

Leadership and Work Stress:
A Three Study Investigation on Stress-Related
Antecedents and Consequences of Full-Range Leadership Behaviors

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Preface

With the finalization of my dissertation a three-year journey is coming to an end. Therefore, I would like to express my gratitude to the people who accompanied me during these exciting and challenging years.

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Summary

This dissertation examines the role the behaviors of leaders play in the context of work stress. Recently, the interrelation between the behavior of the leader and its consequences for followers has received growing attention from researchers as well as practitioners. Yet, important research questions remain unanswered. Therefore, this dissertation combines stress-related antecedents as well as stress-related consequences of leader behaviors in face of the full-range leadership behavior pattern (i.e. laissez-faire, transactional, and transformational leadership) to create an integrative model of leadership and to provide a detailed assessment of potential stress-related outcome variables. Thus, I focus on the extension of findings on the basis of different, innovative measurement approaches to uncover robust effects between leadership and different stress measures. Further, I look at the mediation model of leadership to enable a better understanding of how leaders influence stress levels of their followers. Combined with the specification of when this influence is particularly strong and when it is not, my dissertation provides an encompassing research model in the field of leadership as well as stress research. I have conducted three empirical studies to shed light into this field of inquiry. In the first study I take leader stress into account to investigate how leader stress influences leader behavior patterns. In the second and third study I take follower stress into account and scrutinize which behavioral strategies of leaders have a positive impact on the amount of follower stress and which strategies do not or even have an inverse impact. In study two I highlight the daily variability of leadership behaviors and in study three I implement an objective indicator of stress measurement.

Study one combines research strands from the two perspectives of antecedents and consequences of transformational leader behaviors. The first study of the dissertation contributes to leadership literature by linking perceived leader stress with leaders' displayed transformational leadership behaviors and its impact on followers' levels of burnout. 294 dyads of leaders and their followers took part in this study and provided information on transformational leadership style, levels of perceived stress, and burnout. Results show that (1) stressed leaders display less transformational

leader behaviors, (2) leaders' transformational leadership behaviors reduce follower burnout, and that (3) the relationship between leader stress and follower burnout is mediated by transformational leadership behaviors. Consistent with previous research, results show that leader stress seems to have a negative impact on displayed high quality leader behaviors. Findings help to extend the scholarly understanding of transformational leadership behaviors by identifying its situational origins together with direct consequences of this pattern of behaviors. Therefore, this study represents an important step toward achieving a better understanding of antecedents and also consequences of transformational leader behaviors with regard to leader and follower stress.

The second study of the dissertation contributes to literature on leadership by linking day-level full-range leadership behaviors (laissez-faire, transactional, and transformational leadership) with employees' daily levels of work stress. A moderated mediational framework consisting of the job demands-resources model, and type of daily communication, is introduced to specify how and when leaders affect followers' daily stress levels. Also, leader-distance theory is addressed to focus on the interaction frequency between leader and follower. 209 participants took part in a diary study over five consecutive working days and provided information on their leaders' behavior, characteristics of job demands and resources (with regard to role conflict and social support), type of communication with supervisors, and information on their perceived level of work stress. Results show that leader behaviors have significant effects on followers' levels of stress on a day-to-day basis. Laissez-faire behavior increases followers' daily levels of stress and transactional as well as transformational leader behaviors reduce it. These effects are mediated by job resources, but not by job demands. Similarly, the type of communication functions as a moderator in the relationship between leaders' behaviors, job resources and work stress. Results reveal that leader behaviors vary from one day to another. These results question the static, trait-like perspective of leadership behaviors. Further, results support the notion that daily leadership behaviors directly influence followers' daily levels of work stress. The diary design adds value not only on a methodological basis in case of quality of the data collected, but also on a theoretical basis by looking at the processes in the leader-follower interaction with direct attention paid to actual behaviors.

The third study of the dissertation contributes to literature on leadership by linking the full-range leadership behavior patterns of laissez-faire, transactional and transformational leadership behaviors with a subjective and an objective indicator of employees' work stress. The study includes a mediational framework to specify how leaders affect followers' stress levels, seen through the lens of the job demands-resources model (with regard to organizational justice and role conflict). The study enables a comparison of full-range leadership conducts influence on an objective indicator of employees' work stress, namely cortisol assessed via hair, and a subjective indicator of stress, assessed via questionnaire. Hair cortisol is an objective biological assessment of work stress in this study and provides an innovative means of displaying the cortisol concentration of the human body over time. 129 employees took part in this study. Participants provided information on the leadership behavior of their line manager, and on the characteristics of their job demands and resources, as well as a hair sample, and information on their level of subjective stress. Results show leader behaviors have significant effects on subjective work stress and hair cortisol concentration. Results differ for the two stress measures: hair cortisol is influenced by transformational leadership. This relation is mediated by job resources. Moreover, job demands function as a mediator for the relation between leader behaviors and perceived stress. This study strengthens the relevance of leader behavior for employees' subjective as well as objective level of work stress. It contributes to the literature by combining research on stress-related outcomes of leader behaviors with innovative measures of work stress. By applying the full-range leadership framework, the simultaneous influence of distinctive leadership behavior patterns on followers' levels of work stress could be observed. This study is set apart from recent studies that solely focus on the use of subjective indicators of stress and extends this research tradition by applying an objective biological measure to the assessment of work stress.

In summary this dissertation extends existing research on stress-related antecedents as well as consequences of full-range leadership behaviors. My contribution to the field is to identify stress-related preconditions of (transformational) leadership behavior to gain a better understanding of the role stress may play in the genesis of leader behaviors within organizations. At the same time, my dissertation offers important insights into stress-related consequences of (full-range) leadership behaviors.

Moreover, I outlined mediating mechanisms through the lens of the job demands-resources model to further specify the relation between leader behaviors and work stress. In sum, results show that stress impairs leaders' behaviors, which has important consequences on followers' stress levels (on a subjective as well as objective level of measurement). Taken together, my dissertation helps to close current research gaps and to extend knowledge in the context of stress-related antecedents as well as outcomes of supervisor behaviors.

Zusammenfassung

In der vorliegenden Dissertation wird untersucht, welche Rolle das Verhalten von Führungskräften im Zusammenhang mit Stress bei der Arbeit einnimmt. In den letzten Jahren hat das Verhalten von Führungskräften und deren stressbezogenen Konsequenzen sowohl von Forschern als auch von Praktikern zunehmende Beachtung erfahren. Die Forschung zeigt, dass Führungskräfte Einfluss auf das Stresserleben von deren Mitarbeitern nehmen können. Es wird bisher jedoch kaum untersucht, inwiefern sich Stress bei Führungskräften auf deren eigene Verhaltensweisen auswirkt. Weiterhin ist wenig darüber bekannt, wie genau Führungsverhalten auf das Stresslevel der Mitarbeiter wirkt. Die vorliegende Dissertation untersucht daher stressbezogene Vorbedingungen wie auch Konsequenzen von Führungsverhalten anhand drei empirischer Studien. Hierbei werden die sogenannten Full-Range Leadership Verhaltensweisen (laissez-faire, transaktionale sowie transformationale Führung) genauer betrachtet, um ein integratives Führungsmodell zu untersuchen und um eine detaillierte Messung von potenziellen Stressvariablen zu ermöglichen. Dieser Ansatz stellt eine Erweiterung bestehender Forschung auf Basis innovativer Methoden der Stressmessung dar, um robuste Zusammenhänge zwischen Führung und Stress aufzudecken.

Eine verbreitete Annahme der Führungsforschung ist, dass Führungskräfte besonders in stressigen Situationen auf transformationale Verhaltensweisen zurückgreifen. Gleichzeitig dokumentieren aktuelle empirische Studien, dass Führungskräfte unter starker Beanspruchung ihre Führungsaktivität reduzieren und keine hochanspruchsvollen Verhaltensweisen, wie transformationale Führung, zeigen. Unter Berücksichtigung dieser beiden Forschungsannahmen setzt die erste Studie Vorbedingungen und Konsequenzen transformationaler Führung gemeinsam in ein Rahmenmodell. Auf Grundlage der Emotional Contagion-Theorie wird überprüft, ob sich das Stresserleben der Führungskraft direkt auf das Stressempfinden der Mitarbeiter überträgt oder ob es über eine Änderung des Führungsverhaltens eher indirekt auf die Mitarbeiter wirkt. 294 Führungsdynaden - bestehend aus Führungskraft und Mitarbeiter - nahmen an der Befragung teil. Die Führungskräfte schätzten ihr eigenes subjek-

tives Stresserleben ein. Die Mitarbeiter bewerteten das transformationale Führungsverhalten ihres Vorgesetzten sowie ihr selbsteingeschätztes Burnout-Level. Die Ergebnisse zeigen, dass (1) gestresste Führungskräfte in geringerem Maße transformational führen, (2) das transformationale Führungsverhalten des Vorgesetzten die Ausprägung von Burnout bei Mitarbeitern reduziert und (3) der Zusammenhang zwischen dem Stresserleben der Führungskraft und dem Burnout der Mitarbeiter durch transformationales Führungsverhalten indirekt beeinflusst, also mediiert, wird. Die Ergebnisse stehen somit im Einklang mit beiden Argumentationsrichtungen: ein geringes Stresslevel bewirkt das richtige Maß an Erregung, um transformationales Verhalten zu zeigen, wohingegen zu viel Stress die Fähigkeiten von Führungskräften einschränkt, qualitativ hochwertige Führung auszuüben.

In Studie 2 werden kurzzeitige Effekte von Führungsverhalten auf das Stresserleben von deren Mitarbeitern in den Vordergrund gestellt. Gleichzeitig wird ein übergeordnetes theoretisches Rahmenmodell untersucht, um einen systematischen Vergleich der Auswirkungen von unterschiedlichen Führungsverhaltensweisen auf Mitarbeiterstress durchzuführen. Dies geschieht anhand der Dimensionen der Full-Range Leadership Theorie (laissez-faire, transaktionale sowie transformationale Führung). Das Rahmenmodell wird zu einem moderierten Mediatormodell unter Einbezug der Job Demands-Resources Theorie sowie der Art der Kommunikation zwischen Mitarbeiter und Führungskraft erweitert. Dieses Modell ermöglicht es zu untersuchen, wie und unter welchen Bedingungen der Einfluss des Führungsverhaltens auf das Stresserleben der Mitarbeiter in der täglichen Führungsinteraktion am stärksten ist. Es wurde eine Tagebuchstudie durchgeführt, an der 209 Personen an fünf aufeinanderfolgenden Arbeitstagen teilnahmen. Die Probanden machten in einem Onlinefragebogen Angaben zum Führungsverhalten wie auch zum Stresserleben, zu Anforderungen sowie Ressourcen bei der Arbeit und der Art der Kommunikation mit dem Vorgesetzten. Mehrebenenanalysen zeigen signifikante Zusammenhänge zwischen dem täglichen Verhalten der Führungskraft und dem täglichen Stresserleben der Mitarbeiter. Laissez-faires Führungsverhalten erhöht das Stresserleben der Mitarbeiter, wohingegen transaktionale wie auch transformationale Führungsverhaltensweisen das Stresserleben senken. Diese Zusammenhänge werden durch Ressourcen am Arbeitsplatz vermittelt, nicht jedoch durch Anforderungen. Diese Zusammenhänge werden über die Art der Kommunikation moderiert. Die Ergebnisse zei-

gen, dass Führungsverhalten von Tag zu Tag stark variiert. Die Ergebnisse stellen somit eine statische (traitmäßige) Sichtweise auf Mitarbeiterführung in Frage und unterstreichen die situative Abhängigkeit von Führungsverhalten. Wie genau Führungskräfte das Stresserleben der Mitarbeiter in der täglichen Interaktion beeinflussen, lässt sich aus den vorgestellten Ergebnissen ableiten. Die Ergebnisse zeigen, dass es im täglichen Zusammenarbeiten zwischen Mitarbeitern und Führungskräften im Besonderen auf das Bereitstellen von Ressourcen bei der Arbeit ankommt. Die Tagebuchmethode erweitert bestehende Forschung auf einer methodischen Ebene, da die empirischen Daten eine hohe Qualität aufweisen. Zusätzlich findet eine Erweiterung auf theoretischer Ebene statt, da die Prozesse der täglichen Führungskraft-Mitarbeiter-Interaktion in den Vordergrund gestellt werden.

Die dritte Studie der Dissertation ergänzt bestehende Forschung durch die Verknüpfung der Verhaltensweisen *laissez-fairer*, transaktionaler sowie transformationaler Führung mit unterschiedlichen Indikatoren von Stress bei der Arbeit. Es wird ein Rahmenmodell aufgestellt, um zu untersuchen, wie Führungskräfte das Wohlbefinden ihrer Mitarbeiter beeinflussen. Diese Zusammenhänge werden durch die Perspektive des Job Demands-Resources Modell betrachtet. Die dritte Studie ermöglicht einen Vergleich der Effekte von Full-Range Leadership Verhaltensweisen auf einen objektiven Stressindikator (gemessen über Cortisol im Haar) sowie gleichzeitig auf einen subjektiven Indikator von Mitarbeiterstress (gemessen mittels Fragebögen). Haarcortisol ist eine Methode zur Messung von objektivem (physiologischem) Stress und stellt eine innovative Möglichkeit zur Darstellung der Cortisolkonzentration des menschlichen Körpers dar. 129 Mitarbeiter nahmen an dieser Studie zu zwei Messzeitpunkten teil. Die Teilnehmer gaben Informationen über das Führungsverhalten ihres Vorgesetzten sowie über die Merkmale ihrer Arbeit hinsichtlich Anforderungen und Ressourcen. Gleichzeitig wurde eine Haarprobe entnommen und es wurden Informationen über den subjektiven Stresslevel erhoben. Die Ergebnisse zeigen, dass das Verhalten des Vorgesetzten Auswirkungen auf das subjektive Stresserleben wie auch auf die Haarcortisolkonzentration hat. Die Ergebnisse unterscheiden sich für die beiden Stressmaße: Der Zusammenhang zwischen transformationaler Führung und Haarcortisol wird durch Ressourcen bei der Arbeit mediiert. Darüber hinaus fungieren Arbeitsanforderungen als Mediatoren für den Zusammenhang von Führungsverhaltensweisen und subjektivem Stresserleben der Mitarbeiter. Diese Studie leistet

durch die Kombination von neuesten Erkenntnissen aus der Stressforschung mit denen der Führungsliteratur einen wichtigen Beitrag zu bestehender Forschung. Darüber hinaus ist diese Studie die erste, die einen Vergleich von subjektiven und objektiven Stressindikatoren im Zusammenhang mit Führung ermöglicht.

Die vorliegende Dissertation erweitert bestehende Forschung durch die Betrachtung von stressbezogenen Vorbedingungen von Full-Range Leadership Verhaltensweisen sowie deren direkter Folgen innerhalb eines Rahmenmodells. Die Identifizierung von stressbezogenen Voraussetzungen (transformationaler) Führungsverhaltensweisen ermöglicht ein besseres Verständnis darüber, welche Rolle Stress bei der Entstehung von Führung in Organisationen spielt. Gleichzeitig ermöglicht die Dissertation wichtige Einblicke bezogen auf potenziell stressmindernde und stresserhöhende Konsequenzen von Führung. Darüber hinaus werden zentrale vermittelnde Mechanismen aufbauend auf dem Job Demands-Resources Modell aufgezeigt, um die Beziehung zwischen Führungsverhaltensweisen und Stress am Arbeitsplatz stärker zu beleuchten und um zu erklären, wie der Einfluss der Führungskraft auf das Stresserleben von deren Mitarbeitern erklärt werden kann. Insgesamt zeigen die Ergebnisse, dass Stress das Verhalten von Führungskräften beeinträchtigt, welches wiederum weitreichende Auswirkungen auf das Wohlbefinden der Mitarbeiter hat (auf einer subjektiven und objektiven Messebene von Stress). Zusammengenommen trägt die Dissertation dazu bei aktuelle Forschungslücken zu schließen und neueste Erkenntnisse im Rahmen stressbedingter Vorbedingungen sowie Konsequenzen der Verhaltensweisen von Führungskräften zu generieren.

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List of Abbreviations

| | |
|----------|---|
| AV | identifying and articulating a vision |
| BMI | body mass index |
| cf. | compare |
| CFI | comparative fit index |
| COR | conservation of resources |
| df | degrees of freedom |
| e.g. | exempli gratia |
| et al. | et alia |
| FAG | fostering the acceptance of group goals |
| GFI | goodness of fit index |
| HC | hair cortisol |
| HPE | high performance expectations |
| HR | human resources |
| i.e. | id est |
| IS | providing individualized support |
| ISN | intellectual stimulation |
| JDR | job demands-resources |
| LF | laissez-faire |
| <i>M</i> | mean |
| NFI | normed fit index |
| OJ | organizational justice |
| PAM | providing an appropriate model |
| PS | perceived stress |
| RC | role conflict |
| RMSEA | root-mean-square error of approximation |

| | |
|-----------|---------------------------------------|
| RQ | research question |
| <i>SD</i> | standard derivation |
| SRMR | standardized root mean residual |
| SS | social support |
| TAL | transactional leadership |
| TFL | transformational leadership |
| TLI | Transformational Leadership Inventory |

1. Introduction

Work stress does not only constitute a current topic for occupational health, but poses a big challenge. Exemplarily, the American Psychological Association (2015) revealed that most Americans reported steady or even increasing current stress levels with reference to the stress levels of the last year. On average the 3,000 adult respondents stated that their current stress level has exceeded the level that they believed to correspond to a healthy level. One main source of respondents' stress was attributed to work. Additionally, 53% of the Americans said that stress had a strong to very strong impact on their mental or even physical health. Self-reported symptoms of stress ranged from nervousness via fatigue through to depressiveness. As well, in Germany 43% of 20,000 surveyed employees in employment (Lohmann-Haislah, 2012) reported an increase of work stress and work pressure during the last two years. Further, 69% of these respondents described at least one musculoskeletal consequence of work stress (e.g. backache) and 57% reported at least one vegetative consequence (e.g. exhaustion). On top, Hassard and Cox (2015) have summarized different estimated calculations of economic costs resulting from work stress and its accompanying symptoms in the European Union. On average these estimations exceeded 500 million euros a year within the different European countries. To sum up, epidemiologic studies paint a picture of high work stress prevalence combined with severe stress-related consequences in western countries. From a scientific viewpoint, somatic consequences of stress may affect the immune, the cardiovascular and the metabolic system and, consequently, lead to severe diseases at the endpoint (Chrousos, 2009; Ganster & Rosen, 2013). Even significant associations between psychological distress and increased risk of mortality have been meta-analytically observed to draw a conclusion on the basis of ten large prospective cohort studies comprising information of 70,000 adults from the general population (Russ et al., 2012).

Accordingly, stress ascribed to work is not only prevalent in modern western society, but leads to severe negative consequences for employees' health, their organizations, and, as a result, economy. Thus far, work stress is a serious problem for

all different groups of people on all hierarchical levels from the top of an organization to the bottom of it. Therefore, it is crucial to deepen our understanding on how and by which means organizations may downscale the prevalence of work stress. Consequences of high work stress for organizations particularly deal with lost working days, absenteeism, and diminished firm performance. These aspects pose a big challenge for organizations as they result in overall costs for them (European Agency for Safety and Health at Work, 2009).

A first promising link for organizations to handle the challenge of work stress and its consequences is to draw on supervisors and their influence on their employees. Supervisors may shape working conditions, attitudes and behaviors of their employees (Bass, 1990a; Yukl, 2013) and, therefore, play a crucial role in the process of stress management in organizations. As it is their assignment to sustain and enhance the performance capability of the organization, supervisors have to lead the charge to influence their employees' levels of work stress. They may do this by creating calm working conditions or by directly supporting their employees. Consequently, in the following I set supervisors behaviors into focus of my dissertation to explore which behavioral strategies help leaders to affect the levels of work stress of their followers. I do this by highlighting two important perspectives: First I take leader stress into account and investigate how leader stress influences leader behavior patterns. Second, I take follower stress into account to scrutinize which behavioral strategies of leaders have a positive impact on the amount of follower stress and which strategies do not or even have an inverse impact. I do this by looking at the full-range leadership behaviors (Avolio & Bass, 1991) to aim at displaying the whole spectrum of possible leader behaviors and to use a theoretical framework that helps me to describe core leadership behavior patterns. Moreover, these full-range leadership behaviors represent the core of contemporary leadership theory (Judge & Piccolo, 2004).

