-58). New York, NY: Oxford University Press.
- Peterson, C., & Seligman, M. E. (2004). *Character strengths and virtues: A handbook and classification*. Washington, DC: American Psychological Association.
- Powley, E. H., & Cameron, K. S. (2006). Organizational healing: Lived virtuousness amidst organizational crisis. *Journal of Management, Spirituality & Religion*, 3(1-2), 13-33.
- Quinlan, M., Mayhew, C., & Bohle, P. (2001). The global expansion of precarious employment, work disorganization, and consequences for occupational health: A review of recent research. *International Journal of Health Services*, 31(2), 335-414.
- Ruch, W., Proyer, R. T., Harzer, C., Park, N., Peterson, C., & Seligman, M. E. (2010). Values in action inventory of strengths (VIA-IS): Adaptation and validation of the German version and the development of a peer-rating form. *Journal of Individual Differences*, 31(3), 138.

- Rusk, R. D., & Waters, L. E. (2013). Tracing the size, reach, impact, and breadth of positive psychology. *The Journal of Positive Psychology, 8*(3), 207-221.
- Seligman, M. E., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist, 55*, 5-14.
- Sheldon, K. M., & King, L. (2001). Why positive psychology is necessary. *American Psychologist, 56*(3), 216-217.
- Shimazu, A., & Schaufeli, W. (2009). Towards a positive occupational health psychology: The case of work engagement. *Japanese Journal of Stress Science, 24*(3), 181-187.
- Singh, K., & Choubisa, R. (2010). Empirical validation of values in action-inventory of strengths (VIA-IS) in Indian context. *Psychological Studies, 55*(2), 151-158.
- Smith, P. C., Kendall, L. M., & Hulin, C. L. (1969). *The measurement of satisfaction in work and retirement*. Chicago, IL: Rand McNally.
- Spreitzer, G., Sutcliffe, K., Dutton, J., Sonenshein, S., & Grant, A. M. (2005). A socially embedded model of thriving at work. *Organization Science, 16*(5), 537-549.
- Teece, D. J. (2009). *Dynamic capabilities and strategic management: Organizing for innovation and growth*. New York, NY: Oxford University Press.
- Ulich, E. (2011). *Arbeitspsychologie*. Stuttgart, GER: vdf Hochschulverlag AG.
- Van Veldhoven, M., & Peccei, R. (2014). *Well-being and Performance at Work: The role of context*. New York, NY: Psychology Press.
- Veenhoven, R. (1996). Happy life-expectancy. *Social indicators research, 39*(1), 1-58.
- Veenhoven, R. (2005). Apparent quality-of-life in nations: How long and happy people live. *Social indicators research, 71*, 61-68.
- Vosko, L. F., Zukewich, N., & Cranford, C. (2003). Precarious jobs: A new typology of employment. *Perspectives on labour and income, 15*(4). Retrieved from: <http://www.statcan.gc.ca/pub/75-001-x/01003/6642-eng.html>

- Warr, P., Cook, J., & Wall, T. (1979). Scales for the measurement of some work attitudes and aspects of psychological well-being. *Journal of Occupational Psychology*, 52(2), 129-148.
- Warren, S. (2010). What's Wrong with Being Positive? In P. A. Linley, S. Harrington, & G. Nicola (Eds.), *Oxford Handbook of Positive Psychology and Work* (pp. 313-322). New York, NY: Oxford University Press.
- Weber, M. (1997). *The theory of social and economic organization*. New York, NY: Free Press.
- Weick, K. E. (2006). The role of values in high-risk organizations. In E. D. Hess & K. S. Cameron (Eds.), *Leading with values: Positivity, and high performance* (pp. 55-67). New York, NY: Cambridge University Press.
- Whetten, D. A. (1980). Organizational decline: A neglected topic in organizational Science. *Academy of Management Review*, 5(4), 577-588.
- Williams, K. Y., & O'Reilly, C. A. (1998). Demography and diversity in organizations: A review of 40 years of research. *Research in Organizational Behavior*, 20, 77-140.
- Yelln, E. H., & Trupin, L. (2003). Disability and the characteristics of employment. *Monthly Labor Review*, 126(5), 20-31.



## Chapter 2

# Measuring Psychological Capital: Construction and validation of the Compound PsyCap Scale (CPC-12)\*

**Timo Lorenz<sup>1</sup>, Clemens Beer<sup>1</sup>, Jan Pütz<sup>1</sup>, Kathrin Heinitz<sup>1</sup>**

<sup>1</sup> Department of Education and Psychology, Freie Universität Berlin, Berlin, Germany

\* \* a revised version of this manuscript is published at PLoS ONE:

Lorenz, T., Beer, C., Pütz, J., & Heinitz, K. (2016). Measuring Psychological Capital: Construction and validation of the Compound PsyCap Scale (CPC-12). *PLoS ONE* 11(4): e0152892. doi:10.1371/journal.pone.0152892

### **Abstract**

With the Psychological Capital Questionnaire (PCQ) being the standard measure to assess psychological capital (PsyCap) in the context of organizations, this paper targets to broaden this domain-specific approach by introducing a measure with universal claim. Two studies were conducted to create and validate a German self-report scale (CPC-12) measuring PsyCap. We performed confirmatory factor analyses and correlations with other positive psychological constructs on the data of two German samples ( $N_1 = 321$ ;  $N_2 = 202$ ). The twelve-item CPC-12 exhibits the anticipated factorial structure with a very good model fit and associations to other constructs concur with previous findings with other measures of PsyCap.

*Keywords:* psychological capital; positive psychology; well-being; hope; optimism; resilience; self-efficacy

## *Measuring Psychological Capital: Construction and validation of the Compound*

### *PsyCap Scale (CPC-12)*

#### **Psychological Capital**

Psychological capital (PsyCap) draws from the significant body of research that Seligman and Csikszentmihalyi (2000) have stimulated, following the positive psychology movement. In shifting the focus of psychological research from human deficits like mental illnesses to human assets, strengths were scientifically studied and have been found to allow individuals, groups or even organizations to thrive and prosper (Seligman & Csikszentmihalyi, 2000). Extending this seminal work to the work place, Luthans (2002) identified psychological constructs (i.e. self-efficacy, hope, optimism, happiness, and resilience), which met the criteria of being positive, based on theory and research, and state-like open to development, change and management for performance improvement. All six constructs combined were labeled positive organizational behavior (Luthans, 2002). Luthans and Youssef (2004) bundled four of these states (hope, optimism, resilience, and self-efficacy) into the higher-order construct “positive psychological capital (PsyCap)”. This construct was developed to provide practitioners with a new framework to build and maintain sustainable competitive advantages through human resources (Luthans & Youssef, 2004).

PsyCap as a whole is defined as “a core psychological factor of positivity in general, and POB criteria meeting states in particular, that go beyond human and social capital to gain a competitive advantage through investment/development of ‘who you are’”(Luthans, Avolio, Walumbwa, & Li, 2005, p. 253), its parts as follows: (a) Hope refers to an individual’s motivation to succeed at a specific task in a set context and the way or means by which that task may be accomplished (Luthans, Norman, Avolio, & Avey, 2008). (b) Optimism refers to an individual’s expectancy of positive outcomes (Scheier, Carver, & Bridges, 2001). (c)

Resilience refers to the ability of an individual to bounce back from adversity, uncertainty, risk or failure, and adapt to changing and stressful life demands (Masten & Reed, 2002; Tugade & Fredrickson, 2004). (d) Self-efficacy refers to an individual's confidence in their ability to mobilize their motivation, cognitive resources and courses of action to achieve high levels of performance (Stajkovic & Luthans, 1998).

PsyCap can be distinguished from other forms of people-related capital, specifically human (an individual's stock of knowledge, skills and abilities that can be increased by experience and/or investment in education and training; Becker, 1993) and social capital (the aggregate of the actual or potential resources that are connected to the possession of a durable network of relationships; Bourdieu, 2011; Luthans & Youssef, 2004; Newman, Ucbasaran, Zhu, & Hirst, 2014). It influences a variety of outcomes at the individual level of particular importance for organizations and even beyond the work place (Avey, Reichard, Luthans, & Mhatre, 2011), previous research however focused heavily on a domain-specific measure settled in the context of work. PsyCap is shown to be associated with desirable employee attitudes, such as staying intentions (Avey et al., 2011), job satisfaction and commitment (Larson & Luthans, 2006; Luthans, Avey, & Patera, 2008). Employees high in PsyCap are found to be more empowered, which subsequently leads to less turnover intentions (Luthans, Norman, et al., 2008), and the reduction of absenteeism (Avey, Patera, & West, 2006). Furthermore, individuals high in PsyCap perform better than those low in PsyCap since they can draw upon more resources to pursue goals (Hobfoll, 2002; Luthans, Avolio, Avey, & Norman, 2007). Most importantly, PsyCap is shown to be developable through training interventions (Luthans, Avey, et al., 2008), which makes it a useful and tangible construct actually able to influence individuals and even whole organizations in a positive way.

Besides these work place-specific benefits, studies found evidence linking PsyCap to an improved psychological and physical well-being by reduction of stress (Baron, Franklin, &

Hmieleski, 2013). Because of the reciprocal relationship between job satisfaction and life satisfaction (Judge & Watanabe, 1993), PsyCap enhances the latter. Due to the fact that PsyCap consists of more general constructs (hope, optimism, self-efficacy and resilience) the question at hand is – Is PsyCap merely a domain specific construct with effects solely in work-related areas or is it a much broader construct influencing many possible areas of life?

### **Measuring Psychological Capital**

The Psychological Capital Questionnaire (PCQ; Luthans & Youssef, 2004) is widely recognized as the standard scale measuring PsyCap (Dawkins, Martin, Scott, & Sanderson, 2013). It was developed as a compound measure consisting of (modified) items from published scales for hope (Snyder et al., 1996), optimism (Scheier & Carver, 1985), resilience (Wagnild & Young, 1993), and self-efficacy (Parker, 1998). Predominantly, the PCQ was used in employee, manager and student samples (Dawkins et al., 2013), and its items are closely tied to the work place (i.e. “I feel confident contributing to discussions about the company's strategy.”). One can thus state that the PCQ is a domain-specific measure.

Since PsyCap is shown to be linked to outcomes of general importance for individuals (Baron et al., 2013), this study aims to design and validate a universal measure for the construct. Such a non-domain-specific measure could expedite research on PsyCap for constructs in other domains, i.e. sports and education. Therefore, we conducted two different studies. Study 1 drew from the item pool of published and proven measures for the four different PsyCap-components to create a compound measure, which is deployable in a wide range of applications (including the work place). For testing convergent and discriminant validity, we additionally surveyed the existing PCQ and a measure for occupational self-efficacy. We hypothesized a strong but not perfect positive association between the PCQ and our newly created measure (Compound Psychological Capital Scale – 12; CPC-12), a higher correlation between general self-efficacy and the CPC-12 and a smaller one between

occupational self-efficacy and the CPC-12 compared to the PCQ due to the domain specific traits of the PCQ. In study 2, we re-tested the factorial structure. Furthermore, to test the external validity of the CPC-12 we selected several important positive psychological constructs using preexisting literature on PsyCap expecting to see the effects of PsyCap beyond the work place (Avey et al., 2011) without a domain specific measurement.

*Positive affect (PA) and negative affect (NA)*

The relationship between PA and PsyCap becomes obvious upon reviewing the literature relating PA to three major components of PsyCap: resiliency, self-efficacy and optimism. These studies found that people high in PA show more effective problem resolving skills, more mature coping efforts, experience less conflict at the office (Lyubomirsky, King, & Diener, 2005) and furthermore that positive emotions enhance resilience in the face of adversity (Tugade, Fredrickson, & Feldman Barrett, 2004). People who show more PA are also more optimistic and more likely to maintain a positive outlook during times of adversity (Lyubomirsky et al., 2005). Additionally, they are found to be high in personal competence and self-esteem and report higher self-efficacy (Jundt & Hinsz, 2001; Lyubomirsky et al., 2005; Lyubomirsky, Tkach, & DiMatteo, 2006). Little, Gooty, and Nelson (2007) also reported significant positive correlations between all four components of PsyCap and PA ( $r=.28 - .68$ ).

There is evidently a remarkable overlap between PA and PsyCap. One study even found that the predictive power of PsyCap on work performance, motivation and job satisfaction becomes insignificant once one accounts for PA (Little et al., 2007). Nonetheless the same study also pointed out that none of the PA-items loaded with the PsyCap constructs, meaning that besides the overlap, they are still clearly distinct constructs. For these reasons we expect a strong correlation between CPC-12 and PA. Lyubomirsky et al. (2005) state that NA and PA “regularly show moderate inverse relations across individuals, justifying the use

of such negative states as the inverse of PA” (p. 822), thus we expect a moderate or high negative correlation between NA and PsyCap. This makes sense if you bear in mind the negative effects that PsyCap has on states like stress and anxiety (Baron et al., 2013).

### *Job satisfaction*

There is a clear relationship between job satisfaction and PsyCap. Studies indicate that people high in PsyCap also report higher job satisfaction (Avey et al., 2011; Luthans et al., 2007; Newman et al., 2014). Luthans et al. (2007) report a positive correlation of  $r = .39$ , whereas the meta-analysis of Avey et al. (2011) reports an even higher correlation of  $r = .50 - .57$ . One explanation for this relationship is given by Avey et al. (2011) who state: “Given the general expectancy of success derived from optimism and the belief in personal abilities derived from efficacy, those high in PsyCap report being more satisfied with their job.” (p. 132). In addition Luthans et al. (2007) declare that employees who are hopeful and efficacious are more satisfied with their jobs due to better performance. They are confident to persist, accept challenges and put effort into achieving their goals (efficacy). Furthermore they identify subgoals and pathways to achieve them and are able to foresee and overcome obstacles by pursuing a variety of pathways (hope). We therefore expect the CPC-12 to positively correlate with job satisfaction in about the same range as stated above.

### *Satisfaction with life*

Previous studies on PsyCap concentrated on work-related outcomes, i.e. job satisfaction (Newman et al., 2014). Nonetheless work and non-work life influence each other (Ford, Heinen, & Langkamer, 2007) and there is a positive correlation between job satisfaction and life satisfaction (Rojas, 2007). Ford et al. (2007) name time-based pressure as one major reason for this mutual interaction. If you have to work extra hours in the office you will have less time to enjoy time with family or friends, which can leave you unsatisfied and vice versa. Newman et al. (2014) also stated in their meta-analysis that besides predicting

higher levels of work-family conflict, low PsyCap predicts less meaning of life, things that should result in a decrease in life satisfaction. Lastly it has been reported that life satisfaction is positively related to optimism and self-esteem (Lucas, Diener, & Suh, 1996), posing another connection to PsyCap. For these reasons, we expect a moderate to high positive correlation between the CPC-12 and life satisfaction.

### *Subjective well-being*

Since well-being is measured in many studies as a compound construct consisting of positive and negative affect, life satisfaction and job satisfaction (Judge & Klinger, 2008; Pavot, 2008), PsyCap, as expected, positively relates to well-being (Avey, Luthans, & Jensen, 2009; Avey, Luthans, Smith, & Palmer, 2010; Culbertson, Fullagar, & Mills, 2010; Dawkins et al., 2013). Avey et al. (2010) furthermore show that PsyCap can lead to psychological well-being over time. We therefore expect a high positive correlation between subjective well-being and the CPC-12.

### *Perceived Social Support*

In their study “Very Happy People” Diener and Seligman stated that satisfying social relationships are central to human happiness, so much so that happiness cannot occur without them (Diener & Seligman, 2002). Findings from Karademas (2006) support those claims as he reports a direct positive relationship between social support and life satisfaction as well as an indirect one through optimism. Optimistic people seem to positively appraise future events. To maintain such beliefs optimists rely on a “positive evaluation of the social context and its ‘ability’ to provide the necessary support” (Karademas, 2006, p. 1287). Social support has furthermore not only been found to increase optimism (Karademas, 2006; Symister & Friend, 2003) but also to be associated with self-esteem (Symister & Friend, 2003). Positive correlations between social support and optimism have been found to be moderate ( $r = .29 - .41$ ), similar to the moderate positive ones with self-esteem ( $r = .44$ ) (Karademas, 2006;



Symister & Friend, 2003). High levels of social support have also been found to reduce mortality and to result in positive health outcomes, due to social support functioning as an “exceptionally important stress resilience factor” (Ozbay, Fitterling, Charney, & Southwick, 2008, p. 306). We expect a small to moderate positive correlation between perceived social support and the CPC-12 situated at the lower edge of the range stated above.

### *Meaning of Work*

When looking at meaning, its importance not only in the field of work, but for life in general (Seligman, Parks, & Steen, 2004), becomes clear. It is not just a positive influence on organizational performance or employee engagement (Cartwright & Holmes, 2006). Having meaning in life is also of great importance for living a “full life” (Seligman et al., 2004), which is very desirable for many. Again there is a positive relationship with PsyCap as Coutu (2002) reported a strong relationship between meaning-making and resilience. She stated that one of the things distinguishing resilient people from less resilient people is their ability to create significance and meaning in their hardships and their lives in general. In addition, she reported the effective use of constructing meaning in resilience trainings for businesspeople. Resilient people are more likely to see themselves not as victims in adversity, but rather to recognize the lesson and learning opportunity in their hardship. They are therefore able to create meaning in difficult situations in life and at work (Coutu, 2002). The fact that a sense of self-worth and efficacy are found to be two important pillars in the search for meaning (Baumeister, 1991) and the finding that lower levels of PsyCap seem to result in lower levels of meaning of life (Newman et al., 2014) underline the positive relationship between meaning of work and PsyCap. We expect a moderate positive correlation between the CPC-12 and meaning of work.

### *Engagement*

Engagement is characterized by vigor, dedication and absorption (Bakker, Schaufeli, Leiter, & Taris, 2008). Vigor is a very similar construct to resilience as Bakker et al. (2008) describe vigorous people as mentally resilient, willing to put great effort into their work and to show persistence in the face of adversity. Resilience is not the only personal resource that has been found to reciprocally influence work engagement (Bakker, Gierveld, & Van Rijswijk, 2006; Bakker et al., 2008). Self-efficacy as well as optimism have been found to be equally connected to engagement (Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007, 2009). These personal resources show moderate positive correlations with work engagement ( $r = .29 - .54$ ) (Xanthopoulou et al., 2007, 2009). Xanthopoulou et al. (2007) explain the relationship by suggesting that people high in self-efficacy, optimism and resilience are “confident about their capabilities and optimistic about their future, and thus may identify or even create more aspects of their environment that facilitate goal attainment. This capability leads to goal confrontation and consequently to work engagement” (p. 137). It also has been explicitly stated that people high in PsyCap are more committed to their jobs (Avey et al., 2011) as the organizations they work for fulfill their needs for accomplishment and efficacy, thus leading to them being more “likely to embed themselves and be enthusiastic about their work (engagement)” (p. 132). We therefore expect a solid moderate positive correlation between engagement and the CPC-12 in about a similar range as stated above.

### *Gratitude*

The close relationship of gratitude and PsyCap was demonstrated in a study by Luthans, Youssef, and Avolio (2006), in which they discussed a range of possible constructs to be included into PsyCap. They regard gratitude as a promising aspirant for inclusion describing it as “the extra mile willingly traveled by those with high PsyCap” (Luthans, Youssef, et al., 2006, p. 4). They find that gratitude prevents people from having negative

labels and thoughts about their fellow men, thus decreasing the positivity in those relationships, which would in turn lead to a lower level of PsyCap. They state that being grateful helps us to maintain a positive outlook on life and positively reinforce each other. Maintaining a positive view on life resembles parts of optimism and hope, and this is reflected in other studies, which found positive relationships between gratitude and optimism (Emmons & McCullough, 2003; McCullough, Emmons, & Tsang, 2002; Rash, Matsuba, & Prkachin, 2011), hope (McCullough et al., 2002) and life satisfaction and happiness (Rash et al., 2011). McCullough et al. (2002) report moderate positive correlations between gratitude and optimism ( $r = .28 - .58$ ) as well as for gratitude and the two factors of hope ( $r = .18 - .67$ ). Considering the connection of gratitude to some of the PsyCap components and its actual consideration as a component itself we expect a moderate positive correlation of gratitude with the CPC-12.

### *Personality*

A proactive personality is desirable at an individual level predicting life satisfaction (Cunningham & De La Rosa, 2008), but also from an organization's perspective as it is for example positively related to job performance (Crant, 1995). It means for a person to have an enhanced ability and desire to control the surrounding environment in an active, self-determined way and these control tendencies facilitate effective coping with occupational stressors (Cunningham & De La Rosa, 2008), thus showing similarities to resilience. Optimism also seems closely related to proactive attitude. Schmitz and Schwarzer (1999) identify optimistic expectancy as the quintessence of the construct and describe proactive people as considering life to be full of opportunities. They furthermore associate proactive attitude with Bandura's self-efficacy, deeming the two to be very similar constructs (Schmitz & Schwarzer, 1999). We therefore expect a moderate to high positive correlation between proactive attitude and the CPC-12.

The “Big Five” personality traits extraversion ( $r = .36$ ) and conscientiousness ( $r = .39$ ) reportedly show the strongest relationship with PsyCap. The correlation of agreeableness with PsyCap ( $r = .06$ ) is unremarkable, whereas openness ( $r = -.1$ ) and neuroticism ( $r = -.12$ ) show marginal negative correlations (Dawkins et al., 2013; Luthans et al., 2007). The positive correlation with extraversion seems logical as it has also been found to be positively related to positive affect, life satisfaction and happiness (Lyubomirsky et al., 2005).

Looking at some of the PsyCap components respectively, one study testing the relationship of resilience with personality traits found a strong positive correlation with extraversion ( $r = .61$ ) and conscientiousness ( $r = .45$ ) as well as a strong negative correlation with neuroticism ( $r = -.65$ ). The correlation with agreeableness was unremarkable, but there was a small positive correlation with openness ( $r = .20$ ) (Campbell-Sills, Cohan, & Stein, 2006). The strong negative relationship with neuroticism measures up to one’s expectations. Neurotic people are vulnerable to emotional distress and susceptible to negative emotions and poor coping (Costa & McCrae, 1992). Campbell-Sills et al. (2006) explain the strong positive relationships to extraversion as likely reflecting “the benefits of positive affective style, capacity for interpersonal closeness, and high levels of social interaction and activity” (p. 594). They furthermore explicate that the positive relationship with resilience can be fully explained by the tendency of conscientious people to use task-oriented coping. Taking all these findings together we expect a similar pattern of correlations between the “Big Five” and the CPC-12, moderate positive correlations with extraversion and conscientiousness, a moderate negative correlation with neuroticism, a small correlation with openness and no correlation with agreeableness.

## Study 1

### *Methods*

#### *Participants and Procedure*

Study 1 consisted of a total of 334 participants. Thirteen people were excluded from the analysis (six due to implausible or missing job description e.g. “xxx”, seven due to implausible tenure). The remaining 321 participants averaged 34.89 years ( $SD = 12.78$ ), 60% were women and 76.6% were employees, 8.4% were self-employed and 13.7% temporary workers. Participants worked on average 33.79 hours a week ( $SD = 13.39$ ) and had been employed for half a month to 43 years ( $M_{\text{employment}} = 7.91$  years,  $SD = 9.72$ ). 48% of the participants were in possession of a university degree and another 25% graduated with the general qualification for university entrance. Participants were recruited by publishing the link to the survey in several online social media groups. The survey was conducted in German. All participants were volunteers, no compensation was supplied.

#### *Materials*

All scales were surveyed using a 6-point response format ranging from 1 = “*strongly disagree*” to 6 = “*strongly agree*” in order to minimize potential effects of different response formats on the new scale.

*Hope.* Hope was evaluated using the six item short version of the State Hope Scale (SHS, Snyder et al., 1996). The German version of this scale was derived by translating the original version of the State Hope Scale (Snyder et al., 1996) into German (including a retranslation for verification purposes) according to the guidelines for cross-cultural adaptation proposed by Guillemin, Bombardier and Beaton (1993).

*Optimism.* Optimism was evaluated using two different scales. (a) The affective valence of the orientation towards the future-questionnaire (Affektive Valenz der

Zukunftsorientierung, AFF, Brandtstädter & Wentura, 1994) with five items including one inverted item. Cronbach's  $\alpha$  of the AFF was .82. (b) The revised German version of the Life Orientation Test (LOT-R, Glaesmer, Hoyer, Klotsche, & Herzberg, 2008) with ten items (four filler items and three items respectively tapping the subscales optimism and pessimism; (see also Herzberg, Glaesmer, & Hoyer, 2006).

*Resilience.* Resilience was assessed using the German thirteen item short version of the Resilience Scale (RS-13, Leppert, Koch, Brähler, & Strauß, 2008) .

*Self-efficacy.* Self-efficacy was evaluated using two different measures. (a) The German General Self Efficacy Scale (GSE, Jerusalem & Schwarzer, 1999) with ten items. (b) The German ten item short version of the Occupational Self-Efficacy Scale (OSE, Schyns & von Collani, 2002) .

*Psychological Capital.* PsyCap was surveyed using the German version of the Psychological Capital Questionnaire (Luthans et al., 2007) with 24 items. Six items each measured the four subscales hope, optimism, resilience and self-efficacy.

*Construction of Compound-Psychological-Capital-Scale.* The five selected scales (SHS, AFF, LOT-R, RS-13, and GSE) constitute the pool of items from which the Compound-Psychological-Capital questionnaire (CPC-12) was developed. All four constructs (i.e., hope, resilience, optimism, and self-efficacy) should have equal weight; hence, the best three items of each construct in terms of content and face validity were taken into account. Furthermore, following the concept of rational construction (Moosbrugger & Kelava, 2007), only those items were included which met our claim of universality and are therefore not solely relevant to the workplace. All scales for the item pool were included in this study in their full length to be able to control their correlations comparing PCQ and CPC-12.

### *Data analysis*

The fit of all tested structural equation models was examined using the criteria proposed by Hu and Bentler (1999). Beyond  $\chi^2$  significance testing these criteria comprise a standardized root-mean-square residual (SRMR)  $\leq 0.08$  in combination with at least one of the following fit indices: a root-mean-square error of approximation (RMSEA)  $\leq 0.06$ , a lower bound of the 90% confidence interval of the RMSEA  $\leq 0.06$ , a comparative fit index (CFI)  $\geq 0.95$ , or a Tucker-Lewis-index (TLI)  $\geq 0.95$ . The Satorra-Bentler adjusted  $\chi^2$  was calculated to adjust for non-normal distributions of the variables (Finney & DiStefano, 2013). The confirmatory factor analyses were conducted using the “lavaan” package (Rosseel, 2012) of R statistical software (R Core Team, 2014). Due to forced choice in the standardized questionnaires there was no missing data.

### ***Results***

Table 2.1 presents descriptive statistics, Cronbach’s  $\alpha$  and the correlation matrix for the study variables. The strong but not perfect positive relationship ( $r = .70, p < .001$ ) between the PCQ and the newly created CPC-12 alludes to the measurement of a similar but not identical construct. As hypothesized the correlation between CPC-12 and general self-efficacy is higher compared to the PCQ, while the correlation between CPC-12 and occupational self-efficacy is lower compared to the PCQ.

Table 2.2 exhibits measurement models for all selected scales, including the PCQ measure for PsyCap. To examine the expected factorial structure of the PCQ, we conducted a confirmatory factor analysis (CFA). We began by fitting this model with the six items for each facet (i.e., hope, resilience, optimism, and self-efficacy) and then fit each of the four

dimensions to the higher-order PsyCap. The estimates of model fit (SRMR = .062, RMSEA = .061, CFI = .841) are not acceptable according to Hu and Bentler (1999).

To confirm the expected higher-order factor of PsyCap in the CPC-12, we conducted a CFA on the data analogous to the one above. We began by fitting this model with three items for each facet (i.e., hope, resilience, optimism, and self-efficacy) and then fit each of the four dimensions to the higher-order PsyCap. Results indicated the following estimates of model fit: SRMR = .046, RMSEA = .042, CFI = .962. The model seems to be a very good fit with all three indices meeting the cutoff criteria by Hu and Bentler (1999).

Furthermore, each of the factor loadings was significant on their respective latent factor at  $p < .01$  (Figure 2.1). The confirmatory factor analysis in Study 1 supports the proposed higher-order factor structure for the newly created PsyCap measure CPC-12.

## Study 2

### *Methods*

#### *Participants and Procedure*

Sample 2 consisted of a total of 202 participants (82.7% employees, 9.4% self-employed, and 7.9% temporary workers) between 18-72 years ( $M_{\text{age}} = 37.79$ ,  $SD = 13.10$ ). 72.3% were female. Participants worked on average 35.74 hours a week ( $SD = 11.18$ ) and had been employed for one month to 45 years ( $M_{\text{employment}} = 9.37$  years,  $SD = 9.74$ ). 35.1% were in possession of a university degree and another 25.2% graduated with the general qualification for university entrance. Participants were recruited by publishing the link to the survey in several social media groups. The survey was conducted in German. All participants were volunteers, no compensation was supplied.



## Materials

*Psychological capital.* PsyCap was measured with the CPC-12 (Study 1), using a 6-point response format ranging from 1 = “*strongly disagree*” to 6 = “*strongly agree*”.

*Positive and negative affect.* PA and NA were evaluated using the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988). Participants responded with 20 items to the question asking how they felt “during the past two weeks” (1 = “*very slightly or not at all*” to 5 = “*very much*”). Ten items measured positive affect (e.g. excited, attentive) and ten items measured negative affect (e.g. guilty, afraid). The items were arranged randomly.

*Job satisfaction.* Job satisfaction was measured using three items (Judge, Boudreau, & Bretz, 1994; Judge & Klinger, 2008). The first item measured general job satisfaction (“All things considered are you satisfied with your job?”), which participants were able to answer with “yes” or “no”. The second item (“How satisfied are you with your job in general?”) was rated using a 5-point scale from 1 = “*very dissatisfied*” to 5 = “*very satisfied*”. The third item asked participants to rate the percentage of time they feel satisfied, unsatisfied or neutral with their job in general (e.g. “The percent of time I feel satisfied with my present job.”). The analysis was conducted using the mean-score of the z-standardized items.

*Satisfaction with life.* Life satisfaction was measured using the Satisfaction with Life Scale (Schumacher, 2003), using a 5-point response format ranging from 1 = “*strongly agree*” to 5 = “*strongly disagree*”. Participants rated five given statements (e.g. “I am satisfied with my life.”).

*Subjective well-being.* The standardized z-scores of the four previously described scales were averaged to create subjective well-being. PA, NA and satisfaction with life were

included because Arthaud-Day, Rode, Mooney, and Near (2005) found the three-factor model of subjective well-being consisting of PA, NA and life satisfaction to be superior to any other two- or one-factor model and the best fit to their data. Job satisfaction was then included to add a domain-specific focal point on work (Judge & Klinger, 2008; Pavot, 2008) for the comparability to previous studies on well-being and PsyCap.

*Perceived social support.* A short version of the Perceived Support Questionnaire (Kliem et al., 2014) was used to measure perceived social support. Using a 5-point response format ranging from 1 = “*strongly disagree*” to 5 = “*strongly agree*” participants had the possibility to rate to what extent the six given statements (e.g. “There is someone very close to me whose help I can always count on.”) fit their own lives.

*Meaning of work.* The Work and Meaning Inventory (Steger, Dik, & Duffy, 2012) was used to measure meaning of work. Using a 5-point response format ranging from 1 = “*absolutely untrue*” to 5 = “*absolutely true*” participants rated to what extent the ten given statements (e.g. “My work helps me make sense of the world around me.”) applied to them.

*Engagement.* To measure engagement the Utrecht Work Engagement Scale (Balducci, Fraccaroli, & Schaufeli, 2010) was used. Given a 7-point Likert scale ranging from 1 = “*never*” to 7 = “*always*” participants were asked to rate nine presented statements (e.g. “I am immersed in my job.”).

*Gratitude.* Gratitude was evaluated using the Gratitude-Questionnaire (McCullough et al., 2002). Given a 7-point Likert scale ranging from 1 = “*strongly disagree*” to 7 = “*strongly agree*” participants were asked to rate to what extent the six presented statements (e.g. “I have so much in life to be thankful for.”) applied to them.

*Proactive attitude.* The Proactive Attitude Scale (Schmitz & Schwarzer, 1999) was used to measure proactive attitude. Using a 4-point response format ranging from 1 = “*not at*

*all true*” to 4 = “*exactly true*” participants rated to what extent the eight given statements (e.g. “I can choose my own actions.”) applied to them.

“*Big Five*”. The five personality traits extraversion, neuroticism, conscientiousness, agreeableness and openness were assessed using the Big Five Inventory (BFI-S, Gerlitz & Schupp, 2005). Participants rated 15 statements (e.g. “I see myself as someone who is outgoing, sociable.”) on a 7-point Likert scale from 1 = “*does not apply to me at all*” to 7 = “*applies to me perfectly*”.

### *Data Analysis*

The fit of all tested structural equation models was examined using the same criteria as presented in study 1 (Hu & Bentler, 1999). According to these indices the model for subjective well-being, which consisted of four independent constructs, showed an acceptable fit when tested for the unidimensional character of the compound variable using CFA (Satorra-Bentler- $\chi^2$  (2, 202) = 4.172,  $p < .125$ , CFI = .957, SRMR = .035, RMSEA = .073, CI<sub>RMSEA</sub> = .00 - .15).

The data analysis was run using the statistical software R (R Core Team, 2014). The confirmatory factor analyses were conducted using the “lavaan” package (Rosseeel, 2012), other used packages were “Hmisc” (Harell, with contributions from Dupont and many others, 2015) and “pastecs” (Grosjean & Ibanez, 2014).

We used multiple imputation methods (Enders, 2010) to impute the three missing item responses prior to the statistical analysis. This maximizes power (Gottschall, West, & Enders, 2012) and produces accurate parameter estimates (Enders, 2013).

### **Results**

Results of the CFA for the CPC-12 indicated the following estimates of model fit: Satorra-Bentler- $\chi^2$  (50, 202) = 72.32,  $p < .021$ , CFI = .955, SRMR = .052, RMSEA = .047,

$CI_{RMSEA} = .022 - .068$ . All the indices can be deemed to be a good model fit according to Hu and Bentler (1999).

Table 2.3 presents descriptive statistics, Cronbach's  $\alpha$  and bivariate correlations for the variables of study 2. All correlations are according to our hypotheses. Subjective well-being ( $r = .58$ ), proactive attitude ( $r = .57$ ) and positive affect ( $r = .54$ ) showed the highest positive correlations, agreeableness showed no substantive correlation with the CPC-12, neuroticism and negative affect showed negative correlations.

### **Limitations**

The following limitations should be kept in mind when interpreting the results. All participants were recruited online, which entails that findings may not generalize to people not using the internet or social networks. Although Gosling, Vazire, Srivastava and John (2004) agree that data from the internet is not free of methodological constraints, they do emphasize that samples using online recruitment are as diverse, adjusted, at least as good in quality as most traditional methods and "not as flawed as is commonly believed" (p. 102). The use of a nonprobability sample in this study raises further concerns about generalizability.

In addition, the scales for gratitude ( $\alpha = .68$ ) and proactive attitude ( $\alpha = .67$ ) lack reliability (smaller than  $.70$ ). Results should therefore be considered with caution. The same caution should apply to the five personality traits as they also lack reliability. We found low merits for conscientiousness ( $\alpha = .55$ ), openness ( $\alpha = .59$ ) and agreeableness ( $\alpha = .37$ ), the latter being extremely low.

### **Discussion**

Since its emergence in 2004, the construct of PsyCap is assessed using the PCQ as the standard measure in more than 14 countries and languages, along with slight alterations of the scale to match the target group's needs (Luthans, Youssef-Morgan, & Avolio, 2015). The

domain-specific measure itself is tied to the working world, although studies indicate associations with psychological constructs important for students, the unemployed, and retirees alike (Baron et al., 2013). Therefore, the aim of this study was to develop and validate a German compound measure for PsyCap, with the general claim of being applicable to all domains of life.

According to our results, the CPC-12 fits the proposed model of PsyCap very well. The four subscales hope, optimism, resilience, and self-efficacy are identifiable as subcomponents of the overall measure while the higher-order factor can incrementally explain additional variance in the data. The moderate to high correlations to other work-related (MOW, job satisfaction and engagement;  $r = .28 - .40$ ) and more general constructs of positive psychology (i.e. subjective well-being, proactive attitude, and gratitude;  $r = .22 - .58$ ) are comparable to previous research on PsyCap and speak for the external validity of the CPC-12. The results indicate that PsyCap could in fact be a general construct and applicable to more areas than POB. By abstaining from items with work related connotations, the CPC-12 can be applied to many fields of interest, i.e. sports and education. Due to its correlations with work-related constructs being close compared to the PCQ, the CPC-12 is also an alternative in work-related research for areas where the item wordings of the PCQ might not be suitable, i.e. volunteering or small organizations. It is important to notice that while the CPC-12 is a short and economic way to measure PsyCap we recommend using the original scales we used for the item pool if a specific sub-facet is the key area of interest.

### ***Future Directions***

To achieve these desirable outcomes future research should address the implementation of interventions to increase PsyCap. Although PsyCap is open to development and has already been proven to be alterable through interventions (Luthans, Avey, Avolio, Norman, & Combs, 2006; Luthans, Norman, et al., 2008), organizations to date

still fail to increase their efforts to enhance this underemphasized positive core construct. We go even further and propose to not only implement PsyCap interventions at the work place, but at schools, universities, or even in families. These interventions can be done on the group-level or as tailored training interventions on the basis of individual scores. With the CPC-12 we provide a reliable tool to measure those individual PsyCap scores in many domains of life. To be able to reasonably interpret the scores the quality criterion of standardization of the CPC-12 will have to be addressed to create up-to-date norms and to define the population to which they apply. The generalizability of the CPC-12 should be re-evaluated using different samples in other life-domains.

All in all, PsyCap seems to be multifarious and connected to a wide variety of other positive psychological constructs. High correlations with well-being, life satisfaction or job satisfaction make a case for PsyCap to become a focus of prospective research in positive psychology. We believe that people high in PsyCap are more likely to lead flourishing lives and probably even more likely to build a flourishing society.

## References

- Arthaud-Day, M. L., Rode, J. C., Mooney, C. H., & Near, J. P. (2005). The subjective well-being construct: A test of its convergent, discriminant, and factorial validity. *Social Indicators Research, 74*(3), 445-476.
- Avey, J. B., Luthans, F., & Jensen, S. M. (2009). Psychological capital: A positive resource for combating employee stress and turnover. *Human Resource Management, 48*(5), 677-693.
- Avey, J. B., Luthans, F., Smith, R. M., & Palmer, N. F. (2010). Impact of positive psychological capital on employee well-being over time. *Journal of Occupational Health Psychology, 15*(1), 17-28.
- Avey, J. B., Patera, J. L., & West, B. J. (2006). The implications of positive psychological capital on employee absenteeism. *Journal of Leadership & Organizational Studies, 13*(2), 42-60.
- Avey, J. B., Reichard, R. J., Luthans, F., & Mhatre, K. H. (2011). Meta-analysis of the impact of positive psychological capital on employee attitudes, behaviors, and performance. *Human Resource Development Quarterly, 22*(2), 127-152.
- Bakker, A. B., Gierveld, J., & Van Rijswijk, K. (2006). *Succesfactoren bij vrouwelijke schoolleiders in het primair onderwijs: Een onderzoek naar burnout, bevlogenheid en prestaties [Success factors among female school principals in primary teaching: A study on burnout, work engagement, and performance]*. Diemen, NL: Right Management Consultants.
- Bakker, A. B., Schaufeli, W. B., Leiter, M. P., & Taris, T. W. (2008). Work engagement: An emerging concept in occupational health psychology. *Work & Stress, 22*(3), 187-200.

- Balducci, C., Fraccaroli, F., & Schaufeli, W. B. (2010). Psychometric properties of the Italian version of the Utrecht Work Engagement Scale (UWES-9). *European Journal of Psychological Assessment, 26*(2), 143-149.
- Baron, R. A., Franklin, R. J., & Hmieleski, K. M. (2013). Why entrepreneurs often experience low, not high, levels of stress: The joint effects of selection and Psychological Capital. *Journal of Management*. Advanced Online Publication. doi: 10.1177/0149206313495411
- Baumeister, R. F. (1991). *Meanings of life*. New York, NY: Guilford Press.
- Becker, G. (1993). *Human Capital: A theoretical and empirical approach with special references to education*: Chicago, IL: University of Chicago Press.
- Bourdieu, P. (2011). The forms of capital. (1986). In: Szeman I, Kaposy T (Eds.). *Cultural theory: An anthology* (pp. 81-93). Oxford, UK: John Wiley & Sons.
- Brandstädter, J., & Wentura, D. (1994). Veränderungen der Zeit-und Zukunftsperspektive im Übergang zum höheren Erwachsenenalter: entwicklungspsychologische und differentielle Aspekte. *Zeitschrift für Entwicklungspsychologie und Pädagogische Psychologie; 26*(1): 2-21.
- Campbell-Sills, L., Cohan, S. L., & Stein, M. B. (2006). Relationship of resilience to personality, coping, and psychiatric symptoms in young adults. *Behaviour Research and Therapy, 44*(4), 585-599.
- Cartwright, S., & Holmes, N. (2006). The meaning of work: The challenge of regaining employee engagement and reducing cynicism. *Human Resource Management Review, 16*(2), 199-208.



- Costa, P., & McCrae, R. R. (1992). *Revised NEO Personality Inventory and NEO Five-Factor Inventory: Professional manual*. Odessa, FL: Psychological Assessment Resources: Inc.
- Coutu, D. L. (2002). How resilience works. *Harvard Business Review*, 80(5), 46-56.
- Crant, J. M. (1995). The Proactive Personality Scale and objective job performance among real estate agents. *Journal of Applied Psychology*, 80(4), 532-537.
- Culbertson, S. S., Fullagar, C. J., & Mills, M. J. (2010). Feeling good and doing great: The relationship between psychological capital and well-being. *Journal of Occupational Health Psychology*, 15(4), 421-433.
- Cunningham, C. J., & De La Rosa, G. M. (2008). The interactive effects of proactive personality and work-family interference on well-being. *Journal of Occupational Health Psychology*, 13(3), 271-282.
- Dawkins, S., Martin, A., Scott, J., & Sanderson, K. (2013). Building on the positives: A psychometric review and critical analysis of the construct of psychological capital. *Journal of Occupational and Organizational Psychology*, 86(3), 348-370.
- Diener, E., & Seligman, M. E. (2002). Very happy people. *Psychological Science*, 13(1), 81-84.
- Emmons, R. A., & McCullough, M. E. (2003). Counting blessings versus burdens: An experimental investigation of gratitude and subjective well-being in daily life. *Journal of Personality and Social Psychology*, 84(2), 377-389.
- Enders, C. K. (2010). *Applied missing data analysis*. New York, NY: Guilford Publications.
- Enders, C. K. (2013). Dealing with missing data in developmental research. *Child Development Perspectives*, 7(1), 27-31.

- Finney, S. J., & DiStefano, C. (2013). Non-normal and categorical data in structural equation modeling. In G. R. Hancock & R. O. Mueller (Eds.), *Structural equation modeling: A second course* (2nd ed., pp. 439-492). Charlotte, NC: Information Age Publishing.
- Ford, M. T., Heinen, B. A., & Langkamer, K. L. (2007). Work and family satisfaction and conflict: a meta-analysis of cross-domain relations. *Journal of Applied Psychology*, 92(1), 57-80.
- Gerlitz, J.-Y., & Schupp, J. (2005). Zur Erhebung der Big-Five-basierten Persönlichkeitsmerkmale im SOEP. *DIW Research Notes*, 4, 2005.
- Glaesmer, H., Hoyer, J., Klotsche, J., & Herzberg, P. Y. (2008). Die deutsche Version des Life-Orientations-Tests (LOT-R) zum dispositionellen Optimismus und Pessimismus. *Zeitschrift für Gesundheitspsychologie*, 16(1), 26-31.
- Gosling, S. D., Vazire, S., Srivastava, S., & John, O. P. (2004). Should we trust web-based studies? A comparative analysis of six preconceptions about internet questionnaires. *American Psychologist*, 59(2), 93-104.
- Gottschall, A. C., West, S. G., & Enders, C. K. (2012). A comparison of item-level and scale-level multiple imputation for questionnaire batteries. *Multivariate Behavioral Research*, 47(1), 1-25.
- Grosjean, P., & Ibanez, F. (2014). Pastecs: Package for analysis of space-time ecological series. *R package version*, 1.3-18.
- Guillemin, F., Bombardier, C., & Beaton, D. (1993). Cross-cultural adaptation of health-related quality of life measures: Literature review and proposed guidelines. *Journal of Clinical Epidemiology*, 46(12), 1417-1432.
- Harrell Jr, F., & with contributions from Charles Dupont and many others. (2015). Hmisc: Harrell Miscellaneous. *R package version*, 3.15-10.

- Herzberg, P. Y., Glaesmer, H., & Hoyer, J. (2006). Separating optimism and pessimism: A robust psychometric analysis of the revised Life Orientation Test (LOT-R). *Psychological Assessment, 18*(4), 433-438.
- Hobfoll, S. E. (2002). Social and psychological resources and adaptation. *Review of General Psychology, 6*(4), 307-324.
- Hu, L. t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A multidisciplinary Journal, 6*(1), 1-55.
- Jerusalem, M., & Schwarzer, R. (1999). Allgemeine Selbstwirksamkeit. In R. Schwarzer & M. Jerusalem (Eds.), *Skalen zur Erfassung von Lehrer-und Schülermerkmalen* (pp. 13-14). Berlin, GER: Freie Universität Berlin.
- Judge, T. A., Boudreau, J. W., & Bretz, R. D. (1994). Job and life attitudes of male executives. *Journal of Applied Psychology, 79*(5), 767-782.
- Judge, T. A., & Klinger, R. (2008). Job satisfaction. In M. Eid & R. J. Larsen (Eds.), *The Science of Subjective Well-Being* (pp. 393-413). New York, NY: The Guilford Press.
- Judge, T. A., & Watanabe, S. (1993). Another look at the job satisfaction-life satisfaction relationship. *Journal of Applied Psychology, 78*(6), 939-948.
- Jundt, D., & Hinsz, V. B. (2001). *Are happier workers more productive workers? The impact of mood on self-set goals, self-efficacy, and task performance*. Paper presented at the annual meeting of the Midwestern Psychological Association, Chicago, IL.
- Karademas, E. C. (2006). Self-efficacy, social support and well-being: The mediating role of optimism. *Personality and Individual Differences, 40*(6), 1281-1290.

- Kliem, S., Mößle, T., Rehbein, F., Hellmann, D., Zenger, M., & Brähler, E. (2014). A brief form of the Perceived Social Support Questionnaire (F-SozU) was developed, validated and standardized. *Journal of Clinical Epidemiology*, 68(5), 551-562.
- Larson, M., & Luthans, F. (2006). Potential added value of psychological capital in predicting work attitudes. *Journal of Leadership & Organizational Studies*, 13(2), 75-92.
- Leppert, K., Koch, B., Brähler, E., & Strauß, B. (2008). Die Resilienzskala (RS)–Überprüfung der Langform RS-25 und einer Kurzform RS-13. *Klinische Diagnostik und Evaluation*, 1(2), 226-243.
- Little, L. M., Gooty, J., & Nelson, D. L. (2007). Positive psychological capital: Has positivity clouded measurement rigor. In: Nelson DL, Cooper CL (eds.). *Positive organizational behavior: Accentuating the positives at work* (pp. 191-209), London, UK: SAGE Publicatios Ltd.
- Lucas, R. E., Diener, E., & Suh, E. (1996). Discriminant validity of well-being measures. *Journal of Personality and Social Psychology*, 71(3), 616-628.
- Luthans, F. (2002). Positive organizational behavior: Developing and managing psychological strengths. *The Academy of Management Executive*, 16(1), 57-72.
- Luthans, F., Avey, J. B., Avolio, B. J., Norman, S. M., & Combs, G. M. (2006). Psychological capital development: toward a micro-intervention. *Journal of Organizational Behavior*, 27(3), 387-393.
- Luthans, F., Avey, J. B., & Patera, J. L. (2008). Experimental analysis of a web-based training intervention to develop positive psychological capital. *Academy of Management Learning & Education*, 7(2), 209-221.

- Luthans, F., Avolio, B. J., Avey, J. B., & Norman, S. M. (2007). Positive psychological capital: Measurement and relationship with performance and satisfaction. *Personnel Psychology, 60*(3), 541-572.
- Luthans, F., Avolio, B. J., Walumbwa, F. O., & Li, W. (2005). The psychological capital of Chinese workers: Exploring the relationship with performance. *Management and Organization Review, 1*(2), 249-271.
- Luthans, F., Norman, S. M., Avolio, B. J., & Avey, J. B. (2008). The mediating role of psychological capital in the supportive organizational climate—employee performance relationship. *Journal of Organizational Behavior, 29*(2), 219-238.
- Luthans, F., Youssef-Morgan, C. M., & Avolio, B. J. (2015). *Psychological capital and beyond*. New York, NY: Oxford University Press.
- Luthans, F., & Youssef, C. M. (2004). Human, social, and now positive psychological capital management: Investing in people for competitive advantage. *Organizational Dynamics, 33*(2), 143-160.
- Luthans, F., Youssef, C. M., & Avolio, B. J. (2006). *Psychological capital: Developing the human competitive edge*. New York, NY: Oxford University Press.
- Lyubomirsky, S., King, L., & Diener, E. (2005). The benefits of frequent positive affect: does happiness lead to success? *Psychological Bulletin, 131*(6), 803-855.
- Lyubomirsky, S., Tkach, C., & DiMatteo, M. R. (2006). What are the differences between happiness and self-esteem. *Social Indicators Research, 78*(3), 363-404.
- Masten, A., & Reed, M. (2002). Resilience in development.[In:] CR Snyder, SJ López (Eds.). *Handbook of positive psychology* (pp. 74–88): New York: Oxford University Press.

- McCullough, M. E., Emmons, R. A., & Tsang, J.-A. (2002). The grateful disposition: A conceptual and empirical topography. *Journal of Personality and Social Psychology*, 82(1), 112-127.
- Moosbrugger, H., & Kelava, A. (2007). *Testtheorie und Fragebogenkonstruktion*. Heidelberg, GER: Springer.
- Newman, A., Ucbasaran, D., Zhu, F., & Hirst, G. (2014). Psychological capital: A review and synthesis. *Journal of Organizational Behavior*, 35(S1), 120-138.
- Ozbay, F., Fitterling, H., Charney, D., & Southwick, S. (2008). Social support and resilience to stress across the life span: A neurobiologic framework. *Current Psychiatry Reports*, 10(4), 304-310.
- Parker, S. K. (1998). Enhancing role breadth self-efficacy: The roles of job enrichment and other organizational interventions. *Journal of Applied Psychology*, 83(6), 835-852.
- Pavot, W. (2008). The assessment of subjective well-being. In M. Eid & R. J. Larsen (Eds.), *The science of subjective well-being* (pp. 393-413). New York, NY: The Guilford Press.
- R Core Team. (2014). R: A language and environment for statistical computing. *R Foundation for Statistical Computing*. from <http://www.R-project.org/>
- Rash, J. A., Matsuba, M. K., & Prkachin, K. M. (2011). Gratitude and well-being: Who benefits the most from a gratitude intervention? *Applied Psychology: Health and Well-Being*, 3(3), 350-369.
- Rojas, M. (2007). *The complexity of well-being: A life-satisfaction conception and a domains-of-life approach*. *Researching well-being in developing countries: From theory to research*. Paper presented at the international workshop on researching well-being in developing countries, Delmenhorst, GER.

- Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software*, 48(2), 1-36.
- Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health: assessment and implications of generalized outcome expectancies. *Health Psychology*, 4(3), 219-247.
- Scheier, M. F., Carver, C. S., & Bridges, M. W. (2001). Optimism, pessimism, and psychological well-being. In E. C. Chang (Ed.), *Optimism & pessimism: Implications for theory, research, and practice* (pp. 189-216). Washington, DC: American Psychological Association.
- Schmitz, G. S., & Schwarzer, R. (1999). Proaktive Einstellung von Lehrern: Konstruktbeschreibung und psychometrische Analysen. *Zeitschrift für Empirische Pädagogik*, 13(1), 3-27.
- Schumacher, J. (2003). SWLS–Satisfaction with life scale. In: Schumacher J, Klaiberg A, Braehler E (Eds.). *Diagnostische Verfahren zu Lebensqualität und Wohlbefinden* (pp. 305-309). Göttingen, GER: Hogrefe.
- Schyns, B., & von Collani, G. (2002). A new occupational self-efficacy scale and its relation to personality constructs and organizational variables. *European Journal of Work and Organizational Psychology*, 11(2), 219-241.
- Seligman, M. E., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist*, 55(1), 5-14.
- Seligman, M. E., Parks, A. C., & Steen, T. (2004). *A balanced psychology and a full life*. Philosophical Transactions-Royal Society of London Series B Biological Sciences, 1379-1382.

- Snyder, C. R., Sympson, S. C., Ybasco, F. C., Borders, T. F., Babyak, M. A., & Higgins, R. L. (1996). Development and validation of the State Hope Scale. *Journal of Personality and Social Psychology, 70*(2), 321-335.
- Stajkovic, A. D., & Luthans, F. (1998). Self-efficacy and work-related performance: A meta-analysis. *Psychological Bulletin, 124*(2), 240-261.
- Steger, M. F., Dik, B. J., & Duffy, R. D. (2012). Measuring meaningful work: The work and meaning inventory (WAMI). *Journal of Career Assessment, 10*69072711436160.
- Symister, P., & Friend, R. (2003). The influence of social support and problematic support on optimism and depression in chronic illness: A prospective study evaluating self-esteem as a mediator. *Health Psychology, 22*(2), 123-129.
- Tugade, M. M., & Fredrickson, B. L. (2004). Resilient individuals use positive emotions to bounce back from negative emotional experiences. *Journal of Personality and Social Psychology, 86*(2), 320-333.
- Tugade, M. M., Fredrickson, B. L., & Feldman Barrett, L. (2004). Psychological resilience and positive emotional granularity: Examining the benefits of positive emotions on coping and health. *Journal of Personality, 72*(6), 1161-1190.
- Wagnild, G. M., & Young, H. (1993). Development and psychometric evaluation of the resilience scale. *Journal of Nursing Measurement, 1*(2), 165-178.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063-1070.
- Xanthopoulou, D., Bakker, A. B., Demerouti, E., & Schaufeli, W. B. (2007). The role of personal resources in the job demands-resources model. *International Journal of Stress Management, 14*(2), 121-141.