Besides exploring the elementary link between supervisors' behaviors and stress-related follower outcomes, I put the application of different methodological advancements into focus. This is particularly important as the measurement of (psychological) constructs with the same method may lead to biased effects and, therefore, overestimated or underestimated results, respectively. Problems resulting from

this methodological concern are quite common as cross-sectional self-report questionnaire measurement methods are predominant in contemporary empirical psychological-oriented management literature (Podsakoff, MacKenzie, & Podsakoff, 2012). Furthermore, relationships between variables measured by self-reports may not only be inflated by common method bias (Conway & Lance, 2010), but may also yield to misleading conclusions (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). As I aim to generate new insights about the field of stress-related leadership research by conducting three empirical studies, I actively challenge the problem of common method bias by means of the design of my studies. Hence, to strengthen the validity of conclusions I aim to draw from my empirical studies and to overcome potential limitation of psychological management research, I obtain measures from different sources on various time points and, further on, use statistical techniques to control for potential method bias.

1.1 Goals of the Dissertation

The overall purpose of this dissertation is to explore the role the behavior of leaders plays in the context of work stress. I aim to examine stress-related antecedents as well as stress-related consequences of leader behaviors in face of the full-range leadership behavior pattern (Avolio & Bass, 1991). I want to theoretically explain and empirically investigate if stress experienced by leaders influences their behaviors, as well as if and, in addition to it, how these leader behaviors influence the perceived work stress of their followers. Therefore, I have conducted three empirical studies to shed light on this field of inquiry and to answer five core research questions (cf. Table 1), which will be outlined in the following.

Starting with the first and often neglected perspective within the research field of leadership behavior patterns my dissertation explores the role leader stress plays as a possible antecedent of leadership behavior - in face of transformational leadership. In previous research, the perspective of leaders' well-being has often been ignored. Furthermore, the investigation of, in particular, situational antecedents of transformational leader behavior is scarce (Courtright, Colbert, & Choi, 2014) and has just recently got in our focus of attention. Mainly, to predict transformational leadership behaviors dispositional characteristics of leaders were taken into account

such as genetic predispositions to leadership role occupancy (de Neve, Mikhaylov, Dawes, Christakis, & Fowler, 2013; Li, Arvey, Zhang, & Song, 2012), leaders' cognitive ability and intelligence (Daly, Egan, & O'Reilly, 2015; Wofford & Goodwin, 1994), leaders' gender (Eagly, Johannesen-Schmidt, & van Engen, 2003), or leaders' personality (Bono & Judge, 2004; Judge & Bono, 2000). In addition, contextual antecedents of transformational leader behaviors are under research like positional, organizational or social context characteristics (Walter & Bruch, 2009). Yet, situational, in particular stress-related characteristics of transformational leadership behavior still remain undisclosed (Cavanaugh, Boswell, Roehling, & Boudreau, 2000). This is unfortunate as epidemiological studies have revealed that leaders experience a great deal of stress in their job function (Cavanaugh et al., 2000). Further, stress of leaders is an important subject of empirical research as there are no studies linking leader stress to leader outcomes via leadership style displayed. Consequently, I want to explore the following research question within my dissertation.

Research Question 1: Does leader stress function as an antecedent of transformational leadership behavior?

The second research question of my dissertation deals with the impact leaders may have on their followers with regard to followers' well-being. Mostly beneficial effects of leader behaviors are scrutinized with an emphasis on performance in a large number of various studies (Judge & Piccolo, 2004). However, still not much is known about the consequences of leader behaviors on followers' work stress, although recent studies have revealed the relevance of leadership for employee health (Donaldson-Feilder, Munir, & Lewis, 2013; Skakon, Nielsen, Borg, & Guzman, 2010). Focusing on the full-range leadership behavior patterns, these behaviors may have beneficial or, contrarily, detrimental effects on followers' well-being. Three main points call for a deeper investigation of the influence leaders have on their followers' stress-levels. First, direct and indirect consequences of leader behaviors are still unclear and sometimes yield to different results (Gregersen, Vincent-Höper, & Nienhaus, 2014; Skakon et al., 2010). Second, insights resulting from new methodological advancements between different levels of analysis are not clear yet. Most studies only rely on self-reported questionnaire data and, therefore, are biased by

same-source issues of measurement (Podsakoff et al., 2003). Third, a systematic analysis of the impact of different leadership conducts on followers' levels of work stress has not moved into the focus of attention. Mostly, leadership styles are linked to measures of employee well-being in isolation not assessing multiple, theoretically-connected leadership styles at the same time. With regard to these addressed three issues, I will explore the following research question in my dissertation:

Research Question 2: Which impact do full-range leadership behaviors have on employees' levels of work stress?

The following third research question is clearly linked to the aforementioned one that stated the importance of the influence leader behaviors may have on employees' stress levels. Recent criticism on leadership constructs - in the name of the transformational leadership behavior pattern - has called for a more detailed level of analysis as well as a more in depth characterization of transformational leadership behaviors (van Knippenberg & Sitkin, 2013). As a conclusion, we need to take a closer look on transformational leadership behaviors by assessing this construct on its detailed dimensional level. With that, we need to specify how the transformational leadership dimensions are linked to leadership outcomes i.e., followers' stress levels, and which mediating mechanisms are accountable for these relationships (van Knippenberg & Sitkin, 2013). This is especially important as we cannot expect that all transformational leadership facets have similar effects on followers' stress levels. Some transformational leadership facets do rather focus on followers' peak performance and, as a result, do not foster a consideration of followers' individual background leading to an increase of followers' stress levels (Bass & Riggio, 2006; Podsakoff, MacKenzie, Moorman, & Fetter, 1990). Therefore, to enable a more balanced description of the transformational leadership behavior impact, an operationalization on the dimensional level is necessary.

In addition, a more detailed description of transformational leadership behaviors together with an advancement of knowledge in this field of inquiry would help practitioners to design new leadership training methods, tasks, and role plays including clear manuals for promising behavioral strategies in leadership training. If detailed information on behaviors is transferred within the training situation, learning

effects for practitioners may enhance. In sum, the aforementioned arguments result in the third research question of my dissertation:

Research Question 3: Which impact do transformational leadership behavior facets have on employees' levels of work stress?

The fourth research question addresses the important issue of the mediation model of full-range leadership behavior impact. Moreover, it is still unknown, which mediating mechanisms help us to explain how leaders influence their followers well-being (Arnold & Connelly, 2013; van Knippenberg & Sitkin, 2013). More specific, to now little empirical research has been conducted to explore the mechanisms linking the behavior of the leader to followers' work stress. Even in the well-studied field of transformational leadership investigations of the mediation model in the context of well-being are scarce (Arnold & Connelly, 2013). Hence, there are even less studies trying to uncover the generating, mediational link between laissez-faire as well as transactional leadership and follower stress. Because of that, identifying crucial generating mechanisms through which leaders may affect their followers stress levels is important to advance knowledge in this field of inquiry.

Generally, when it comes to explore mediating mechanism of leadership behaviors, typically, there is a lack of clear theory to guide the investigation and derivation of key mediators (van Knippenberg & Sitkin, 2013). To overcome this limitation, I use the job demands-resources model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) to follow a guideline to select and categorize potential mediators within the broaden categories of job resources and job demands. By looking through the lens of the job demands-resources model I use a well-validated framework to specify the link between leader and follower stress. Therefore, the fourth research question deals with the mediation model.

Research Question 4: How do leadership behaviors impact employees' levels of work stress?

The fifth and last research question of my dissertation addresses the moderation model of full-range leadership behaviors. Similar to the mediation model of

(full-range) leadership behavior and followers' work stress, there is only sparse evidence to outline a clear moderation model in this branch of research. There are only few studies that try to transfer knowledge from the context of performance-driven outcomes of leadership behaviors to that of stress-related ones (Arnold & Connelly, 2013). Thus, we need to explore under what conditions the impact of certain leader behaviors is potentially strong and under what conditions it is not. This is important as some studies failed to find an association between leader behaviors and employees' health (Arnold & Connelly, 2013; Gregersen et al., 2014). Furthermore, exploring the moderating model is particularly evident when the daily perspective of leader influence on followers' well-being is highlighting to paint a clear picture of what happens on a day-to-day basis between leaders and followers in the field. To investigate this topic, I draw back on means of communication to outline under what conditions certain leader behaviors unfold their stress-reducing or, contrarily, stress-promoting effect. This enables us to derive clear implications for leaders to better evaluate the effects their behavior has on their followers with regards to work stress. All in all, this results in the fifth research question.

Research Question 5: When do leadership behaviors impact employees' levels of work stress?

Hence, I designed three studies to test my research questions, which collectively investigate whether, when, and how leadership behavior is linked to followers' levels of work stress. Hence, study one explores antecedents of transformational leader behaviors. The study was conducted in a convenience sample focusing on dyads of leaders and their respective followers. I collected ratings of leaders' levels of work stress together with followers' ratings of their leader's transformational leadership behaviors as well as their own levels of work stress. In that sense, study one provides an estimation of how leaders own levels of work stress spill over on followers' levels of stress. However, study one does not allow me to focus on the link between leader behaviors and their consequences on followers stress levels. Study two is a diary study to capture how leader behaviors affect followers' stress levels on a day-to-day basis through the allocation of job resources and the deterioration of job demands. I focused on type of communication to explain when leaders influence on

their followers' stress level is strongest and when it is not. However, results of study two do not go beyond the application of self-report questionnaire measures. Finally, study three focuses on the implementation of a biological measure of work stress, namely cortisol assessed via hair. Likewise, I integrated the job demands-resources framework to explore how leader behavior interacts with hair cortisol and, simultaneously, perceived stress. Taken together, these three studies provide a comprehensive examination of the leader behavior-work stress relation. I, therefore, provide insights into antecedents, consequences, and more specifically on moderators and mediators to explore key explanatory mechanisms of this relationship.

Table 1. *Focal Points of the Three Studies*

| Study | Research Questions (RQ) addressed |
|--------------|--|
| Study 1 | RQ 1: Antecedents of Transformational Leadership Behaviors RQ 2: Impact of Leadership Behaviors |
| Study 2 | RQ 2: Impact of Leadership Behaviors RQ 4: Mediating Mechanisms of Leadership Impact RQ 5: Moderating Relations of Leadership Behaviors |
| Study 3 | RQ 2: Impact of Leadership Behaviors RQ 3: Impact of Transformational Leadership Behavior Facets RQ 4: Mediating Mechanisms of Leadership Impact |

1.2 Outline of the Dissertation

The outline of my dissertation consists of six main parts, which are described in detail in the six chapters of this dissertation. To accomplish the overall goals of this dissertation, I follow a clear structure (cf. Table 2). First, introduction, research questions, and outline of my dissertation are described. After that, I summarize the main theoretical background before presenting three empirical studies, which depict the core part of this dissertation to empirically test and answer the research questions mentioned in the preceding paragraph. Within each empirical study I focus on a description of the main underlying theory, methods of data collection and analysis

used, results of hypotheses tests, and discussion of the main findings. Finally, the dissertation closes with an overall discussion to summarize and transfer main findings of this overall research project.

In chapter one the introduction of the dissertation is stated as well as the main five research questions together with the outline and structure of the dissertation.

Table 2. *Overview of the Chapter Structure*

| Chapter | Content |
|----------------|---|
| 1 | Introduction, research questions, goals, and outline of the dissertation |
| 2 | Theoretical background |
| 3 | Study 1: <i>How Does Leader Stress Influence Follower Burnout? An Analysis of Transformational Leadership Behavior</i> |
| 4 | Study 2: <i>Day-Level Leadership and Followers' Day-Level of Work Stress: A Multilevel Analysis of Leadership Behavior</i> |
| 5 | Study 3: <i>Two Processes of Leadership on Stress: Independent Influence of Full-Range Leadership Dimensions on Hair Cortisol and Perceived Stress</i> |
| 6 | Overall discussion, summarization, contribution, and implications |

Chapter two covers the overarching theoretical background of the dissertation and presents an overview of core theoretical concepts of this dissertation. At first, leadership behaviors are introduced with a more specific description of the full-range leadership behavior patterns. Subsequently, work stress - as the second major concept of this dissertation - is introduced. It starts with a description of biological and psychological origins as well as potential consequences of work stress on individuals. After that, two overarching theoretical theories are introduced i.e., conservation of resources theory (Hobfoll, 1989) and the job demands-resources model (Demerouti et al., 2001), that function as guiding principles for hypotheses development within the three empirical studies. Finally, a description of the overall research model of this

dissertation aims at explaining the main relations among variables covered within the three empirical reports. Moreover, innovative as well as methodological strengths of the whole dissertation project are discussed. The chapter closes with a short summary of the main (theoretical and methodological) contributions of my research project.

In Chapter three the first empirical study is presented that addresses stress-related antecedents of transformational leadership behaviors together with stress-related consequences of this pattern of leader behavior. The study builds up on the conservation of resources theory (Hobfoll, 1989) to link leaders' available resources to stressful reactions i.e., reduced effort for leadership behaviors. By drawing back on the field of emotional contagion, meaning leader affect influencing follower affect, a comprehensive model of transformational leadership behavior is tested to outline consequences of leaders' behaviors together with its antecedents in one study. This approach enables me to draw conclusions about whether leader stress is spilled-over on subordinates stress, or whether leader stress influences leadership behaviors, which as a consequence, affect follower burnout. Therefore, the first empirical study addresses the first and second research questions (cf. Table 1) of my dissertation. Within chapter three I describe introduction, theory and hypotheses, methods, results, discussion of results, limitations, and implications for future research as well as practical implications of study one.

Chapter four describes the second empirical study of the dissertation. It focuses on a systematic comparison of the consequences of different leadership constructs on followers' levels of work stress. Study two applies a diary design to take the notion into consideration that leader behavior depends on person- as well as situation-based factors (Johnson, Venus, Lanaj, Mao, & Chang, 2012). I consider the job demands-resources model (Demerouti et al., 2001) as a way of examining and explaining how leaders impinge on their followers' levels of work stress on a day-to-day basis. Further, my second study builds on leader-distance theory (Antonakis & Atwater, 2002) to explore how the type of communication used by leaders precipitates the leadership behavior impact. The second empirical study addresses research questions two, four, and five (cf. Table 1). After introducing and describing underlying theory, procedure, results are presented as well as an integration of findings of the second empirical study in existing theory.

Chapter five describes the third empirical study that addresses the influence of full-range leadership behaviors on followers' perceived, subjective levels of stress as well as their physiological, objective levels of stress - in face of cortisol assessed via hair. This approach allows for a comparison of leadership behaviors on subjective and objective stress levels simultaneously. I also include different but theoretically connected leadership constructs to conduct a systematic comparison of the consequences of different leadership constructs on employees' levels of work stress. In addition, and equally applied as in study two, a mediational framework is implemented to specify the effects of leader behavior on work stress through the lens of the job demands-resources model (Demerouti et al., 2001). The third empirical study addresses research questions two, three, and four (cf. Table 1). The description of study three starts with an introduction into the topic, the theoretical background, procedures as well as results, and ends with a discussion of findings and implications for research and practice.

Chapter six comprises the overall discussion of the dissertation. At first, a summary of main findings of my three empirical studies is given. Then, results are linked to existing theory and consequences for my research model are outlined. Thereafter, limitations that similarly occur within all three empirical studies are discussed and implications for future research building up on these limitations are proposed together with implications for human resource practitioners. Subsequently, the dissertation closes with a conclusion.

2. Theoretical Background

Organizational leaders play such an important role as they may shape followers¹ awareness of work through distributing tasks, setting goals, appraising performance, or motivating them. Building on Yukl's (2013) synopsis of leadership theory, leaders typically engage in activities dealing with supervising, planning and organizing, decision making, monitoring (performance) indicators, controlling, representing, coordinating, consulting, and administering. These activities are based on interactions with peers, outsiders, and followers through mostly oral communication. Generally, these activities are fragmented and often interrupted since interruptions occur frequently in the daily leadership routine.

In general, leadership is an influencing process resulting from perceptions of leaders' behaviors from the perspective of followers (Bass, 1990a). This influencing process aims at creating agreement on and understanding of the way to guide, to structure, and to facilitate activities in an organization. With this behavior of leaders, followers' attitudes, behaviors, and well-being can be affected (Yukl, 2013). Per definition, leadership is "the ability of an individual to influence, motivate, and enable others to contribute toward the effectiveness and success of the organizations of which they are members" (House, Javidan, Hanges, & Dorfman, 2002, p. 5). In the following, I set the focus on the dyadic perspective between leaders and followers not taking the group or organizational level perspective into account. This approach emphasizes behaviors displayed by leaders which are recognized by (one of their) followers. Furthermore, I focus on supervisory-level leaders and their immediate followers to scrutinize behaviors of leaders aiming at directly influencing their followers. This direct influence may result from meetings, speeches, sending messages, or participating in activities involving both leader and follower (Yukl, 2013).

In the 1980s, research about leadership started to emphasize the emotional and symbolic aspects of leadership to understand how leaders achieve extraordinary

¹ In the following the terms follower, employee, and subordinate are used interchangeably, because of their similar meaning in the leadership context and to ensure simplification of language. The same applies to the terms leader, manager, and supervisor.

performance of their followers (Yukl, 2013). The most influential theory that resulted from that research tradition is the full-range leadership theory (FRLT; Avolio & Bass, 1991). Historically, it commenced with the description of a pattern of leader behaviors that focus on transactional obligations that are contingent to goal achievement (Burns, 1978). Within his innovative work Burns (1978) distinguished between transactional leadership and transforming leadership. Hereby, he defined transactional leadership as an exchange process through which one person makes contact to another person with the intention to exchange valued things. Indeed, this transactional relation has not been characterized by a pursuit of higher purpose between leader and follower. This aspect has been further developed and is subsumed within the term of transforming leadership that is characterized by raising one another to higher levels of motivation with regard to common purpose. Avolio and Bass (1991) developed this idea further and extended this solely transactional description of leader behavior by inspirational, visionary, and charismatic patterns of leader behaviors. Completed by laissez-faire, they developed the full-range of leadership model. At present, this model of leadership is predominant in leadership research (Judge & Piccolo, 2004).

2.1 Full-Range Leadership Behaviors

The full-range leadership theory (FRLT) proposed by Avolio and Bass (1991) comprises three types of leadership behaviors: transformational, transactional, and laissez-faire. The FRLT in its original form is represented by nine distinct factors (Avolio & Bass, 1991): five transformational factors, three transactional factors and one (non-transactional) laissez-faire factor. Recent publications have criticized the theoretical and statistical structure of the nine-factor FRLT model (Heinitz & Rowold, 2007; Podsakoff et al., 1990). This has led to a more detailed structure of transformational leader behaviors as well as a simplification of transactional leadership to only one transactional (contingent reward) factor. This adjusted full-range leadership model has displayed acceptable criterion and construct validity (Krüger, Rowold, Borgmann, Staufenbiel, & Heinitz, 2011; Rowold, 2011; Rowold & Borgmann, 2014). Therefore in the following, the conceptualization of transformational and transactional leadership by Podsakoff et al. (1990) is used to ultimately

arrive at an eight-factor model of full-range leadership behaviors. This model includes laissez-faire, transactional leadership in face of contingent reward, and transformational leadership as identifying and articulating a vision, providing an appropriate model, fostering the acceptance of group goals, high performance expectations, providing individualized support, and intellectual stimulation. The three main types of leadership behaviors (laissez-faire, transactional and transformational) differ in their consideration of level of leader activity and can be ordered on a continuum ranging from highly active to totally passive behaviors (Antonakis & House, 2013). Laissez-faire is classified as the absence of leadership, meaning the leader does not engage in leader activity, whereas transactional leadership - based on contingent reward - subsumes typical management behaviors like setting objectives and monitoring outcomes. Transformational leadership, however, is the most active type of leader behavior and aims at a transformation of values to enhance followers' performance (Bass, 1985). These positive consequences of transformational leadership have been reproduced on a meta-analytical basis (Jackson, Meyer, & Wang, 2013; Judge & Piccolo, 2004; Wang, Oh, Courtright, & Colbert, 2011) displaying that transformational leadership behavior outperforms transactional and laissez-faire regarding leader effectiveness, with the latter one representing the most ineffective type of leader behavior.