Xanthopoulou, D., Bakker, A. B., Demerouti, E., & Schaufeli, W. B. (2009). Reciprocal relationships between job resources, personal resources, and work engagement. *Journal of Vocational Behavior, 74*(3), 235-244.

**Table 2.1.***Descriptive statistics and inter-correlations for study 1*

	<i>D</i>	Hope	Optimism (AFF)	Optimism (LOT-R)	Resilience	General Self-Efficacy	Occupational Self-Efficacy	PsyCap (PCQ)	PsyCap (CPC-12)
Hope	.25	.84							
(AFF) Optimism	.83	.49***	.82						
(LOT-R) Optimism	.41	.44***	.58***	.74					
Resilience	.64	.56***	.46***	.41***	.79				
General Self-Efficacy	.22	.55***	.42***	.35***	.70***	.88			
Occupational Self-Efficacy	.29	.56***	.47***	.39***	.56***	.67***	.85		
(PCQ) PsyCap	.51	.61***	.56***	.55***	.59***	.55***	.77***	.92	
(CPC-12) PsyCap	.44	.79***	.65***	.53***	.80***	.82***	.71***	.70***	.82

Notes: Cronbach's  $\alpha$  is displayed diagonal; AFF = Affektive Valenz der Zukunftsorientierung (Affective valence of the future orientation), LOT-R = Life Orientation Test – Revised, PsyCap = Psychological Capital, PCQ = Psychological Capital Questionnaire, CPC-12 = Compound Psychological Capital Scale.; p-scores: \* <.05, \*\*<.01, \*\*\*<.001.

**Table 2.2.***Measurement models for study 1 using MLM estimator*

		N factors	X <sup>2</sup>	df	p	SRMR	TLI	CFI	RMSEA	RMSEA 90%-CI
(PCQ)	PsyCap	4+g	549.04	248	<.001	.062	.823	.841	.061	.055 - .068
12)	PsyCap (CPC-	4+g	77.727	50	.007	.046	.950	.962	.042	.024 - .058

Notes: PsyCap = Psychological Capital, PCQ = Psychological Capital Questionnaire, CPC-12 = Compound Psychological Capital Scale.

**Table 2.3.***Descriptive statistics and inter-correlations for study 2*

	<i>M</i>	<i>SD</i>	PsyCap (CPC-12)	SWB <sup>a</sup>	PA	NA <sup>b</sup>	JS <sup>a</sup>	LS	PSS	MoW	Eng	Grat	ProA	Con	Extr	Neur	Open	Agree
PsyCap (CPC-12)	4.54	0.50	.81															
SWB <sup>a</sup>	0 <sup>a</sup>	0.68 <sup>a</sup>	.58***	-														
PA	3.40	0.60	.54***	.64***	.86													
NA	4.22	0.62	-.25***	-.68***	-.16*	.64												
JS <sup>a</sup>	0 <sup>a</sup>	0.81 <sup>a</sup>	.40***	.70***	.30***	-.33***	.72											
LS	3.74	0.63	.39***	.71***	.29***	-.38***	.27***	.74										
PSS	4.42	1.3	.22**	.41***	.14	-.35***	.18*	.47***	.87									
MoW	3.64	0.76	.28***	.50***	.38***	-.25***	.43***	.30***	.16*	.91								
Eng	4.77	0.65	.39***	.60***	.51***	-.24***	.52***	.38***	.21**	.70***	.95							
Grat	5.88	0.8	.27***	.43***	.26***	-.23***	.22**	.46***	.45***	.30***	.33***	.68						
ProA	3.07	0.39	.57***	.54***	.39***	-.35***	.30***	.46***	.48***	.41***	.48***	.48***	.67					
Con	5.48	0.89	.29***	.34***	.29***	-.27***	.17*	.19**	.17*	.24***	.37***	.16*	.35***	.55				
Extr	5.12	1.11	.24***	.22**	.18*	-.20*	.05	.17*	.30***	.22**	.31***	.25***	.34***	.18*	.70			
Neur	3.96	1.21	-.49***	-.35***	-.20**	.34***	-.17*	-.24***	-.20**	-.17*	-.23***	-.16*	-.37***	-.12	-.19**	.70		
Open	5.19	1.04	.20**	.21**	.24***	-.13	.10	.10	.18**	.32***	.33***	.25***	.30***	.19**	.37***	-.08	.59	
Agree	5.34	0.88	.04	.14*	.02	-.13	.07	.18**	.23**	.17*	.17*	.24***	.19**	.18*	.02	.06	.11	.37

Notes: Cronbach's  $\alpha$ s are displayed diagonal; CPC-12 = Compound Psychological Capital Scale, SWB<sup>a</sup> = subjective well-being, PA = positive affect, NA = negative affect, JS<sup>a</sup> = job satisfaction, LS = satisfaction with life, PSS = perceived social support, MoW = meaning of work, Eng = engagement, Grat = gratitude, ProA = proactive attitude, Con = conscientiousness, Extr = extraversion, Neur = neuroticism, Open = openness, Agree = agreeableness; p-scores: \* <.05, \*\* <.01, \*\*\* <.001. <sup>a</sup> standardized z-scores

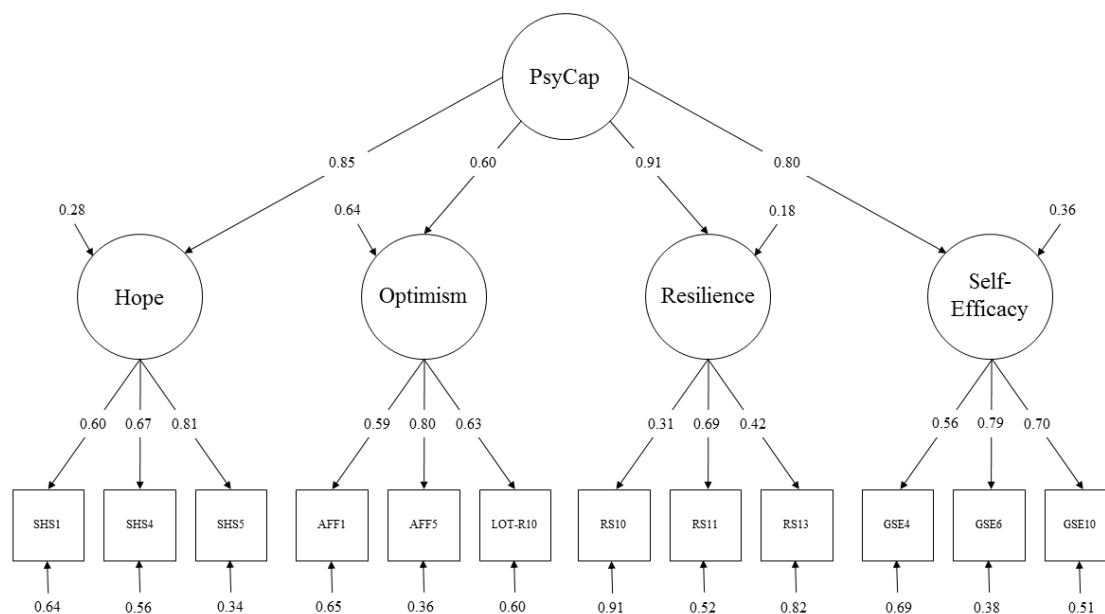


Figure 2.1. Four (plus g-) factor measurement model for Psychological Capital. Abbreviated items refer to Appendix.

## Appendix

## CPC-12 Scale (German)

1. Sollte ich mich in einer Zwickmühle befinden, würden mir viele Auswege einfallen.  
(SHS1)<sup>a</sup>
2. Im Moment betrachte ich mich als recht erfolgreich. (SHS4)<sup>a</sup>
3. Mir fallen viele Strategien ein, um meine derzeitigen Ziele zu erreichen. (SHS5)<sup>a</sup>
4. Ich freue mich auf das Leben, das noch vor mir liegt. (AFF1)<sup>b</sup>
5. Die Zukunft wird für mich viel Gutes mit sich bringen. (AFF5)<sup>b</sup>
6. Alles in allem erwarte ich, dass mir mehr gute als schlechte Dinge widerfahren.  
(LOT-R10)<sup>c</sup>
7. Ich kann mich auch überwinden, Dinge zu tun, die ich eigentlich nicht machen will.  
(RS10)<sup>d</sup>
8. Wenn ich in einer schwierigen Situation bin, finde ich gewöhnlich einen Weg  
heraus. (RS11)<sup>d</sup>
9. Ich kann es akzeptieren, wenn mich nicht alle Leute mögen. (RS13)<sup>d</sup>
10. In unerwarteten Situationen weiß ich immer, wie ich mich verhalten soll. (GSE4)<sup>e</sup>
11. Wenn ein Problem auftaucht, kann ich es aus eigener Kraft meistern. (GSE10)<sup>e</sup>
12. Schwierigkeiten sehe ich gelassen entgegen, weil ich mich immer auf meine  
Fähigkeiten verlassen kann. (GSE6)<sup>e</sup>

## CPC-12 Scale (English)

1. If I should find myself in a jam, I could think of many ways to get out of it.<sup>a</sup>
2. Right now, I see myself as being pretty successful.<sup>a</sup>
3. I can think of many ways to reach my current goals.<sup>a</sup>
4. I am looking forward to the life ahead of me.<sup>b</sup>
5. The future holds a lot of good in store for me.<sup>b</sup>
6. Overall, I expect more good things to happen to me than bad.<sup>c</sup>
7. Sometimes I make myself do things whether I want to or not.<sup>d</sup>
8. When I'm in a difficult situation, I can usually find my way out of it.<sup>d</sup>
9. It's okay if there are people who don't like me.<sup>d</sup>
10. I am confident that I could deal efficiently with unexpected events.<sup>e</sup>
11. I can solve most problems if I invest the necessary effort.<sup>e</sup>
12. I can remain calm when facing difficulties because I can rely on my coping abilities.<sup>e</sup>

Notes: <sup>a</sup> State Hope Scale (SHS), <sup>b</sup> Affective Valence of the Orientation towards the Future-Questionnaire (AFF), <sup>c</sup> Life-Orientation-Test (LOT-R), <sup>d</sup> Resilience Scale (RS-13), <sup>e</sup> The General Self-Efficacy Scale (GSE)

## Chapter 3

### **Well-being and labor: Do resilience and meaning of work buffer the job demands of midwives?\***

**Timo Lorenz<sup>1</sup>, Sarah Krückels<sup>1</sup>, Daniel Schulze<sup>2</sup>, Kathrin Heinitz<sup>1</sup>**

<sup>1</sup> Department of Education and Psychology, Freie Universität Berlin, Berlin, Germany

<sup>2</sup> no affiliation

\* a German version of this manuscript is accepted for publication:

Lorenz, T., Krückels, S., Schulze, D., & Heinitz, K. (accepted). Bringt es der Storch? Der Einfluss von Resilienz und Bedeutung der Arbeit auf das Wohlbefinden von Hebammen.

*Praxis Klinische Verhaltensmedizin und Rehabilitation*, 98(2), 90-101.



### **Abstract**

Working conditions are worsening for midwives in Germany, yet many remain in the profession and even report high job satisfaction. According to the Demand-Induced Strain Compensation model, high job demands and lack of job resources lead to reduced subjective well-being and sickness. However, personal resources could diminish this impact. The present study investigated the influence of resilience and meaning of work on the impact of cognitive, emotional and physical job demands and job resources on subjective well-being (composed of positive affect, negative affect, life satisfaction, and job satisfaction) of 550 midwives. For multiple regression analysis three models were created, each including job resources and job demands on qualitative equivalent dimensions. In all models, the results provide evidence for an effect of resilience and meaning of work on the subjective well-being. Further investigations of resilience of midwives and developing interventions to foster resilience are discussed.

*Keywords:* resilience, meaning of work, subjective well-being, midwives, job demands

*Well-being and labor: Do resilience and meaning of work buffer the job demands of German midwives?*

**Introduction**

Understaffing, inadequate income, shift-work, insufficient time for women and for completing their duties are just a few of the adversities midwives across Europe deal with on a daily basis (e.g. Ball, Curtis & Kirkham, 2002; Glass, 2009; Knezevic et al., 2011). In 2011, 61% of all midwives working in Germany were exclusively self-employed, earning around 7.50€ per hour while the costs for professional indemnity saw a 56% increase in 2010 and another 15% increase in 2012, while the mean working hours went up as well (Albrecht, Loos, Sander, Schliwen, & Wolfschütz, 2012). High costs for professional indemnity seem to be an issue in Germany alone, although the Directive 2011/24/EU of the European Parliament and of the Council of 9 March 2011 on the application of patients' rights in cross-border healthcare requires that all health care professionals giving direct patient care while working in the EU have indemnity insurance for registration. Still many countries do have a different liability system compared to Germany: The claims do not come through to the individual practitioners but the social security fund will provide lifetime care, for example in cerebral palsy (e.g. the Netherlands).

Yet even though working conditions for midwives in Germany have worsened during the last decade, there still are women and men who would not even consider any job other than attending to families before, during and after birth (Kirkham, Morgan, & Davies, 2006).

Midwives in other European countries report similar obstacles and working conditions (Büscher, Sivertsen & White, 2009), but in general report fewer self-employed midwives than Germany, e.g. according to the survey of the Ordre de sages-femmes (2010) the percentage of self-employed midwives in France was 15%.

Why then are most European midwives still happy with their profession? The present study examines resilience and meaning of work as possible moderator variables on the

connection of German midwives job demands and resources in order to shed light on this question.

The Demand-Induced Strain Compensation (DISC) Model (de Jonge & Dormann, 2003) offers the opportunity of conceptualizing occupational stress of midwives. In the DISC Model, job demands, job resources and their outcomes subjective well-being (SWB) and health represent a multidimensional construct consisting of cognitive, emotional and physical dimensions (de Jonge & Dormann, 2003). According to the '*Triple-Match Principle*' (TMP), only when job demands, job resources and the outcomes counteract on the same qualitative dimension, can job resources buffer the impact of job demands on well-being and health (de Jonge & Dormann, 2003, 2006; de Jonge, Demerouti, & Dormann, 2014). When job demands and job resources are balanced, well-being and health ensue (de Jonge & Dormann, 2003; Van de Ven, 2011). People aim for subjective well-being (SWB) as one of the most important goals in their lives (e.g. Diener, Sapyta, & Suh, 1998; Tay et al., 2015). SWB is not only associated with but can also lead to health and longevity (e.g. Diener, 2013; Diener & Chan, 2011; Xu & Roberts, 2010), positively influence social relationships (Diener, 2013; Tay & Diener, 2011) and increase work-related productivity and success (Erdogan, Bauer, Truxillo, & Mansfield, 2012).

An important resource to counteract work related stress is resilience (Erdogan et al., 2012; Schaufeli & Taris, 2014). Resilience as a multi-definitional construct (Heffron & Boniwell, 2011) is the personal ability to adapt well to adversity without any significant consequences on mental or physical well-being (Seery, Holman, & Silver, 2010). Bouncing back from negative emotional experiences not only moderates the impairments through stress (Tugade, Fredrickson, & Barrett, 2004; Wagnild & Young, 1993), but also leads to growth through adversity (McAllister & McKinnon, 2009; Richardson, 2002; Seery et al., 2010). Resilience might play a key role in the struggle with workplace adversity of health care professionals and midwives, as resilient individuals show more effective stress responses,

better recovery from self-depletion and have strategies to prevent future stress (e.g. Grafton, Gillespie, & Henderson, 2010; Hunter & Warren, 2014; Jackson, Firtko, & Edenborough, 2007; Lightsey, 2006; Richardson, 2002). Resilience can buffer the effects of workplace adversity on further outcomes, i.e. life satisfaction (Judge & Watanabe, 1993) and well-being (e.g. Cummins & Wooden, 2014; Jackson et al., 2007; Souri & Hasanirad, 2011).

Individuals who experience their work as meaningful also report greater well-being (Arnold, Kelloway, McKee, Turner, & Barling, 2007; Steger, Dik, & Duffy, 2012) and job satisfaction (e.g. Steger et al., 2012). Still there is no agreement yet on what meaning of work (MOW) includes, hence there is no overall definition (Steger et al., 2012). Rosso, Dekas, and Wrzesniewski (2010) define meaningful work as work that has not only meaning for the people, but is also important and appreciated (meaningfulness). People search for psychological meaningfulness of their work, establish a meaning of life through work and seek to contribute something to the community or serve a greater good through their work (Steger et al., 2012). Living a calling (a perfect fit of an individual with his or her career) makes work ultimately meaningful and leads to global life satisfaction and job satisfaction (Duffy, Allan, Autin, & Douglass, 2014; Duffy & Dik, 2013; Hagmaier & Abele, 2014; Peterson, Park, Hall, & Seligman, 2009).

This study examines hypotheses regarding the influence of resilience and MOW as well as the impact of job demands and job resources on SWB. Following the '*Triple-Match Principle*' (de Jonge & Dormann, 2003, 2006; de Jonge et. al., 2014) three models of qualitative corresponding job resources and job demands – a cognitive (a), an emotional (b) and a physical model (c) - were created for testing the following hypotheses:

- (1) Resilience is positively related to the subjective well-being.
- (2) MOW is positively related to the subjective well-being.
- (3) Possessing job resources is positively related to the subjective well-being.

- (4) Perceived job demands are negatively related to the subjective well-being.
- (5) Job resources reduce the impact of job demands on subjective well-being.
- (6) Resilience reduces the impact of job demands on subjective well-being.
- (7) MOW reduces the impact of job demands on subjective well-being.

## Methods

### Participants and Procedure

All in all, 580 German midwives participated in this study. Thirty participants were excluded from the data set (one due to implausible response behavior with lack of variance in answers, 29 because of non-employment status), so that 550 midwives (women = 545, men = 2, other = 1, not specified = 2) between ages 19-65 ( $M_{age} = 38.87$ ,  $SD_{age} = 11.02$ ) were included in the analysis. Most midwives had achieved general qualification for university (64.7%), 19.5% had a secondary certificate, 12.7% had received a vocational diploma and 2.2% obtained their general qualification for university via second-chance education. 515 (93.6%) finished their apprenticeship, 51 (9.3%) had a Bachelor's degree, 21 (3.8%) received a polytechnic degree, 34 (6.2%) earned a university degree and 17 (3.1%) obtained any other vocational degree (e.g. alternative practitioner). 352 midwives worked full-time (64.0%), 172 (31.1%) worked part-time, 27 (4.9%) worked any minor employment, five (0.9%) worked irregularly and 17 (0.9%) worked during maternity-leave.

To guarantee access to midwives all over Germany, participants were recruited via internet. In detail, group administrators of German midwife groups in social networks were addressed to publish the link to the survey. Also midwives, birth centers, midwife organizations (i.e. Deutscher Hebammenverband, DHV; Bund freiberuflicher Hebammen Deutschlands e.V., BfHD e.V.; and Deutscher Fachverband für Hausgeburtschilfe, DFH) and executive midwives of several labor wards in Germany were contacted directly via email. The survey was administered in German. Participation was voluntary including informed consent, no compensation was supplied.

## Assessments and Measures

**Control variable.** Due to the negative correlation between working hours and SWB (Spector et al., 2004; Hughes & Parkes, 2007, van Wanrooy et al., 2011) working hours per week were used as control variable in all models.

**Job Demands and Job Resources.** Job demands and job resources were evaluated using the Demands Induced Strain Questionnaire 1.1. German version (DISQ, Dormann et al., 2004). As this version of the DISQ only differed in one item from the DISQ 2.1. English version (de Jonge et al., 2009), this item was translated using the standard back-translation method (Geisinger, 1994) and the questionnaire was adapted to the target group of German midwives.

Cognitive, emotional, and physical job demands and job resources were measured via 32 items, to which the participants responded with a 5-point scale from 1 = *'not or very rarely'* to 5 = *'very often or always'* (e.g. 'Midwife X will have to make complex decisions at work'). Cronbach's alpha of the job demands scale was  $\alpha = .90$  ( $\alpha_{\text{cog.}} = .69$ ,  $\alpha_{\text{emo.}} = .82$ ,  $\alpha_{\text{phy.}} = .90$ ) and for the job resources scale was  $\alpha = .85$  ( $\alpha_{\text{cog.}} = .63$ ,  $\alpha_{\text{emo.}} = .78$ ,  $\alpha_{\text{phy.}} = .79$ ). The analysis was conducted using the standardized mean score of the DISQ.

**Resilience.** Resilience was evaluated using the Resilienzskala 13 (RS-13, Leppert, Koch, Brähler, & Strauß, 2008). Participants responded to 13 items with a 7-point scale ranging from 1 = *'no, I do not agree'* to 7 = *'yes, I fully agree'* (e.g. 'When facing a trying situation, I tend to find a solution.'). According to Pangallo, Zibarras, Lewis, & Flaxman (2014) the scale operationalized resilience on the higher order themes of adaptability and hardiness. The analysis was conducted using the standardized mean score of the RS-13 ( $\alpha = .84$ ).

**Meaning of Work.** Meaning of work was evaluated via the Work and Meaning Inventory (WAMI, Harzer & Steger, 2012). Participants responded to ten items with a 5-point

scale ranging from 1 = *'absolutely untrue'* to 5 = *'absolutely true'* (e.g. 'I understand how my work contributes to my life's meaning. '). The analysis was conducted using the standardized mean score of the WAMI ( $\alpha = .83$ ).

***Subjective Well-Being.*** SWB was composed of the four factors positive affect, negative affect, life satisfaction, and job satisfaction to include a specific domain focus on work (Judge & Klinger, 2008; Pavot, 2008). The standardized  $z$ -scores of these scales were averaged to the SWB scale.

***Positive and Negative Affect.*** Positive and negative affect was evaluated with the German version of the Positive and Negative Affect Schedule (PANAS, Krohne, Egloff, Kohlmann, & Tausch, 1996). Participants were asked to review how they felt during the last weeks in general using ten positive and ten negative adjectives with a 5-point scale from 1 = *'very slightly or not at all'* to 5 = *'extremely'* (e.g. 'active'). The analysis was conducted using the standardized mean score of the PANAS ( $\alpha_{\text{neg}} = .84$ ,  $\alpha_{\text{pos}} = .86$ ).

***Life Satisfaction.*** Life Satisfaction was evaluated using the German version of the Satisfaction with Life Scale (SWL-Scale, Glaesmer, Grande, Braehler, & Roth, 2011). Participants completed five items with a 7-point scale from 1 = *'strongly disagree'* to 7 = *'strongly agree'* (e.g. 'In most ways my life is close to my ideal. '). The analysis was conducted using the standardized mean score of the SWL-Scale ( $\alpha = .88$ ).

***Job Satisfaction.*** Job satisfaction was measured with three items (Judge, Boudreau, & Bretz, 1994; Judge & Klinger, 2008). This scale consisted of one item asking participants to rate the percentage of time they are satisfied, unsatisfied or neutral with their job in general (e.g. 'The percent of time I feel satisfied with my present job... '), one item measuring their general job satisfaction ('All things considered are you satisfied with your job? ') which participants either answered with 'yes' or 'no' and a third item ('How satisfied are you with your job in general? ') rating the job satisfaction using a 5-point scale from 1 = *'very*

*dissatisfied* to 5 = *very satisfied*. The analysis was conducted using the mean-score of the z-standardized items ( $\alpha = .77$ ).

### **Data analysis**

We ran our data analysis using R (R Core Team, 2013) and the R-packages ‘lavaan’ (Rosseel, 2012), ‘psych’ (Revelle, 2015), ‘boot’ (Canty & Ripley, 2015; Davison & Hinkley, 1997), ‘Hmisc’ (Harrell, with contributions from Dupont and many others, 2015), ‘QuantPsyc’ (Fletcher, 2012), ‘car’ (Fox & Weisberg, 2012), and ‘gvlma’ (Peña & Slate, 2014).

The data was checked for the necessary prerequisites to conduct multiple regression analysis. While the variance inflation factor over all models and variables was good with scores between 1.08 – 1.52 (Eid, Gollwitzer, & Schmitt, 2010; p. 687; O’Brien, 2007), homoscedasticity was not given and in addition the data was skewed (for both test statistic see Peña & Slate, 2006), thus the significance of the effects was bootstrapped with 10000 replications (Davison & Hinkley, 1997).

As SWB consisted of four independently measured constructs, we tested for the unidimensionality of the compound variable using confirmatory factor analysis (CFA). The Satorra-Bentler adjusted  $\chi^2$  was calculated to adjust for non-normal distributions of the variables (Finney & DiStefano, 2013). The fit was inspected using the criteria proposed by Hu and Bentler (1999). According to these indices the model for well-being showed a good fit (Satorra-Bentler- $\chi^2$  (2, 550) = 23.5,  $p < .001$ , CFI = .986, SRMR = .018, RMSEA = .061,  $CI_{RMSEA} = .014-.114$ ).

### **Results**

Table 3.1 offers a general overview over the bivariate correlations, *M* and *SD* of all variables used in this study.

The models composed of cognitive, emotional or physical job demands and the respective job resources, resilience, meaning of work, and work hours as predictors of SWB



were tested using multiple regression analysis. For a complete overview of the results of these models see Table 3.2.

The results of the cognitive model are in favor of hypotheses 1a-4a and 6a and inconsistent with hypotheses 5a and 7a. The results of the emotional model are in favor of hypotheses 1b-4b and inconsistent with hypotheses 5b-7b. The results of the physical model are in favor of hypotheses 1c-3c and inconsistent with hypotheses 4c-7c.

Over all three models resilience ( $\beta_c = 0.465$ -  $\beta_p = 0.481$ ) and meaning of work ( $\beta_e = 0.224$ -  $\beta_c = 0.258$ ) show the greatest effect on well-being of midwives. While cognitive, emotional and physical job resources have a marginal to small statistically significant effect on well-being ( $\beta_p = 0.063$ -  $\beta_e = 0.113$ ), the interactions between the job demands and job resources ( $\beta_p = 0.002$ -  $\beta_c = 0.052$ ) have no effect.

### **Limitations**

The results of this study should be interpreted with the following limitations in mind. First, the midwives were recruited and participated online. Therefore the study might have only reached certain midwives and lack generalizability. According to Gosling, Vazire, Srivastava and John (2004), however, the online recruitment should only be of marginal effect to the results. Second, the results of this study might only apply to midwives working in Germany because of specific health care regulations and the health care system (e.g. high costs for professional indemnity and high rate of self-employed midwives). Testing the three models in a different country might lead to different results. Third, Cronbach's alpha of cognitive job demands ( $\alpha_{cog} = .69$ ) and job resources ( $\alpha_{cog} = .63$ ) is smaller than .70 and should therefore only be interpreted cautiously.

### **Discussion**

The purpose of this study was to examine whether resilience and MOW influence the impact of job demands and job resources on the SWB of midwives. Resilience, MOW and possessing fitting job resources are positively associated with the SWB of midwives in all

tested models. These results support main effects of previous research (e.g. Arnold et al., 2007; Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007; Bakker, van Veldhoven, & Xanthopoulou, 2010; Cummins & Wooden, 2014; Jackson et al., 2007; Souri & Hasanirad, 2011; Steger et al., 2012). Furthermore, work hours show a statistically significant negative influence on SWB as predicted by results of past studies (Hughes & Parkes, 2007; Kleiner, Schunck, & Schömann, 2015; Rotenberg et al., 2008; Spector et al., 2004; van Wanrooy et al., 2011). Cognitive and emotional job demands show statistically significant negative effects on SWB, while physical job demands show no influence. Since previous studies tested the DISC-Model in nurses (e.g. de Jonge, Dormann, & van den Tooren, 2008) further investigation of the DISC-Model among midwives and therefore the impact of job demands on SWB is needed for fostering these results. Only in the cognitive model the interaction between MOW and job demands shows a statistically significant but negative influence on well-being. Those results might be originated in increased bureaucracy and documentation of the work processes as this involves a conflict of their work values and the core of their occupation - being with the women and families (Finlay & Sandall, 2009; Phillips, 2009; Shen, Cox, & McBride, 2004). According to Phillips (2009, p. 2), 'for many midwives being 'with the institution' was more likely than being 'with the woman' '.

Further the results of the present study do not support de Jonge and Dormann's (2006) assumption of the '*Triple-Match Principle*' (TMP) and therefore do not support the '*buffer hypothesis*'. The interactions between job demands and job resources on qualitative same dimensions do not lead to SWB. Daniels and de Jonge (2010) reported that 79% of all DISC-Model studies showed evidence in support of the TMP. So some, but not all studies investigating the key assumptions of the DISC-Model showed support of the TMP for all job resources and job demands, i.e. Van de Ven, de Jonge and Vlerick (2014) found no statistically significant interaction effects supporting the TMP among employees in the technology sector. However, as the TMP is considered a probabilistic principle (de Jonge et

al., 2008), Van de Ven (2011) does not examine missing evidence for the TMP in some studies to be counterevidence to the DISC-Model. Additionally, interaction effects between job demands and job resources are harder to find than main effects of job demands and job resources (van den Tooren, 2010), especially in homogenous samples (de Jonge & Kompier, 1997).

### **Future Directions.**

*Theoretical Implications.* As the present data does not sufficiently support the TMP, another theoretical framework comes to mind: Following the broaden-and-build theory of positive emotions (Fredrickson, 2001) the midwives in the present study might have been resilient because they reported SWB. Longitudinal studies with a representative sample of midwives in different career stages, a diverse range of clinical roles and different working conditions (Hunter & Warren, 2013) are needed to show the direction of SWB and resilience. Results from such studies could also show the development of resilience by attending students or newly qualified midwives over time.

Moreover, resilience might be more important for SWB of some professions than others. Further investigation of the resilience of professions in healthcare and other fields is needed to rank the resilience of the present sample and judge its importance for other professions. Resilience as a dynamic concept consisting of personal and environmental influences (e.g. Rutter, 2012) shows that external as well as internal factors influence SWB (Biggio & Cortese, 2013). Whether it is in fact internal or external factors that influence SWB to a greater extent needs further investigation.

The effect of resilient midwives on the women and families they work with might also become a focus of future studies. Also future studies should analyze resilience in European countries with different healthcare systems and thereby different working conditions (e.g. percentage of self-employed midwives).

***Practical Implications.*** MOW can be developed using job crafting (e.g. Albrecht, 2015). While job crafting employees actively change their job designs to gain more meaning and receive positive outcomes, i.e. resilience (Berg, Dutton, & Wrzesniewski, 2013; Wrzesniewski & Dutton, 2001), it requires organizational and supervisory support (Albrecht, 2015) as well as transformational and empowering leaders (Tims, Bakker, & Xanthopoulou, 2011). Since 60% of midwives in Germany are self-employed (Albrecht et al., 2012), these prerequisites become moot for the majority of the midwife workforce. Another possible way of enhancing meaning of work could be by building personal resources, i.e. psychological capital (e.g. Sweetman & Luthans, 2010; Albrecht, 2015) but this approach requires further evaluation.

Resilience on the other hand can be developed through work-based, educational programs (McAllister & McKinnon, 2009; McDonald, Jackson, Wilkes, & Vickers, 2012). Therefore resilience should be integrated into midwifery education and supervision (e.g. Hunter & Warren, 2013; Rodwell & Munro, 2013). As resilient midwives can function as a source of resilience for their colleagues (Hunter & Warren, 2013; McDonald et al., 2012), buddy systems or mentoring programs should be provided especially in ‘critical moments’, i.e. the first year of practice, after traumatic clinical events, when being subject of complaint or investigation (Hunter & Warren, 2013; Hodges, Keeley, & Troyan, 2008). Some studies attempted to establish interventions to promote resilience and career longevity for nurses and midwives (Grafton et al., 2010; Hunter & Warren, 2014; Jackson et al., 2007; McDonald, Jackson, Wilkes, & Vickers, 2013). A strong sense of professional identity (Hunter & Warren, 2013), protective self-management such as self-reflection, self-discovery (Hunter & Warren, 2013; McDonald et al., 2012), and self-care (Foureur et al., 2013; Grafton et al., 2010; Jackson et al., 2007) are individual factors that might foster resilience in midwives by social learning (Bandura, 1977; McDonald et al., 2012). There is currently little evidence however about the impact of these interventions (Hunter & Warren, 2014). Leppin et al. (2014) found

small to moderate effects of resilience trainings while stressing that they lack a formal structure and consistent theoretical basis. Before designing interventions to bolster resilience, we therefore need to define the construct of resilience more clearly and consistently to answer the question ‘When is a midwife resilient?’.

Although organizational and political approaches and changes are urgently needed for fostering resilience in midwives (McDonald et al., 2012), the work of midwives will always include workplace adversities (Hunter & Warren, 2013). It is therefore important that midwives are able to manage their reactions to these circumstances.

Nevertheless a working environment that promotes resilience through facilitating work-life balance (Hunter & Warren, 2013; Jackson et al., 2007; McCann et al., 2013) and peer-support (Hodges et al., 2008; Hunter & Warren, 2013) is essential for building SWB and hope in workers who will then perform better and will rarely intend to leave their job (Erdogan et al., 2012). Building resilience can also potentially enhance the care midwives provide for women (Grafton et al., 2010; McAra-Couper et al., 2014). Hence, the SWB of midwives could lead to more SWB and health of families.

## References

- Albrecht, S. L. (2015). Meaningful work: Some key questions for research and practice. In R. J. Burke, K. M. Page & C. L. Cooper (Eds.), *Flourishing in life, work and careers: Individual wellbeing and career experiences* (pp. 210- 234). Cheltenham, UK: Edward Elgar Publishing Limited.
- Albrecht, M., Loos, S., Sander, M., Schliwen, A., & Wolfschütz, A. (2012). Versorgungs- und Vergütungssituation in der außerklinischen Geburtshilfe [The medical care and salary situation in ambulatory obstetrics]. *Ergebnisbericht für das Bundesministerium für Gesundheit [Evaluation report of the Federal Ministry of Health]*. Berlin, GER: IGES Institut GmbH.
- Arnold, K. A., Kelloway, E. K., McKee, M. C., Turner, N., & Barling, J. (2007). Transformational Leadership and psychological well-being: The mediating role of meaningful work. *Journal of Occupational Health Psychology, 12*(3), 193-203.
- Bakker, A. B., Hakanen, J. J., Demerouti, E., & Xanthopoulou, D. (2007). Job resources boost work engagement, particularly when job demands are high. *Journal of Educational Psychology, 99*(2), 274-284.
- Bakker, A. B., van Veldhoven, M., & Xanthopoulou, D. (2010). Beyond the demand-control model: Thriving on high job demands and resources. *Journal of Personnel Psychology, 9*(1), 3-16.
- Ball, L., Curtis, P., & Kirkham, M. (2002). *Why do midwives leave?*. London, UK: Royal College of Midwives.
- Bandura, A., 1977. Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review 84*(2), 191–215.

- Berg, J. M., Dutton, J. E., & Wrzesniewski, A. (2013). Job crafting and meaningful work. In B. J. Dik, Z. S. Byrne & M. F. Steger (Eds.), *Purpose and meaning in the workplace* (pp. 81-104). Washington, DC: American Psychological Association.
- Biggio, G., & Cortese, C. G. (2013). Well-being in the workplace through interaction between individual characteristics and organizational context. *International Journal of Qualitative Studies on Health and Well-Being*, 8. doi: : 10.3402/qhw.v8i0.19823.
- Büscher, A., Sivertsen, B., & White, J. (2009). Nurses and midwives: a force for health. *Survey on the situation of nursing and midwifery in the member states of the European Region of the World Health Organization. WHO Regional Office for Europe. Denmark: Copenhagen.*
- Canty, A., & Ripley, B. (2015). boot: Bootstrap R (S-Plus) Functions. *R package version* 1.3-15.
- Cummins, R. A., & Wooden, M. (2014). Personal resilience in times of crisis: The implications of SWB homeostasis and set-points. *Journal of Happiness Studies*, 15(1), 223-235.
- Daniels, K., & de Jonge, J. (2010). Match making and match breaking: The nature of match within and around job design. *Journal of Occupational and Organizational Psychology*, 83(1), 1-16.
- Davison, A. C., & Hinkley, D. V. (1997). *Bootstrap methods and their applications*. Cambridge, UK: Cambridge University Press.
- de Jonge, J., Demerouti, E., & Dormann, C. (2014). Current theoretical perspectives in work psychology. In M. C. W. Peeters, J. de Jonge & T. W. Taris (Eds.). *An Introduction to contemporary work psychology*, 1 (pp. 90-113). Hoboken, NJ: John Wiley & Sons, Ltd.
- de Jonge, J., & Dormann, C. (2003). The DISC Model: Demand-Induced Strain Compensation Mechanisms in job stress. In M.F. Dollard, A.H. Winefield, & H.R.

- Winefield (Eds.), *Occupational stress in the service professions* (pp. 43-74). London, UK: Taylor & Francis.
- de Jonge, J., & Dormann, C. (2006). Stressors, resources, and strain at work: A longitudinal test of the Triple-Match principle. *Journal of Applied Psychology, 91*(6), 1359-1374.
- de Jonge, J., Dormann, C., & van den Tooren, M. (2008). The Demand-Induced Strain Compensation Model: Renewed theoretical considerations and empirical evidence. In M. Sverke, J. Hellgren, K. Näswall (Eds.), *The individual in the changing working life* (pp. 67-87). Cambridge, UK: Cambridge University Press.
- de Jonge, J., Dormann, C., van Vegchel, N., von Nordheim, T., Dollard, M., Cotton, S., & van den Tooren, M. (2009). *The DISQ Questionnaire: English Version 2.1.* Eindhoven, NL: Eindhoven University of Technology.
- de Jonge, J., & Kompier, M. A. (1997). A critical examination of the Demand-Control-Support Model from a work psychological perspective. *International Journal of Stress Management, 4*(4), 235-258.
- Diener, E. (1984). Subjective well-being. *Psychological Bulletin, 95*(3), 542-575.
- Diener, E. (2000). Subjective well-being. *American Psychologist, 55*(1), 34-43.
- Diener, E. (2013). The remarkable changes in the science of subjective well-being. *Perspectives on Psychological Science, 8*(6), 663-666.
- Diener, E., & Chan, M. Y. (2011). Happy people live longer: Subjective well-being contributes to health and longevity. *Applied Psychology: Health and Well-Being, 3*(1), 1-43.
- Diener, E., Sapyta, J. J., & Suh, E. (1998). Subjective well-being is essential to well-being. *Psychological Inquiry, 9*(1), 33-37.
- Dormann, C., de Jonge, J., van Vegchel, N., von Nordheim, T., Dollard, M., & Cotton, S. (2004). *Der DISC Fragebogen: Deutsche Version 1.1.* Mainz, GER: Johannes Gutenberg-University Mainz.



- Duffy, R. D., Allan, B. A., Autin, K. L., & Douglass, R. P. (2014). Living a calling and work well-being: A longitudinal study. *Journal of Counseling Psychology, 61*(4), 605-615.
- Duffy, R. D., & Dik, B. J. (2013). Research on calling: What have we learned and where are we going?. *Journal of Vocational Behavior, 83*(3), 428-436.
- Eid, M., Gollwitzer, M., & Schmitt, M. (2010). *Statistik und Forschungsmethoden*. Basel, CH: Beltz-Verlag.
- Erdogan, B., Bauer, T. N., Truxillo, D. M., & Mansfield, L. R. (2012). Whistle while you work: A review of the life satisfaction literature. *Journal of Management, 38*(4), 1038-1083.
- Finlay, S., & Sandall, J. (2009). 'Someone's rooting for you': Continuity, advocacy and street-level bureaucracy in UK maternal healthcare. *Social Science & Medicine, 69*(8), 1228-1235.
- Finney, S. J., & DiStefano, C. (2013). Non-normal and categorical data in structural equation modeling. In G. R. Hancock & R. O. Mueller (Eds.), *Structural equation modeling: A second course* (2nd ed., pp. 439-492). Charlotte, NC: Information Age Publishing.
- Fletcher, T. D. (2012). QuantPsyc: Quantitative Psychology Tools. R package version 1.5.. Retrieved from <http://CRAN.R-project.org/package=QuantPsyc>
- Foureur, M., Besley, K., Burton, G., Yu, N., & Crisp, J. (2013). Enhancing the resilience of nurses and midwives: Pilot of a mindfulness-based program for increased health, sense of coherence and decreased depression, anxiety and stress. *Contemporary Nurse: A Journal for the Australian Nursing Profession, 45*(1), 114-125
- Fox, J., & Weisberg, S. (2011). *An {R} Companion to applied regression* (2nd edition). Thousand Oaks, CA: Sage.
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The Broaden-and-Build Theory of positive emotions. *The American Psychologist, 56*(3), 218-226.

- Geisinger, K. F. (1994). Cross-cultural normative assessment: Translation and adaptation issues influencing the normative interpretation of assessment instruments. *Psychological Assessment, 6*(4), 304-312.
- Glass, N. (2007). Investigating women nurse academics' experiences in universities: the importance of hope, optimism and career resilience for workplace satisfaction. In M. H. Oermann & K. T. Heinrich (Eds.), *Annual review of nursing education, 5*. (pp. 111-136). New York, NY: Springer.
- Glass, N. (2009). An investigation of nurses' and midwives' academic/ clinical workplaces: A healing model to improve and sustain hope, optimism, and resilience in professional practice. *Holistic Nursing Practice, 23*(3), 158-170.
- Glaesmer, H., Grande, G., Braehler, E., & Roth, M. (2011). The German version of the Satisfaction With Life Scale (SWLS). *European Journal of Psychological Assessment, 27*(2), 127-132.
- Gosling, S. D., Vazire, S., Srivastava, S., & John, O. P. (2004). Should we trust web-based studies? A comparative analysis of six preconceptions about internet questionnaires. *American Psychologist, 59*(2), 93-104.
- Grafton, E., Gillespie, B., & Henderson, S. (2010). Resilience: The power within. *Oncology Nursing Forum, 37*(6), 698-705.
- Hagmaier, T., & Abele, A. E. (2014). When reality meets ideal: Investigating the relation between calling and life satisfaction. *Journal of Career Assessment, 1*, 1-16.
- Harrell, F.E. with contributions from Charles Dupont and many others. (2015). Hmisc: Harrell Miscellaneous. *R package version 3.15-0*. Retrieved from <http://CRAN.R-project.org/package=Hmisc>
- Harzer, C., & Steger, M. F. (2012). *Meaning at work: The German adaptation of the Work and Meaning Inventory (WAMI; Steger, Dik, & Duffy, in press)*. Poster session

- presented at the 6th European Conference on Positive Psychology (ECP). Russia: Moscow.
- Heffron, K., Boniwell, I. (2011). *Positive psychology: Theory, research and applications*. New York, NY: Open University Press.
- Hodges, H. F., Keeley, A. C., & Troyan, P. J. (2008). Professional resilience in baccalaureate-prepared acute care nurses: First steps. *Nursing Education Perspectives*, 29(2), 80-89.
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1-55.
- Hughes, E. L., & Parkes, K. R. (2007). Work hours and well-being: The roles of work-time control and work-family interference. *Work & Stress*, 21(3), 264-278.
- Hunter, B., & Warren, L. (2013). *Investigating resilience in midwifery: Final report*. Cardiff, UK: Cardiff University.
- Hunter, B., & Warren, L. (2014). Midwives' experiences of workplace resilience. *Midwifery*, 30(8), 926-934.
- Jackson, D., Firtko, A., & Edenborough, M. (2007). Personal resilience as a strategy for surviving and thriving in the face of workplace adversity: A literature review. *Journal of Advanced Nursing*, 60(1), 1-9.
- Judge, T. A., Boudreau, J. W., & Bretz, R. D. (1994). Job and life attitudes of male executives. *Journal of Applied Psychology*, 79(5), 767-782.
- Judge, T. A., & Klinger, R. (2008). Job satisfaction: Subjective well-being at work. In M. Eid & R. J. Larsen (Eds.), *The science of subjective well-being* (pp. 393-413). New York, NY: The Guilford Press.
- Judge, T. A., & Watanabe, S. (1993). Another look at the job satisfaction-life satisfaction relationship. *Journal of Applied Psychology*, 78(6), 939- 948.

- Kirkham, M., Morgan, R., & Davies, C. (2006). *Why do midwives stay?* London, UK: Royal College of Midwives.
- Kleiner, S., Schunck, R., & Schömann, K. (2015). Different contexts, different effects? Work time and mental health in the United States and Germany. *Journal of Health and Social Behavior*, 56(1), 98-113.
- Knezevic, B., Milosevic, M., Golubic, R., Belosevic, L., Russo, A., & Mustajbegovic, J. (2011). Work-related stress and work ability among Croatian university hospital midwives. *Midwifery*, 27(2), 146-153.
- Krohne, H. W., Egloff, B., Kohlmann, C. W., & Tausch, A. (1996). Untersuchungen mit einer deutschen Version der 'Positive and Negative Affect Schedule' (PANAS). [Investigations with a German version of the Positive and Negative Affect Schedule (PANAS)]. *Diagnostica*, 42(2), 139-156.
- Leinweber, J., & Rowe, H. J. (2010). The costs of 'being with the woman': Secondary traumatic stress in midwifery. *Midwifery*, 26(1), 76-87.
- Leppert, K., Koch, B., Brähler, E., & Strauß, B. (2008). Die Resilienzskala (RS) – Überprüfung der Langform RS-25 und einer Kurzform RS-13 [The resilience scale (RS) - Validation of the long version RS-25 and the short version RS-13]. *Klinische Diagnostik und Evaluation*, 1(2), 226-243.
- Leppin, A. L., Bora, P. R., Tilburt, J. C., Gionfriddo, M. R., Zeballos-Palacios, C., Dulohery, M. M., ... Montori, V. M. (2014). The efficacy of resiliency training programs: A systematic review and meta-analysis of randomized trials. *PLoS ONE*, 9(10), 1-15.
- Lightsey, O. R. (2006). Resilience, meaning, and well-being. *The Counseling Psychologist*, 34(1), 96-107.
- McAllister, M., & McKinnon, J. (2009). The importance of teaching and learning resilience in the health disciplines: A critical review of the literature. *Nurse Education Today*, 29(4), 371-379.

- McAra-Couper, J., Gilkison, A., Crowther, S., Hunter, M., Hotchin, C., & Gunn, J. (2014). Partnership and reciprocity with women sustain lead maternity carer midwives in practice. *New Zealand College of Midwives*, 49, 29-33.
- McCann, C. M., Beddoe, E., McCormick, K., Huggard, P., Kedge, S., Adamson, C., & Huggard, J. (2013). Resilience in the health professions: A review of recent literature. *International Journal of Wellbeing*, 3(1), 60-81.
- McDonald, G., Jackson, D., Wilkes, L., & Vickers, M. H. (2012). A work-based educational intervention to support the development of personal resilience in nurses and midwives. *Nurse Education Today*, 32(4), 378-384.
- McDonald, G., Jackson, D., Wilkes, L., & Vickers, M. H. (2013). Personal resilience in nurses and midwives: Effects of a work-based educational intervention. *Contemporary Nurse: A Journal for the Australian Nursing Profession*, 45(1), 134-143.
- O'Brien, R. M. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality & Quantity*, 41(5), 673-690.
- Ordre de sages-femmes (2010). *Survey of European midwifery regulators*. Retrieved from: [http://www.ordre-sages-femmes.fr/NET/img/upload/1/75\\_SecondSurveyofEuropeanMidwiferyRegulatorsEN.pdf](http://www.ordre-sages-femmes.fr/NET/img/upload/1/75_SecondSurveyofEuropeanMidwiferyRegulatorsEN.pdf). France: Paris.
- Pangallo, A., Zibarras, L., Lewis, R., & Flaxman, P. (2014). Resilience through the lens of interactionism: A systematic review. *Psychological Assessment*, 27(1), 1-20.
- Pavot, W. (2008). The assessment of subjective well-being: Successes and shortfalls. In M. Eid & R. J. Larsen (Eds.), *The science of subjective well-being* (pp. 124-140). New York, NY: The Guilford Press
- Peña, E. A., & Slate, E. H. (2006). Global validation of linear model assumptions. *Journal of the American Statistical Association*, 101(473), 341-354.

- Peña, E. A., & Slate, E. H. (2014). gvlma: Global validation of linear models assumptions. R package version 1.0.0.2. Retrieved from <http://CRAN.R-project.org/package=gvlma>
- Peterson, C., Park, N., Hall, N., & Seligman, M. E. P. (2009). Zest and work. *Journal of Organizational Behavior, 30*(2), 161-172.
- Phillips, M. (2009). *Woman centred care? An exploration of professional care in midwifery practice*. Huddersfield, UK: University of Huddersfield.
- R Core Team. (2013). R: A language and environment for statistical computing. Vienna, Austria R Foundation for Statistical Computing. Retrieved from <http://www.R-project.org/>
- Revelle, W. (2015). psych: Procedures for personality and psychological research, Version 1.5.1. Northwestern University, Evanston, Illinois, USA. Retrieved from <http://CRAN.R-project.org/package=psych>
- Richardson, G. E. (2002). The metatheory of resilience and resiliency. *Journal of Clinical Psychology, 58*(3), 307-321.
- Rodwell, J., & Munro, L. (2013). Well-being, satisfaction and commitment: The substitutable nature of resources for maternity hospital nurses. *Journal of Advanced Nursing, 69*(10), 2218-2228.
- Rosseel, Y. (2012). lavaan: An R Package for Structural Equation Modeling. *Journal of Statistical Software, 48*(2), 1-36.
- Rosso, B. D., Dekas, K. H., & Wrzesniewski, A. (2010). On the meaning of work: A theoretical integration and review. *Research in Organizational Behavior, 30*, 91-127.
- Rotenberg, L., Portela, L. F., Banks, B., Griep, R. H., Fischer, F. M., & Landsbergis, P. (2008). A gender approach to work ability and its relationship to professional and domestic work hours among nursing personnel. *Applied Ergonomics, 39*(5), 646-652.
- Rutter, M. (2012). Resilience as a dynamic concept. *Development and Psychopathology, 24*(02), 335-344.

- Schaufeli, W. B., & Taris, T. W. (2014). A critical review of the Job Demands-Resources Model: Implications for improving work and health. In G.F. Bauer, & O. Hämmig (Eds.), *Bridging occupational, organizational and public health*, 8 (pp. 43-68). New York, NY: Springer.
- Schulte, P., & Vainio, H. (2010). Well-being at work – overview and perspective. *Scandinavian Journal of Work, Environment & Health*, 36(5), 422-429.
- Seery, M. D., Holman, E. A., & Silver, R. C. (2010). Whatever does not kill us: Cumulative lifetime adversity, vulnerability, and resilience. *Journal of Personality and Social Psychology*, 99(6), 1025-1041.
- Sheen, K., Slade, P., & Spiby, H. (2014). An integrative review of the impact of indirect trauma exposure in health professionals and potential issues of salience for midwives. *Journal of Advanced Nursing*, 70(4), 729–743.
- Shen, J., Cox, A., & McBride, A. (2004). Factors influencing turnover and retention of midwives and consultants: A literature review. *Health Services Management Research*, 17(4), 249-262.
- Skinner, V., Madison, J., & Humphries, J. H. (2012). Job satisfaction of Australian nurses and midwives: A descriptive research study. *Australian Journal of Advanced Nursing*, 29(4), 19-27.
- Souri, H., & Hasanirad, T. (2011). Relationship between resilience, optimism and psychological well-being in students of medicine. *Procedia - Social and Behavioral Sciences*, 30(0), 1541-1544.
- Spector, P. E., Cooper, C. L., Poelmans, S., Allen, T. D., O'Driscoll, M., Sanchez, ... Yu, S. (2004). A cross-national comparative study of work-family stressors, working hours and well-being: China and Latin America versus the Anglo World. *Personnel Psychology*, 57(1), 119-142.
- Steger, M. F., Dik, B. J., & Duffy, R. D. (2012). Measuring meaningful work: The Work and

- Meaning Inventory (WAMI). *Journal of Career Assessment*, 20(3), 322-337.
- Sweetman, D., & Luthans, F. (2010). The power of positive psychology: Psychological capital and work engagement. In A. B. Bakker & M. P. Leiter (Eds.), *Work engagement: A handbook of essential theory and research* (pp. 54-68). New York, NY: Psychology Press.
- Tay, L., & Diener, E. (2011). Needs and subjective well-being around the world. *Journal Of Personality and Social Psychology*, 101(2), 354-365.
- Tay, L., Kuykendall, L., & Diener, E. (2015). Satisfaction and happiness – The bright side of quality of life. In W. Glatzer, L. Camfield, V. Møller, & M. Rojas (Eds.), *Global Handbook of Quality of Life* (pp. 839-853). New York, NY: Springer.
- Tims, M., Bakker, A. B., & Xanthopoulou, D. (2011). Do transformational leaders enhance their followers' daily work engagement?. *The Leadership Quarterly*, 22(1), 121-131.
- Tugade, M. M., Fredrickson, B. L., & Barrett, L. F. (2004). Psychological resilience and positive emotional granularity: Examining the benefits of positive emotions on coping and health. *Journal of Personality*, 72(6), 1161-1190.
- van den Tooren, M. (2010). *Job demands, job resources, and self-regulatory behavior: Exploring the issue of match*. Dissertation, Technische Universiteit Eindhoven, NL.
- Van de Ven, B. (2011). *Psychological well-being of employees in the technology sector: The interplay of job demands and resources*. Dissertation, Universitat Ghent, BEL.
- Van de Ven, B., de Jonge, J., Vlerick, P. (2014). Testing the Triple-Match principle in the technology sector: A two-wave longitudinal panel study. *Applied Psychology: An International Review*, 63(2), 300-325.
- Van de Ven, B., Vlerick, P., & de Jonge, J. (2008). The interplay of job demands, job resources and cognitive outcomes in informatics. *Stress and Health*, 24(5), 375-382.
- Wagnild, G. M., & Young, H. M. (1993). Development and psychometric evaluation of the resilience scale. *Journal of Nursing Measurement*, 1(2), 165-178.



van Wanrooy, B., Bewley, H., Bryson, A., Forth, J., Freeth, S., Stokes, L., & Wood, S.