Bridging back to the aforementioned influencing process of leadership within the FRLT, these influencing mechanisms are strongly connected to the specific behaviors of the FRLT components, which will be described in detail in the subsequent section. Generally, all FRLT behavior influence mechanisms are characterized by compliance, identification, and enhancement of self-efficacy (Yukl, 2013). In the following, the different components of FRLT will be outlined in detail.

2.1.1 Laissez-Faire

Laissez-faire represents a passive leadership style since the leader reduces leader activity to a minimum. Laissez-faire is typically described as the absence of leadership that is characterized by the avoidance of making decisions, of concern for goal attainment, of use of authority, and of taking responsibility (Antonakis, Avolio, & Sivasubramaniam, 2003). Additionally, laissez-faire leaders are ineffective, fre-

quently absent, and passive, which results in failure to arrange work tasks, to meddle in problems, and to solve conflicts between employees (Bass, 1985). The leader is appointed to a leadership position but in practice the duties which are associated with this role are not fulfilled (Aasland, Skogstad, Notelaers, Nielsen, & Einarsen, 2009). This results in not meeting legitimate expectations of followers although followers are in need of assistance. Because the leader volitionally and actively avoids his followers' concerns and expectations, these non-leadership behaviors lead to negative follower reactions (Skogstad, Hetland, Glasø, & Einarsen, 2014). Also, this passive leadership behavior involves a lack of clarity regarding duties and responsibilities for followers (Skogstad, Hetland et al., 2014) resulting in frustration and dissatisfaction (Skogstad, Einarsen, Torsheim, Aasland, & Hetland, 2007). Furthermore, negative consequences of laissez-faire behavior subsume the occurrence of elevated stressors at the workplace e.g., role conflict and role ambiguity (Kelloway, Sivanathan, Francis, & Barling, 2005; Skogstad et al., 2007; Skogstad, Hetland et al., 2014), and with that increased workplace incivility among employees (Harold & Holtz, 2015). Moreover, the avoidance of important leadership tasks is the least effective type of management resulting in a loss of productivity, impaired job satisfaction, and poor regard of the leader (Judge & Piccolo, 2004).

Leaders engage in passive behaviors because of a lack of knowledge, incompetence, or a strategic intent to harm employees (Hinkin & Schriesheim, 2008; Skogstad et al., 2007). Aasland et al. (2009) have revealed that this phenomenon is not seldom. About 20% of the respondents of a representative sample of 4,500 employees reported experiencing laissez-faire behaviors of their leader quite often within a time interval of six months.

2.1.2 Transactional Leadership

Transactional leadership behavior is an active type of management as leaders take the initiative to accomplish organizational goals. Transactional leadership - in face of contingent reward - is characterized by goal setting and monitoring outcomes (Podsakoff et al., 1990). Leaders try to link rewards for followers, which can be material or psychological in nature, with their followers' performance at work (Bass, 1990b). The transactional leader organizes requirements, tasks, and rewards for fol-

lowers by providing the essential material together with psychological support to clarify roles and expectations (Antonakis et al., 2003). Initially, goals are clarified, and when these goals are met by followers, the transactional leader gives recognition and reward (Bass, 1985). Transactional leaders clearly communicate their expectations so that their followers can deliver performance. This pattern of behavior increases followers' job satisfaction (Judge & Piccolo, 2004) as well as performance (Wang et al., 2011), and commitment (Jackson et al., 2013).

Research on antecedents of transactional leadership behaviors is scarce. Merely, personality factors have been identified to influence the occurrence of transactional leader behaviors in face of conscientiousness and agreeableness (De Hoogh, Den Hartog, & Koopman, 2005).

The influence process of transactional leader behaviors is best described by the term compliance. The leader influences the behavior of followers into the desired direction, but does not affect their attitudes (Yukl, 2013). Therefore, followers adapt their behaviors, but they are not automatically convinced of what they do. This is different to the influence process of transformational leadership. While transactional leadership helps leaders to form the basis for a relationship with their followers through specifying expectations, clarifying responsibilities, and providing recognition for achieving expectable performance, transformational leadership goes one step beyond and aims at reaching for outstanding performance (Bass, 1985).

2.1.3 Transformational Leadership

Transformational leaders engage in proactive behavior to raise followers' awareness of the collective interests of the group or organization (Antonakis et al., 2003). They motivate followers to work for the benefit of the collective and help them to achieve extraordinary goals. Transformational leadership is known as the most active and effective type of leader behavior that aims at a transformation of values to enhance follower performance (Bass, 1985). Transformational leaders act as a role model for their employees and create a group identity to foster motivation (Podsakoff et al., 1990). At the same time, leaders are concerned about personal feelings, setting objectives, and allocating tasks (Bass, 1985). Transformational leaders try to develop followers, challenge their individual thinking, and inspire them to

achieve more than they think they are capable of doing (Bass, 1985; Bass, Avolio, Jung, & Berson, 2003).

Historically, Bass (1990b) used four elements to theoretically describe transformational leadership. Firstly, inspirational motivation means that leaders create an appealing vision of the future and use symbols to articulate this vision to followers. Secondly, idealized influence describes a leader that acts like a role model for followers that is characterized by charisma, identification, and trust. Thirdly, individual consideration means that leaders treat their followers as individuals and acknowledge their feelings and emotions while considering needs and abilities of them. Fourthly, intellectual stimulation refers to leaders that challenge their followers to look at problems from a novel perspective and to actively create new and innovative solutions. However, this conceptualization of transformational leadership has been criticized (see also Chapter 2.1; cf. Podsakoff et al., 1990; Yukl, 1999) and revisited by other groups of authors. Therefore, I have chosen to focus on the conceptual definition of Podsakoff et al. (1990) to provide a more detailed description of the transformational leader behavior pattern.

Thus, I conceptually define transformational leadership by six distinct behaviors (Podsakoff et al., 1990): *Identifying and articulating a vision* describes leaders acting and talking in a consistent manner. They set an example of the basic values of the organization, and identify new opportunities for the group that are articulated within an attractive and emotive vision for the future. This vision is abstract as it comprises the values and objectives of all followers to accentuate similarities. It delivers guidance for the future, and provides a rationale for behavior; this leads to employee trust and enthusiasm. This facet of transformational leadership is comparable with Bass' (1985) concept of inspirational motivation. *Providing an appropriate model* means that transformational leaders represent a model for their employees that is consistent with the values the leader represents (Podsakoff et al., 1990). Providing an appropriate model is associated with idealized influence (Bass, 1985), as is the following dimension of transformational leadership: *Fostering the acceptance of group goals* describes a leader creating an identity to motivate the group to work towards a common objective. This behavior promotes cooperation while interests of followers are encouraged. *High performance expectations* are characterized by out-

standing expectations within the group. Leaders place trust in their followers to strive for excellence and quality. As with identifying and articulating a vision, high performance expectations are linked with inspirational motivation (Bass, 1985). *Providing individualized support* means that leaders identify, cater for, and respect their followers' needs. Leaders are concerned about personal feelings while setting objectives and allocating tasks. This transformational leadership behavior corresponds to individualized consideration (Bass, 1985). With *intellectual stimulation* leaders encourage their followers to question inflexible patterns of thinking, thus stimulating constructive thinking and idea generation. Followers are inspired to participate in and contribute to group behaviors. This leader behavior overlaps with intellectual stimulation as defined by Bass (1985).

Factors influencing the emergence of transformational leadership are commonly located in the individual background of leaders. These are dispositional characteristics such as gender (Eagly et al., 2003), personality (Judge & Bono, 2000), and intelligence (Daly et al., 2015; Wofford & Goodwin, 1994). Also, the emergence of transformational leadership depends on the context i.e., social or organizational context, in which leaders are situated (Walter & Bruch, 2009).

Transformational leadership has been linked to numerous outcome criteria in a plethora of different research projects and designs. These criteria range from motivational outcomes to affect-related outcomes to performance-oriented outcomes (Jackson et al., 2013; Judge & Piccolo, 2004; Wang et al., 2011). Moreover, transformational leadership behavior has been labeled as the most effective form of leadership (Bass, 1985).

The positive effects of transformational leader behaviors are ascribed to the influence process of individualized support (Podsakoff et al., 1990; Shanock & Eisenberger, 2006) that aims at enhancing followers' self-efficacy (Liu, Siu, & Shi, 2010). It is assumed that leaders activate the self-concept of their followers to affect motivational mechanisms (Shamir, House, & Arthur, 1993) and, furthermore, to create a sense of identification to increase followers' commitment to the leader's values (Conger, Kanungo, & Menon, 2000).

2.2 Work Stress

Building on the seminal work of Lazarus and Folkman (1984) to define the concept of stress, stress is labeled as the psychological response of an individual to a situation that exceeds the individuals' resources. This process builds the basis of the so called stress reaction. Situations, circumstances, or events that have the potential to trigger this stress reaction are called stressors. The negative consequences of stress are called strains. Stressors are usually classified as physical or psychological. Physical stressors can be, amongst others, temperature, noise, injury, or physical exertion. Psychological stressors subsume traumatic life events, isolation, interpersonal conflict, or time pressure (Dickerson & Kemeny, 2004; McEwen, 2010). Likewise, the stress response may be behavioral as well as physiological in nature. Physiological consequences of stress affect the heart rate, blood pressure, cortisol levels, or cognitive functioning. Behavioral consequences deal with coping strategies to promote health e.g., sports, or contrarily damaging behaviors e.g., smoking (McEwen, 2010). Yet, stress may lead to severe health- and performance-impairing short-term as well as long-term consequences. These may include cardiovascular diseases like diabetes, or psychological disorders such as depression. Further, stress may result in impaired attention capacity, memory capacity, decision making, judgement and performance (Beilock & Carr, 2005; Buchanan, Tranel, & Adolphs, 2006; Chajut & Algom, 2003; Ganster & Rosen, 2013; Jamal, 1985; LeBlanc, 2009; Shaham, Singer, & Schaeffer, 1992).

Two perspectives are drawn to explain the occurrence of stress in the human body. One perspective merely focuses on the psychological, subjective interpretation of the stressor, and one focuses on neurobiological, physiological approaches with regard to the stress reaction in the human body. From a neurobiological perspective, stress is defined as a "real or interpreted threat to the physiological or psychological integrity of an individual that results in physiological and/or behavioral responses" (McEwen, 2010, p. 11). The hypothalamic-pituitary-adrenal axis (HPA axis) plays a core role in the neurobiological stress process. The HPA axis is activated if psychological or physiological challenges occur and trigger the production of glucocorticoids. This activation of the HPA axis leads to a cascade of hormonal reactions, starting with the release of corticotropin releasing hormone (CRH), which stimulates the

anterior pituitary gland to secrete adrenocorticotropin hormone (ACTH). This reaction triggers the adrenal cortex to release cortisol into the bloodstream (Dickerson & Kemeny, 2004). This glucocorticoid hormone cortisol is also known as the “stress hormone”. There are four different measurement methods to detect cortisol levels in the human body: serum, blood, saliva, and hair.

Following the psychological viewpoint on stress, a two-stage process is used to describe its genesis (Lazarus & Folkman, 1984). In the first stage, an individual evaluates whether a situation poses a threat to the individual, or whether it is challenging or even harmless. In the second stage, the individual checks available options to cope with the threat i.e., if the individual has enough resources to overcome this situation. If now an individual does not have enough resources to cope with the threat, stress is experienced. Accordingly, problem-focused coping strategies are carried out if the stressor is viewed as feasible. Individuals draw back on emotion-focused coping strategies instead if the stressor is unfeasible (Folkman, Lazarus, Gruen, & DeLongis, 1986). Problem-based coping contains actions to eliminate the stressor whereas emotion-based coping aims at minimizing the negative emotional impact of the stressor (Lazarus & Folkman, 1984). The amount of psychological stress is commonly measured via questionnaire.

In the following I focus on two core stress theories which transfer the aforementioned stress process to the organizational context i.e., the job demands-resources model and the conservation of resources theory. The two theories have in common that they describe conditions in the workplace that result in the experience of stress. Moreover, both theories are used within the three empirical studies as overarching framework, which helps me to subsume arguments for hypotheses on a content-related basis.

2.2.1 The Conservation of Resources Theory

Conservation of resources theory (COR theory) captures Lazarus and Folkman's (1984) line of thought that resources play a central role in the stress process. Generally, COR theory describes resources as those objects, personal characteristics, energies, or conditions that are valued by the individual (Hobfoll, 1989). These resources represent major aspects to deal with stressful situations, whereby individuals

seek to acquire and maintain resources in order to minimize stress (Hobfoll, 1989, 2001). The basic principle of COR theory is that people strive to retain, protect, and build resources and try to fend off what is threatening to them. Therefore, according to COR theory, stress occurs in one of three instances: firstly, if individuals' resources are threatened with loss, secondly, if individual resources are lost, and thirdly, if individuals fail to gain sufficient resources following significant investment (Hobfoll, 2001). Further, COR theory posits that if individuals assume to have enough resources to overcome stressful situations, the negative stress-reaction can be mitigated. Those resources may be objective i.e., computer, vehicle, house, or personal, such as self-efficacy and intelligence. Also, resources may be energetic i.e., time and money, or condition-related i.e., work role and socioeconomic status (Ganster & Perrewé, 2011). The similarity these different types of resources share is that they may facilitate the achievement of goals and are valued by the individual. If an individual is challenged by a stressful situation, depleted resources may be compensated by other resources. However, with the loss of important resources the individuals coping capabilities are reduced (Ganster & Perrewé, 2011). There are key corollaries to describe and to explain the occurrence of stress within the COR framework (Hobfoll & Shirom, 2001). First, individuals must invest resources to gain new resources, to protect resources, and to stop the loss of resources. Second, the amount of available resources determines the chance of losing or gaining resources i.e., the more resources available, the higher the probability of resource gain and the lower the probability of further resource loss. Third, those individuals who can draw back on strong resource pools are more likely to experience resource gains, whereas individuals who cannot are more likely to experience resource loss. Fourth, if individuals have a strong resource pool, they more likely engage in risky behaviors to gain even more resources, whereas individuals without a strong resource pool do not (Hobfoll, 1989, 2001; Hobfoll & Shirom, 2001).

Transferring COR theory into the leadership context, COR theory may explain the interrelation between leader stress and leadership behavior. As stressed leaders are trapped in the process of resource loss, the likelihood of engaging in demanding leadership strategies drops, whereas the likelihood of engaging in effortless leadership strategies rises.

2.2.2 The Job Demands-Resources Model

The job demands-resources model (JD-R model; Demerouti et al., 2001) also builds up on Lazarus and Folkman's (1984) idea that stress occurs as a response to challenging situations that may be buffered by individuals resources. In this manner, the JD-R model enables a detailed description of stress-reducing as well as stress-promoting working conditions. Generally, the JD-R model distinguishes two distinct categories of working conditions that are related to employees' well-being and motivation. On the one hand, the model subsumes aspects of the job that require sustained effort or skills, like work pressure, emotional demands, or role ambiguity. These are so-called job demands. These demands are associated with physiological or psychological costs which lead as a consequence to sleeping problems, exhaustion, and impaired health. Job-demands generally turn into job stressors, but are not negative in nature. Job stressors only result from demands if individuals need to invest high effort to overcome them while there is a lack of room for recovery, or when these demands exceed individuals capabilities (Bakker & Demerouti, 2007; Bakker, Demerouti, & Schaufeli, 2003; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007). Additionally, two kinds of demands are distinguished: challenge- and hindrance-related demands (Cavanaugh et al., 2000). Both types of demands deplete energy of individuals, but have different effects on performance. Challenge-related demands describe a stressful work environment that has the potential of future gains or personal growth (e.g. responsibility). These challenge-related demands may have indirect effects on motivation that, coincidentally, buffer the stress-promoting effects of the stressors. Contrarily, hindrance-related demands describe a stressful work environment that is characterized by barriers that hinder personal growth (Zhang, LePine, Buckman, & Wei, 2014).

Besides, the JD-R model covers aspects of the job that reduce job demands, that stimulate personal growth, and that assist in achieving goals. These are so-called job resources (Bakker & Demerouti, 2007). For example, social support, performance feedback, and autonomy are known to lead to higher work engagement, more job-related learning, and organizational commitment. By defining the role of resources in the process of individuals' well-being and motivation, the JD-R model can be linked to COR theory. COR theory forms the basis of the JD-R model because

within COR theory the importance of resources as a primer of human behavior is highlighted (Bakker & Demerouti, 2007; Bakker et al., 2003). The JD-R model “can be seen as an elaborate application of the COR theory in the work domain” (Perko, Kinnunen, Tolvanen, & Feldt, 2016, p. 108). Similarly, within JD-R model resources occur on the task-related (e.g. autonomy), the job-related (e.g. role clarity), the interpersonal (e.g. team climate), as well as organizational (e.g. job security) level of individuals at work.

In addition to the distinction of job demands and job resources the JD-R model comprises two different underlying processes (Bakker & Demerouti, 2007; Demerouti et al., 2001). One pathway impairs health and the other one fosters motivation. First, the health-impairing pathway of the JD-R model leads to constant overtaxing and exhaustion. This causes a depletion of individuals’ mental and physical resources, energy draining, and, consequently, health problems (Bakker et al., 2003). Second, the motivating pathway of the JD-R model results in high engagement. Resources have a high motivational potential as basic needs are fulfilled and intrinsic motivational aspects of individuals are captured. This creates a strong involvement of individuals and leads to a reduction of demands, a reinforcement of commitment, and higher motivation i.e., job resources buffer job demands (Bakker & Demerouti, 2007; Xanthopoulou et al., 2007).

Linking the JD-R model to the relation of leader and led, supervisory support constitutes an important job resource for employees that fosters performance (Shanock & Eisenberger, 2006). These supportive behaviors subsume direct help, affirmation, and affective support in the working context (Frese, 1999). Additionally, leaders may influence the perception and interpretation of job characteristics (Piccolo & Colquitt, 2006) and guide employees towards an integration of these characteristics into the framework of resources and demands. Also, leaders may accentuate positive aspects of stressful situations and, with that, buffer negative ones (LePine, Zhang, Rich, & Crawford, 2015). Taken together, constructive leaders may both influence the interpretation of central aspects of the job as well as actually be an important resource for employees.

2.3 Research Model and Questions

The present research model (cf. Figure 1) of this dissertation aims to provide an integrative and comprehensive outline of main concepts that deal with stress-related antecedents as well as consequences of leader behaviors. Within this model, the focus is set on the behavior of the leader i.e., the full-range leadership behavior pattern, to scrutinize prerequisites and possible outcomes of these theoretically connected types of leader behaviors. In the following, key characteristics of my research model are closely linked to the initial research questions. I differentiate between multiple perspectives on stress-related leadership impact, antecedents of leadership behavior, and finally third variable influences. The comprehensive research model is best described by five focal points:

- (1) Stress-related antecedents of leadership behaviors
- (2) Stress-related consequences of leadership behaviors
- (3) Theoretically connected leadership behavior patterns
- (4) Differentiated measurement of work stress
- (5) Theoretically connected mediating mechanisms

(1) **Stress-related antecedents of leadership behaviors.** Focusing on research between leader effectiveness and crisis situations e.g., situations with high levels of experienced stress, transformational leadership behavior has always been outlined as the treatment of choice. One main assumption in this context is that transformational leaders may act as a role model that does not panic and, likewise, transform personal concerns of followers into efforts to achieve group goals (Bass & Riggio, 2006). Furthermore, it is assumed that in situations characterized by highly stressful demands leaders' would behave in a transformational way, because stress and crisis promote the emergence of charisma (Conger & Kanungo, 1998). Other scholars have equally noted that transformational leadership functions at its best in times of crisis and, in particular, unfolds its motivational potential in these stressful work conditions (Halverson, Murphy, & Riggio, 2004).

However, it is reasonable that in times of high stress and crisis leaders by themselves are limited in their ability to perform effective leadership behaviors. Recent empirical studies have implied that diminished psychological resources of leaders have been accompanied by a reduction of effort in leader behaviors (Byrne et al., 2014; Courtright et al., 2014). Others have argued that core leadership tasks i.e., decision-making, empathy, or goal-setting, are incompatible with high stress experienced by the leader (Arnold & Connelly, 2013). Therefore, it is possible that too much stress experienced by the leader may inhibit effective behaviors and result in poor leadership. To shed light into this field of attention, the core element of research question one will be explored in the first empirical study of my dissertation that deals with stress-related antecedents of transformational leadership behavior.