(2013). *The 2011 Workplace Employment Relations Study (WERS): First findings*.

London, UK: Department for Business, Innovation & Skills. Retrieved from

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/336651/bis-14-1008-WERS-first-findings-report-fourth-edition-july-2014.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/336651/bis-14-1008-WERS-first-findings-report-fourth-edition-july-2014.pdf) [15.03.2015]

Wrzesniewski, A., & Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. *Academy of Management Review*, 26(2), 179-201.

Xu, J., & Roberts, R. E. (2010). The power of positive emotions: It's a matter of life or death - Subjective well-being and longevity over 28 years in a general population. *Health Psychology*, 29(1), 9-19.

**Table 3.1.**  
*Summary of the bivariate correlations of all variables*

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12
(1) cog. JD.	4.18	.52	1											
(2) emo. JD.	3.39	.72	.59***	1										
(3) phy. JD.	3.42	.99	.51***	.52***	1									
(4) cog. JR.	3.47	.59	-.04	-.17***	-.18***	1								
(5) emo. JR.	3.27	.78	-.17***	-.28***	-.20***	.54***	1							
(6) phy. JR.	2.83	.89	-.31***	-.35***	-.53***	.49***	.49***	1						
(7) Res	5.54	.75	.08	.00	.06	.23***	.18***	.11*	1					
(8) MOW	3.90	.57	-.05	-.10**	-.14**	.28***	.28***	.18***	.35***	1				
(9) PA	3.37	.64	.03	-.05	.04	.17***	.24***	.09*	.57***	.42***	1			
(10) NA (r)	1.91	.63	-.07	-.24***	-.10*	.15***	.17***	.14***	.44***	.18***	.43***	1		
(11) LS	5.04	1.16	-.02	-.14**	-.04	.17***	.20***	.10*	.43***	.30***	.46***	.39***	1	
(12) JS	0.00 <sup>a</sup>	.83	-.11**	-.30***	-.20***	.34***	.32***	.26***	.24***	.40***	.36***	.43***	.39***	1
(13) SWB	0.00 <sup>a</sup>	.75	-.06	-.24***	-.10**	.28***	.31***	.20***	.56***	.44***	.75***	.75***	.75***	.73***

*Note.* cog. JD. = cognitive job demands, emo. JD. = emotional job demands, phy. JD. = physical job demands, cog JR = cognitive job resources, emo. JR. = emotional job resources, phy. JR. = physical job resources, Res = resilience, MOW = meaning of work, PA = positive affect, NA (r) = negative affect reversed, LS = life satisfaction, JS = job satisfaction, SWB = subjective well-being. <sup>a</sup>= standardized z-scores, \* p < .05 \*\* p < .01 \*\*\* p < .001.

**Table 3.2.**  
*Results of bootstrapped multiple regression models on subjective well-being*

	<i>b</i>	bootstrapped <i>SE</i>	$\beta$	bootstrapped 95% CI	
				2,5%	97,5%
<b><i>Cognitive model (R<sup>2</sup> = .412)</i></b>					
Res	0.347	0.034	0.465	0.626	0.762
MOW	0.192	0.035	0.258	0.316	0.453
cog. JR	0.074	0.034	0.099	0.083	0.214
cog. JD	-0.035	0.032	-0.047	-0.135	-0.007
Workhours	-0.093	0.043	-0.104	-0.259	-0.089
cog. JD*cog. JR	0.004	0.033	0.006	-0.055	0.072
cog. JD*Res	0.039	0.037	0.052	0.006	0.150
cog. JD*MOW	-0.053	0.034	-0.070	-0.173	-0.037
<b><i>Emotional model (R<sup>2</sup> = .448)</i></b>					
Res	0.355	0.035	0.476	0.641	0.778
MOW	0.167	0.036	0.224	0.266	0.406
emo. JR	0.085	0.035	0.113	0.100	0.238
emo. JD	-0.135	0.033	-0.181	-0.336	-0.204
Workhours	-0.066	0.043	-0.074	-0.205	-0.038
emo. JD*emo. JR	0.006	0.032	0.008	-0.050	0.074
emo. JD*Res	0.020	0.035	0.027	-0.028	0.109
emo. JD*MOW	0.008	0.035	0.011	-0.052	0.085
<b><i>Physical model (R<sup>2</sup> = .407)</i></b>					
Res	0.359	0.035	0.481	0.649	0.786
MOW	0.188	0.035	0.252	0.309	0.446
phy. JR	0.047	0.038	0.063	0.019	0.170
phy. JD	-0.034	0.039	-0.045	-0.144	0.008
Workhours	-0.088	0.043	-0.098	-0.250	-0.080
phy. JD*phy. JR	0.002	0.031	0.002	-0.057	0.063
phy. JD*Res	0.041	0.034	0.054	-0.149	0.014
phy. JD*MOW	0.009	0.034	-0.011	-0.086	0.052

*Note.* MOW = Meaning of Work, Res = resilience, cog. = cognitive, emo. = emotional, phy. = physical, JD = Job Demands, JR = job resources, CI = confidence interval.

## Chapter 4

### **Job barriers and autism: Comparing job-related barriers and possible solutions in and outside of autism-specific employment.\***

**Timo Lorenz<sup>1</sup>, Cora Frischling<sup>1</sup>, Raphael Cuadros<sup>1</sup>, Kathrin Heinitz<sup>1</sup>**

<sup>1</sup> Department of Education and Psychology, Freie Universität Berlin, Berlin, Germany

\* a revised version of this manuscript is published at PLoS ONE:

Lorenz, T., Frischling, C., Cuadros, R., Heinitz, K.(2016). Autism and overcoming job barriers: Comparing job-related barriers and possible solutions in and outside of autism-specific employment. *PLoS ONE 11*(1): e0147040.

### **Abstract**

The aim of this study was to identify expected and occurred barriers preventing individuals with autism from entering the job market and staying in the job as well as to identify the solutions to overcome these barriers. Moreover, possible effects of an autism-specific employment on general and occupational self-efficacy as well as life and job satisfaction were examined. Sixty six employed individuals with autism – 17 of them with autism-specific employment - participated in an online survey. Results showed a variety of possible barriers. Individuals in autism-specific employment named formality problems most frequently while individuals in non-autism-specific employment mentioned social problems most. In terms of solutions, both groups used self-solutions as much as external help, but a more specific categorization of their responses showed important differences. Additionally, self-efficacies were higher in participants in autism-specific employment while comparisons regarding life or job satisfaction showed no differences. Possible implications of the results are discussed with regard to problem solving behavior and the use of strengths.

*Keywords:* autism; life satisfaction; self-efficacy, job, employment, job satisfaction

*Job barriers and autism: Comparing job-related barriers and possible solutions in and outside of autism-specific employment.*

### **Introduction**

Autism, from its first mention in the 1940s (Asperger, 1944; Kanner, 1943), has since become a condition arousing interest not only in researchers and the public media but in employers as well. Companies in the IT sector such as “specialisterne” in Denmark, “Passwerk” in Belgium or “auticon” in Germany specifically employ individuals with autism. However, as the Secretary General of the United Nations Ban Ki-moon pointed out recently, the overall majority of individuals with autism is still unemployed (Ban, 2015).

### **Autism**

According to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V), individuals with Autism Spectrum Disorder (autism) show repetitive behavioral patterns and impairment in communication skills from early childhood on (American Psychological Association, 2013). The distinction between Autism Spectrum Disorder, Asperger’s Syndrome and Pervasive Developmental Disorder not otherwise specified in the previous editions has thus been replaced by an umbrella category that includes all three forms while differentiating by severity within the category. For the sake of non-discriminating language, we will use the term “Autism Spectrum Condition” and refer to people concerned as individuals with autism throughout the remainder of this manuscript.

Prevalence for Autism Spectrum Condition varies, but it is currently best estimated at 74 out of 10.000 children (French, Bertone, Hyde, & Fombonne, 2013). There is a positive correlation with the prevalence and publication year of the study, which might stem from changes in the availability of diagnosis and services, or changes of criteria for diagnosis rather than from an actual increase in cases of Autism Spectrum Condition (French et al., 2013). Regardless, the importance of its related issues, like employment, rises with the prevalence.

## **Autism Spectrum Condition and employment**

There is no all-embracing statistic as to how many individuals with autism are currently employed. So far, studies have usually assessed employment only in specific groups (Howlin, Alcock, & Burkin, 2005; Wehman et al., 2014), not permitting a broad generalization. An employment rate of one third has been found for young adults in the United States (Standifer, 2011) and for adults in the United Kingdom (Howlin, Goode, Hutton, & Rutter, 2004). The United Nations recently specified an employment rate of 20% (Ban, 2015).

A possible explanation for the low employment rate could be barriers during job search, job application or employment. Based on the outcome of their interviews, Müller, Schuler, Burton, and Yates (2003) identified such barriers in the categories of the application process (résumés, phone contact, interviews), the adaptation to new job routines, communication and social interaction.

Research on reasons for the low employment rates of individuals with autism has been limited up to now. To our knowledge, no study has been conducted that takes into consideration the expectations of individuals with autism, potentially preventing them from initiating the process of seeking employment, or the ways they overcame the barriers they encountered. Knowing these barriers and possible solutions could help start processes to reduce such barriers and initiate trainings to strengthen individuals with autism. This could help them get into the job and retain it.

A chance to overcome possible barriers or results of overcoming them could be constructs from the field of positive psychology. The concept of positive psychology (Seligman & Csikszentmihalyi, 2000) and the strengths approach (Clifton & Harter, 2003) stress the importance of focusing on the positive capabilities of individuals rather than trying to erase weaknesses. Based on these theories we inquired how the individuals with autism

overcame the barriers they faced in order to identify important resources that can be used for practical application, i.e. to create a basis for potential interventions both at the workplace and in support programs. With the help of these findings and the results of the positive constructs we measured, we hope to both encourage employers and support workers to pave the way for the employment of individuals with autism.

Several forms of employment for individuals with autism have been established. Frequently mentioned are competitive employment (regular job without support, non-autism-specific employment), supported employment (competitive employment with support by the employer or an agency, autism-specific employment) and sheltered workshops (long-term placement for individuals with disabilities; see Capovilla, 2001 for an overview).

We sought to qualitatively compare the reports given by individuals in autism-specific employment with individuals with autism working in non-autism-specific employment. We saw this as a first step towards identifying barriers and solutions that could be quantitatively assessed in future research. In addition, our aim was to examine positive implications employment could have for individuals with autism in a supported competitive environment.

### **Self-efficacy**

In research on people's behavior towards overcoming job barriers (e.g. Pinquart, Juang, & Silbereisen, 2003) as well as raising their life satisfaction (Weber, Ruch, Littman-Ovadia, Lavy, & Gai, 2013), one concept has been focused on: self-efficacy. It is a construct of social cognitive theory defined as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986, p. 94). Thus it is action-related and focuses on the future.

In neurotypical adults – those who show no divergence in neurological development viz. without autism (Attwood) - positive correlations have been found between self-efficacy



and work-related outcomes such as job performance, job satisfaction (Judge & Bono, 2001), health outcomes (Holden, 1992) and subjective well-being (Magaletta & Oliver, 1999).

We assume that an autism-specific employment creates a more supportive environment than a non-autism-specific employment. As a result, this support may lead to higher self-efficacy because such employees are supported to experience mastery and receive verbal persuasion which are important sources of self-efficacy (Bandura, 1997). Our hypotheses are:

1. Individuals with autism in autism-specific employment have a higher general self-efficacy than individuals with autism in non-autism-specific employment.
2. Individuals with autism in autism-specific employment have a higher occupational self-efficacy than individuals with autism in non-autism-specific employment.

### **Life and Job Satisfaction**

Life satisfaction is a concept closely associated with subjective well-being (Diener, 1984). As opposed to the emotional components of subjective well-being, life satisfaction “should be viewed as a global assessment of a person's quality of life according to his own chosen criteria” (Shin & Johnson, 1978 p. 478).

Overall job satisfaction, as a measure of work-related subjective well-being, evaluates one's job affectively (Bakker & Oerlemans, 2011). It has been closely related to one's overall satisfaction with life and job performance (Judge, Boudreau, & Bretz, 1994). To our knowledge no study on the relation between employment and life satisfaction or job satisfaction in individuals with autism has been conducted up to this point.

We assume that an autism-specific employment creates a better person-organization and person-environment fit than a non-autism-specific employment. As a result, this fit may lead to a higher life and job satisfaction (Jiang & Jiang, 2015; Judge, 1994; Kristof - Brown, Zimmerman, & Johnson, 2005; Schmidt & Hunter, 1998). Supported employments have previously been found beneficial for individuals with autism, relating to improvement in

cognitive skills even outside the work domain (García - Villamisar & Hughes, 2007) and in quality of life (Billstedt, Gillberg, & Gillberg, 2010; García-Villamisar, Wehman, & Navarro, 2002). Our hypotheses are:

3. Individuals with autism in autism-specific employment have a higher life satisfaction than individuals with autism in non-autism-specific employment.
4. Individuals with autism in autism-specific employment have a higher job satisfaction than individuals with autism in non-autism-specific employment.

## **Methods**

### **Participants and procedure**

Participants in this study were recruited through autism community forums and through internal communication of the survey in an autism-specific company. Selection criteria for this study were as follows: (1) a formal diagnosis of autism and a score of  $\geq 6$  on the Autism Spectrum Quotient Test with 10 items (AQ-10) (Allison, Auyeung, & Baron-Cohen, 2012) and (2) current employment. 16 participants had to be excluded because they did not meet these selection criteria (14 due to a missing diagnosis, one due to a score of  $< 6$  on the AQ-10 and one due to being unemployed). The AQ-10 was conducted in order to affirm the self-reported diagnosis of autism. Since formal diagnosis of autism was a necessary criterion for employment at the autism-specific company, no AQ-10 was tested in this group.

Participants in this study were 66 German individuals with autism (females: 36; males: 29; other: 1). The participants' age ranged from 22 to 55 ( $M_{\text{age}} = 35.96$ ;  $SD_{\text{age}} = 10.22$ ). All participants were employed and their mean for organizational tenure was 4.68 years ( $SD = 6.55$  years). 49 of them were in non-autism-specific employment and 17 in autism-specific employment. An overview of the occupational fields of all participants can be found in Table 4.1. All participants in the autism-specific company were employed in a company in the field of IT, thus they were sorted into the category of natural sciences, geography and computer science.

The survey was administered in German. Participation in this study was completely voluntary including informed consent. All individuals participated via an online survey they could take at a time of their liking. They were informed that their data was obtained and analyzed anonymously and that they could interrupt or stop the survey at any time.

### **Qualitative measures**

**Materials.** We created a qualitative questionnaire with a total of 28 open-formatted questions. We constructed these questions forming eight thematic blocks about topics that might influence the employment process of individuals with autism. Some of these topics had been introduced previously in interviews with students and adults with work experience with autism (Camarena & Sarigiani, 2009; Müller et al., 2003). Our thematic blocks addressed the topics of the general process of job-seeking, drafting applications, contact with employers, job demands, the workday, workplace equipment, work environment, support mechanisms, and other problems than those mentioned.

In each thematic block we asked individuals (1) what problems they expected regarding the particular topic, (2) which problems actually occurred and (3), if applicable, how they had solved these problems. Distinguishing the most important problems from the most frequent ones is fundamental for possible practical implications. Hence we asked participants to identify the three problems which seemed most important to them, naming the most crucial first. An English version of the questionnaire can be found in appendix A.

**Data analysis.** Responses were analyzed using inductive category formation in QCAmap by Mayring (2014). All responses were reviewed and broad categories and subcategories were formed. These categories were the same for the expected and occurred problems. Different categories for the solutions were created. Tables 4.2 and 4.3 give an overview of the complete category system including definitions of categories and corresponding examples. In a next step, all responses were coded independently by three raters, with the instruction to note problems with the coding for a review of the category

system. Ambiguous categories were subsequently defined more explicitly and new categories were formed in order to relieve the “other“ category. After a second coding the system was reviewed again for possibly scarce definitions. One category was eliminated because it was used disproportionately little by all raters and there was consent as to how these responses could be coded instead. We measured the agreement between the three raters using the Fleiss’ Kappa coefficient for three or more raters as proposed by von Eye (2006). Our agreement was  $\kappa = .96$  for expected barriers,  $\kappa = .93$  for occurred barriers and  $\kappa = .89$  for solutions, resulting in a high mean agreement of  $\kappa_{\text{mean}} = .92$  ( $SD = 0.03$ ). All coding results depict the coding decisions of the main rater.

Answers were rated as irrelevant / not codeable (1) when they were not comprehensible, e.g. contained only special characters like a question mark or an incomplete word sequence, and (2) when they did not contain a response to the question, e.g. did not contain a barrier or a solution, respectively. The irrelevant answers in expected barriers (4%), occurred barriers (2%) and solutions (17%) were excluded from further analysis.

### **Quantitative measures**

**Demographics.** We collected data regarding age, gender (“male“, “female“, and “other“ in order to include individuals that did not see themselves in one of the dichotomous categories), current employment and the tenure in the current job. The current employment was encoded into fields of occupation in accordance with the “Classification of occupations“ (Klassifikation der Berufe, Bundesagentur für Arbeit, 2011).

**General self-efficacy.** General self-efficacy was assessed using the General Self-efficacy Scale developed by Schwarzer and Jerusalem (1995). The scale consists of 10 items (e.g. "I have no difficulties realizing my intentions and goals.") with a four-point Likert-scale ranging from 1 = “I completely disagree“ to 4 = “I completely agree“. Cronbach’s  $\alpha$  was .88.

**Occupational self-efficacy.** Occupational self-efficacy was measured using the Occupational Self-efficacy Scale (Schyns & von Collani, 2012). The scale consists of 8 items

(e.g. “I have a solution for every problem at my job.”) with a four-point Likert-scale ranging from 1 = “*I completely disagree*“ to 4 = “*I completely agree*“. Cronbach’s  $\alpha$  was .89.

**Life satisfaction.** Life satisfaction was measured with a German translation of the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985). The scale consists of 5 items (e.g. “I am satisfied with my life.”) with a five-point Likert-scale ranging from 1 = “*I completely disagree*“ to 4 = “*I completely agree*“. Cronbach’s  $\alpha$  was .91.

**Job satisfaction.** Job satisfaction was measured with a German translation of three items proposed by Judge et al. (1994). The items were as follows: (1) a yes-no response to the question “All things considered are you satisfied with your job?“, (2) a five-stage rating question “How satisfied are you with your job in general?“ ranging from 1 = “*very unsatisfied*“ to 5 = “*very satisfied*“, and (3) an item where the participants reported the percentage of time they were satisfied, dissatisfied or neutral regarding their job. Due to their different response formats the items were standardized before further analysis. Cronbach’s  $\alpha$  was .85.

**Control Items.** In addition to the questionnaires, participants completed the following control items:

(1) My quality of life has improved since entering my current employment.

(improvement item)

(2) A job is important for my quality of life. (job importance item)

(3) I can use and hone my strengths in my current employment. (strengths item)

Participants assessed their agreement with these statements on a five-point Likert-scale ranging from 1 = “*I completely disagree*“ to 5 = “*I completely agree*“. These items were used in order to further determine possible underlying mechanisms of our expected trends and thus indicate a way for possible future research.

## Data analysis

Due to the small sample size we decided to use Bayesian data analysis for more reliable results (Dunson, 2000; Kruschke, Aguinis, & Joo, 2012; Lee & Song, 2004) and non-normal variables (Schoot et al., 2014). In Bayesian analyses the data is combined with reasonable prior knowledge about the parameter in question, which results in robust estimations even in small samples when traditional frequentist approaches yield large standard errors and thus statistically less stable results. Furthermore, the parameter distribution is not limited to be necessarily normal. From the data and the prior information, a so called posterior distribution of the parameter is estimated through Monte Carlo Markov chain methods (Kruschke et al., 2012; Schoot et al., 2014; Zyphur & Oswald, 2015). We ran our data analysis using R (R Core Team, 2013) with the R-package “Bayesian First Aid” (Bååth, 2014) and WinBUGS (Lunn, Thomas, Best, & Spiegelhalter, 2000). The package uses an non-informative prior with a very broad t-distribution for the t-test analysis (Kruschke et al., 2012) and follows Barnard, McCulloch, and Meng (2000) using separate priors on  $\sigma_x$ ,  $\sigma_y$  and  $\rho$  with a uniform prior on  $\rho$ . This use of an uninformative prior allows the estimation to closely mimic classical frequentist estimation as the prior does not influence the results while resulting in more intuitive and robust inferences on parameters (Zyphur & Oswald, 2015). Group differences in answer frequencies of open questions were evaluated by Bayesian inference test using binomial distribution. The posterior distribution were inspected to find the percentage in favor a difference hypothesis. In Bayesian correlations and t-tests we report mean scores of parameters as well as the 95% high density interval (HDI) which reports the range of 95% of the posterior distribution (Kruschke et al., 2012). It is important to note, that HDIs are not exactly the same as common confidence intervals, as the latter incorporate information on the impreciseness of the parameter estimation whereas HDIs reflect the parameter distribution itself (Kruschke et al., 2012; Zyphur & Oswald, 2015). Due to forced-

choice in the questionnaires there was no missing data. For correlation analysis with gender, the participant in the category “other“ was eliminated from the dataset due to lack of representativeness.

## Results

### Qualitative results

**Expected barriers.** Participants gave a total of 242 answers to the question which barriers they expected before entering the job market. For individuals in non-autism-specific employment, the most frequent problem fell into the category of social problems of communication (15%), followed by the formality problems of equipment and environment (12%), work routines (10%), application process (10%) and qualification (8%) (see Table 4.4). Participants with autism-specific employment pointed out the formality problem of qualification as the most frequent problem (23%), then the social problem of communication (11%), followed by the formality problems of equipment and environment (9%), work routine (9%), and cognitive job demand problems (9%) (see Table 4.5). The ratio of the general categories in both groups can be seen in Table 4.6. Individuals with autism-specific employment expected more formality problems and more job demand problems, but less social problems than individuals with no such specific employment. Job demand problems were the least frequent in individuals in non-autism-specific employment, but not in individuals with autism-specific employment.

**Occurred barriers.** Participants named 357 barriers they encountered. The formality problem of equipment and environment was the most common one for individuals without (16%, see Table 4.4) and with autism-specific employment (18%, see Table 4.5). However, while this was followed by the social problem of communication (15%) and the formality problem of work routine (13%) in non-autism-specific employment, the second and third most frequent problems for individuals in autism-specific employment were also formality problems, namely application processes (16%) and work routines (12%).

For individuals in non-autism-specific employment the expectations and the occurrence of problems showed the same ratio of general categories (see Table 4.6). Individuals with autism-specific employment, however, faced more formality problems and less job demands and social problems than expected. They also faced fewer problems than they expected (59%) compared to individuals in non-autism-specific employment (72%, see Table 4.7). In a Bayesian inference test 95.8% of the posterior distribution are in favor of the difference.

**Solutions.** Two hundred sixty three solutions were named in total. The most frequent solution was external help from the work environment in individuals in non-autism-specific employment (22%, see Table 4.4). Individuals working in autism-specific employment however named the self-solutions communication (23%) and acceptance (21%) as their most frequent approach to solving problems, even before using external help from the work environment (18%, see Table 4.5). The overall proportion between self-solutions and external help was balanced in both groups (see Table 4.6). Yet in sum, individuals in autism-specific employment solved a slightly higher proportion of occurred problems (61%) than individuals in non-autism-specific employment (55%, see Table 4.7). In a Bayesian inference test, 78.1% of the posterior distribution are in favor of the difference.

**Rating.** Participants in non-autism-specific jobs rated the social problems as most important to them (43%), followed by formality problems (30%) and job demand problems (27%). These general categories had the same order in the second priority participants rated (50%, 37% and 13%, respectively). Yet in the third priority, formality problems were named most frequently (70%), then job demand problems (20%) and then social problems (10%).

Participants in autism-specific employment, however, put higher emphasis on formality problems (60%) than on social problems (40%) in the first priority. In the second priority, this ratio changes to 48% / 52%. Job demand problems are only mentioned as a third priority and are the most frequently named (48%), before formality problems (28%) and social problems (24%).



## Quantitative results

Results for mean values and standard deviation as well as all bivariate correlations can be found in Table 4.8.

**Demographics.** There was a correlation between gender and occupational self-efficacy ( $r = -.29$ , see Table 4.8) with males tending to have higher occupational self-efficacy than females. The same tendency was seen for gender and general self-efficacy ( $r = -.20$ ).

**Self-Efficacy.** General self-efficacy was correlated with the employment group ( $r = .28$ ), general self-efficacy being higher with individuals in autism-specific employment. Results of the Bayesian t-tests are presented in Table 4.9. The t-test showed a mean difference of .40 with an effect of  $d = .67$  between the individuals in non-autism-specific employment ( $M = 2.0$ ,  $SD = .50$ ) and in autism-specific employment ( $M = 2.4$ ,  $SD = 0.66$ ).

There was a correlation between occupational self-efficacy and the employment group ( $r = .24$ ) insofar as individuals with autism-specific employment tended to have higher occupational self-efficacy. The t-test showed a mean difference of .39 with an effect of  $d = .59$  between the individuals in non-autism-specific employment ( $M = 2.3$ ,  $SD = .68$ ) and in autism-specific employment ( $M = 2.7$ ,  $SD = .62$ ). Thus, the data speaks in favor of hypotheses 1 and 2.

**Life satisfaction and job satisfaction.** Life satisfaction in individuals in non-autism-specific employment ( $M = 2.6$ ,  $SD = 1.10$ ) showed a mean difference of .19, with the 95% high density interval crossing 0, with an effect of  $d = .18$  from life satisfaction in individuals in autism-specific employment ( $M = 2.8$ ,  $SD = 0.95$ ).

There was also no difference between means,  $d = .01$ , for individuals in non-autism-specific employment and in autism-specific employment regarding job satisfaction. The data does not speak in favor of hypotheses 3 and 4.

**Control Items.** Correlations of all control items with general self-efficacy, occupational self-efficacy, life satisfaction, job satisfaction and the other control items were moderate to strong. The strengths item, asking whether personal strengths are used in current employment, showed the highest correlations, namely with general self-efficacy ( $r = .45$ ), occupational self-efficacy ( $r = .48$ ), life satisfaction ( $r = .62$ ) and job satisfaction ( $r = .81$ ).