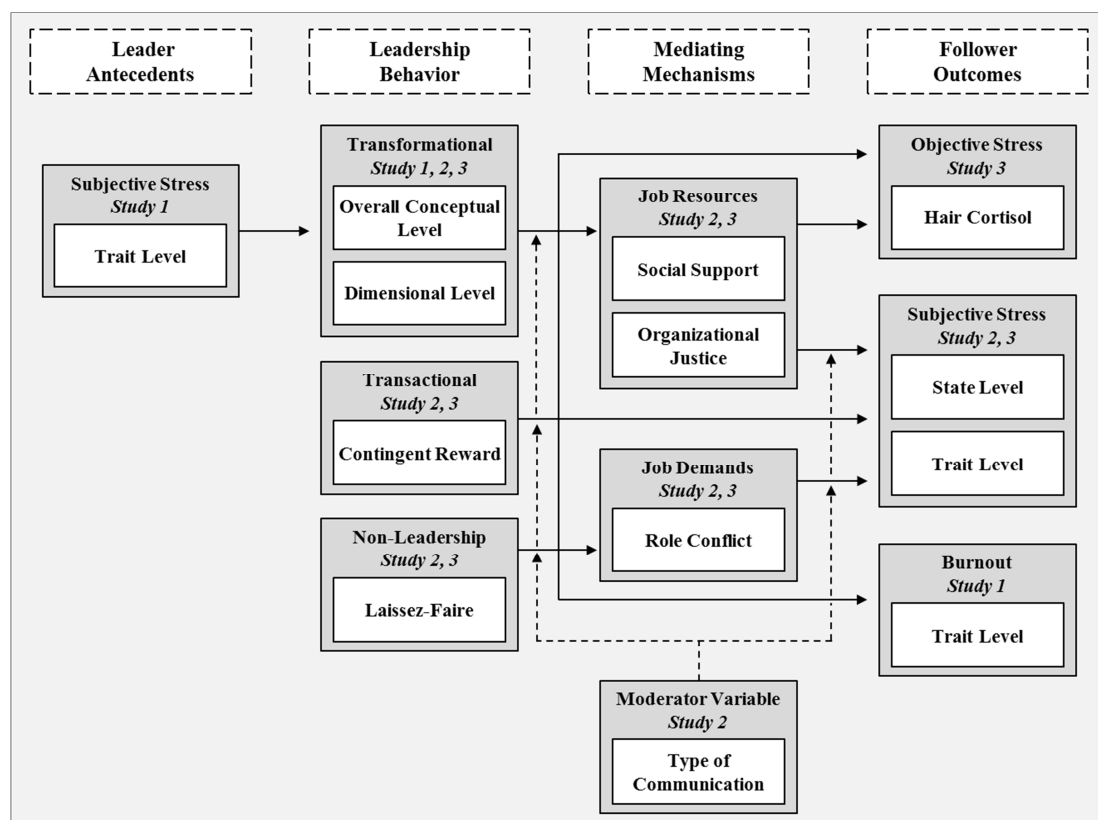


Figure 1. Research Model of the Dissertation.

(2) **Stress-related consequences of leadership behaviors.** Dating back to the beginning of leadership research, two different points of view have been captured. On the one hand, leaders may help their followers to cope with stress, but on

the other hand, leaders may even be the source of stress for their followers (Bass, 1990a). Still, there are only a few studies linking effects of the different full-range leadership behavior patterns to work stress. With regard to laissez-faire behavior of the leader, this pattern of non-leadership fosters the evermore occurrence of stressful and challenging situations. The leader omits to create a clear structure and guidance so that followers are not assured by the leader to overcome present challenges. Therefore, stress cannot be reduced (Skogstad et al., 2007). With regard to transactional leadership, this pattern of behavior may lead to a reduction of stress through providing immediate solutions for occurring problems by the coordination of rapid reactions (Bass, 1990a). With regard to transformational leadership, the leader may go one step beyond the mere transactional behavior by focusing on long-term, higher-order solutions for problems to reduce potential levels of follower stress. With this, transformational leaders aim at transforming crisis into challenges to reach a shift of followers' attention away from the stressful situation (Bass, 1990a).

This stress-related focus on leadership outcomes is important as current research still encloses important research questions unanswered (Skakon et al., 2010). This includes that some studies could not replicate stable effects of leadership behaviors on correlates of followers' work stress (Malloy & Penprase, 2010; Stordeur, D'Hoore, & Vandenberghe, 2001). Also, employee well-being is such an important topic in the current state of research that we need to understand the influence of leaders on the prevalence of followers' work stress more precisely, which is in turn connected to key indices of organizational performance.

(3) **Theoretically connected leadership behavior patterns.** Browsing main academic search engines and academic journals yields a wide range of studies assessing outcomes of various leadership patterns and styles. These range from authentic leadership via shared leadership through to ambidextrous leadership. The link between these numerous different studies is that mostly only the impact of one single, specific leadership style is assessed. Meaning that no theoretical leadership framework is implemented that includes different but theoretically connected leadership constructs. Until now, only a few studies have conducted a systematic compari-

son of the consequences of distinct but theoretically coherent leadership constructs on employees' level of work stress.

To address this limitation and to present a more balanced perspective on the role of leadership in the context of work stress in my dissertation, the full-range leadership theory is applied. The full-range leadership model covers three main patterns of leader behaviors (i.e. laissez-faire, transactional, and transformational leadership) that can be distinguished in terms of their level of activity, which the leader has to invest to attain the optimal level of efficacy. With this, I follow the promising strategy of Judge and Piccolo (2004) to present a comprehensive approach of comparative leadership research. This is particularly important as no leader is assumed to behave in the same manner on every occasion that requires leadership behavior, but instead leader behavior may vary depending on situational or personal characteristics (Johnson et al., 2012). Therefore, the present dissertation adds value to leadership theory as I put the synchronous influence of different but theoretically connected leadership behavior patterns into focus. This approach enables me to gain a better understanding on which leadership behaviors have unique predictive validity over and above others.

(4) Differentiated measurement of work stress. To enhance existing research I aim to integrate innovative methods of stress measurement to ensure high quality of empirical data collected (Podsakoff et al., 2003; Podsakoff et al., 2012). Therefore, I draw back on different sources within the empirical studies one and three to reduce potential causes of common method bias. More precisely, in study one I survey dyads of leaders and followers, and in study three I collect data from questionnaires together with biological markers of respondents. Concerning the application of biological indicators, I follow a growing body of organizational literature calling for the application of more innovative and rigorous methods to advance and strengthen theory (Antonakis, Day, & Schyns, 2012). Thus, the combination of biological and psychological research traditions to integrate and advance knowledge in the organizational context, in regards of biological aspects of organizational behavior, is a promising research approach in the leadership field.

Besides, I vary the measurement context in study two by applying a diary-design. This repeated-measure research design, focusing on a within-person perspec-

tive, attenuates problems concerning same-source aspects of measurement (Courtright, Gardner, Smith, McCormick, & Colbert, 2015). Further, the daily assessment of leadership behaviors reduces potential biases within the process of subjective measurement of leader conducts, which may be caused by interpersonal factors between leaders and those they lead or temporary changes in the mood of followers (Brown & Keeping, 2005). Furthermore, the diary design buffers potential recall biases, which can occur within the assessment of subjective work stress, because stress levels are rated only a few hours after the end of a working day and on every day of the working week. Finally, the diary design of study two provides a detailed picture on the consequences of transformational leadership behaviors by focusing on daily processes to explain how leaders affect followers' stress levels. In conclusion, the three empirical studies enable a detailed assessment of leadership impact on different levels of analysis of stress (trait vs. state levels).

(5) **Theoretically connected mediating mechanisms.** To create an encompassing mediation model in my dissertation, I draw back on the job demands-resources model (Demerouti et al., 2001) to provide a guiding structure to organize potentially stress-reducing as well as stress-promoting mechanisms within the leadership influence process. Interestingly, although there is a wide range of studies assessing a mediation model for full-range leadership behaviors, there are nearly no studies looking at health-related outcomes of followers. Instead, almost always positive, performance-oriented outcome criteria are scrutinized. Moreover, to now there is no empirical study that uses a clear framework to integrate different mediators into an overarching theoretical concept (van Knippenberg & Sitkin, 2013).

In general, the relation between leadership behavior and followers' work stress may be linked through the presence or absence of potentially harmful or, diametrically opposite, innocuous working conditions (Donaldson-Feilder et al., 2013). Within this framework, leaders may influence the occurrence, perception, or interpretation of these working conditions and buffer negative or boost positive aspects of work (Piccolo & Colquitt, 2006). Therefore, the job demands-resources framework helps me to test theoretically derived harmful as well as resource-strengthening aspects of the job that can be influenced by the leader. As a result, I am able to present

a coherent set of mediating variables that are grounded within a theoretical framework to explain the role of full-range leadership behaviors and the mediation process by which stress-related outcomes are affected (van Knippenberg & Sitkin, 2013).

Summarizing the research agenda of my dissertation, I aim to subsume antecedents, correlates, mediators, and moderators of the (full-range) leadership behavior pattern influence. By analyzing these encompassing research questions, my dissertation contributes to existing research in several ways. Firstly, I extend current research by analyzing stress-related antecedents of (transformational) leadership behavior since this approach has not been accounted yet. Secondly, by identifying mediators within the relation between leader behavior and follower work stress, I am able to paint a clear theoretically driven picture to explain how leaders affect followers' levels of work stress. Thirdly, testing potential moderating factors within the stress-related influence process of leader behaviors enables me to precisely describe when leadership behavior enfold its stress-reducing impact and when it does not. Fourthly, the simultaneous application of the full-range leadership behaviors provides promising insights on interrelations as well as unique effects of distinct leadership behavior patterns. Fifthly, by making use of different methodological advancements i.e., diary methods, questionnaires, biological indicators, as well as different respondents observed, I strengthen the generalizability and the contribution of my study results.

The contribution of my dissertation will be outlined more precisely in the following chapters (cf. Chapters 3, 4, and 5) within the presentation of the three studies that I conducted to answer the aforementioned research questions.

3. Study 1 - How Does Leader Stress Influence Follower Burnout? An Analysis of Transformational Leadership Behavior

3.1 Introduction

While researchers have learned a great deal about the consequences of certain leader behaviors, relatively little is known about its genesis. Put simply, it remains unclear why certain people engage in effective leadership behaviors while others do not. Although transformational leadership – so far one of the most effective leadership styles (Judge & Piccolo, 2004; Wang et al., 2011) - has been extensively studied in last decades, insights on situational antecedents are lacking in this field of inquiry since “there is an alarmingly limited amount of research on antecedents of transformational [...] leadership” (Courtright et al., 2014, p. 690).

Conger and Kanungo (1998) have argued that particularly in situations characterized by highly stressful demands leaders’ would behave in a transformational way, because stress and crisis promote the emergence of charisma. I challenge this assumption as recent empirical studies have demonstrated that diminished psychological resources by means of stress have been accompanied by a reduction of effort in leader behaviors (Byrne et al., 2014). Building up on the conservation of resources theory (COR theory; Hobfoll, 1989), which links individuals’ available resources to stressful reactions, the interrelation between leader stress and leadership behaviors will be outlined in this study.

Besides exploring antecedents of transformational leader behaviors, this study includes its consequences as well. Whereas there is a plethora of studies on positive consequences (Judge & Piccolo, 2004), there are only few studies exploring stress-related outcomes of transformational leadership. Recent studies have mentioned the consequences of specific patterns of transformational leadership behaviors on followers’ levels of work stress (Skakon et al., 2010; Zwingmann et al., 2014) and have highlighted the positive i.e., stress-reducing effect of transformational leadership. To test an encompassing model of transformational leader behaviors - combining antecedents, behavior, and consequences - I draw back on the field of emotional conta-

gion e.g., leader affect influencing follower affect. Recently, a relation between displayed negative mood of leaders and followers' experience of negative mood has been observed (Sy, Côté, & Saavedra, 2005). Further, followers' negative affect at work has been related to attributions of their leaders charismatic behaviors (Johnson, 2008). By looking on these processes through the lens of emotional contagion theory, conclusions can be drawn on whether it is a spill-over effect of leader stress on subordinates, or whether leader stress influences leadership behaviors, which as a consequence affect follower burnout. Consequently, antecedents of transformational leadership behaviors regarding leaders' level of work stress will be explored together in a framework with direct consequences of leader stress on followers' levels of burnout.

To summarize, this study contributes to theoretical work on transformational leadership by following repeated calls for an integrative research on antecedents of transformational leadership behaviors (Avolio, Walumbwa, & Weber, 2009; Courtright et al., 2014; Johnson et al., 2012) while setting the focus on situational, stress-related antecedents. Using a mediational framework to test the relationship between antecedents of transformational leadership behaviors and its consequences with regard to followers' levels of work stress, this study provides promising insights into the field of leadership theory. Accordingly, the aim of this study is to explain why transformational leadership behaviors are not consistently implemented in management although its effectiveness is known.

3.2 Theory and Hypotheses

Transformational leadership is known as the most active and effective type of leader behavior that aims at a transformation of values to enhance followers' performance (Bass, 1985). There is a plethora of studies highlighting the positive effects of transformational leader behaviors on followers with regard to performance, job satisfaction, and commitment to the organization (Jackson et al., 2013; Judge & Piccolo, 2004; Wang et al., 2011). Transformational leaders accomplish these desirable outcomes by engaging in proactive behaviors to raise followers' awareness of the collective interests of the group (Antonakis et al., 2003). Therefrom, transformational leaders motivate their followers to work for the benefit of the group and help them to achieve extraordinary goals. Following the concept of Podsakoff et al. (1990), trans-

formational leadership is defined by six distinct patterns of behaviors: Identifying and articulating a vision, providing an appropriate model, fostering the acceptance of group goals, high performance expectations, providing individualized support, and intellectual stimulation.

3.2.1 Antecedents of Transformational Leader Behaviors

Research on antecedents of transformational leader behaviors has pointed out different approaches to gain important insights on characteristics of successful leaders. There is a large amount of studies focusing on the context of leadership or on core leader trait variables. Firstly, much research has been done on contextual factors influencing how a leader behaves. Walter and Bruch (2009) distinguished between leaders' social context, central positional characteristics, national culture, or organizational characteristics. These contextual variables can be clearly linked to the emergence of transformational leader behaviors (Shamir & Howell, 1999). Secondly, much is known about the influence of demographic characteristics like gender (Eagly et al., 2003), leader intelligence (Atwater & Yammarino, 1993), or leader personality traits (Bono & Judge, 2004; Judge & Bono, 2000) on the emergence of transformational leader behaviors. Yet, current research on antecedents of transformational leadership lacks to focus on situational factors (Courtright et al., 2014).

In recent years, studies have started to look at leaders' mood and emotions to identify the influence of affective states on displayed leader behaviors. From this research strand it is concluded that especially positive mood and emotions are related to leaders' transformational behaviors (Gooty, Connelly, Griffith, & Gupta, 2010; Joseph, Dhanani, Shen, McHugh, & McCord, 2015; Walter & Bruch, 2009). Nevertheless, this focus on positive affective states is accompanied by a lack of research on negative feelings of leaders (Joseph et al., 2015; Walter & Bruch, 2009). Consequently, this study aims to highlight the influence of leader stress on transformational leader behaviors. To do this, I build up on first approaches conducted by Byrne et al. (2014) who linked depressive symptoms, anxiety, and workplace alcohol consumption to the occurrence of transformational leadership as well as Courtright et al. (2014) who assessed the influence of developmental challenges on transformational leader conducts.

As outlined in the introduction section, COR theory constitutes a framework to structure and explain how stress-related antecedents influence leader behaviors. COR theory states that personal resources play a fundamental role in the occurrence of work stress (Hobfoll, 2001). It is proposed that cognitive resources are reduced when individuals try to adapt to stressful conditions. This results in shifting the focus of attention away from needs of others towards solely personal needs (Hobfoll, 1989, 2001). In the context of leadership, COR theory presumes that stressed leaders will be less transformational i.e., will use less demanding leadership strategies. Following Byrne et al. (2014), COR theory provides an optimal framework to address effects of stress on leaders' behaviors as depleted leaders cannot fulfill the ambitious demands to conduct high quality leadership. When individuals are threatened with loss of important resource, they strive to inhibit this resource loss. As a result, they cannot enact in behaviors that require a large amount of personal investment. Further, leaders who suffer from stress will tend to engage in behaviors which are characterized by inaction and avoidance. In contrast for effective leadership, it is crucial that the leader invests cognitive and emotional capacity. If these capacities are depleted, due to leaders perceived stress, leaders will engage in rather effortless leader strategies to retain their own personal resources (Byrne et al., 2014). Dóci and Hofmans (2015) have demonstrated that cognitively challenging tasks depleted leaders resources since transformational leadership behaviors decreased as a function of rising task complexity. Generally, demanding or stressful situations reduce cognitive resource capacity and, as a consequence, mitigate the cognitive basis for the enactment of transformational leader behaviors as cognitive capacity plays a fundamental role in the context of high quality leadership (Wofford & Goodwin, 1994). Additionally, stress has been shown to have detrimental effects on individuals' cognitive capacity (Schoofs, Preuss, & Wolf, 2008) and coincidentally, diminished capacity results into decreased performance capability as well as an impairment of higher-order cognitive functioning (Qin, Hermans, van Marle, Luo, & Fernández, 2009). In the context of leadership, it is known that stress influences how leaders make use of their cognitive capacities (Fiedler & Garcia, 1987) which highlights the fact that stress is an important factor that influences how leaders interact with their followers. Further, Collins and Jackson (2015) scrutinized antecedents of constructive and destructive behaviors of

leadership concluding that constructive leadership e.g., transformational leadership, is more likely when there is a sufficient level of psychological resources.

Accentuating the most distinctive aspect of the transformational leadership behavior pattern, that is setting an example of an attractive vision of the future (Bass, 1985), a clear linkage between leader stress and visionary behaviors can be outlined. Following Podsakoff et al. (1990), identifying and articulating a vision describes leaders acting and talking in a consistent manner. They set an example of the basic values of the organization, and articulated an attractive and emotive vision for the future (Bass, 1985). This vision is abstract as it comprises the values and objectives of all followers to emphasize similarities. It delivers guidance for the future, and provides a rationale for behavior; this leads to employee trust and enthusiasm. Accordingly, leaders forming and role modeling a vision of the future need to draw on cognitive resources and also a high amount of working memory capacity (Strange & Mumford, 2005; Wofford & Goodwin, 1994). Generally, this working memory capacity is the best predictor of leaders' performance (Hedlund et al., 2003). In particular, for the formation of a vision leaders need to simplify different elements to create a shared positive image of the future which gives sense and identity. The key challenge for leaders is posed by deciding what is important and what is not while much information is available. If now cognitive capacity is reduced by stress, leaders fail to create and to communicate an attractive vision of the future (Partlow, Medeiros, & Mumford, 2015). In summary, this line of argument results in the first hypothesis:

Hypothesis 1: Stressed leaders display less transformational leader behaviors.

3.2.2 Effects of Transformational Leader Behaviors on Follower Burnout

After relating leader stress to displayed leadership behaviors, in the following, consequences of these leader behaviors are outlined with respect to follower burnout. Work-related burnout is defined as “the degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to his/her work” (Kristensen, Borritz, Villadsen, & Christensen, 2005, p. 197) that results from emotionally demanding work situations. In addition, “although there are many different conceptualizations of burnout, there is one characteristic all definitions have in common: an exhaustion of the organism which is caused by work stress” (Plieger,

Melchers, Montag, Meermann, & Reuter, 2015, p. 20). The incidence of burnout is generally influenced by high quantitative job demands, role conflicts, poor social support, or a lack of feedback (Maslach, Schaufeli, & Leiter, 2001). However, to what extent leaders' behaviors impinge on follower burnout is not specifically clear yet (De Hoogh & Den Hartog, 2009).