### **Limitations**

The results of this study should be interpreted with the following limitations in mind. First, the participants were recruited and participated online. Therefore, the study may have only reached certain individuals and lack generalizability. According to Gosling, Vazire, Srivastava, and John (2004), however, the online recruitment should only be of marginal effect to the results. Also, all participants were employed and thus can only indicate a reflection of the individuals with autism that successfully applied for a job. Individuals who did not succeed were not part of the study. More concerns about generalizability are warranted because this study used a nonprobability sample. Furthermore, participants were all of German-speaking descent, and were therefore relatively ethnically homogeneous. The participants in the non-autism-specific employment sample were not diagnosed by means of a singular diagnostic method. Instead, they were asked to provide information about their autism diagnosis. Due to the strong variation within the diagnostic process, we had to rely upon the participants' self-reported data of an existing diagnosis.

### **Discussion**

The main purpose of this study was to identify barriers individuals with autism might have faced and solutions they might have used in the process of entering the job market. We thereby also sought to examine positive work-related variables that could be of importance in the employment process.

In the first step of our study we identified a wide range of barriers that individuals with autism expected and encountered. Some of them, like filling out job applications, job

search, communication and interaction with supervisors had also been reported by Müller et al. (2003). By contrast, we created a system of perceived barriers that is both more general and more specific through its structure of general categories and sub-categories.

The higher frequency of social problems in non-autism-specific employment and of formality problems in autism-specific employment suggests a difference in the nature of the barriers individuals with autism encounter when entering the job market. The two groups did not just differ in the number of certain problems that occurred but also in how they rated their importance. Individuals with non-autism-specific employment rated social problems as more important than formality problems while the contrary occurred with individuals with autism-specific employment. In that regard, the most frequent problems were also seen as the most important ones. However, even though individuals in autism-specific employment faced more job demand than social problems, they rated job demand problems as less important. This is relevant because it shows that in practice, social problems should not be neglected when they are less frequent.

Our findings suggest that individuals in different employment face qualitatively different barriers. Hagner and Cooney (2005) found that supervisors reported direct communication as an important strategy for successful employment of individuals with autism. The use of this strategy might have led to the small number of communication problems for individuals in autism-specific employment. At the same time, their skill set not matching their job content (formality problem – qualification) might hinder successful long-term employment (Mawhood & Howlin, 1999). Problems concerning work routines occurred in both groups and could be solved by introducing more structure in schedule and responsibilities (Hagner & Cooney, 2005). Many participants of both groups also named the equipment and work environment as problems, criticizing e.g. the noise level in open-plan offices. Since many individuals with autism have shown high sensitivity to sensory input like noise and light (Alcántara, Weisblatt, Moore, & Bolton, 2004; Rimland & Edelson, 1995;

Russo, Zecker, Trommer, Chen, & Kraus, 2009; Talay-Ongan & Wood, 2000) and participants in our study frequently reported such problems, a reduction of distracting stimuli by creating individual workspaces seems important and necessary. All of these findings present some form of adaptation to the needs of individuals with autism. Hence we endorse the idea of Mawhood and Howlin (1999) that a successful approach towards employment of individuals with autism is based on an appropriate work setting and understanding of their individual needs.

Regarding solutions, we found different patterns in our two study groups that might provide further ideas for this approach. Individuals in autism-specific employment tended to solve occurring problems less with resignation and more with acceptance, communication and practice or further qualification. This is interesting, because impairment in communication is a core symptom of Autism Spectrum Condition (American Psychological Association, 2013) and has been named as a cause of difficulties in the employment process (Hendricks, 2010; Müller et al., 2003). Yet for participants in autism-specific employment this reported weakness was not just attenuated but even transformed into a resource of problem solving behavior. Maybe this was facilitated by being surrounded by peers or supervisor's adjustment towards more direct communication (Hagner & Cooney, 2005).

Communication, as well as the self-solutions acceptance and practice/qualification, matches the description of active coping given by Carver, Scheier, and Weintraub (1989), as opposed to avoidance coping (methods of resignation and denial). Avoidance coping has shown to be less effective than active coping (Montgomery & Rupp, 2005) and correlates with psychological strains (Jex, Bliese, Buzzell, & Primeau, 2001). Active coping, however, has shown relations with optimism (Nes & Segerstrom, 2006), hope (Danoff-Burg, Prelow, & Swenson, 2004; Geffken et al., 2006) and resilience (Dumont & Provost, 1999; Maddi, 1999; Smith et al., 2008; Steinhardt & Dolbier, 2008). Thus these constructs, too, seem to be important strengths for active problem solving. It is for further studies to examine how

individuals with autism could identify their strengths, how they might relate to their coping behavior and how they might even pave the way for more long-term and prevention-oriented solutions (Spychala, 2009).

The second part of our study focused on positive correlates of employment and the type of employment in individuals with autism. Concerning the relation of employment groups with general and occupational self-efficacy, our results showed small correlations and medium effects between autism-specific employment and general and occupational self-efficacy.

These differences in self-efficacies between individuals with and without autism-specific employment could have been found for several reasons. A possible explanation might be, that self-efficacy is an effect resulting from employment in an autism-specific company. Its system of on-the-job support might create a protected environment in which employees are fostered and experience mastery. It has been suggested that self-efficacy is influenced by past experiences of mastering a situation and external appraisal (Bandura, 1986, 1997; Luthans, Luthans, & Luthans, 2004; Luthans, Youssef-Morgan, & Avolio, 2015; Wood & Bandura, 1989). Thus individuals in autism-specific employment might have had more of these experiences and were more positively appraised by supervisors or job coaches, resulting in a higher general and occupational self-efficacy. It might be that it is related to mastering the demanding entry process in the autism-specific company.

Furthermore, one could hypothesize that job demands in the autism-specific company, located in the IT sector, were particularly high, thus attracting only individuals already seeing themselves as very self-efficient. At the same time the autism-specific company aims at employing individuals with autism based on their strengths while being a regular competitive business. When their selection procedures are highly demanding and based on testing for relevant strengths, it is possible that the selected employees are those with highest cognitive capacities and also highest self-efficacies.

Our finding of a correlation between occupational self-efficacy and gender could serve as another explanation for the group differences, since only males were in autism-specific employment. However, we argue that the occupational field of this group as well as the gender might be responsible for this finding because neurotypical males show higher task-specific self-efficacy in tasks involving IT and computers (Durnell & Haag, 2002; Vekiri & Chronaki, 2008). Further assessment could evaluate whether the nature of task's relation to occupational self-efficacy is influenced by gender.

In our comparison of qualitative and quantitative results we saw that self-efficacy could also be linked to coping behavior. Jex et al. (2001) found the correlation of self-efficacy to be negative with avoidance coping and positive with active coping, which is consistent with our results. It would be important to examine the direction of this possible effect in order to see whether self-efficacy is a strength encouraging active coping or the result of effective coping experiences. In conclusion, we can only speculate for possible causal connections from our correlations. Only experimental or longitudinal studies can test the underlying mechanisms.

However, even though our results indicated that participants in autism-specific employment showed higher general self-efficacy than those in non-autism-specific employment, it is still to note that general self-efficacy is more than one standard deviation below the mean of neurotypical adults ( $M = 29.59$ ,  $SD = 5.29$ ,  $N = 18,000$ , based on the dataset of Schwarzer, 2015 compared to  $M = 22.17$ ,  $SD = 5.82$  in our total sample). This is also consistent with the findings of Lorenz and Heinitz (2014), who found differences of more than one standard deviation for general and occupational self-efficacy between individuals with autism and neurotypical individuals.

Factors influencing self-efficacy may be within individuals' control or outside of it (Luthans et al., 2015). Resources such as knowledge or skills can be used when available or can otherwise be acquired. One could suggest that individuals with autism have lower self-

efficacy because they have fewer resources. One could also suggest that acquisition of resources can prove more difficult for them than for neurotypical individuals, due to a lack of embodied empathy (Minio-Paluello, Baron-Cohen, Avenanti, Walsh, & Aglioti, 2009), possibly indicating impaired vicarious learning. Hence, some resources may be less controllable for individuals with autism.

As stated earlier, mastery of past experiences and external appraisal are potential antecedents of self-efficacy (Bandura, 1986, 1997; Luthans et al., 2004; Luthans et al., 2015; Wood & Bandura, 1989). We argue that individuals with autism face many difficulties in education and work life (Chown & Beavan, 2012; Müller et al., 2003) and lack positive experiences of mastery because these problems are rarely solved by supporting parties (see Gerhardt & Lainer, 2011, for an overview). Moreover, stigma and subsequent focus on weaknesses as well as a lack of external appraisal of individuals with autism might also lower their self-efficacy, as it does in other groups facing prejudices (Inzlicht, McKay, & Aronson, 2006; Kleim et al., 2008).

General self-efficacy's positive relation with job performance (Judge & Bono, 2001; Stajkovic & Luthans, 1998), health (Holden, 1992) and subjective well-being (Magaletta & Oliver, 1999) was mentioned earlier. Its connection to life satisfaction, job satisfaction and improvement of quality of life (improvement item) has been indicated in our study. Self-efficacy is also a factor introduced by Luthans et al. (2004) as one of four components of the positive psychological capital, a construct recently suggested to be crucial in employee well-being and satisfaction (Avey, Luthans, Smith, & Palmer, 2010). It therefore seems of high importance to thoroughly investigate the discrepancy in self-efficacy between individuals with and without autism. Furthermore, it may even extend the search for possible unused strengths to the other components of positive psychological capital, namely optimism, hope and resilience (Luthans et al., 2004).

While our results showed moderate to strong correlations of life and job satisfaction with general and occupational self-efficacy, respectively, employment groups only differed in both self-efficacies, but not in satisfaction. We argue that this is due to the high amount of problems in both groups, leading to a similar level of satisfaction. At the same time, even though the employment groups reported different types of occurred problems (i.e. more social or formality problems), their life and job satisfaction did not differ. Thus, quality of barriers may not influence satisfaction measures. What might influence satisfaction measures is one's personal evaluation of whether a job is important for one's quality of life (job importance item). We found that participants who evaluated their job as important for their quality of life had higher life satisfaction but not job satisfaction. Emphasizing on a job when evaluating quality of life may sensitize individuals with autism and trigger demands towards their job. Further research is needed to address possible implications of this finding on the employment of individuals with autism.

In sum, our two groups of individuals without and with autism-specific employment showed differences in quality of occurred barriers, quality of coping strategies, levels of general and occupational self-efficacy, but not in life or job satisfaction. Based on these findings we proposed a more customized approach to successfully employ individuals with autism. Employment should be based on their needs and their resources, which might also help them in coping actively with potential problems. This focus on strengths instead of deficits is crucial to our approach of positive organizational psychology and could not only facilitate concrete problem solving but also enhance self-efficacy.

However, before designing practical applications, the next aim must be to investigate barriers and solutions quantitatively in order to assess their relations to coping strategies, self-efficacies and life and job satisfaction. We are positive that the present study is one step towards a better understanding of possible employment and well-being for individuals with autism.



## References

- Alcántara, J. I., Weisblatt, E. J., Moore, B. C., & Bolton, P. F. (2004). Speech - in - noise perception in high - functioning individuals with autism or Asperger's syndrome. *Journal of Child Psychology and Psychiatry*, 45(6), 1107-1114.
- Allison, C., Auyeung, B., & Baron-Cohen, S. (2012). Toward brief “red flags” for autism screening: the short autism spectrum quotient and the short quantitative checklist in 1,000 cases and 3,000 controls. *Journal of the American Academy of Child & Adolescent Psychiatry*, 51(2), 202-212.
- American Psychological Association. (2013). DSM–5 Autism spectrum disorder. Arlington, VA: American Psychiatric Publishing
- Asperger, H. (1944). Die „Autistischen Psychopathen” im Kindesalter. *Archiv für Psychiatrie und Nervenkrankheiten*, 117(1), 76-136.
- Attwood, A. (1998). *Asperger's syndrome: A guide for parents and professionals*. London, UK: Jessica Kingsley Publishers.
- Avey, J. B., Luthans, F., Smith, R. M., & Palmer, N. F. (2010). Impact of positive psychological capital on employee well-being over time. *Journal of Occupational Health Psychology*, 15(1), 17.
- Bååth, R. (2014). *Bayesian First Aid: A package that implements Bayesian alternatives to the classical \*.test functions in R*. Paper presented at the UseR! 2014 - the International R User Conference, Los Angeles, CA.
- Bakker, A. B., & Oerlemans, W. (2011). Subjective well-being in organizations. In K. S. Cameron & G. M. Spreitzer (Eds.), *The Oxford handbook of positive organizational scholarship* (pp. 178-189). New York, NY: Oxford University Press
- Ban, K.-m. (2015). Secretary-General's Message for 2015. from <http://www.un.org/en/events/autismday/2015/sgmessage.shtml>

- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman.
- Barnard, J., McCulloch, R., & Meng, X.-L. (2000). Modeling covariance matrices in terms of standard deviations and correlations, with application to shrinkage. *Statistica Sinica*, 10(4), 1281-1312.
- Billstedt, E., Gillberg, I. C., & Gillberg, C. (2010). Aspects of quality of life in adults diagnosed with autism in childhood: A population-based study. *Autism*, 5(1), 7-20.
- Bundesagentur für Arbeit. (2011). *Klassifikation der Berufe 2010 Bundesagentur für Arbeit*. Nürnberg, GER: Bundesagentur für Arbeit.
- Camarena, P. M., & Sarigiani, P. A. (2009). Postsecondary Educational Aspirations of High-Functioning Adolescents With Autism Spectrum Disorders and Their Parents. *Focus on Autism and Other Developmental Disabilities*, 24(2), 115-128.
- Capo, L. C. (2001). Autism, employment, and the role of occupational therapy. *Work*, 16(3), 201-207.
- Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, 56(2), 267-283.
- Chown, N., & Beavan, N. (2012). Intellectually capable but socially excluded? A review of the literature and research on students with autism in further education. *Journal of Further and Higher Education*, 36(4), 477-493.
- Clifton, D. O., & Harter, J. K. (2003). Investing in strengths. In A. K. S. Cameron, B. J. E. Dutton, & C. R. E. Quinn (Eds.), *Positive organizational scholarship: Foundations of a new discipline* (pp. 111-121). San Francisco, CA: Berrett-Koehler Publishers, Inc.

- Danoff-Burg, S., Prelow, H. M., & Swenson, R. R. (2004). Hope and life satisfaction in Black college students coping with race-related stress. *Journal of Black Psychology, 30*(2), 208-228.
- Diener, E. (1984). Subjective well-being. *Psychological Bulletin, 95*(3), 542-575.
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*(1), 71-75.
- Dumont, M., & Provost, M. A. (1999). Resilience in adolescents: Protective role of social support, coping strategies, self-esteem, and social activities on experience of stress and depression. *Journal of Youth and Adolescence, 28*(3), 343-363.
- Dunson, D. B. (2000). Bayesian latent variable models for clustered mixed outcomes. *Journal of the Royal Statistical Society: Series B (Statistical Methodology), 62*(2), 355-366.
- Durndell, A., & Haag, Z. (2002). Computer self efficacy, computer anxiety, attitudes towards the Internet and reported experience with the Internet, by gender, in an East European sample. *Computers in Human Behavior, 18*(5), 521-535.
- French, L. R., Bertone, A., Hyde, K. L., & Fombonne, E. (2013). Epidemiology of Autism Spectrum Disorders. In J. D. Buxbaum & P. R. Hof (Eds.), *The Neuroscience of Autism Spectrum Disorder* (pp. 3-24). New York, NY: Elsevier
- García-Villamizar, D., Wehman, P., & Navarro, M. D. (2002). Changes in the quality of autistic people's life that work in supported and sheltered employment. A 5-year follow-up study. *Journal of Vocational Rehabilitation, 17*(4), 309-312.
- García - Villamizar, D., & Hughes, C. (2007). Supported employment improves cognitive performance in adults with autism. *Journal of Intellectual Disability Research, 51*(2), 142-150.
- Geffken, G. R., Storch, E. A., Duke, D. C., Monaco, L., Lewin, A. B., & Goodman, W. K. (2006). Hope and coping in family members of patients with obsessive-compulsive disorder. *Journal of Anxiety Disorders, 20*(5), 614-629.

- Gerhardt, P. F., & Lainer, I. (2011). Addressing the needs of adolescents and adults with autism: A crisis on the horizon. *Journal of Contemporary Psychotherapy, 41*(1), 37-45.
- Gosling, S. D., Vazire, S., Srivastava, S., & John, O. P. (2004). Should we trust web-based studies? A comparative analysis of six preconceptions about internet questionnaires. *American Psychologist, 59*(2), 93-104.
- Hagner, D., & Cooney, B. F. (2005). "I do that for everybody": Supervising employees with autism. *Focus on Autism and Other Developmental Disabilities, 20*(2), 91-97.
- Hendricks, D. (2010). Employment and adults with autism spectrum disorders: Challenges and strategies for success. *Journal of Vocational Rehabilitation, 32*(2), 125-134.
- Holden, G. (1992). The relationship of self-efficacy appraisals to subsequent health related outcomes: A meta-analysis. *Social work in Health Care, 16*(1), 53-93.
- Howlin, P., Alcock, J., & Burkin, C. (2005). An 8 year follow-up of a specialist supported employment service for high-ability adults with autism or Asperger syndrome. *Autism, 9*(5), 533-549.
- Howlin, P., Goode, S., Hutton, J., & Rutter, M. (2004). Adult outcome for children with autism. *Journal of Child Psychology and Psychiatry, 45*(2), 212-229.
- Inzlicht, M., McKay, L., & Aronson, J. (2006). Stigma as ego depletion: how being the target of prejudice affects self-control. *Psychological Science, 17*(3), 262-269.
- Jex, S. M., Bliese, P. D., Buzzell, S., & Primeau, J. (2001). The impact of self-efficacy on stressor-strain relations: Coping style as an explanatory mechanism. *Journal of applied Psychology, 86*(3), 401-409.
- Jiang, Z., & Jiang, X. (2015). Core self-evaluation and life satisfaction: The person-environment fit perspective. *Personality and Individual Differences, 75*, 68-73.

- Judge, T. A. (1994). Person–organization fit and the theory of work adjustment: Implications for satisfaction, tenure, and career success. *Journal of Vocational Behavior*, 44(1), 32-54.
- Judge, T. A., & Bono, J. E. (2001). Relationship of core self-evaluations traits—self-esteem, generalized self-efficacy, locus of control, and emotional stability—with job satisfaction and job performance: A meta-analysis. *Journal of Applied Psychology*, 86(1), 80.
- Judge, T. A., Boudreau, J. W., & Bretz, R. D. (1994). Job and life attitudes of male executives. *Journal of Applied Psychology*, 79(5), 767-782.
- Kanner, L. (1943). Autistic disturbances of affective contact. *Nervous Child*, 2, 217-250.
- Kleim, B., Vauth, R., Adam, G., Stieglitz, R.-D., Hayward, P., & Corrigan, P. (2008). Perceived stigma predicts low self-efficacy and poor coping in schizophrenia. *Journal of Mental Health*, 17(5), 482-491.
- Kristof - Brown, A. L., Zimmerman, R. D., & Johnson, E. C. (2005). Consequences of individuals' fit at work: A meta-analysis of person-job, person-organization, person-group, and person-supervisor fit. *Personnel Psychology*, 58(2), 281-342.
- Kruschke, J. K., Aguinis, H., & Joo, H. (2012). The time has come bayesian methods for data analysis in the organizational sciences. *Organizational Research Methods*, 15(4), 722-752.
- Lee, S.-Y., & Song, X.-Y. (2004). Evaluation of the bayesian and maximum likelihood approaches in analyzing structural equation models with small sample sizes. *Multivariate Behavioral Research*, 39(4), 653-686.
- Lorenz, T., & Heinitz, K. (2014). Aspergers - Different, not less: Occupational strengths and job interests of individuals with Asperger's Syndrome. *PloS one*, 9(6).

- Lunn, D. J., Thomas, A., Best, N., & Spiegelhalter, D. (2000). WinBUGS-a bayesian modelling framework: Concepts, structure, and extensibility. *Statistics and Computing*, 10(4), 325-337.
- Luthans, F., Luthans, K. W., & Luthans, B. C. (2004). Positive psychological capital: Beyond human and social capital. *Business Horizons*, 47(1), 45-50.
- Luthans, F., Youssef-Morgan, C. M., & Avolio, B. J. (2015). *Psychological Capital and Beyond*. Oxford, UK: Oxford University Press.
- Maddi, S. R. (1999). The personality construct of hardiness: I. Effects on experiencing, coping, and strain. *Consulting Psychology Journal: Practice and Research*, 51(2), 83-94.
- Magaletta, P. R., & Oliver, J. (1999). The hope construct, will, and ways: Their relations with self-efficacy, optimism, and general well - being. *Journal of Clinical Psychology*, 55(5), 539-551.
- Mawhood, L., & Howlin, P. (1999). The outcome of a supported employment scheme for high-functioning adults with autism or Asperger syndrome. *Autism*, 3(3), 229-254.  
doi: 10.1177/1362361399003003003
- Mayring, P. (2014). Qualitative content analysis - theoretical foundation, basic procedures and software solution. from Social Science Open Access Repository SSOAR, URN: <http://nbn-resolving.de/urn:nbn:de:0168-ssoar-395173> .
- Minio-Paluello, I., Baron-Cohen, S., Avenanti, A., Walsh, V., & Aglioti, S. M. (2009). Absence of embodied empathy during pain observation in Asperger syndrome. *Biological psychiatry*, 65(1), 55-62.
- Montgomery, C., & Rupp, A. A. (2005). A meta-analysis for exploring the diverse causes and effects of stress in teachers. *Canadian Journal of Education*, 28(3), 458-486.

- Müller, E., Schuler, A., Burton, B. A., & Yates, G. B. (2003). Meeting the vocational support needs of individuals with Asperger syndrome and other autism spectrum disabilities. *Journal of Vocational Rehabilitation, 18*(3), 163-175.
- Nes, L. S., & Segerstrom, S. C. (2006). Dispositional optimism and coping: A meta-analytic review. *Personality and Social Psychology Review, 10*(3), 235-251.
- Pinquart, M., Juang, L. P., & Silbereisen, R. K. (2003). Self-efficacy and successful school-to-work transition: A longitudinal study. *Journal of Vocational Behavior, 63*(3), 329-346.
- R Core Team. (2013). R: A language and environment for statistical computing. Vienna: Austria R Foundation for Statistical Computing. Retrieved from <http://www.R-project.org/>
- Rimland, B., & Edelson, S. M. (1995). Brief report: A pilot study of auditory integration training in autism. *Journal of Autism and Developmental Disorders, 25*(1), 61-70.
- Russo, N., Zecker, S., Trommer, B., Chen, J., & Kraus, N. (2009). Effects of background noise on cortical encoding of speech in autism spectrum disorders. *Journal of Autism and Developmental Disorders, 39*(8), 1185-1196.
- Schmidt, F. L., & Hunter, J. E. (1998). The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 85 years of research findings. *Psychological Bulletin, 124*(2), 262.
- Schoot, R., Kaplan, D., Denissen, J., Asendorpf, J. B., Neyer, F. J., & Aken, M. A. (2014). A gentle introduction to Bayesian analysis: Applications to developmental research. *Child Development, 85*(3), 842-860.
- Schwarzer, R. (2015). *General Self-Efficacy Scale [Data file]*. Retrieved from: <http://userpage.fu-berlin.de/~health/selfscal.htm>

- Schwarzer, R., & Jerusalem, M. (1995). Generalized self-efficacy scale. In J. Weinman, S. Wright, & M. Johnston (Eds.), *Measures in health psychology: A user's portfolio. Causal and control beliefs* (pp. 35-37). Windsor, UK: NFER-NELSON
- Schyns, B., & von Collani, G. (2012). Berufliche Selbstwirksamkeit *Zusammenstellung sozialwissenschaftlicher Items und Skalen ZIS Version1500* (Vol. 13). Bonn, GER: GESIS
- Seligman, M. E., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist*, *55*(1), 5-14.
- Shin, D. C., & Johnson, D. M. (1978). Avowed happiness as an overall assessment of the quality of life. *Social Indicators Research*, *5*(1-4), 475-492.
- Smith, B. W., Dalen, J., Wiggins, K., Tooley, E., Christopher, P., & Bernard, J. (2008). The brief resilience scale: assessing the ability to bounce back. *International Journal of Behavioral Medicine*, *15*(3), 194-200.
- Spychala, A. (2009). *Proactive Work Behaviour*. (Dissertation), Konstanz, GER:Universität Konstanz. Retrieved from <http://nbn-resolving.de/urn:nbn:de:bsz:352-opus-117464>
- Stajkovic, A. D., & Luthans, F. (1998). Self-efficacy and work-related performance: A meta-analysis. *Psychological Bulletin*, *124*(2), 240-261.
- Standifer, S. (2011). *Fact sheet on autism employment*. Paper presented at the National Conference on Autism and Employment, St. Louis, MO.
- Steinhardt, M., & Dolbier, C. (2008). Evaluation of a resilience intervention to enhance coping strategies and protective factors and decrease symptomatology. *Journal of American College Health*, *56*(4), 445-453.
- Talay-Ongan, A., & Wood, K. (2000). Unusual sensory sensitivities in autism: A possible crossroads. *International Journal of Disability, Development and Education*, *47*(2), 201-212.



- Vekiri, I., & Chronaki, A. (2008). Gender issues in technology use: Perceived social support, computer self-efficacy and value beliefs, and computer use beyond school. *Computers & Education, 51*(3), 1392-1404.
- von Eye, A. (2006). An alternative to Cohen's  $\kappa$ . *European Psychologist, 11*(1), 12-24.
- Weber, M., Ruch, W., Littman-Ovadia, H., Lavy, S., & Gai, O. (2013). Relationships among higher-order strengths factors, subjective well-being, and general self-efficacy – The case of Israeli adolescents. *Personality and Individual Differences, 55*(3), 322-327.
- Wehman, P. H., Schall, C. M., McDonough, J., Kregel, J., Brooke, V., Molinelli, A., . . . Thiss, W. (2014). Competitive employment for youth with Autism Spectrum Disorders: Early results from a randomized clinical trial. *Journal of Autism and Developmental Disorders, 44*(3), 487-500.
- Wood, R., & Bandura, A. (1989). Social cognitive theory of organizational management. *Academy of Management Review, 14*(3), 361-384.
- Zyphur, M. J., & Oswald, F. L. (2015). Bayesian estimation and Inference: A user's guide. *Journal of Management, 41*(2), 390-420.