Fostering followers' abilities and problem solving skills are distinctive behavior patterns of transformational leaders. As a consequence, followers become confident that they can overcome potential stressful situations or difficulties (Bass, 1985). Likewise, transforming personal concerns into an effort to achieve group goals and to handle challenging situations are key aspects of transformational leadership that help followers to cope with stress and its origins (Bass & Riggio, 2006). Transformational leaders identify new opportunities and create a vision (Bass, 1985). This vision delivers guidance for the future, and provides a rationale for behavior that leads to employee trust and confidence. This includes the communication of meaning and purpose of potentially challenging situations to reframe stressful experiences (Rowold & Schlotz, 2009). Besides, transformational leaders provide individualized support by identifying and respecting their followers' needs. These empowering behaviors help their followers to manage stressful situations (Bass & Riggio, 2006) by offering personal coaching, treating followers as individuals (Hater & Bass, 1988), and paying attention to individual differences (Yammarino, Spangler, & Bass, 1993). In particular, transformational leaders emphasize the positive aspects of challenging situations (Zhang et al., 2014) as they influence how these potential stressors of the work environment are perceived and interpreted (Piccolo & Colquitt, 2006). Additionally, transformational behaviors serve as a resource for followers as they accentuate positive aspects of stressful situations and buffer negative ones (LePine et al., 2015). This strengthens followers' beliefs to overcome challenges and to achieve positive and desired outcomes (LePine, Podsakoff, & LePine, 2005).

On an empirical basis, transformational leader behaviors have been linked to different outcomes of follower well-being. For example, in a large-scale study using a sample of 90,000 employees Zwingmann et al. (2014) investigated the health-promoting effects of transformational leadership. They have shown that transformational leader behaviors promoted physical health and well-being regardless of fol-

lowers' cultural background. In addition, multiple studies linked transformational leader behaviors to the promotion of health (Arnold, Turner, Barling, Kelloway, & McKee, 2007; Kelloway, Turner, Barling, & Loughlin, 2012), as well as the reduction of stress (Liu et al., 2010) and burnout (De Hoogh & Den Hartog, 2009; Hetland, Sandal, & Johnsen, 2007; Seltzer, Numerof, & Bass, 1989). With respect to follower burnout, Densten (2005) showed that in particular visionary leader behaviors reduced aspects of burnout. Summarizing the aforementioned link between transformational leader behaviors and follower burnout, these leader conducts help to provide followers with tools to handle challenging aspects of their job and to mitigate the detrimental effects of core aspects of burnout (Breevaart, Bakker, Hetland, & Hetland, 2014). In summary, these conclusions result in the second hypothesis:

Hypothesis 2: Transformational leader behaviors reduce follower burnout.

3.2.3 Influence of Leader Stress on Follower Burnout by Means of Transformational Leadership

As outlined in the previous sections, I have stated that leaders' perceived stress functions as a core antecedent of transformational leader behaviors. I have concluded that stressed leaders display less transformational leadership behaviors. Likewise, I have outlined that transformational leader behaviors influence followers' levels of burnout. I also propose that transformational leadership behaviors mediate the relationship between leader stress and follower burnout. As research in the context of leader stress is scarce, I draw back on research focusing on negative mood as well as emotion. Stressed leaders may be perceived as less transformational, because these patterns of behavior are rather characterized by positive than negative emotions (Bass, 1985; Conger & Kanungo, 1998). To outline this assumption, I look through the lens of emotional contagion theory. Emotional contagion is described as an unconscious and automatic transmission of emotions between individuals i.e., leader and follower, meaning that followers catch the emotions displayed by their leaders (Bono & Ilies, 2006). The key mechanisms that underlie emotional contagion are mimicry and synchrony as well as emotional experience and feedback (Johnson, 2008; Tee, 2015). Mood contagion operates between leaders' negative affect and

followers' negative affect in the way that leaders being in a negative mood presumably have followers also being in a negative mood (Sy et al., 2005).

In general, empirical and theoretical studies have suggested that positive mood causes favorable leadership outcomes, whereas negative mood causes unfavorable outcomes (Gooty et al., 2010). Yet, studies examining the interrelation between negative mood and emotions with leadership are scarce (Gooty et al., 2010; Joseph et al., 2015). Most studies focus on the beneficial effects of positive leader affect ignoring potential detrimental effects of negative mood. Empirical findings linking emotional contagion with regards to the criteria of leader effectiveness, leader emergence, and displayed transformational leadership style have revealed the following detailed pattern of results: First, with regards to leader effectiveness, empirical studies have revealed a strong connection between negative affect and the perception of leader effectiveness (Lewis, 2000) in the way that positive mood engenders perceptions of leader effectiveness (Gooty et al., 2010) whereas negative ones do not. Leaders who express positive emotions are generally perceived as more effective than leaders who express negative emotions (Connelly & Ruark, 2010; Gaddis, Connelly, & Mumford, 2004). In addition, followers of leaders who display negative emotions even perform worse (Gaddis et al., 2004). When leaders express negative emotions, followers are more likely to question the sincerity behind the leaders' intentions and may consider ulterior motives (Eberly & Fong, 2013) that are incompatible with transformational leadership. Second, with regards to leader emergence, meta-analytical results have shown that leader trait negative affect, defined as a dispositional tendency to feel negative emotions which is in turn connected to the feeling of distress (Watson & Tellegen, 1985), is negatively associated with leadership emergence (Joseph et al., 2015). That is because in particular charismatic behaviors, as a distinct pattern of transformational leadership, are strongly characterized by positive emotions. Third, with respect to transformational leadership behaviors, positive mood has been positively related to follower ratings of charisma (Johnson, 2008). Likewise, positive affect displayed by leaders has led to higher ratings of charismatic leadership (Damen, van Knippenberg, & van Knippenberg, 2008; Johnson, 2009; Tee, 2015). Beyond, in a longitudinal study, Perko et al. (2016) demonstrated that followers who stated being in a low well-being group reported less transformational

leadership behaviors of their supervisors in comparison to followers with good well-being.

On a more trait-related basis, Joseph et al. (2015) meta-analytically showed that leader trait negative affect consistently revealed negative relationships with leadership effectiveness ($\rho = -.24$), leadership emergence ($\rho = -.13$), and transformational leadership behaviors ($\rho = -.18$). Further, the relationship between leader trait negative affect and leadership effectiveness seemed to be partially mediated by transformational leadership behaviors. The authors have concluded that on the one hand leaders who score high on negative affect engage less frequently in transformational leader behaviors and, on the other hand, they are perceived as being less transformational.

Merging the arguments of the previous sections, I demonstrated that the more stress a leader experiences, the less likely he will enact in transformational leader behaviors, which are in need of high cognitive capacities and resources. Further, I outlined that leader behaviors influence followers' levels of burnout. Taken together, evidence suggests that leaders who experience high levels of work stress less likely adopt transformational leadership behaviors resulting in burned out followers. Also, these findings are supported by findings concerning emotional contagion where the perception of leaders is strongly influenced by negative affect. Therefore, hypothesis three states:

Hypothesis 3: The relationship between leader stress and follower burnout is mediated by transformational leadership behaviors.

Figure 2 summarizes the present research model of this study and visualizes the interconnections between the different variables included.



Figure 2. Proposed Relationships among Study Variables of Study 1.

3.3 Method

3.3.1 Sample and Data Collection

The sample consisted of 294 pairs of leaders and their followers who worked together in a regular employment relationship. Leaders and followers were matched and concurrently asked to participate in this study. Leaders provided information on their level of perceived stress and subordinates informed about their direct leader's transformational leadership behaviors and their own level of burnout. Dyads of leaders and followers were recruited using a snowball sampling technique at the hand of research assistants who monitored data collection and contacted participants from their personal environment. This sampling technique has been applied in previous studies (Breevaart, Bakker, Demerouti, & Derks, 2015; Harold & Holtz, 2015) and has been demonstrated to yield to representative samples (Demerouti & Rispens, 2014; Wheeler, Shanine, Leon, & Whitman, 2014).

The group of followers consisted of 121 men and 171 women of whom 26% had at least a certificate of secondary education, 32% a higher education entrance qualification, and 37% a university degree². 80% were in a regular employment relationship, 3% were civil servants, and 11% were students. Most of the subordinates were between 20 and 30 years old (52%), 23% between 30 and 40, and the remaining participants older than 40. The majority of the leaders were male (67%) with most of them holding a university degree (61%) or at least a higher education entrance qualification (20%). With regard to leaders' age, most of them were between 40 and 50

² Missing from 100% did not provide information concerning demographics.

(35%), 25% were between 30 and 40, and the others older than 50. Thirty-four percent of the leaders worked at the lower management level, 42% at the middle management level, and 24% at the upper management level.

3.3.2 Measures

Leaders' perceived stress. Leaders provided information on their level of perceived stress using eight items from the validated version (sample item: „I get irritated easily, although I don't want this to happen.“; Mohr, Müller, & Rigotti, 2005) of the Irritation Scale of Mohr, Müller, Rigotti, Aycan, and Tschan (2006). The response format ranged from 1 (*I strongly disagree*) to 7 (*I strongly agree*). Cronbach's alpha was .90.

Follower burnout. Six items from the Copenhagen Burnout Inventory (Kristensen et al., 2005) validated in a German sample (Nübling, Stöbel, Hasselhorn, Michaelis, & Hofmann, 2006) were used to measure followers' work-related burnout. Participants stated how far they applied to the presented statements (sample item: „How often do you feel emotionally exhausted?“) on a response format ranging from 1 (*always*), 2 (*often*), 3 (*sometimes*), 4 (*seldom*), to 5 (*never/ hardly ever*). For the analyses the scale was reversed such that a high value represented a high level of follower burnout. Cronbach's alpha was .90.

Leadership behaviors. Followers rated their direct leaders transformational leadership behaviors using the Transformational Leadership Inventory (Heinitz & Rowold, 2007; Podsakoff et al., 1990). The TLI consists of six distinct facets of transformational leadership behaviors (Krüger et al., 2011): Identifying and articulating a vision (5 items; sample item, “My supervisor paints an interesting picture of the future for our group”); providing an appropriate model (3 items; “My supervisor provides a good model for me to follow”); fostering the acceptance of group goals (4 items; “My supervisor gets the group to work together for the same goal”); high performance expectations (3 items; “My supervisor shows us that he/she expects a lot from us”); providing individualized support (4 items; “My supervisor shows respect for my personal feelings”); and intellectual stimulation (3 items; “My supervisor challenges me to think about old problems in new ways”). The overall composite score was used in analysis with Cronbach's alpha of .94.

Control variables. Leaders' age and gender, followers' age and gender, as well as leaders' transactional leadership and laissez-faire behaviors were included in all reported analyses steps as control variables to minimize potential biases associated with demographic differences and other leader behaviors. Leaders' transactional leadership behaviors were assessed using the four-item scale of the TLI (sample item: "My supervisor provides me with positive feedback if I perform well."; Cronbach's alpha = .89; Podsakoff et al., 1990). Laissez-faire behaviors were assessed using four items (sample item: "My supervisor tries to avoid decisions"; Cronbach's alpha = .84; Rowold, 2011) with a response format ranging from 1 (*I strongly disagree*) to 5 (*I strongly agree*) for both leadership measures.

Distinctiveness of study variables. Maximum likelihood confirmatory factor analyses with IBM SPSS AMOS 22 were conducted to test whether the proposed five-factor model (Leaders' perceived stress, leaders' transformational leadership behaviors, follower burnout, leaders' transactional behaviors, and laissez-faire) fits the data better than alternative models. Results of confirmatory factor analyses using item parcels indicated that the expected five-factor model fits the data reasonably well ($\chi^2(25) = 61.95, p < .01$; root-mean-square error of approximation (RMSEA) = .07; standardized root mean residual (SRMR) = .03; comparative fit index (CFI) = .98) and better than the other models that were tested (cf. Table 3).

Table 3. *Study 1: Results of Confirmatory Factor Analyses*

| Model | χ^2 | <i>df</i> | $\Delta\chi^2 (\Delta df)$ | CFI | RMSEA | SRMR |
|--|----------|-----------|----------------------------|-----|-------|------|
| Hypothesized 5-factor model | 61.95** | 25 | | .98 | .07 | .03 |
| 3-factor model (leadership, leader stress, follower burnout) | 293.83** | 32 | 231.88** (7) | .87 | .17 | .06 |
| 2-factor model (leadership, stress variables) | 546.64** | 34 | 484.69** (9) | .74 | .23 | .13 |
| 1-factor model | 824.99** | 35 | 763.04** (10) | .59 | .28 | .15 |

Note. $N = 294$. All alternative models were compared to the hypothesized 5-factor model.

CFI = comparative fit index; RMSEA = root-mean-square error of approximation; SRMR = standardized root mean residual.

* $p < .05$; ** $p < .01$.

3.4 Results

Means, standard deviations and correlations among study variables are presented in Table 4.

Hypothesis 1 stated that stressed leaders display less transformational leader behaviors and was supported by the results. Results of regression analysis using IBM SPSS 22.0 show that leader stress significantly influences transformational leader behaviors ($b = -.20$, $SE = .03$, $p < .01$; cf. Table 5) while controlling for demographics. Control variables did not influence transformational leader behaviors displayed, except for leaders' gender ($b = .20$, $SE = .07$, $p < .01$).

Hypothesis 2 proposed that transformational leader behaviors reduce follower burnout. Looking at the direct effects of transformational leader behaviors on follower burnout while controlling for demographics, Table 5 shows a significant negative effect ($b = -.26$, $SE = .11$, $p < .05$) supporting hypothesis 2. Additionally, a direct effect from leader stress on follower burnout was observed ($b = .13$, $SE = .04$, $p < .01$). Control variables did not influence follower burnout, except for followers' gender ($b = .32$, $SE = .09$, $p < .01$).

A mediational framework was tested within hypothesis 3 using the PROCESS macro to test for indirect effects in mediation analyses (Model 4; Hayes, 2013). Leaders' perceived stress was specified as predictor, transformational leadership as mediator, and follower burnout as outcome variable while entering leaders' age and gender, followers' age and gender, transactional leadership, and laissez-faire as control variables in the regression analysis. Bias-corrected confidence intervals were set at 95% from the bootstrap analysis with 5,000 bootstraps resamples. The indirect effect of leader stress on follower burnout via transformational leadership behaviors was significant (estimate = .05, $SE = .03$, 95% $CI [.01, .11]$) indicating mediation and giving support for hypothesis 3.

Table 4. *Study 1: Means (M), Standard Deviations (SD), and Correlations*

| | <i>M</i> | <i>SD</i> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|----------|-----------|--------|-------|------|-------|--------|--------|--------|--------|-------|
| 1. Age _{Leader} ^a | 3.79 | 1.04 | - | | | | | | | | |
| 2. Gender _{Leader} ^b | 0.31 | 0.46 | -.17** | - | | | | | | | |
| 3. Age _{Follower} ^a | 2.80 | 1.07 | .40** | -.11 | - | | | | | | |
| 4. Gender _{Follower} ^b | 0.58 | 0.49 | -.04 | .28** | -.11 | - | | | | | |
| 5. Leader stress | 2.85 | 1.09 | .06 | .06 | -.06 | .05 | (.90) | | | | |
| 6. LF | 2.07 | 0.77 | .04 | -.05 | .08 | -.05 | .28** | (.84) | | | |
| 7. TAL | 3.65 | 0.83 | -.05 | .11 | -.09 | .00 | -.27** | -.59** | (.86) | | |
| 8. TFL | 3.53 | 0.62 | -.07 | .12* | -.06 | .04 | -.31** | -.60** | .71** | (.94) | |
| 9. Follower burnout | 2.49 | 0.77 | -.02 | .08 | -.02 | .23** | .29** | .23** | -.28** | -.32** | (.90) |

Note. *N* = 294. Internal consistency coefficients (Cronbach's alphas) are reported in the parentheses on the diagonal.

^aage coded as 1 = younger than 20, 2 = between 20 and 30, 3 = between 30 and 40, 4 = between 40 and 50, 5 = between 50 and 60, 6 = older than 60; ^bgender coded as 1 = female and 0 = male; LF = laissez-faire; TAL = transactional leadership; TFL = transformational leadership.

p* < .05; *p* < .01.

Table 5. *Study 1: Results of Regression Analyses*

| | Transformational leadership behavior | | Follower burnout | |
|---|--------------------------------------|-----------|------------------|-----------|
| | <i>b</i> | <i>SE</i> | <i>b</i> | <i>SE</i> |
| <i>Controls</i> | | | | |
| Age _{Leader} ^a | .00 | .03 | -.03 | .04 |
| Gender _{Leader} ^b | .20** | .07 | .06 | .10 |
| Age _{Follower} ^a | -.04 | .03 | .00 | .04 |
| Gender _{Follower} ^b | -.01 | .07 | .32** | .09 |
| LF | | | .03 | .07 |
| TAL | | | -.09 | .08 |
| <i>Study variables</i> | | | | |
| Leader stress | -.20** | .03 | .13** | .04 |
| TFL | | | -.26* | .11 |
| <i>R</i> ² | .15 | | .21 | |
| <i>F</i> | 9.98** | | 9.26** | |

Note. *N* = 294. Unstandardized regression coefficients are reported.

^aage coded as 1 = younger than 20, 2 = between 20 and 30, 3 = between 30 and 40, 4 = between 40 and 50, 5 = between 50 and 60, 6 = older than 60; ^bgender coded as 1 = female and 0 = male; LF = laissez-faire; TAL = transactional leadership; TFL = transformational leadership.

p* < .05; *p* < .01.

3.5 Discussion

The general objective of this study was to implement a mediational framework to test the relationship between stress-related antecedents of transformational leadership behaviors and its consequences with regard to followers' levels of work stress. Results supported all hypotheses in the way that leader stress negatively influenced transformational leader behaviors (hypothesis 1), leaders' transformational leadership behaviors reduced follower burnout (hypothesis 2), and the relationship between leader stress and follower burnout was mediated by transformational leadership behaviors (hypothesis 3).

Consistent with previous research, results show that leader stress seems to have a negative impact on displayed high quality leader behaviors. Similarly, George

(2000) noted that negative feelings inhibit leaders ability to build trusting relations with followers and reduce the occurrence of transformational behaviors. In addition, results confirm the argumentation outlined by Halverson et al. (2004) who demonstrated that low levels of stress may provide just enough arousal to behave transformational, whereas too much stress may interfere with leader's ability to conduct transformational leadership. Other scholars have noted that transformational leadership functions at its best in times of crisis (Conger & Kanungo, 1998; Halverson et al., 2004). Yet, consistent with the results, Dóci and Hofmans (2015) have proposed that an inverted u-function perfectly describes and explains the relation between leader stress and leaders' transformational behaviors. According to COR theory, leaders' resources may be depleted until a specific stress level is reached so that no more resources are left to perform adequate leader behaviors. In line with findings from stress research, the present study supports the view that stress reduces leaders' cognitive resource capacity, feedback processing, decision making and strategic thinking (Starcke & Brand, 2012) to perform high quality leader behaviors. Moreover, stress is linked to less perspective taking and cooperative interactions resulting in a more egocentric view not taking followers into account (Epley, Keysar, van Boven, & Gilovich, 2004; Tomova, von Dawans, Heinrichs, Silani, & Lamm, 2014). Stress experienced by leaders inhibits important skills and requirements of performing resource-demanding leader behaviors. Furthermore, this study replicates and extends findings that highlight the importance of leader behavior for followers' well-being. It seems that transformational leaders empower their followers and encourage them in their abilities to achieve important goals by reframing possible stressful situations into challenging demands (Conger & Kanungo, 1998). With this focus on positive emotional aspects (Bono & Ilies, 2006) the incidence of burnout is reduced.

In sum, these findings help to extend the scholarly understanding of transformational leadership behaviors by identifying an important situational antecedent together with direct consequences of these patterns of behaviors. I have demonstrated effects of transformational leadership on follower burnout, while controlling for the effects of transactional leadership and laissez-faire.