**Table 4.1***Current employment of individuals with autism*

<b>Classification according to KldB 2010 code</b>	<b>N</b>	<b>%</b>
Agriculture, forestry, animal husbandry, and horticulture	1	1.5
Production of raw materials	3	4.5
Construction, architecture, surveying, and building technology	2	3
Natural sciences, geography and computer science	25	38
Transportation, logistics, protection and security	2	3
Commercial services, retail, sales and distribution, hotels and tourism	7	10.5
Business organization, accounting, law and administration	9	13.5
Health care, social affairs, and education	12	18
Humanities, social sciences, and economic sciences, media, art, culture and design	5	8

*Note.* KldB = Klassifikation der Berufe (classification of occupations),

**Table 4.2.***Category system for responses concerning expected and occurred barriers*

<b>General category</b>	<b>Sub-category</b>	<b>Definition</b>	<b>Response example</b>
Social problems	colleagues	Interaction with colleagues	„working in a team“
	communication	General communication; non-personal communication in application process	„misunderstandings in social communication“
	customers	Interaction with customers	„clients complained about too little contact“
	handling the diagnosis	Problems regarding autism-typical behavior and its handling	„prejudices against severe disabilities“
	interview	Communication problems in job interviews	„job interviews (unsecure manner, wrong responses to questions)“
	mobbing	Mobbing, verbal and physical attacks	„animosities, mobbing, physical violence“
	supervisors	Interaction with supervisors	„missing / insufficient personal contact with [...] supervisors“
	other	Other social situations	„christmas parties, birthdays, etc.“
Formality problems	agencies	External organizations: authorities, non-profit associations, civil service	„no help from the job center“
	application process	Finding matching job vacancies; creating applications	„mean effort of 7h for one cover letter“
	equipment and environment	Work setting and sensory influences with concrete cause	„placement into an open plan office“
	work routine	Plans and working structures defined externally; hierarchy	„unclear work instructions“
	qualification	Professional suitability; CV	„rejection because of missing job experience“
	support	Orientation period and contact person	„not enough guidance“
	other	Other formal requirements	„age, gender“
Job demand problems	cognitive	Skills; capabilities	„I cannot or barely multitask“
	stress & psychosomatic	Stress and its emotional and physical consequences	„loneliness, dejectedness, headache, backache“
	time-related	Mismatch between personal rhythm and work rhythm	„feeling of no leisure time left because of commuting“
	other	Other job demands	„moving into a new city“

**Table 4.3.***Category system for responses concerning solutions*

<b>General category</b>	<b>Sub-category</b>	<b>Definition</b>	<b>Response example</b>
Self-solutions	acceptance	Showing strength in perseverance	„with a lot of patience“
	avoidance / resignation	Escaping from / giving up on a situation and suffering from it	„I suffered and held my tongue“
	communication	Approaching colleagues or superiors proactively	„Asking further questions until everything is clear“
	compensation	Using strengths to compensate	„strengths in other areas“
	concealment of diagnosis	Hiding diagnosis; lying about it	„lying with general requirements (flexibility, resilience etc.)“
	information about diagnosis	Making the diagnosis an open issue	„I told my supervisor of my diagnosis. He took it well.“
	practice / qualification	Intellectual solution in form of trouble-shooting and seeking more information	„application training“
	other	Self-solution not otherwise specifiable; compromise; independency; luck	„self-employed, with home office“
External help	external institutions	External organizations: authorities, non-profit associations, civil service	„usage of integrational service“
	private environment	Family, friends, acquaintances	„my parents helped me“
	work environment	Colleagues, superiors	„reduction of working time“
	other	Help from others, not otherwise specified	„I had support“

**Table 4.4.***Absolute and relative response frequency for participants without autism-specific job*

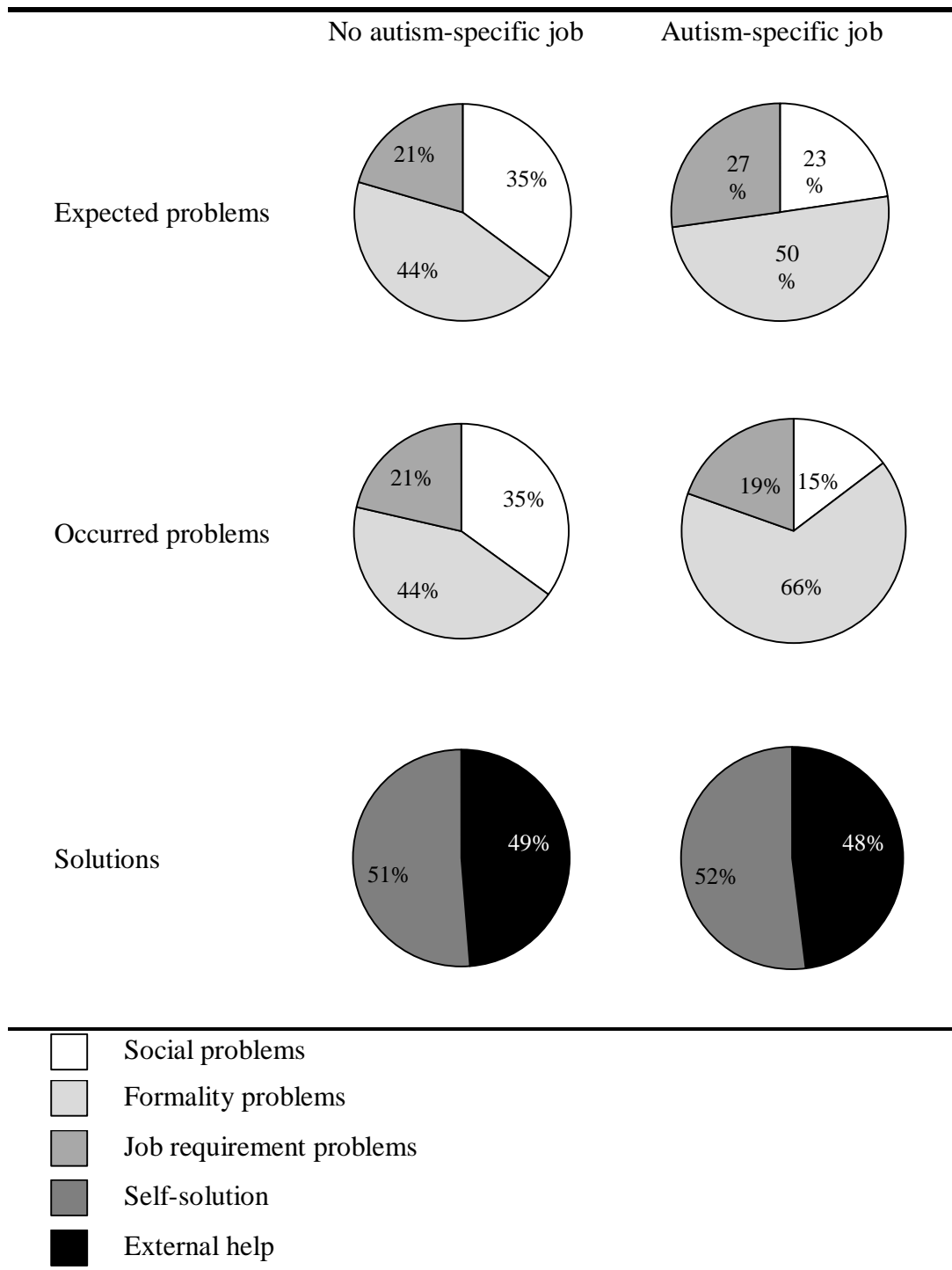
<b>Question type</b>	<b>General category</b>	<b>Sub-category</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	
Barriers	Social problems	colleagues	14	7	19	7	
		communication	28	15	43	15	
		customers	8	4	10	3	
		handling the diagnosis	9	5	14	5	
		interview	12	6	14	5	
		mobbing	2	1	11	4	
		supervisors	3	2	8	3	
		other	3	2	2	1	
		Formality problems	agencies	5	3	6	2
			application process	18	10	21	7
			equipment and environment	23	12	47	16
			qualification	15	8	6	2
			support	5	3	10	3
			work routine	19	10	38	13
			other	2	1	4	1
		Job demand problems	cognitive	10	5	15	5
			stress & psychosomatic	8	4	19	7
			time-related	1	1	1	0
			other	4	2	2	1
		Solutions	Self-solution		Used solutions		
acceptance	27			13			
avoidance / resignation	27			13			
communication	18			9			
compensation	4			2			
concealment of diagnosis	4			2			
information about diagnosis	9			4			
practice / qualification	19			9			
other	27			13			
External help	external institutions			14	7		
	private environment			3	1		
	work environment			46	22		
	other			8	4		

**Table 4.5.***Absolute and relative response frequency for participants with autism-specific job*

<b>Question type</b>	<b>General category</b>	<b>Sub-category</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	
Barriers	Social problems	colleagues	1	2	6	9	
		communication	6	11	4	6	
		customers	1	2	0	0	
		handling the diagnosis	3	6	2	3	
		interview	1	2	0	0	
		mobbing	0	0	0	0	
		supervisors	2	4	0	0	
		others	1	2	0	0	
		Formality problems	agencies	2	4	1	1
			application process	4	8	11	16
			equipment and environment	5	9	12	18
			qualification	12	23	7	10
			support	1	2	7	10
			work routine	5	9	8	12
	Job demand problems	others	0	0	1	1	
		cognitive	5	9	4	6	
		stress & psychosomatic	3	6	2	3	
		time-related	0	0	1	1	
			others	1	2	1	1
	Solutions	Self-solution		Used solutions			
acceptance			12	21			
avoidance / resignation			0	0			
communication			13	23			
compensation			2	4			
concealment of diagnosis			0	0			
information about diagnosis			1	2			
practice / qualification			7	12			
other			2	4			
External help			external institutions	2	4		
		private environment	4	7			
		work environment	10	18			
		other	4	7			

**Table 4.6.**

*General categories for expected problems, occurred problems and solutions in individuals with no autism-specific job vs. with autism-specific job*



*Note.* Irrelevant answers were not included in this analysis. All relevant general categories were relativised by the number of sub-categories they contained, making the coding of each general category equally probable.

**Table 4.7.**

*Absolute and relative frequency of cross-question cases for participants without vs. with autism-specific job*

		NASE		ASE	
		N	%	N	%
Occurrence of expected problems					
	The expected problems occurred.	106	72	27	59
	The expected problems did not occur.	41	28	19	41
Solution of occurred problems					
	The occurred problems were solved.	129	55	33	61
	The occurred problems were not solved.	105	45	21	39

*Note.* NASE = individual with non-autism-specific employment; ASE = individual with autism-specific employment. Only responses without missing data were included in this analysis.



**Table 4.8.***Summary of the bivariate Bayesian correlations of all variables*

	male	female	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
(1) Gender	N = 29 NASE	N = 36 ASE										
(2) Employment	N = 49 <b>M</b>	N = 17 <b>SD</b>	-. <sup>b</sup>	1								
(3) Tenure	4.76	6.52	.07 [-.22;.35]	-.25 [-.49;.25]	1							
(4) GSE	2.22	0.58	-.20 [-.42;.05]	.28 [.01;.52]	-.06 [-.31;.20]	1						
(5) OSE	2.32	0.67	-.29 [-.51;.05]	.24 [.01;.47]	.01 [-.24;.27]	.83 [.73;.89]	1					
(6) LS	2.65	1.07	-.09 [-.35;.14]	.07 [-.17;.32]	.17 [-.10;.42]	.44 [.22;.62]	.45 [.24;.64]	1				
(7) JS <sup>a</sup>	0.00	0.88	.02 [-.23;.26]	.00 [-.25;.24]	.10 [-.17;.36]	.30 [.06;.52]	.38 [.16;.58]	.65 [.49;.78]	1			
(8) improvement	3.41	1.35	-.09 [-.34;.16]	.08 [-.17;.32]	.01 [-.26;.27]	.33 [.09;.54]	.32 [.10;.53]	.38 [.16;.58]	.61 [.44;.76]	1		
(9) job importance	4.11	1.23	-.17 [-.41;.08]	.18 [-.06;.43]	-.01 [-.28;.26]	.41 [.18;.61]	.42 [.20;.62]	.35 [.12;.55]	.23 [-.02;.45]	.34 [.09;.56]	1	
(10) strengths	3.39	1.40	-.13 [-.37;.11]	.16 [-.08;.39]	.09 [-.17;.35]	.45 [.24;.64]	.48 [.27;.66]	.62 [.45;.76]	.81 [.72;.90]	.60 [.42;.75]	.29 [.05;.51]	1

*Note.* 95% high-density intervals are displayed in brackets; NASE = non-autism-specific employment; ASE = autism-specific employment; GSE = general self-efficacy, OSE = occupational self-efficacy, LS = life satisfaction, JS = job satisfaction, improvement = control item regarding quality of life improvement during current employment, job importance = control item regarding the importance of a job for the quality of life, strengths = control item regarding the use of strengths in current employment, <sup>a</sup> = standardized z-score, <sup>b</sup> = left out of data-analysis due to one employment group being an all-male-group.

**Table 4.9.***Results Bayesian t-tests – non autism-specific employment vs. autism-specific employment*

	NASE N = 49	ASE N = 17			
	Mean [HDI] (SD)		Difference of means [HDI]	Effect size	Difference of mean probability in %
GSE	2.00 [1.9; 2.2] (.50)	2.40 [2.1; 2.8] (.66)	.40 [.02; .78]	.67	2 < 0 < 98
OSE	2.30 [2.1; 2.5] (0.68)	2.70 [2.3; 3.0] (.62)	.39 [.01; .76]	.59	2 < 0 < 98
LS	2.6 [2.3; 2.9] (1.10)	2.80 [2.3; 3.3] (.95)	.19 [-.41; .77]	.18	50 < 0 < 50
JS <sup>a</sup>	.00 [-.24; .26] (0.86 <sup>l</sup> )	.01 [-.44; .48] (.88)	.01 [-.52; .53]	.01	51 < 0 < 49

*Note.* HDI = 95% high-density interval; ; NASE = non-autism-specific employment ASE = autism-specific employment; GSE = general self-efficacy, OSE = occupational self-efficacy, LS = life satisfaction, JS = job satisfaction, <sup>a</sup> = standardized z-score.

## Appendix

## Questionnaire on barriers to employment and their overcoming

1. Did you expect to have any problems with the general process of job-seeking?
  - a. No.
  - b. Yes, namely: \_\_\_\_\_
2. What problems occurred during the general process of job-seeking?
  - a. None.
  - b. The following: \_\_\_\_\_
3. If applicable, how did you resolve these problems?
  - a. \_\_\_\_\_
4. Did you expect to have any problems when drafting your application?
  - a. No.
  - b. Yes, namely: \_\_\_\_\_
5. What problems occurred during the creation of your application?
  - a. None.
  - b. The following: \_\_\_\_\_
6. If applicable, how did you solve these problems?
  - a. \_\_\_\_\_
7. Did you expect to have any problems with regard to the contact with potential employers?
  - a. No.
  - b. Yes, namely: \_\_\_\_\_
8. What problems occurred regarding the contact with potential employers?
  - a. None.
  - b. The following: \_\_\_\_\_
9. If applicable, how did you solve these problems?
  - a. \_\_\_\_\_

10. Did you expect to have any problems with regard to the demands of each job?

- a. No.
- b. Yes, namely: \_\_\_\_\_

11. What problems occurred regarding the job demands?

- a. None.
- b. The following: \_\_\_\_\_

12. If applicable, how did you solve these problems?

- a. \_\_\_\_\_

13. Did you expect to have any problems with regard to the working day?

- a. No.
- b. Yes, namely: \_\_\_\_\_

14. What problems occurred regarding the work routine?

- a. None.
- b. The following: \_\_\_\_\_

15. If applicable, how did you solve these problems?

- a. \_\_\_\_\_

16. Did you expect to have any problems with regard to the workplace equipment?

- a. No.
- b. Yes, namely: \_\_\_\_\_

17. What problems occurred regarding the equipment of your workplace?

- a. None.
- b. The following: \_\_\_\_\_

18. If applicable, how did you solve these problems?

- a. \_\_\_\_\_

19. Did you expect to have any problems within the work environment?
- No.
  - Yes, namely: \_\_\_\_\_
20. What problems occurred regarding the work environment?
- None.
  - The following: \_\_\_\_\_
21. If applicable, how did you solve these problems?
- \_\_\_\_\_
22. Did you expect to have any problems with the support mechanisms at the workplace?
- No.
  - Yes, namely: \_\_\_\_\_
23. What problems occurred regarding the support at the workplace?
- None.
  - The following: \_\_\_\_\_
24. If applicable, how did you solve these problems?
- \_\_\_\_\_
25. Did you expect to have any problems other than those mentioned previously
- No.
  - Yes, namely: \_\_\_\_\_
26. What problems that are not mentioned so far occurred?
- None.
  - The following: \_\_\_\_\_
27. If applicable, how did you solve these problems?
- \_\_\_\_\_

28. Please name one to three possible problems, that you consider the most challenging. Name the most challenging first. This question helps us identify the potential need for certain measures.

---

---

---

## **Chapter 5**

### **General discussion and future directions**

The last chapter of this work will deal with general limitations or methodological issues not discussed in the previous studies. I will conclude this work with practical and theoretical implications for future work. Before that, I will recapitulate the previous chapters.

## **Recapitulation**

### **Recapitulation chapter 2**

In chapter 2, two studies were conducted to create and validate a German self-report scale – the Compound Psychological Capital Scale (CPC-12) measuring psychological capital (PsyCap, Luthans, Luthans, & Luthans, 2004). We performed confirmatory factor analyses and correlations with other positive psychological constructs on the data of two German samples ( $N_1 = 321$ ;  $N_2 = 202$ ). According to our results, the CPC-12 fits the proposed model of PsyCap very well. The four subscales hope, optimism, resilience, and self-efficacy are identifiable as subcomponents of the overall measure while the higher-order factor can incrementally explain additional variance in the data. The moderate to high correlations to other work-related (meaning of work, job satisfaction and engagement;  $r = .28 - .40$ ) and more general constructs of positive psychology (i.e. subjective well-being, proactive attitude, and gratitude;  $r = .22 - .58$ ) are comparable to previous research on PsyCap (e.g., Avey, Reichard, Luthans, & Mhatre, 2011; Newman, Ucbasaran, Zhu, & Hirst, 2014) and speak for the external validity of the CPC-12. The results indicate that PsyCap could in fact be a general construct and applicable to more areas than positive organizational behavior (POB). By abstaining from items with work-related connotations, the CPC-12 can be applied to many fields of interest, i.e. sports and education. Due to the correlations of the CPC-12 with work-related constructs being similar to the Psychological Capital Questionnaire (PCQ, Avey et al., 2011; Luthans et al., 2004; Luthans, Youssef, & Avolio, 2006), the CPC-12 is also an alternative in work-related research for areas where the item wordings of the PCQ might not be suitable, i.e. volunteering or small organizations.



### **Recapitulation chapter 3**

In chapter 3 we focused on the influence of resilience and meaning of work (MOW) on the impact of cognitive, emotional and physical job demands and job resources on subjective well-being (composed of positive affect, negative affect, life satisfaction, and job satisfaction) of 550 midwives. This target group is of special interest because working conditions are worsening for midwives in Germany, e.g. understaffing, inadequate income, shift-work, insufficient time for women and for completing their duties (e.g. Ball, Curtis & Kirkham, 2002; Glass, 2009; Knezevic et al., 2011), yet many remain in the profession and even report high job satisfaction (Kirkham, Morgan, & Davies, 2006).

Within the Demand-Induced Strain Compensation model (DISC, de Jonge & Dormann, 2003), high job demands and lack of job resources lead to reduced subjective well-being and sickness, multiple regression analysis was used to create three models, each including job resources and job demands on qualitative equivalent dimensions.

While the results of the present study do not support de Jonge and Dormann's (2006) assumption of the 'Triple-Match Principle' (TMP) and therefore do not support the 'buffer hypothesis', the results provide evidence for a positive correlation of resilience and MOW and the subjective well-being in all models.

After discussing possible further investigations of resilience of midwives and interventions to foster resilience, we come to the conclusion that although organizational and political approaches and changes are urgently needed for fostering resilience in midwives (McDonald, Jackson, Wilkes, & Vickers, 2012), the work of midwives will always include workplace adversities (Hunter & Warren, 2013). It is therefore important that midwives are able to manage their reactions to these circumstances and that positive psychology in the workplace could be a much-needed approach to this topic.

## **Recapitulation chapter 4**

The aim of the study in chapter 4 was to discover how individuals with autism succeed in entering the job market. We therefore sought to on the one hand identify expected and occurred barriers keeping them from taking up and staying in employment, and on the other hand to identify the solutions used to overcome these barriers. Sixty-six employed individuals with autism – 17 of them with autism-specific employment – participated in an online survey, combining open interview questions and questionnaires.

In our qualitative content analysis, we found three main categories of barriers: social, formality, and job demand problems. Social problems include any obstacle concerning communication and human interaction. Formality problems sum up problems with organizational and practical process-related aspects of the job entry. Job demand problems describe difficulties with meeting specific requirements of an employment. Regarding solutions, we found two main categories: self-solution and external help. Self-solutions sum up different coping strategies of the individual. Solutions with external help include all approaches where the individual sought support.

Individuals in non-autism-specific employment reported a higher frequency of social and formality problems in autism-specific employment. This suggests a difference in the nature of the barriers individuals with autism encounter when entering the job market. The two groups – individuals in autism-specific employment and individuals in non-autism-specific employment - did not just differ in the number of certain problems that occurred but also in how they rated their importance. Individuals with non-autism-specific employment rated social problems as more important than formality problems while the contrary occurred with individuals with autism-specific employment. In that regard, the most frequent problems were also seen as the most important ones. However, even though individuals in autism-specific employment faced more job demand than social problems, they rated job demand

problems as less important. This is relevant because it shows that in practice, social problems should not be neglected when they are less frequent.

Regarding solutions, we found different patterns in our two study groups as well. Individuals in autism-specific employment tended to solve occurring problems less with resignation and more with acceptance, communication and practice or further qualification. This is interesting, because impairment in communication is a core symptom of Autism Spectrum Condition (American Psychological Association, 2013) and has been named as a cause of difficulties in the employment process (Hendricks, 2010; Müller, Schuler, Burton, & Yates, 2003). Yet for participants in autism-specific employment this reported weakness was not just attenuated but even transformed into a resource of problem solving behavior. Maybe this was facilitated by being surrounded by peers or supervisor's adjustment towards more direct communication (Hagner & Cooney, 2005).

In sum, our two groups of individuals without and with autism-specific employment showed differences in quality of occurred barriers, levels of general and well-being for individuals with autism.

## **Methodological issues**

### **Cross-sectional designs**

The first and most important limitations of the studies in this work is the use of cross-sectional designs. This type of research design cannot establish a temporal precedence of a hypothesized cause relative to its effect (Bowen & Wiersma, 1999). This is of course weakening the causal inference that can be made by such a design. Possible procedures to strengthen this inference with a cross-sectional design such as the counterfactual model of causation (Holland, 1986; Rubin, 1974, 1978) or the use of the propensity score method (Li, 2013; Rosenbaum & Rubin, 1983; Rubin, 1997) were not applicable in these studies due to non-random assignment and in case of chapter 4 a small sample size. The only remedy to

overcome the shortcomings in studies like these would be longitudinal studies in which the research units would be observed on multiple occasions (Ployhart & Vandenberg, 2010). I fully agree with Mills, Fleck & Kozikowski (2013) that research in positive psychology in the workplace is in dire need of longitudinal research as the majority of research in this field is cross-sectional (Donaldson & Ko, 2010). This call stands in contrast to a development that our own field of work is experiencing. The rise of short-term contracts and precarious employment in European academia (Gill, 2009; Kauppi, 2015) is thwarting this much needed collection of longitudinal data in research in positive psychology in the workplace.

### **Common method variance**

Another issue not discussed in the studies that needs at least some mentioning as it is an ongoing debate in the field of work and organizational psychology is the common method variance. Since the article by Podsakoff, MacKenzie, Lee, & Podsakoff (2003) in the *Journal of Applied Psychology*, this topic is heavily debated in work and organizational psychology (Lance, Dawson, Birkelbach, & Hoffman, 2010; Pace, 2010; Spector & Brannick, 2010). It divides the field into two groups (with deep trenches between them) with the supporters of Podsakoff et al. (2003) on one side and the other side going as far as to name common method variance an urban legend (Chan, 2009; Spector, 2006). I want to acknowledge this ongoing debate. Not opening Pandora's Box any further, I want to state that we are partially on the 'other side' but not going as far as to dismiss it as a myth. As long as this debate cannot clear if common method is in fact a problem to the results in this field, how big it might be, or if the suggested remedies are not making even worse statistical artifacts – I take a stand as a “skeptical Podsakoff agnostic”.

### **Validity**

Concluding this subsection of the chapter, and circling back to the topics from our introduction in chapter 1, I want to address another issue – the validity of results. First, I want

to address our internet survey sampling. Although data from internet surveys is not free of methodological constraints, samples from online recruitment are as diverse, adjusted, at least as good in quality as most traditional methods (Gosling, Vazire, Srivastava, & John, 2004). We discussed this point in all three studies, including the fact of a non-probabilistic sample, so I want to focus on the external validity – the possibility to generalize a particular effect across person, settings, and time (Cook, Campbell, & Day, 1979) – especially the generalizability across cultures as this was part of our introduction. In chapter 2 the results showed a bad factorial fit for the Psychological Capital Questionnaire (PCQ, Luthans & Youssef, 2004) due to cultural differences between North American culture (especially corporate culture) and German culture resulting in problematic wordings. The Compound Psychological Capital Scale (CPC-12) we created in chapter 2 works for the German wording but I am very cautious to state that the CPC-12 would be a universal scale across cultures, especially before it is re-evaluated using different samples in other life-domains in different cultures. At this point, I want to emphasize once more the importance of confirmation of a factorial structure when scales of different cultural backgrounds are imported. Not only is this question of the external validity of results a question of factorial structure but of a cultural context and i.e. its laws and regulations influencing the people within this culture (Leong & Wong, 2003; Pedrotti & Edwards, 2009). A good example here are our results on the effect of resilience on subjective well-being in German midwives in chapter 3. The strong effect could be a cultural artifact of the worsening work situation for midwives in Germany (Albrecht, Loos, Sander, & Schliwen, 2012). When we look at the research we do, we have to adopt a culturally embedded perspective, seeing the context our research subjects are living in. This is even more true when we have to go beyond racial, ethnical and cultural issues to the perspective of the human diversity model (Chin, 1993) with a focus on unique differences and patterns in groups. This focused lens approach is important in chapter 4 with our research question on individuals with Asperger's Syndrome, as some of the barriers and solutions are

specific to their neurodiverse development, not being comparable to other neurodiverse individuals, i.e. individuals with attention deficit and hyperactivity disorder.

In conclusion, I can say that the external validity of results is in dependence to the focus of the research lens, from questions of statistical, to cultural, to diversity relevance or as Nussbaum (1997, p. 59) put it:

We see ourselves and our customs (as well as our results as we might add) more clearly when we see our own way in relation to those of others.

This is a good bridge to our next part because a cultural and diversity sensitive view is not only of relevance to a methodological issue but also an important point when it comes to practical implications thus combining the methodological pillar of our approach with the second one, social relevance.

### **Practical implications**

Picking up the cultural and diversity-sensitive perspective, I want to focus on a general practical implication, as many study-specific implications have been part of the last chapters. With our second pillar of the contemporary approach to positive psychology in the workplace in mind – social relevance- there is one implication for applied research of great importance: The inclusion of people from the target group into the research design process. I followed this implication in chapter 3 by including co-author Sarah Krückels, a midwife herself, into the research process to get an insight into the problems of this group of workers. In chapter 4, I met with autism self-advocacy groups and individuals with autism to get feedback on important topics and item wordings. This inclusion of people from the group of interest of the research is an important step to go from research *on*, to research *with* and research *for* the target group.