3.5.1 Limitations and Future Directions

A main limitation due to the cross-sectional design of this study is that causal effects cannot be drawn. Future research should implement an experimental setting by inducing stress to leaders and measure its direct impact on transformational behaviors (Dóci & Hofmans, 2015) to outline the interrelation between stressful working-conditions and leader behaviors. Making causal conclusions is particularly important as there may exist two possible lines of argumentation for the explanation of my study results. First, it is possible, that followers' mood influences leader performance i.e., an opposite interpretation of the results is conceivable (Tee, 2015). Likewise, Howell and Shamir (2005) have argued that followers may actively influence the behaviors of their leaders. Second, leadership strategies may also have an effect on leaders own levels of stress (Arnold, Connelly, Walsh, & Martin Ginis, 2015) in the way that high quality leader behaviors are in high need of leaders resources, which leads to resource depletion, and as a consequence more stress for leaders. Therefore, future research should replicate findings within an experimental framework to rule out concerns regarding causality.

Additionally, within this research design there are certain problems regarding common method variance. Although two sources for data collection - leaders and their respective followers - participated in this study, followers rated their leaders' behaviors and their own level of burnout. Therefore, future research should use objective, biological indicators of follower stress, like heart-rate variability or cortisol levels, to strengthen the quality of the data. Alternatively, ratings of leaders' behaviors from an independent third party would be useful to separate effects of leader stress on leadership behaviors from effects resulting from the perception of leadership behaviors in general (Gaddis et al., 2004; Halverson et al., 2004; Johnson, 2009). Future research should isolate the influence of actually displayed behaviors from raw perceptions of behaviors which may be biased, because followers' feel stressed for themselves.

Finally, future studies should combine research on situation and trait approaches of antecedents of leader behaviors (Oreg & Berson, 2015). As some trait variables may comprise resistance to stress, such as core-self evaluations or resilience, it is important to combine both research strands. Also, antecedents of leader

stress were not taken into account. Therefore, future research should explore why leaders are stressed and how this affects leader behaviors.

3.5.2 Practical Implications

Findings of this study suggest a number of important practical implications. First, as stressed leaders display less high quality leadership behaviors, it seems to be important to support managers with methods and tools of stress prevention as well as intervention. Organizations should offer possibilities for their managers - and also their employees - to get sensitized and informed about possibilities to cope with stressful situations or even to prevent them (Lamontagne, Keegel, Louie, Ostry, & Landsbergis, 2007). For instance, mindfulness-based stress reduction poses a suitable intervention to enhance strategies of coping with distress in everyday life (Grossman, Niemann, Schmidt, & Walach, 2004). Second, as transformational leader behaviors have positive effects on employees - not only in the face of burnout (Judge & Piccolo, 2004) - advising leaders to display these high quality behavior patterns should be essential for organization. Since recent studies have revealed that transformational leadership training is effective (Abrell, Rowold, Weibler, & Moenninghoff, 2011; Barling, Weber, & Kelloway, 1996) and efficient (Avolio, Avey, & Quisenberry, 2010), organizations should not hesitate to introduce transformational leadership as the core leadership model within their organization.

3.5.3 Conclusion

This study represents an important step toward achieving a better understanding of antecedents and also consequences of transformational leader behaviors with regard to leader and follower stress. In this regard, leaders experiencing stress are hindered in enacting high quality leader behaviors, which in turn spills over on their followers' levels of stress.

4. Study 2 - Day-Level Leadership and Followers' Day-Level of Work Stress: A Multilevel Analysis of Leadership Behavior

4.1 Introduction

Research regarding the interrelationship between the behavior of the supervisor and employees' level of work stress comprises divergent findings. This suggests that the effects of leader behaviors can, on the one hand, promote health (Skakon et al., 2010; Zwingmann et al., 2014) and, on the other hand, hamper it (Schyns & Schilling, 2013). However, most studies only consider the impact of one specific leadership style, and do not implement a theoretical leadership framework that includes different but theoretically connected leadership constructs. Until now, only a few studies have conducted a systematic comparison of the consequences of different leadership constructs on employees' level of work stress (Gregersen et al., 2014). As a theoretical framework, the full-range leadership theory covers three distinct leadership constructs (Bass, 1985) i.e., laissez-faire, transactional and transformational leadership, which can be distinguished in terms of their level of activity as well as efficacy (Avolio & Bass, 1991; Judge & Piccolo, 2004).

Consequently, the present study builds on this classification by focusing on the leader-follower interaction on a day-to-day basis with regards to the effects of day-level full-range leadership behaviors on employees' daily work stress. Following Breevaart, Bakker, and Demerouti (2014), the short-term effects of the leader-follower interaction on followers' levels of work stress, which may depend on a daily fluctuation in leader behaviors and which may therefore have different consequences on the psychological state exhibited by followers, are not yet explicitly known. Furthermore, previous research has revealed a considerable fluctuation in leader behavior within a working week because leader behavior depends on person- as well as situation-based factors (Johnson et al., 2012; Tims, Bakker, & Xanthopoulou, 2011). Thus, the diary procedure applied here enables a detailed view of consequences of the interaction between leader and follower in the context of work stress. Simultaneously, the job demands-resources framework (Demerouti et al., 2001) is considered

as a way of examining and explaining how leaders impinge on their followers' levels of work stress. Further, the research builds on leader-distance theory (Antonakis & Atwater, 2002) by considering how the type of communication between leader and follower precipitates these supposed effects.

Additionally, daily assessment of leadership behaviors reduces potential biases within the process of subjective measurement of leader conducts, which may be caused by interpersonal factors between leaders and those they lead or, equally, temporary changes in the mood of followers (Brown & Keeping, 2005). Furthermore, the diary design buffers potential recall biases, which can occur within the assessment of subjective work stress, because stress levels are rated only a few hours after the end of a working day, and on every day of the working week. The fact that work stress is assessed on a daily basis is a noticeable strength in this study, because not all working days proceed in the same way (Sonnentag, Dormann, & Demerouti, 2010) and because daily fluctuations in stress levels can be assumed just like the applicable constructs mood (Larsen & Kasimatis, 1990) and emotional well-being (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000).

In summary, this study contributes to the literature of leadership in four different ways. Firstly, the application of the full-range leadership model enables an all-encompassing view of the effects of leader behaviors on followers' levels of work stress. Secondly, the diary design of this study provides a detailed picture of the leader-follower interaction by focusing on daily processes to explain how leaders affect followers' stress levels. Likewise, by including the type of communication between leader and follower, information on the requirements of optimal leader efficacy can be defined. Lastly, the diary design reduces biases within the assessment of leadership behaviors as well as work stress, because information is collected every day and can, therefore, be directly related to the occurrence of the situations that determine various outcomes.

4.2 Theoretical Background

4.2.1 Day-Level Leadership Behaviors

Until now, a view of leader behaviors based on traits has been predominant in leadership literature (Bono & Judge, 2004; Yukl, 2013). The behavior of a leader is characterized by leadership constructs and the leader is thought to draw on certain behaviors in different situations. Coincidentally, these behaviors have been studied in isolation in a cross-sectional context, but have not been broken down to the level of day-to-day interaction between leader and follower. It is, however, reasonable to assume that leader behaviors fluctuate on a daily basis because each working day poses different challenges for both leaders and their followers, and these require different leadership strategies (Antonakis & Atwater, 2002). For example, on any given day, the leader has to provide targeted information to followers to create a clear structure, perhaps because a new task has been started. On another day, no detailed feedback is necessary. Instead, the leader has to consider followers' needs and feelings should a difficult personal situation begin to affect work. The leader, therefore, offers support to ease the situation. Only very few diary studies have attempted to account for these aspects (Breevaart, Bakker, Hetland, Demerouti et al., 2014; Tims et al., 2011); it has become apparent that there is a considerable amount of variation in day-to-day leader behavior. This must be taken into account. The aim of this study is to combine research from daily interaction studies with research from literature discussing the scope of leadership traits, and apply these to the constructs of full-range leadership theory (FRLT).

4.2.2 Full-Range Leadership Behaviors

From a theoretical perspective the FRLT consists of three distinct patterns of leadership behaviors (Avolio & Bass, 1991). These leadership behaviors can be put on a continuum from highly active to totally passive - that is from *laissez-faire* via transactional to transformational leadership (Antonakis & House, 2013). From this point of view, *laissez-faire* represents a passive leadership style because the leader reduces leader activity to a minimum. *Laissez-faire* is typically described as the ab-

sence of leadership, which means that decisions are, in the first instance, usually avoided and subsequently, no responsibility is taken for them (Antonakis et al., 2003). Furthermore, the laissez-faire leader neither intervenes in problems nor moderates conflicts between employees (Bass, 1985). The avoidance of important leadership tasks leads to loss of productivity, or impaired job satisfaction and dissatisfaction with the leader (Judge & Piccolo, 2004).

Transactional leadership - defined as contingent reward - is characterized by goal setting and monitoring outcomes (Podsakoff et al., 1990). The transactional leader organizes requirements, tasks, and rewards for followers by providing the material required together with the psychological support necessary to clarify roles and expectations (Antonakis et al., 2003). This pattern of behavior increases followers' job satisfaction (Judge & Piccolo, 2004) as well as performance (Wang et al., 2011).

Lastly, transformational leadership, which is the most active type of leader behavior, is best described as the enhancement of followers' motivation to work for the benefit of the organization and to achieve extraordinary goals by raising the followers' awareness of the collective interests of the group (Antonakis et al., 2003). Transformational leaders act as a role model for their employees and create a group identity to foster motivation (Podsakoff et al., 1990). At the same time, leaders are concerned about personal feelings, set objectives and allocate tasks (Bass, 1985). The positive effects of transformational leader behaviors in terms of followers' job satisfaction, motivation, and performance have been demonstrated on a meta-analytical basis (Judge & Piccolo, 2004; Wang et al., 2011).

4.3 Hypotheses

4.3.1 Findings of Day-Level Leadership Behaviors on Followers' Levels of Work Stress

When relating the daily behavior of the supervisor to the daily level of followers' work stress, it is important to note that perceived stress – according to diary data - is regarded as a variable representing a personal state. Hence, a fluctuation in the level of perceived stress by one person within one working week is reasonable.

Reis et al. (2000) have demonstrated that daily well-being measured according to positive and negative affect varied across the week. Similarly, perceived stress has been associated with the number of stressful events in a single working day, and these daily stressors were linked to mood changes (van Eck, Nicolson, & Berkhof, 1998). Likewise, Bolger, DeLongis, Kessler, and Schilling (1989) have shown that interpersonal stressors have a particular influence on the occurrence of negative mood on a daily basis. Interpersonal events include interaction between supervisor and follower; this general interaction may, therefore, pose a potential stressor. Repetti (1993) revealed that days with distressing interactions with supervisors were accompanied by more negative and fewer positive mood states. Also, negative consequences of daily social conflicts with supervisors at work spill over to followers' private lives (Volmer, 2015). Furthermore, the leader-follower interaction may constitute a direct evaluation of followers' performance and with that, an increase in anxiety about monitoring. This interaction can lead to great irritation (Bono, Foldes, Vinson, & Muros, 2007).

These leader-follower interactions are not fundamentally related to negative consequences for followers. For example, Miner, Glomb, and Hulin (2005) have shown that the incidence of positive events among employees was much higher than that of negative events in an experiencing sampling procedure. In conclusion, most leadership behaviors are, to a greater extent, positive rather than negative in nature. As an example, leaders may provide personalized support to followers to account for their feelings and needs. Similarly, leaders may use strategies to encourage their followers to overcome problems, which corresponds to the behavior characteristics of transformational leaders (Podsakoff et al., 1990). Moreover, Bono et al. (2007) have revealed that employees with leaders engaging in transformational behaviors experience more positive emotions during the working day. Results from cross-sectional studies show that transformational leader behaviors promote the well-being of followers (Arnold et al., 2007; Kelloway et al., 2012; Zwingmann et al., 2014) and reduce their levels of stress (Hetland et al., 2007; Liu et al., 2010; Seltzer et al., 1989).

Leaders may motivate their followers and clarify expectations. By assigning tasks and establishing structures, followers feel well led and have a clear understanding of what they have to do. These behaviors are characteristic of transactional lead-

ers and from a cross-sectional perspective, transactional leader behaviors are linked to the reduction of work stress (Sosik & Godshalk, 2000; Zwingmann et al., 2014).

Furthermore, leaders may not interact at all with their followers and on certain days they may not even provide support for them or intervene in problems. Not organizing working tasks and avoiding decisions can be put on a level with an absence of leadership; this is typical of laissez-faire leadership style (Bass, 1990b). Cross-sectional research consistently reveals the stressful consequences of this type of non-leadership. A positive relationship between laissez-faire and several stress outcomes has been observed (Skogstad et al., 2007; Skogstad, Hetland et al., 2014; Zwingmann et al., 2014). When pooling knowledge from both research perspectives and transferring day-level findings related to the leader-follower interaction to the concepts of leadership constructs (laissez-faire, transactional, transformational) along with the results from cross-sectional studies, the following hypothesis can be concluded:

Hypothesis 1: The behavior of the direct leader is associated with followers' perceived levels of work stress. The leadership constructs of (a) transformational and (b) transactional leadership are negatively related to work stress, whereas (c) laissez-faire is positively related to work stress.

4.3.2 Mediation Model of Daily Leadership Behaviors

Generally, the job demands-resources model (Demerouti et al., 2001) distinguishes two distinct categories of working conditions that are related to employees' well-being and motivation. On the one hand, the model subsumes aspects of the job that require sustained effort or skills, like work pressure. These are so-called job demands. These demands are associated with physiological or psychological costs, leading to exhaustion and impaired health. On the other hand, the model covers aspects of the job that reduce job demands and that assist in achieving goals. These are so-called job resources (Bakker & Demerouti, 2007). When integrating daily leadership behavior into the job demands-resources framework, it is assumed that active leaders may promote resources (Nielsen, Randall, Yarker, & Brenner, 2008) and diminish demands (Stordeur et al., 2001). On the other hand, passive leaders do not enhance the availability of job resources but instead increase job demands (Skogstad

et al., 2007; Skogstad, Hetland et al., 2014). Diary studies have shown that there are high fluctuations in the perception of job demands and resources on a daily level (Sonnentag, 2003; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009), which implies that there is considerable day-to-day variation that calls for a daily assessment. Further, Totterdell, Wood, and Wall (2006) revealed that daily demands influence psychological strain. This strain reaction is subject to temporal variations depending on job characteristics. In their study, job-related strain was reduced by social support in a time-sampling diary design. Social support also functions as a resource that enables individuals to effectively reduce work to family conflicts (Goh, Ilies, & Wilson, 2015). Likewise, Zohar (1999) showed that daily hassles i.e., the exact opposite of social support, impaired employees' end-of-day mood and fatigue. There is clear empirical evidence social support in particular and role conflict represent job demands and resources (Bakker & Demerouti, 2007). On a meta-analytical basis, results show that role conflict increases emotional exhaustion - as a manifestation of work stress - whereas social support, provided by supervisors or coworkers, decreases emotional exhaustion (Lee & Ashforth, 1996). The construct of social support is characterized by direct help, affirmation and affective support in the working context (Frese, 1999). It can be offered by colleagues or supervisors, and is linked to reduced strain (Firth, Mellor, Moore, & Loquet, 2004; Viswesvaran, Sanchez, & Fisher, 1999). Beyond that, role conflict occurs when employees receive inconsistent or conflicting expectations concerning their behavior at work (Rizzo, House, & Lirtzman, 1970). The outcome is related to poor well-being (Nixon, Mazzola, Bauer, Krueger, & Spector, 2011).

Linking the aforementioned job demands and resources to leadership behaviors, it is expected that leaders do directly influence the occurrence of role conflict and social support. At first, looking at the resource of social support, laissez-faire leadership behaviors reduce the probability of supporting behaviors inside a working group. Especially when leaders avoid their subordinates while they need assistance from their supervisor, conflicts between coworkers occur (Skogstad et al., 2007). In conclusion, in a working environment that is characterized by increased interpersonal conflict, the occurrence of social support is less likely. Therefore, there are no beneficial effects on well-being, because laissez-faire leaders do not act as role models for their employees to foster team-building action. However, transformational leaders do

set an example for their followers and emphasize team cohesiveness. This pattern of leadership behavior aims at enhancing performance (Podsakoff et al., 1990) and creating an atmosphere of helping and supporting. For instance, the transformational leadership conduct of individualized support functions as an example of supporting behavior (Podsakoff et al., 1990) that is adapted and imitated by followers. Further, Sosik and Godshalk (2000) revealed significant relationships between transformational leader behaviors and job-related stress. Stress was reduced by leaders who implemented mentoring functions such as social support. This effect also showed up for transactional leaders who engaged in supportive behaviors by setting clear goals and by increasing followers' job satisfaction (Sosik & Godshalk, 2000) but to a lesser degree than transformational leaders. In addition, Nielsen and Daniels (2012) showed that social support mediated the relationship between transformational leadership and several criteria of well-being on an individual level of analysis between leader and follower.

Secondly, as regards the job demand role conflict, laissez-faire leaders generally leave their followers alone when they actually need specific directions. They do not create a clear structure to guide followers and therefore, followers do not exactly know what is expected of them (Skogstad, Hetland et al., 2014). Without feedback from their supervisor, important information on working tasks is overlooked, leading to a feeling of perceived insecurity and therefore, stress. In this manner, Skogstad et al. (2007) found that the relationship between laissez-faire and distress was mediated by the stressor role conflict. In contrast to this, transactional as well as transformational leaders do clearly communicate their own expectations, and those of the organization, to their followers (Bass, 1990b). This creates a positive information culture and provides followers with a rationale for their work. As a result, a feeling of safety and clarity is achieved which is, in turn, associated with low role conflicts and less stress at work. In addition, current literature indicates relationships between transactional as well as transformational leadership behaviors, role conflict and emotional exhaustion (Stordeur et al., 2001). In summary, this line of argument results in the second hypothesis:

Hypothesis 2: The relationship between leadership constructs and followers' levels of work stress is mediated by the job demands-resources dimensions of (a) role conflict and (b) social support.

4.3.3 Moderation by Type of Communication

Building on leader-distance theory (Antonakis & Atwater, 2002), a theoretical framework to specify conditional effects for the daily leader-follower interaction is created. Leader-distance theory defines the distance between leaders and followers as a neutralizer that reduces the effects that leader behaviors have on followers. Theoretically, leader distance can be measured in cases of psychosocial distance, physical distance, hierarchical leadership, and the frequency of leader-follower interaction (Antonakis & Atwater, 2002). I put the type of communication between leader and follower as an indicator of leader distance into focus. I propose that using a combination of direct as well as indirect means of communication represents the standard i.e., ordinary interaction between leader and follower. Albeit in the following, I aim to contrast both extremes of using only one type of communication while neglecting the other to highlight differences between direct and indirect types of communication. Using only direct means of communication (e.g., face-to-face) may represent a close distance whereas using only indirect means of communication (e.g., email) may represent a high to medium distance. Although, different technical communication platforms, like telephone, video conferencing, or email, enable leaders to build up a personal connection with their followers, face-to-face interaction within direct means of communication offers leaders opportunities to go beyond the mere transmission of information. As proposed by Antonakis and Atwater (2002), a direct interaction between leader and follower is needed to bring transformational leadership into effect, to communicate a vision, to provide an example of effective behaviors, and to provide individual support. Frequent interaction with followers enables transformational leaders to reinforce their visionary message and build a close relationship with followers (Howell, Neufeld, & Avolio, 2005). Through this personal relationship, the key messages of transformational leadership will be emphasized by leaders' actions and behaviors in support of their vision. From this point of view, the stress-reducing effect of transformational leadership only occurs when leaders communicate in a

direct manner with their followers. However, for the other leadership constructs, no such close distance is needed. Looking at the core definition of transactional leadership, giving feedback or monitoring outcomes can also be achieved via email, and these behaviors do not necessarily need to be assisted by personal contact. For transactional behaviors, the actual content of the information provided is much more important than the style and type of communication through which it is transported (de Vries, Bakker-Pieper, & Oostenveld, 2010). It follows that transactional leadership also works in certain contexts, and does, therefore, have a stress-reducing effect on followers. In contrast to transformational behaviors, which are more relationship-oriented, the rather task-oriented aspects of the job representing transactional behaviors can be conveyed through an indirect as well as direct means of communication since the preciseness of the information is independent of its means of conveyance. For laissez-faire, neither direct nor indirect communication is necessary since laissez-faire is defined as the absence of leadership. This is best described by avoidance and inactivity (Skogstad, Aasland et al., 2014). By definition, laissez-faire leaders try to avoid contact with their followers and seem to be unapproachable. In this case, it is irrelevant which type of communication is used because the frequency of interaction with followers has shown to be reduced to a minimum for leaders engaging in laissez-faire behaviors (Skogstad et al., 2007). As a consequence, the stress-promoting effect of laissez-faire leadership occurs under every means of communication. In summary, the aforementioned rationale can result in the following hypothesis:

Hypothesis 3a: The type of communication between leader and follower moderates the relationship of leadership constructs with (a) job demands and (b) resources as well as followers' levels of (c) work stress.