There are many advantages to that approach. The first advantage is the joint expertise: While the researcher possesses the knowledge on psychological and methodological issues, the person from the target group can help to identify important questions of relevance as well as a view from the inside on possible idiosyncrasies of that specific group. The second advantage is better communication of the results back to the target group using a network that picks up the research language and translates it into the language used and understood in the target group by social networks, blogs and official communications of associations and organizations. Another advantage is taking us back to the criticism of positive psychology in the workplace I mentioned in chapter 1. An integration of individuals from the target group sharpens the eye towards possible structural or cultural problems thus providing an amount of protection or at least a critical reflection against the criticism expressed by Warren (2010, p.320):

...positive psychology might unwittingly be providing the apparatus for a kind of “organizational projection” whereby the organization remains blameless and appears saintly in “allowing” its staff to learn how to flourish, rather than recognized for generating the conditions for negativity to such deep-rooted hold in the first place.

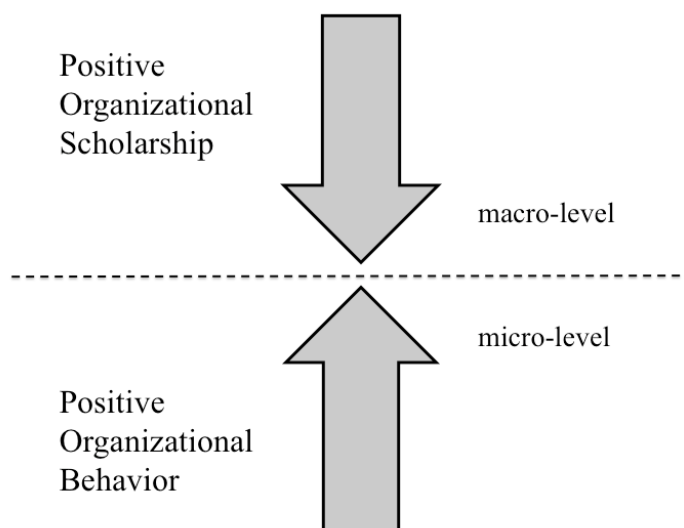
In a next step, the close communication with individuals from the research target group can help to tailor specific interventions from the rich options of positive psychology interventions (e.g., Bolier et al., 2013; Gander, Proyer, Ruch, & Wyss, 2013; Luthans, Avey, Avolio, & Peterson, 2010; Luthans, Avey, & Patera, 2008; Robertson, Cooper, Sarkar, & Curran, 2015). Stepping away from a one-size-fits-all approach, such tailored interventions can help to improve the effectiveness of interventions by i.e. considering possible problems with word ambiguities or metaphors due to autism (Attwood, 2006; Szatmari, Bremner, & Nagy, 1989) or fitting interventions into the tight workday of a midwife.

## Theoretical implications

Following the practical implications, I think there are theoretical implications that need to be discussed. I will start with a more general implication about the need for a theoretical model to integrate research on positive psychology in the workplace, followed by specific theoretical implications following the results of our studies.

### Model integration

When trying to integrate our studies in the model by Luthans & Youssef (2007, figure 5.1) for the relationship between positive organizational scholarship (POS) and POB, I would argue that all three studies are situated on the micro-level or in the cluster of POB.

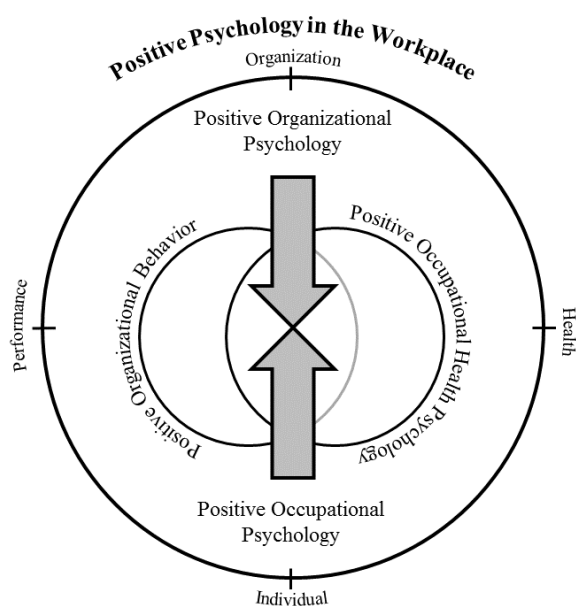


*Figure 5.1.* Proposed model by Luthans & Youssef (2007) for the relationship between POS and POB.

With a look at our proposed model from chapter 1 (figure 5.2.), the picture is more differentiated as the construction of the CPC-12 in chapter 2 is part of POB. The studies from chapter 3 and 4 are situated in the overlapping part of POB and positive occupational psychology as they focus on classical variables used in POB - resilience and self-efficacy - while including topics of occupational psychology like job demands and resources as well as



work environment. As this model is more differentiated than the one proposed by Luthans & Youssef (2007), it leaves room for improvement, i.e. a dimension on how positive psychology is integrated in the workplace – from short trainings to improvement of the “heart” of the company with equal interest in financial and well-being outcomes. Such a typology of positive psychology in the workplace could help theoretical foundations as much as the evaluations and comparisons of the application in organizations.



*Figure 5.2.* An integrated model of the terms used in positive psychology at the workplace

### **Bayesian structural modeling**

On a methodological level, following chapter 2, Bayesian structural equation modeling (BSEM) could be an interesting alternative to the traditional maximum-likelihood parameter estimation of confirmatory factor analysis (CFA) for the cultural comparison of constructs. The assumptions of the classical CFA could be too strict for practical purposes in cultural comparisons, where small deviations from complete independence have no substantial theoretical impact (Church & Burke, 1994) and a random effect model could be favorable over fixed effects. As there is an ongoing debate on the appropriateness of CFA in estimating measurement models of questionnaires (e.g., Fong & Ho, 2013; Golay, Lecerf, Watkins, &

Canivez, 2014; Golay, Reverte, Rossier, Favez, & Lecerf, 2011; McCrae, Zonderman, Costa, Bond, & Paunonen, 1996), the use of BSEM (MacCallum, Edwards, & Cai, 2012; Muthén & Asparouhov, 2012) could be a useful alternative. In this analysis the zero-fixed cross-loadings are treated as random effects with mean zero and a small variance, allowing for sample-wise minor divergences from independence (Muthén & Asparouhov, 2012). This could prove an interesting alternative for scales used in positive psychology in the workplace.

### **Resilience versus hardiness**

In consequence of chapter 2 and our study on the resilience of midwives stands the theoretical implication of the comparison or interaction between the constructs resilience and hardiness. While resilience is defined in many forms, making it kind of a blurry concept (Pangallo, Zibarras, Lewis, & Flaxman, 2015), the most common definition is the ability to bounce back or recover from stress, and to adapt to stressful or traumatic events (Carver, 1998; Tusaie & Dyer, 2004) or as Windle (2011, p.152) defined

...the process of effectively negotiating, adapting to, or managing significant sources of stress or trauma. Assets and resources within the individual, their life and environment facilitate this capacity for adaptation and “bouncing back” in the face of adversity. Across the life course, the experience of resilience will vary.

Different from resilience, hardiness was introduced by Suzanne Kobasa (Kobasa, 1979) as a personal resource against the consequences of negative effects, especially occupational stress, on health (Kobasa, 1982; Kobasa, Maddi, & Kahn, 1982). It is proposed as a composite construct with the components commitment, control, and change:

“Commitment is the ability to believe in the truth, importance and interest value of who one is and what one is doing; and thereby, the tendency to involve oneself fully in many situations of life [...]. Control refers to the tendency to believe and act as if one could influence the course of events [...]. Challenge is based on the belief that change, rather than stability, is the normative mode of life” (Kobasa, 1988, p.101).

Hardiness is seen as a personality variable – the hardy personality (Kobasa, 1979, 1982; Kobasa, Maddi, Puccetti, & Zola, 1985; Kobasa, Maddi, & Zola, 1983) - in contrast to resilience, which is seen on the spectrum between state and trait (Luthans et al., 2004; Luthans et al., 2006). Future research should concentrate on the possible interaction of these constructs or if and how they possibly serve as prerequisites of each other (Maddi, 2005, 2013). A deeper understanding of the effect and its paths of “bouncing back” versus “staying strong” could help to tailor new interventions, job crafting or the understanding of person-environment fit in specific stressful environments.

### **The role of self-efficacy in inclusion**

Derived from our study in chapter 4 on job barriers and autism, I see great potential in further research on autism-related career development and self-efficacy (Bandura, 1977, 1982). The early research on women’s career choices and self-efficacy has shown that this variable has an effect on the willingness to engage in specific tasks as well as the persistence under resistance (Betz & Hackett, 1981, 1983; Hackett & Betz, 1981) and is linked to critical occupational outcomes (Betz, 2001). Furthermore, research on individuals with disabilities has found that little experience in competitive employment and positive feedback diminishes the use of past performances as potential sources for developing occupational self-efficacy (Fabian & Liesener, 2005). I think that research on the effect of occupational self-efficacy and employment and work environment could be a fertile ground for the creation of vocational interventions, as well as important indications for organizational policies such as diversity trainings in the workplace.

### **Conclusion**

As our studies can only be a start with a few spotlights into different areas, I hope that I could show the importance of a contemporary approach to positive psychology in the workplace based on the use of solid methods and social relevance. WI would argue that these

two pillars are mandatory for an approach towards the problems interrelated with globalization and the changes of work we have seen in the last two decades, especially the intensification of work, diversity and topics that stayed without a direct spotlight here, i.e. the aging of the workforce. Furthermore, I think that it is time to integrate these pillars into the academic curriculum for a comprehensive education of young scientists and applied psychologists who not only see possible consequences of their research but also should involve themselves in policymaking, from academia to organizations. I believe that positive psychology in the workplace should have its focus on the chance for all individuals to lead flourishing lives and might make it even more likely to build a flourishing society.

With this last conclusion, I encourage you, the reader, to conduct research, involve yourself in policymaking, educate young academics on important topics – all based on the two pillars of our contemporary approach to positive psychology in the workplace – solid methods and social relevance.

## References

- Albrecht, M., Loos, S., Sander, M., & Schliwen, A. (2012). *Versorgungs- und Vergütungssituation in der außerklinischen Geburtshilfe [The medical care and salary situation in ambulatory obstetrics]*. Berlin, GER: IGES Institut GmbH.
- American Psychological Association. (2013). *DSM-5 Autism spectrum disorder*. Arlington, VA: American Psychiatric Publishing
- Attwood, A. (2006). *The complete guide to Asperger's syndrome*. London, UK: Jessica Kingsley Publishers.
- Avey, J. B., Reichard, R. J., Luthans, F., & Mhatre, K. H. (2011). Meta-analysis of the impact of positive psychological capital on employee attitudes, behaviors, and performance. *Human Resource Development Quarterly*, 22(2), 127-152.
- Ball, L., Curtis, P., & Kirkham, M. (2002). *Why do midwives leave?*. London, UK: Royal College of Midwives.
- Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191-214.
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37(2), 122-147.
- Betz, N. E. (2001). Career self-efficacy. In F. T. Leong & A. Barak (Eds.), *Contemporary models in vocational psychology: A volume in honor of Samuel H. Osipow* (pp. 55-77). Mahwah, NJ: Erlbaum.
- Betz, N. E., & Hackett, G. (1981). The relationship of career-related self-efficacy expectations to perceived career options in college women and men. *Journal of Counseling Psychology*, 28(5), 399-410.

- Betz, N. E., & Hackett, G. (1983). The relationship of mathematics self-efficacy expectations to the selection of science-based college majors. *Journal of Vocational Behavior*, 23(3), 329-345.
- Bolier, L., Haverman, M., Westerhof, G. J., Riper, H., Smit, F., & Bohlmeijer, E. (2013). Positive psychology interventions: A meta-analysis of randomized controlled studies. *BMC Public Health*, 13(1), 119.
- Bowen, H. B., & Wiersma, M. F. (1999). Matching method to paradigm in strategy research: Limitations of cross-sectional analysis and some methodological alternatives. *Strategic Management Journal*, 20, 625-636.
- Carver, C. S. (1998). Resilience and thriving: Issues, models, and linkages. *Journal of Social Issues*, 54(2), 245-266.
- Chan, D. (2009). So why ask me? Are self-report data really that bad? In C. E. Lance & R. J. Vandenberg (Eds.), *Statistical and methodological myths and urban legends* (pp. 309-336). New York, NY: Routledge.
- Chin, J. L. (1993). Toward a psychology of difference: Psychotherapy for a culturally diverse population. In J. L. Chin, V. De la Cancela, & Y. M. Jenkins (Eds.), *Diversity in psychotherapy: The politics of race, ethnicity, and gender* (pp. 69-91). Estport, CN: Praeger.
- Church, A. T., & Burke, P. J. (1994). Exploratory and confirmatory tests of the big five and Tellegen's three- and four-dimensional models. *Journal of Personality and Social Psychology*, 66(1), 93.
- Cook, T. D., Campbell, D. T., & Day, A. (1979). *Quasi-experimentation: Design & analysis issues for field settings*. Boston, MA: Houghton Mifflin
- de Jonge, J., & Dormann, C. (2003). The DISC Model: Demand-Induced Strain Compensation Mechanisms in job stress. In M.F. Dollard, A.H. Winefield, & H.R.

- Winefield (Eds.), *Occupational stress in the service professions* (pp. 43-74). London, UK: Taylor & Francis.
- de Jonge, J., & Dormann, C. (2006). Stressors, resources, and strain at work: A longitudinal test of the Triple-Match principle. *Journal of Applied Psychology, 91*(6), 1359-1374.
- Donaldson, S. I., & Ko, I. (2010). Positive organizational psychology, behavior, and scholarship: A review of the emerging literature and evidence base. *The Journal of Positive Psychology, 5*(3), 177-191.
- Fabian, E. S., & Liesener, J. J. (2005). Promoting the career potential of youth with disabilities. In S. D. Brown & R. W. Lent (Eds.), *Career development and counseling: Putting theory and research to work* (pp. 551-572). New York, NY: Wiley.
- Fong, T., & Ho, R. (2013). Factor analyses of the Hospital Anxiety and Depression Scale: a Bayesian structural equation modeling approach. *Quality of Life Research, 22*(10), 2857-2863.
- Gander, F., Proyer, R. T., Ruch, W., & Wyss, T. (2013). Strength-based positive interventions: Further evidence for their potential in enhancing well-being and alleviating depression. *Journal of Happiness Studies, 14*(4), 1241-1259.
- Gill, R. (2009). Breaking the silence: The hidden injuries of neo-liberal academia. In R. Flood & R. Gill (Eds.), *Secrecy and silence in the research process: Feminist reflections*. London, UK: Routledge.
- Glass, N. (2009). An investigation of nurses' and midwives' academic/ clinical workplaces: A healing model to improve and sustain hope, optimism, and resilience in professional practice. *Holistic Nursing Practice, 23*(3), 158-170.
- Golay, P., Lecerf, T., Watkins, M. W., & Canivez, G. L. (2014). *Bayesian structural equation modeling of the WISC-IV with a large referred US sample*. Paper presented at the 9th Conference of the International Test Commission, San Sebastian, ES.

- Golay, P., Reverte, I., Rossier, J., Favez, N., & Lecerf, T. (2011). *Revisiting the factor structure of the French WISC-IV: Insights through Bayesian structural equation modeling (BSEM)*. Paper presented at the 12th Congress of the Swiss Psychological Society, Fribourg, CH.
- Gosling, S. D., Vazire, S., Srivastava, S., & John, O. P. (2004). Should we trust web-based studies? A comparative analysis of six preconceptions about internet questionnaires. *American Psychologist, 59*(2), 93-104.
- Hackett, G., & Betz, N. E. (1981). A self-efficacy approach to the career development of women. *Journal of Vocational Behavior, 18*(3), 326-339.
- Hagner, D., & Cooney, B. F. (2005). "I do that for everybody": Supervising employees with autism. *Focus on Autism and Other Developmental Disabilities, 20*(2), 91-97.
- Hendricks, D. (2010). Employment and adults with autism spectrum disorders: Challenges and strategies for success. *Journal of Vocational Rehabilitation, 32*(2), 125-134.
- Holland, P. W. (1986). Statistics and causal inference. *Journal of the American statistical Association, 81*(396), 945-960.
- Hunter, B., & Warren, L. (2013). *Investigating resilience in midwifery: Final report*. Cardiff, UK: Cardiff University.
- J. Mills, M., R. Fleck, C., & Kozikowski, A. (2013). Positive psychology at work: A conceptual review, state-of-practice assessment, and a look ahead. *The Journal of Positive Psychology, 8*(2), 153-164.
- Kauppi, N. (2015). The academic condition: Unstable structures, ambivalent narratives, dislocated identities. In L. Evans & J. Nixon (Eds.), *Academic identities in higher education: The changing European landscape*. London, UK: Bloomsbury Academic.
- Kirkham, M., Morgan, R., & Davies, C. (2006). *Why do midwives stay?* London, UK: Royal College of Midwives.



- Knezevic, B., Milosevic, M., Golubic, R., Belosevic, L., Russo, A., & Mustajbegovic, J. (2011). Work-related stress and work ability among Croatian university hospital midwives. *Midwifery*, 27(2), 146-153.
- Kobasa, S. C. (1979). Stressful life events, personality, and health: an inquiry into hardiness. *Journal of Personality and Social Psychology*, 37(1), 1.
- Kobasa, S. C. (1982). Commitment and coping in stress resistance among lawyers. *Journal of Personality and Social Psychology*, 42(4), 707.
- Kobasa, S. C. (1988). Conceptualization and measurement of personality in job stress research. In J. J. Hurrell Jr., L. R. Murphy, S. L. Sauter, & C. L. Cooper (Eds.), *Occupational stress: Issues and developments in research* (pp. 100-109). New York, NY: Taylor & Francis.
- Kobasa, S. C., Maddi, S. R., & Kahn, S. (1982). Hardiness and health: A prospective study. *Journal of Personality and Social Psychology*, 42(1), 168.
- Kobasa, S. C., Maddi, S. R., Puccetti, M. C., & Zola, M. A. (1985). Effectiveness of hardiness, exercise and social support as resources against illness. *Journal of Psychosomatic Research*, 29, 525-533.
- Kobasa, S. C., Maddi, S. R., & Zola, M. A. (1983). Type A and hardiness. *Journal of Behavioral Medicine*, 6, 41-51.
- Lance, C. E., Dawson, B., Birkelbach, D., & Hoffman, B. J. (2010). Method effects, measurement error, and substantive conclusions. *Organizational Research Methods*, 13(3), 435-455.
- Leong, F. T., & Wong, P. T. (2003). Optimal human functioning from cross-cultural perspectives: Cultural competence as an organizing framework. In W. V. Walsh (Ed.),

- Counseling psychology and optimal human functioning* (pp. 123-150). Mahwah, NJ: Lawrence Erlbaum.
- Li, M. (2013). Using the propensity score method to estimate causal effects: A review and practical guide. *Organizational Research Methods, 16*(2), 188-226.
- Luthans, F., Avey, J. B., Avolio, B. J., & Peterson, S. J. (2010). The development and resulting performance impact of positive psychological capital. *Human Resource Development Quarterly, 21*(1), 41-67.
- Luthans, F., Avey, J. B., & Patera, J. L. (2008). Experimental analysis of a web-based training intervention to develop positive psychological capital. *Academy of Management Learning & Education, 7*(2), 209-221.
- Luthans, F., Luthans, K. W., & Luthans, B. C. (2004). Positive psychological capital: Beyond human and social capital. *Business Horizons, 47*(1), 45-50.
- Luthans, F., & Youssef, C. M. (2004). Human, social, and now positive psychological capital management: Investing in people for competitive advantage. *Organizational Dynamics, 33*(2), 143-160.
- Luthans, F., & Youssef, C. M. (2007). Emerging positive organizational behavior. *Journal of Management, 33*(3), 321-349.
- Luthans, F., Youssef, C. M., & Avolio, B. J. (2006). *Psychological capital: Developing the human competitive edge*. Ney York, NY: Oxford University Press.
- MacCallum, R. C., Edwards, M. C., & Cai, L. (2012). Hopes and cautions in implementing Bayesian structural equation modeling. *Psychological Methods, 17*(3), 340-345.
- Maddi, S. (2005). On hardiness and other pathways to resilience. *The American Psychologist, 60*(3), 265-267.
- Maddi, S. (2013). Personal Hardiness as the basis for Resilience. *Hardiness* (pp. 7-17). Dordrecht, NL: Springer Netherlands.

- McCrae, R. R., Zonderman, A. B., Costa, P. T., Bond, M. H., & Paunonen, S. V. (1996). Evaluating replicability of factors in the Revised NEO Personality Inventory: Confirmatory factor analysis versus Procrustes rotation. *Journal of Personality and Social Psychology, 70*(3), 552.
- McDonald, G., Jackson, D., Wilkes, L., & Vickers, M. H. (2012). A work-based educational intervention to support the development of personal resilience in nurses and midwives. *Nurse Education Today, 32*(4), 378-384.
- Müller, E., Schuler, A., Burton, B. A., & Yates, G. B. (2003). Meeting the vocational support needs of individuals with Asperger syndrome and other autism spectrum disabilities. *Journal of Vocational Rehabilitation, 18*(3), 163-175.
- Muthén, B., & Asparouhov, T. (2012). Bayesian structural equation modeling: a more flexible representation of substantive theory. *Psychological Methods, 17*(3), 313-335.
- Newman, A., Ucbasaran, D., Zhu, F., & Hirst, G. (2014). Psychological capital: A review and synthesis. *Journal of Organizational Behavior, 35*(S1), 120-138.
- Nussbaum, M. C. (1997). *Cultivating humanity*. Cambridge, MA: Harvard University Press.
- Pace, V. L. (2010). Method variance from the perspectives of reviewers: Poorly understood problem or overemphasized complaint? *Organizational Research Methods, 13*(3), 421-434.
- Pangallo, A., Zibarras, L., Lewis, R., & Flaxman, P. (2015). Resilience through the lens of interactionism: A systematic review. *Psychological Assessment, 27*(1), 1-20.
- Pedrotti, J., & Edwards, L. (2009). The intersection of positive psychology and multiculturalism in counseling. In J. Ponterotto, M. Casas, L. Suzuki, & C. Alexander (Eds.), *Handbook of multicultural counseling* (pp. 165-174). Thousand Oaks, CA: Sage.
- Ployhart, R. E., & Vandenberg, R. J. (2010). Longitudinal research: The theory, design, and analysis of change. *Journal of Management, 36*(1), 94-120.

- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879.
- Robertson, I. T., Cooper, C. L., Sarkar, M., & Curran, T. (2015). Resilience training in the workplace from 2003 to 2014: A systematic review. *Journal of Occupational and Organizational Psychology, 88*(3), 533–562.
- Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika, 70*(1), 41-55.
- Rubin, D. B. (1974). Estimating causal effects of treatments in randomized and nonrandomized studies. *Journal of Educational Psychology, 66*(5), 688-701.
- Rubin, D. B. (1978). Bayesian inference for causal effects: The role of randomization. *The Annals of Statistics, 6*, 34-58.
- Rubin, D. B. (1997). Estimating causal effects from large data sets using propensity scores. *Annals of Internal Medicine, 127*(8), 757-763.
- Spector, P. E. (2006). Method variance in organizational research truth or urban legend? *Organizational Research Methods, 9*(2), 221-232.
- Spector, P. E., & Brannick, M. T. (2010). Common method issues: An introduction to the feature topic in organizational research methods. *Organizational Research Methods, 13* (3), 403-406. doi:10.1177/1094428110366303
- Szatmari, P., Bremner, R., & Nagy, J. (1989). Asperger's Syndrome: A review of clinical features. *The Canadian Journal of Psychiatry, 34*, 554-560.
- Tusaie, K., & Dyer, J. (2004). Resilience: A historical review of the construct. *Holistic Nursing Practice, 18*(1), 3-10.
- Warren, S. (2010). What's Wrong with Being Positive? In P. A. Linley, S. Harrington, & G. Nicola (Eds.), *Oxford Handbook of Positive Psychology and Work* (pp. 313-322). New York, NY: Oxford University Press.

Windle, G. (2011). What is resilience? A review and concept analysis. *Reviews in Clinical Gerontology, 21*(2), 152-169.

**Authors' contributions:****Measuring Psychological Capital: Construction and validation of the Compound****PsyCap Scale**

*Timo Lorenz, Clemens Beer, Jan Pütz, & Kathrin Heinitz*

Study concept and design: Timo Lorenz

Method development: Timo Lorenz

Acquisition of data: Timo Lorenz, Clemens Beer, Jan Pütz

Drafting of the manuscript: Timo Lorenz, Clemens Beer, Jan Pütz

Critical revision of the manuscript: Timo Lorenz, Kathrin Heinitz

Statistical analyses: Timo Lorenz, Clemens Beer, Jan Pütz

Study supervision: Timo Lorenz, Kathrin Heinitz

**Well-being and labor: Do resilience and meaning of work buffer the job demands of midwives?**

*Timo Lorenz, Sarah Krückels, Daniel Schulze, & Kathrin Heinitz*

Study concept and design: Timo Lorenz

Method development: Timo Lorenz, Daniel Schulze

Acquisition of data: Sarah Krückels

Drafting of the manuscript: Timo Lorenz, Sarah Krückels

Critical revision of the manuscript: Timo Lorenz, Kathrin Heinitz

Statistical analyses: Timo Lorenz, Daniel Schulze

Study supervision: Timo Lorenz, Kathrin Heinitz

**Job barriers and autism: Comparing job-related barriers and possible solutions in and outside of autism-specific employment.**

*Timo Lorenz, Cora Frischling, Raphael Cuadros, & Kathrin Heinitz*

Study concept and design: Timo Lorenz, Cora Frischling

Method development: Timo Lorenz (quantitative & qualitative), Cora Frischling (qualitative)

Acquisition of data: Timo Lorenz

Drafting of the manuscript: Timo Lorenz, Cora Frischling

Critical revision of the manuscript: Raphael Cuadros

Statistical analyses: Timo Lorenz (quantitative & qualitative), Cora Frischling (qualitative),  
Raphael Cuadros (qualitative)

Study supervision: Timo Lorenz, Kathrin Heinitz



## **Curriculum Vitae**

For reasons of data protection,  
the curriculum vitae is not included in the online version

## **Curriculum Vitae**

For reasons of data protection,  
the curriculum vitae is not included in the online version

## **Curriculum Vitae**

For reasons of data protection,  
the curriculum vitae is not included in the online version

## **Curriculum Vitae**

For reasons of data protection,  
the curriculum vitae is not included in the online version

## **Curriculum Vitae**

For reasons of data protection,  
the curriculum vitae is not included in the online version

## **Curriculum Vitae**

For reasons of data protection,  
the curriculum vitae is not included in the online version

## **Erklärung**

Hiermit versichere ich, dass ich die vorgelegte Arbeit selbstständig verfasst habe.  
Andere als die angegebenen Hilfsmittel habe ich nicht verwendet. Die Arbeit ist in keinem  
früheren Promotionsverfahren angenommen oder abgelehnt worden.

Berlin, 26. Januar 2016

(Timo Lorenz)