As described in the previous section it is assumed that type of communication as a measure of leader distance influences the effect of leader behavior on work characteristics and also outcomes. Likewise, this relationship is expected to be mediated by job demands and resources. Looking at the connection between the daily occurrence of job resources and demands under the different means of communication, direct communication is best suitable to offer direct support and make followers work for the same goal. Likewise, demands may be lessened as leaders have the op-

portunity to directly recognize ambiguities and to reduce them. In situations with only indirect communication, leaders may not even notice possible problematic situations which may call for an intervention. In conclusion, it is hypothesized that type of communication not only influences the direct effects of this research framework, but also influences indirect relationships between study variables resulting in a moderated mediational model:

Hypothesis 3b: The type of communication moderates the indirect relationship of leadership constructs with followers' levels of work stress through the job demands-resources dimensions of (a) role conflict and (b) social support.

Figure 3 summarizes the present research model of this study and visualizes the interconnections between the different variables included.

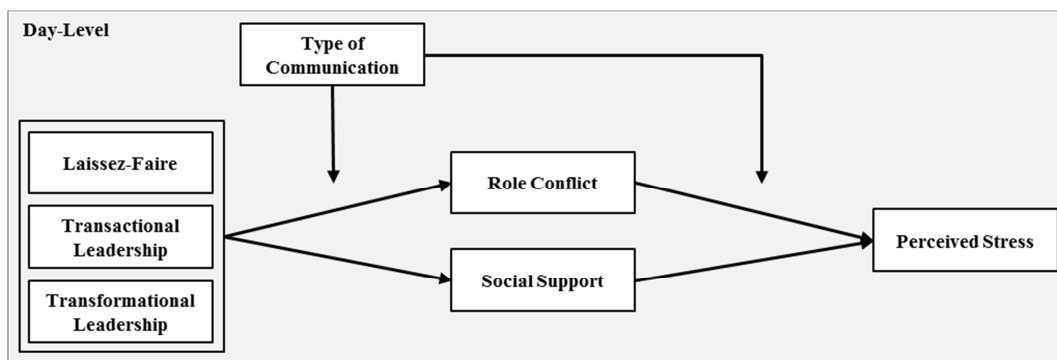


Figure 3. Proposed Relationships among Study Variables of Study 2.

4.4 Method

4.4.1 Sample and Data Collection

Overall, 209 employees participated in a diary study over five consecutive working days. Questionnaires were provided online, and participants were contacted each day of the week via email by research assistants who monitored data collection. Responses of participants were anchored specifically to the corresponding day of the week, and electronic time stamps were used to confirm that each survey was com-

pleted by time. All diary measures were shortened and adapted versions of existing scales to measure employees' work stress, leaders' type of communication, and the full-range of leadership dimensions.

The final sample of 209 participants resulted in 1001 measurement points due to the occurrence of missing values. Only those responses were taken into account from participants that completed the questionnaire on at least three days inside one working week to maximize statistical power while limiting the amount of missing data. Of the final sample, 108 participants were female (52%) and 92 (44%) male³ with a mean age of 34.92 years ($SD = 12.92$), ranging from 19 to 62. Regarding their educational background, 32% had a university degree, 31% had at least a high school degree, 25% a secondary school certificate, and 9% a secondary modern school qualification. Most participants were in a regular employment relationship (75%), civil servants (8%), or students (6%).

4.4.2 Measures

Participants evaluated to what extent they agreed with statements concerning leadership behaviors, job demands and resources, type of communication and level of perceived stress on the working day in question. All response scales for the measures were on a 1 (*I strongly disagree*) to 5 (*I strongly agree*) scale with the exception of the response scale for the type of communication. All scales are shortened versions of existing and already published scales. Items were chosen with reference to high factor loadings and content-related matching for daily measurement. Given the fact that shortened versions were used here, a pre-study was applied to test the validity of the shortened versions by comparing them with the original scales using an independent sample. In the pre-study, employees rated their direct supervisor's leadership behavior as well as the job demands-resources dimensions role conflict and social support on measurement point one. After three weeks, they rated their own perceived level of work stress as well as their level of work engagement using the 17-item Utrecht Work Engagement Scale (Schaufeli, Bakker, & Salanova, 2006). A snowball sample was obtained consisting of 318 employees with a mean age of 30.58 years ($SD = 11.22$), 49.4% of whom were female. In the following conclusion, in-

³ Missing from 100% did not provide information concerning demographics.

formation on the items applied in the day-level questionnaire is reported, and thereafter results from the pre-study are summarized to compare the shortened measures with the original scales.

Laissez-faire. In the day-level study, a single-item was used for the assessment of laissez-faire (“today, my supervisor was not available to deal with urgent problems”; cf. Rowold, 2011; Rowold & Borgmann, 2014).

Results from the pre-study revealed a correlation between the single-item of laissez-faire (LF) and the original 4-item scale of $r = .82$ ($p < .01$). Cronbach’s Alpha of the long version was .84. With respect to criterion-related validity, the short version of LF showed a negative relationship with work engagement ($R^2 = .03$, $F(1, 314) = 9.63$, $p < .01$; $\beta = -.17$, $p < .01$) as did the 4-item version ($R^2 = .03$, $F(1, 315) = 9.67$, $p < .01$; $\beta = -.17$, $p < .01$).

Transactional leadership. Transactional leadership (TAL), defined as contingent reward, was measured using one item (“today, my supervisor did not acknowledge my good performance”) from the Transformational Leadership Inventory (TLI; Podsakoff, MacKenzie, & Bommer, 1996; Podsakoff et al., 1990). This was validated in a German sample by Heinitz and Rowold (2007) along with Krüger et al. (2011), who ensured construct validity of the leadership model.

In the pre-study, the correlation between the single-item and the original 4-item scale was $r = .77$ ($p < .01$). Cronbach’s Alpha for the original scale was .87. A positive relationship regarding criterion-related validity showed up for the single-item measure with work engagement ($R^2 = .03$, $F(1, 313) = 10.26$, $p < .01$; $\beta = .18$, $p < .01$) and with the 4-item scale ($R^2 = .06$, $F(1, 316) = 18.86$, $p < .01$; $\beta = .24$, $p < .01$).

Transformational leadership. Transformational leadership (TFL) was assessed with six items from the TLI. The TLI measures six transformational leadership facets: Identifying and articulating a vision (“today, my supervisor has painted an interesting picture of the future for our group”), providing an appropriate model (“today, my supervisor was a good model for me to follow”), fostering the acceptance of group goals (“today, my supervisor got the group to work together for the same goal”), high performance expectations (“today, my supervisor showed us that he/she expects a lot from us”), providing individualized support (“today, my

supervisor did not respect my personal feelings”) and intellectual stimulation (“today, my supervisor challenged me to think about old problems in new ways”).

Pre-study results show a correlation between the original 22-item version of the TLI and the 6-item version of $r = .95$ ($p < .01$). Cronbach’s Alpha for the short measure was .78 and .93 respectively for the original scale. Unweighted least-squares factor analysis resulted in a good fit for the 6-item scale (normed fit index (NFI) = .97, goodness of fit index (GFI) = .99, standardized root mean residual (SRMR) = .06). Considering the criterion-related validity, the 6-item scale was positively related to work engagement ($R^2 = .11$, $F(1, 316) = 38.56$, $p < .01$; $\beta = .33$, $p < .01$) as was the 22-item scale ($R^2 = .14$, $F(1, 316) = 52.77$, $p < .01$; $\beta = .38$, $p < .01$).

Job demands-resources dimensions, role conflict and social support. A single item from an adapted version of the Role Conflict and Ambiguity scale by Rizzo et al. (1970) validated in a German sample by Herrmann, Felfe, and Hardt (2012) was used to measure job demands (“today, I often received incompatible assignments on how I should do my job”) as regards role conflict (RC).

In the pre-study, the single-item measure and the original 5-item scale correlated with $r = .71$ ($p < .01$). Cronbach’s Alpha for the original scale was .73. With regards to criterion-related validity, the single-item measure negatively influenced work engagement ($R^2 = .09$, $F(1, 313) = 32.69$, $p < .01$; $\beta = -.31$, $p < .01$) as did the 5-item scale ($R^2 = .07$, $F(1, 315) = 28.12$, $p < .01$; $\beta = -.27$, $p < .01$).

To measure social support (SS) a single item from Udris and Rimann (1999) also introduced by Herrmann, Felfe, and Hardt (2012) was used to assess job resources (“today, teamwork together with my colleagues was cooperative”).

Pre-study results show a correlation of $r = .89$ ($p < .01$) between the single-item version and the original 3-item version. Cronbach’s Alpha for the original scale was .80. The single-item measure positively influenced work engagement ($R^2 = .09$, $F(1, 311) = 30.69$, $p < .01$; $\beta = .30$, $p < .01$) as well as the original 3-item scale ($R^2 = .10$, $F(1, 312) = 34.71$, $p < .01$; $\beta = .32$, $p < .01$).

Perceived stress. Three items from the German version (Mohr, Rigotti, & Müller, 2005) of the Irritation Scale by Mohr et al. (2006) were applied to measure

perceived stress (PS). A sample item was “today, even at home I have to think of my problems at work”.

In the pre-study, the correlation between the 8-item original scale and the 3-item short version was $r = .94$ ($p < .01$) with Cronbach’s Alpha for the original scale of .91 and .79 for the short version, respectively. Results of the factor analysis show a moderate fit for the 3-item scale (NFI = .93, GFI = .97, SRMR = .10). Assessing criterion-related validity, the 3-item scale was related to work engagement ($R^2 = .02$, $F(1, 315) = 5.44$, $p < .05$; $\beta = -.13$, $p < .05$) as was the 8-item scale ($R^2 = .03$, $F(1, 315) = 11.03$, $p < .01$; $\beta = -.18$, $p < .01$).

In summary, results of the pre-study indicate a good fit and validity for the short measures applied in the day-level questionnaire in relation to the original scale composites. For each construct measured with multiple items, the average item score is used in hypothesis testing to reduce the complexity of the overall model.

Type of communication. Type of communication was measured using two items focusing on either direct or indirect communication. “Today, did you directly communicate with your supervisor (face-to-face, telephone call, etc. ...)?” as well as “Today, did you indirectly communicate with your supervisor (email, etc. ...)?”. A new item was computed from these two questions, representing the type of communication on the respective day of the week, and including four categories ranging from 1 (*both (direct and indirect) communication*), 2 (*only direct communication*), 3 (*only indirect communication*), to 4 (*no communication*).

4.4.3 Analytical Approach

Data were analyzed using multilevel modeling with MPLUS Version 6 (Muthén & Muthén, 2011). The structure of the data is characterized by repeated measurements nested within individuals. This leads to a two-level model with days at the first level (Level 1; $N = 1001$) nested within persons at the second level (Level 2; $N = 209$). All substantial study variables were measured at the day-level (Level 1) and were centered on the group mean.

Intra-class coefficients (ICCs) were estimated based on an unconditional random coefficient model in order to estimate the relative amount of between-person

and within-person variation. Results show that 32.3% of the variation in LF, 39.7% in TAL, 52.4% in TFL, 30.4% in SS, 36.9% in RC, and 53.4% in PS were attributable to between-person variations. These results emphasize that the multilevel structure of the data should be taken into account while testing hypotheses.

To test for multilevel mediation, the procedure outlined by Preacher and colleagues (Preacher, Zhang, & Zyphur, 2011; Preacher, Zyphur, & Zhang, 2010) was applied. The model tested corresponds to a 1-(1-1)-1 mediation model, meaning that predictor, mediators, and outcome variables were all assessed on the day level (Level 1). To test for moderated mediation, the procedures outlined by Preacher, Rucker, and Hayes (2007) were integrated into those of Preacher et al. (2011) and adapted to form a multilevel framework. As the moderator variable is nominal with four categories, dummy regressions were conducted to account for this issue. All further reported estimates are unstandardized estimates.

4.5 Results

Intercorrelations, means, standard deviations, and internal consistencies of the study variables at the between- and the within-person levels are reported in Table 6.

Results of multilevel analyses investigating a direct relationship between leadership constructs, the two mediators, and perceived stress are shown in Table 7. Relationships were analyzed at the within-person level. Overall, leadership constructs influenced both role conflict and social support with laissez-faire reducing social support ($\gamma = -0.09$, $SE = 0.04$, $p < .05$) and increasing role conflict ($\gamma = 0.20$, $SE = 0.05$, $p < .01$). On the other hand, transactional (for TAL with SS: $\gamma = 0.07$, $SE = 0.04$, $p < .05$ (one-tailed); for TAL with RC: $\gamma = -0.10$, $SE = 0.03$, $p < .01$) and transformational (for TFL with SS: $\gamma = 0.21$, $SE = 0.08$, $p < .05$; for TFL with RC: $\gamma = -0.08$, $SE = 0.07$, ns) leadership influenced role conflict and social support in the opposite directions. With regards to perceived strain LF increased ($\gamma = 0.13$, $SE = 0.04$, $p < .01$) while TAL ($\gamma = -0.07$, $SE = 0.03$, $p < .01$) and TFL ($\gamma = -0.16$, $SE = 0.06$, $p < .01$) both decreased the level of participants' perceived stress.

Table 6. Study 2: Means (*M*), Standard Deviations (*SD*), and Correlations

| | <i>M</i> | <i>SD</i> | <i>ICC</i> | 1 | 2 | 3 | 4 | 5 | 6 |
|--------|----------|-----------|------------|--------|--------|--------|--------|--------|--------|
| 1. LF | 1.99 | 0.77 | 32.3% | (.) | -.30** | -.30** | -.23** | .40** | .28** |
| 2. TAL | 3.71 | 0.89 | 39.7% | -.33** | (.) | .36** | .20** | -.25** | -.22** |
| 3. TFL | 2.89 | 0.56 | 52.4% | -.34** | .47** | (.71) | .23** | -.14** | -.18** |
| 4. SS | 4.09 | 0.67 | 30.4% | -.33** | .31** | .30** | (.) | -.28** | -.33** |
| 5. RC | 1.76 | 0.75 | 36.9% | .50** | -.35** | -.16* | -.49** | (.) | .26** |
| 6. PS | 1.90 | 0.80 | 53.4% | .31** | -.27** | -.18** | -.48** | .38** | (.84) |

Note. *M* = mean (person-level), *SD* = standard deviation (person-level); *ICC* = intraclass correlations. Correlations below the diagonal are person-level correlations ($n = 209$), correlations above the diagonal are day-level correlations ($n = 1001$); Cronbach's alpha for day-level variables are mean internal consistencies averaged over all measurement days.

LF = laissez-faire; TAL = transactional leadership; TFL = transformational leadership; SS = social support; RC = role conflict; PS = perceived strain.

* $p < .05$; ** $p < .01$.

Mediational analysis. Table 8 summarizes the results of the mediational model assuming role conflict and social support mediate the influence of the leadership behaviors on followers' levels of work stress. At first, a direct effect was observed only for social support ($\gamma = -0.11$, $SE = 0.03$, $p < .01$) but not for role conflict ($\gamma = 0.06$, $SE = 0.04$, ns). Looking at the indirect effects, the relationship between LF and PS is mediated via SS (estimate = 0.01, $SE = 0.01$, $p < .05$ (one-tailed)) but not via RC (estimate = 0.01, $SE = 0.00$, ns). Moreover, for TAL, no indirect effect was significant (via SS, estimate = -0.01, $SE = 0.00$, ns ; via RC, estimate = -0.01, $SE = 0.00$, ns). Whereas the relationship between TFL and PS is mediated by SS (estimate = -0.02, $SE = 0.01$, $p < .05$), it is not influenced by RC (estimate = 0.00, $SE = 0.00$, ns).

Table 7. Study 2: Multilevel Models Predicting Day-Level Social Support, Role Conflict, and Perceived Stress

| Variable | Social support | | Role conflict | | Perceived stress | |
|-------------------------------|-------------------|------|---------------|------|------------------|------|
| | Estimate | SE | Estimate | SE | Estimate | SE |
| Within-person level (Level 1) | | | | | | |
| LF | -0.09* | 0.04 | 0.20** | 0.05 | 0.13** | 0.04 |
| TAL | 0.07 [†] | 0.04 | -0.10** | 0.03 | -0.07** | 0.03 |
| TFL | 0.21* | 0.08 | -0.08 | 0.07 | -0.16** | 0.06 |
| Residual variance | 0.66** | 0.06 | 0.63** | 0.05 | 0.44** | 0.03 |
| R^2 within | 0.03* | 0.01 | 0.06** | 0.02 | 0.06** | 0.02 |

Note. Unstandardized estimates are reported. Models are random intercept models with fixed slopes.

SE = standard error; LF = laissez-faire; TAL = transactional leadership; TFL = transformational leadership.

[†] $p < .05$ (one-tailed); * $p < .05$; ** $p < .01$ (two-tailed).

Table 8. *Study 2: Multilevel Models Predicting Day-Level Perceived Stress*

| Variable | Perceived stress | |
|-------------------------------|-------------------|------|
| | Estimate | SE |
| Within-person level (Level 1) | | |
| Path a_{w11} : LF → SS | -0.09* | 0.04 |
| Path a_{w21} : LF → RC | 0.20** | 0.05 |
| Path a_{w12} : TAL → SS | 0.07 [†] | 0.04 |
| Path a_{w22} : TAL → RC | -0.10** | 0.03 |
| Path a_{w13} : TFL → SS | 0.21* | 0.09 |
| Path a_{w23} : TFL → RC | -0.08 | 0.07 |
| Path b_{w1} : SS → PS | -0.11** | 0.03 |
| Path b_{w2} : RC → PS | 0.06 | 0.04 |
| Path $c_{w,1}$: LF → PS | 0.11** | 0.04 |
| Path $c_{w,2}$: TAL → PS | -0.06* | 0.03 |
| Path $c_{w,3}$: TFL → PS | -0.13* | 0.06 |
| Indirect effect LF via SS | 0.01 [†] | 0.01 |
| Indirect effect LF via RC | 0.01 | 0.00 |
| Indirect effect TAL via SS | -0.01 | 0.00 |
| Indirect effect TAL via RC | -0.01 | 0.00 |
| Indirect effect TFL via SS | -0.02* | 0.01 |
| Indirect effect TFL via RC | 0.00 | 0.00 |
| Residual variance SS | 0.52** | 0.04 |
| Residual variance RC | 0.50** | 0.04 |
| Residual variance PS | 0.43** | 0.03 |
| R^2 SS, within | 0.04* | 0.02 |
| R^2 RC, within | 0.07** | 0.03 |
| R^2 PS, within | 0.07** | 0.02 |

Note. Unstandardized estimates are reported. Models are 1-(1-1)-1 mediation models with a random intercept and fixed slopes.

SE = standard error; LF = laissez-faire; TAL = transactional leadership; TFL = transformational leadership, SS = social support, RC = role conflict, PS = perceived stress.

[†] $p < .05$ (one-tailed); * $p < .05$; ** $p < .01$ (two-tailed).

Moderation analysis. Separate multilevel dummy regressions were calculated to test for the moderating effect of type of communication on the relationship between leadership constructs and role conflict, social support and perceived stress. This approach was used to account for complexity of the model as there are three dummy variables representing the moderator and, therefore, three interaction terms for each leadership construct. In the case of dummy regression, significant interac-

tion terms represent a difference in the slopes of the relationship between the independent and the dependent variable as a function of the reference category of the moderator in comparison to the given category of the interaction term. The reference category was set to both types of communication. It is assumed that the use of both types of communication represents the ordinary interaction between supervisor and follower. That is, mostly direct communication is assisted by indirect communication (e.g., email). Therefore, the three dummy variables represent the remaining categories of the moderator and are included in the regression together with the leadership construct as an independent variable along with the three interaction terms. Regression models and procedures to estimate simple slopes as well as simple slope tests of significance are calculated with reference to Dawson (2014).

When testing the moderating effect of type of communication on the relationship between laissez-faire and social support, the use of both types of communication is compared to the other three types of communication (see Table 9). Merely for the use of direct communication alone ($\gamma = -0.16$, $SE = 0.09$, $p < .05$ (one-tailed)) a difference to the reference category could be observed. None of the other interaction terms reached significance and therefore did not differ from the reference category (for only indirect communication, $\gamma = -0.16$, $SE = 0.13$, *ns*; for no type of communication, $\gamma = 0.02$, $SE = 0.12$, *ns*). The nature of this interaction is illustrated in Figure 4, which indicates that simple slopes did not reach any level of significance as regards type of communication. Using both types of communication, laissez-faire is not related to social support (simple slope = -0.05 , $SE = 0.07$, *ns*). The same pattern showed up only for direct communication (simple slope = -0.20 , $SE = 0.20$, *ns*), only for indirect communication (simple slope = -0.21 , $SE = 0.20$, *ns*), and for no communication (simple slope = $-.03$, $SE = 0.19$, *ns*).

Table 9. *Study 2: Multilevel Dummy Regressions Testing for Moderating Effects between Laissez-Faire, Social Support, Role Conflict, and Perceived Stress with Type of Communication as Moderator Variable*

| Variable | Social support | Role conflict | Perceived stress |
|--|--------------------|-------------------|------------------|
| both types of communication ^a | -0.05 | 0.01 | 0.16** |
| direct communication ^b | 0.35 [†] | -0.56** | -0.08 |
| indirect communication ^c | 0.27 | -0.53* | 0.02 |
| no communication ^d | -0.17 | -0.28 | 0.07 |
| direct communication x LF | -0.16 [†] | 0.36** | 0.07 |
| indirect communication x LF | -0.16 | 0.27 [†] | 0.03 |
| no communication x LF | 0.02 | 0.17 | -0.08 |

Note. Unstandardized estimates are reported.

LF = laissez-faire; ^a both types of communication is treated as reference category for dummy regression; ^b direct communication coded as 1 = direct communication and 0 = both types of communication;

^c indirect communication coded as 1 = indirect communication and 0 = both types of communication; ^d no communication coded as 1 = no communication and 0 = both types of communication.

[†] $p < .05$ (one-tailed); * $p < .05$; ** $p < .01$ (two-tailed).

For the moderating effect of type of communication on the relationship between LF and RC, significant interaction terms for only direct communication ($\gamma = 0.36$, $SE = 0.11$, $p < .01$) and only indirect communication ($\gamma = 0.27$, $SE = 0.14$, $p < .05$ (one-tailed)) confirm a deviation from both types of communication. No difference was observed for no communication ($\gamma = 0.17$, $SE = 0.11$, *ns*). The pattern of these interactions is displayed in Figure 4. Simple slope analyses showed a significant positive relationship between LF and RC for only direct communication (simple slope = 0.37, $SE = 0.19$, $p < .05$) as well as for only indirect communication (simple slope = 0.28, $SE = 0.21$, $p < .05$ (one-tailed)). No significant slopes occurred for both types of communication (simple slope = 0.01, $SE = 0.09$, *ns*) or no communication (simple slope = 0.18, $SE = 0.19$, *ns*).

Dummy regression to explore the interrelationship between LF and PS depending on type of communication revealed no significant interaction terms (for only direct communication, $\gamma = 0.07$, $SE = 0.07$, *ns*; for only indirect communication, $\gamma = 0.03$, $SE = 0.12$, *ns*; for no communication, $\gamma = -0.08$, $SE = 0.08$, *ns*). Simple slope

analysis (cf. Figure 4) showed a positive relationship between LF and PS for both types of communication (simple slope = 0.16, $SE = 0.06$, $p < .01$) and for only direct communication (simple slope = 0.24, $SE = 0.13$, $p < .05$). No relationship was observed for only indirect communication (simple slope = 0.20, $SE = 0.15$, ns) or no communication (simple slope = 0.08, $SE = 0.13$, ns).

Testing for moderation in the relationship between TAL and SS (see Table 10), none of the interaction terms reached significance (for only direct communication, $\gamma = 0.02$, $SE = 0.07$, ns ; for only indirect communication, $\gamma = -0.06$, $SE = 0.11$, ns ; for no communication, $\gamma = 0.00$, $SE = 0.10$, ns) indicating no difference in the slopes between the reference category “both types of communication” and the other three types of communication. Only the simple slope for both types of communication indicated a positive relationship (simple slope = 0.11, $SE = 0.06$, $p < .05$ (one-tailed); cf. Figure 4), whereas the other simple slopes did not (for only direct communication, simple slope = 0.13, $SE = 0.12$, ns ; for only indirect communication, simple slope = 0.04, $SE = 0.14$, ns ; for no communication, simple slope = 0.11, $SE = 0.14$, ns).

Looking at the moderating effect of type of communication on the relationship of TAL and RC, the use of only indirect communication differed from the baseline condition ($\gamma = -0.19$, $SE = 0.11$, $p < .05$ (one-tailed)), whereas the other two types of communication did not (for only direct communication, $\gamma = -0.03$, $SE = 0.08$, ns ; for no communication, $\gamma = 0.00$, $SE = 0.08$, ns). Likewise, simple slopes showed a negative relationship between TAL and RC (see Figure 4) under the use of both types of communication (simple slope = -0.12, $SE = 0.06$, $p < .05$ (one-tailed)) and only indirect communication (simple slope = -0.31, $SE = 0.15$, $p < .01$). No relationship occurred for only direct communication (simple slope = -0.14, $SE = 0.14$, ns) as well as no communication (simple slope = -0.12, $SE = 0.13$, ns).

Table 10. *Study 2: Multilevel Dummy Regressions Testing for Moderating Effects between Transactional Leadership, Social Support, Role Conflict, and Perceived Stress with Type of Communication as Moderator Variable*

| Variable | Social support | Role conflict | Perceived stress |
|--|-------------------|--------------------|--------------------|
| both types of communication ^a | 0.11 [†] | -0.12 [†] | -0.08 [†] |
| direct communication ^b | 0.14 | 0.03 | 0.23 |
| indirect communication ^c | 0.28 | 0.63 | 0.33 |
| no communication ^d | 0.05 | -0.06 | -0.19 |
| direct communication x TAL | 0.02 | -0.03 | -0.07 |
| indirect communication x TAL | -0.06 | -0.19 [†] | -0.07 |
| no communication x TAL | -0.00 | 0.00 | 0.01 |

Note. Unstandardized estimates are reported.

TAL = transactional leadership; ^a both types of communication is treated as reference category for dummy regression; ^b direct communication coded as 1 = direct communication and 0 = both types of communication;

^c indirect communication coded as 1 = indirect communication and 0 = both types of communication; ^d no communication coded as 1 = no communication and 0 = both types of communication.

[†] $p < .05$ (one-tailed); * $p < .05$; ** $p < .01$ (two-tailed).

The moderation of the relationship between TAL and PS by type of communication revealed no significant interaction terms (for only direct communication, $\gamma = -0.07$, $SE = 0.06$, ns ; for only indirect communication, $\gamma = -0.07$, $SE = 0.10$, ns ; for no communication, $\gamma = 0.01$, $SE = 0.07$, ns). Simple slope analyses showed a negative relationship between TAL and PS for both types of communication (simple slope = -0.08 , $SE = 0.05$, $p < .05$ (one-tailed)) as well as for only indirect communication (simple slope = -0.15 , $SE = 0.10$, $p < .05$ (one-tailed)). However, there was no significant relationship for only indirect communication (simple slope = -0.15 , $SE = 0.13$, ns) or no communication (simple slope = -0.07 , $SE = 0.10$, ns).

Dummy regression revealed a significant interaction term for the relationship between TFL and SS (see Table 11) for only indirect communication ($\gamma = 0.45$, $SE = 0.17$, $p < .01$). The other interaction terms did not reach significance (for only direct communication, $\gamma = 0.26$, $SE = 0.12$, ns ; for no communication, $\gamma = 0.24$, $SE = 0.19$, ns) indicating no deviation from the reference category. Results of simple slope analyses are displayed in Figure 4. Slopes were positive for only direct communication

(simple slope = 0.34, $SE = 0.23$, $p < .05$ (one-tailed)) and for only indirect communication (simple slope = 0.53, $SE = 0.25$, $p < .01$). In the other conditions no relationship with social support was found (for both types of communication, simple slope = 0.08, $SE = 0.12$, ns ; for no communication, simple slope = 0.32, $SE = 0.27$, ns).

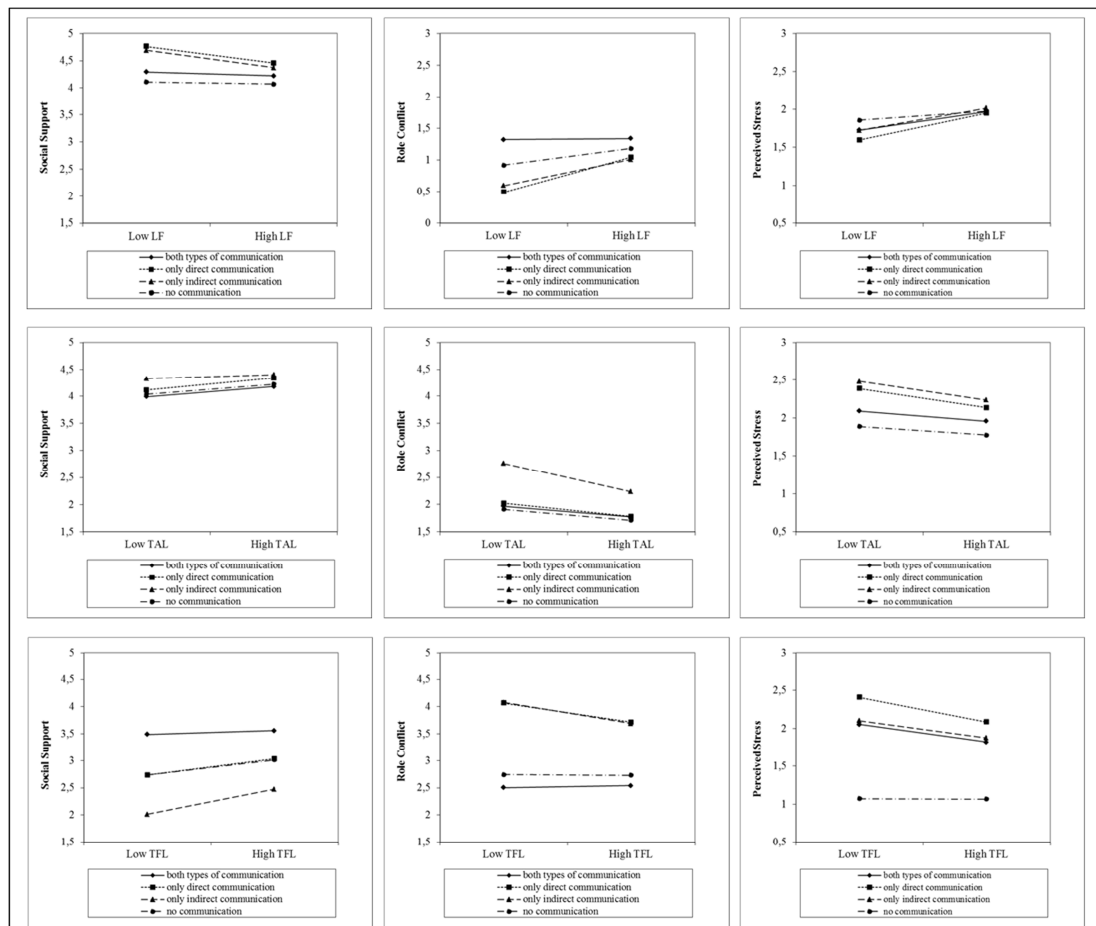


Figure 4. Interaction Plots of Leadership Constructs, Mediators, and Work Stress. LF = laissez-faire; TAL = transactional leadership; TFL = transformational leadership.

Looking at the interaction terms for dummy regression for the relationship between TFL and RC, significant deviations from the reference category showed up for only direct communication ($\gamma = 0.45$, $SE = 0.14$, $p < .01$) as well as only indirect communication ($\gamma = -0.49$, $SE = 0.22$, $p < .05$) but not for no communication ($\gamma = -0.06$, $SE = 0.17$, ns). Simple slopes for only direct communication (simple slope = -0.41, $SE = 0.26$, $p < .05$ (one-tailed)) as well as only indirect communication (simple slope = -0.45, $SE = 0.29$, $p < .05$ (one-tailed)) showed a negative relationship be-

tween TFL and RC, whereas no significant relationship was observed for both types of communication (simple slope = 0.04, $SE = 0.13$, ns) or no type of communication (simple slope = -0.02, $SE = 0.28$, ns).

Table 11. *Study 2: Multilevel Dummy Regressions Testing for Moderating Effects between Transformational Leadership, Social Support, Role Conflict, and Perceived Stress with Type of Communication as Moderator Variable*

| Variable | Social support | Role conflict | Perceived stress |
|--|----------------|---------------|-------------------|
| both types of communication ^a | 0.08 | 0.04 | -0.26* |
| direct communication ^b | -0.64 | 1.37** | 0.31 |
| indirect communication ^c | -1.28* | 1.36* | 0.05 |
| no communication ^d | -0.65 | 0.21 | -0.87* |
| direct communication x TFL | 0.26* | -0.45** | -0.11 |
| indirect communication x TFL | 0.45** | -0.49* | 0.01 |
| no communication x TFL | 0.24 | -0.06 | 0.26 [†] |

Note. Unstandardized estimates are reported.

TFL = transformational leadership; ^a both types of communication is treated as reference category for dummy regression; ^b direct communication coded as 1 = direct communication and 0 = both types of communication; ^c indirect communication coded as 1 = indirect communication and 0 = both types of communication; ^d no communication coded as 1 = no communication and 0 = both types of communication.

[†] $p < .05$ (one-tailed); * $p < .05$; ** $p < .01$ (two-tailed).

For the relationship between TFL and PS a significant interaction for no communication ($\gamma = 0.26$, $SE = 0.14$, $p < .05$ (one-tailed)) was observed. Dummy regression showed no deviation from the reference category for the other types of communication (for only direct communication, $\gamma = -0.11$, $SE = 0.11$, ns ; for only indirect communication, $\gamma = 0.01$, $SE = 0.17$, ns). Simple slope analysis revealed a negative relationship between TFL and PS for both types of communication (simple slope = -0.26, $SE = 0.10$, $p < .01$) as well as only direct communication (simple slope = -0.37, $SE = 0.20$, $p < .05$), but not for the other types of communication (for only indirect communication, simple slope = -0.26, $SE = 0.22$, ns ; for no communication, simple slope = -0.01, $SE = 0.22$, ns).

Moderation of the mediated relationships. Although mediational effects from leadership behaviors through social support and role conflict were proposed, they are not statistically required for testing moderated mediation. When testing for moderated mediation, the indirect effect that is attributed to the mediator has to vary with the different levels of the moderator. To examine this issue, conditional indirect effects of leadership behaviors on perceived stress via role conflict and via social support at the different values of type of communication were computed.

Testing for moderated mediation in the relationship between LF and PS via SS (cf. Table 12), all conditional indirect effects reached significance (for both types of communication, estimate = 0.02, SE = 0.01, $p < .05$; for only direct communication, estimate = 0.01, SE = 0.01, $p < .05$; for only indirect communication, estimate = 0.02, SE = 0.01, $p < .05$; for no communication, estimate = 0.02, SE = 0.01, $p < .01$). Looking at the same relationship via RC, all conditional indirect effect were similarly significant (for both types of communication, estimate = 0.02, SE = 0.01, $p < .05$ (one-tailed); for only direct communication, estimate = 0.01, SE = 0.01, $p < .05$ (one-tailed); for only indirect communication, estimate = 0.02, SE = 0.01, $p < .05$ (one-tailed); for no communication, estimate = 0.02, SE = 0.01, $p < .05$ (one-tailed)) and thus did not differ depending on type of communication used.

For the relationship between TAL and PS via SS, conditional indirect effects were significant when both types of communication were used (estimate = -0.01, SE = 0.01, $p < .05$), when only direct communication (estimate = -0.02, SE = 0.01, $p < .05$) as well as only indirect communication took place (estimate = -0.01, SE = 0.01, $p < .05$ (one-tailed)). The conditional indirect effect was not significant for no communication (estimate = -0.01, SE = 0.01, *ns*). In contrast, for the relationship between TAL and PS via RC, all conditional indirect effects reached significance (for both types of communication, estimate = -0.01, SE = 0.01, $p < .05$; for only direct communication, estimate = -0.01, SE = 0.01, $p < .05$; for only indirect communication, estimate = 0.02, SE = 0.01, $p < .05$; for no communication, estimate = 0.014, SE = 0.01, $p < .05$).

Table 12. *Study 2: Summary of Indirect Effects of Leadership Constructs on Perceived Stress via Social Support and Role Conflict*

| Indirect effects | LF on Perceived stress | | TAL on Perceived stress | | TFL on Perceived stress | |
|-----------------------------------|---------------------------|--------|----------------------------|--------|----------------------------|--------|
| Via social support | | | | | | |
| Type of communication | | | | | | |
| <i>both (direct and indirect)</i> | 0.02* | (0.01) | -0.01* | (0.01) | -0.03** | (0.01) |
| <i>only direct</i> | 0.01* | (0.01) | -0.02* | (0.01) | -0.04** | (0.01) |
| <i>only indirect</i> | 0.02* | (0.01) | -0.01 [†] | (0.01) | -0.03* | (0.01) |
| <i>no kind of communication</i> | 0.02** | (0.01) | -0.01 | (0.01) | -0.03* | (0.01) |
| Via role conflict | | | | | | |
| Type of communication | | | | | | |
| <i>both (direct and indirect)</i> | 0.02 [†] | (0.01) | -0.01* | (0.01) | -0.02 | (0.01) |
| <i>only direct</i> | 0.02 [†] | (0.01) | -0.01* | (0.01) | -0.02 [†] | (0.01) |
| <i>only indirect</i> | 0.02 [†] | (0.01) | -0.02* | (0.01) | -0.02 [†] | (0.01) |
| <i>no kind of communication</i> | 0.02 [†] | (0.01) | -0.01* | (0.01) | -0.02 | (0.01) |

Note. Unstandardized coefficients are reported (with standard errors in parentheses).

LF = laissez-faire; TAL = transactional leadership; TFL = transformational leadership.

[†] $p < .05$ (one-tailed); * $p < .05$; ** $p < .01$ (two-tailed).

Focusing on the conditional indirect effects of TFL on PS via SS, all effects were significant (for both types of communication, estimate = -0.03, $SE = 0.01$, $p < .05$; for only direct communication, estimate = -0.04, $SE = 0.01$, $p < .05$; for only indirect communication, estimate = -0.03, $SE = 0.01$, $p < .05$; for no communication, estimate = -0.01, $SE = 0.01$, $p < .05$). Whereas the conditional indirect effects for TFL on PS via RC were only significant for only direct communication (estimate = -0.02, $SE = 0.01$, $p < .05$ (one-tailed)) and only indirect communication (estimate = -0.02, $SE = 0.01$, $p < .05$ (one-tailed)), but not for the other two types of communication (for both types of communication, estimate = -0.02, $SE = 0.01$, ns ; for no communication, estimate = -0.02, $SE = 0.01$, ns).

In general, the patterns of results suggest moderated mediation for transactional leadership and perceived stress via social support as well as for the relationship between transformational leadership and perceived stress via role conflict.

4.6 Discussion

4.6.1 Impact of Daily Leader Behaviors on Daily Work Stress

The general objective of this study was to explore the role leadership behaviors have on employees' perceived work stress in day-to-day interaction between leader and follower. Results support the notion that full-range leader behaviors directly influence followers' levels of work stress. This means that laissez-faire is associated with increasing followers' work stress whereas transactional and transformational leadership behaviors reduce it. Considering the mediational analysis, results indicate that social support mediates the relationship between laissez-faire and perceived stress as well as between transformational leader behaviors and perceived stress. This shows that on a daily basis, it is much more important for leaders to create a supportive atmosphere for their followers and to care for members of workgroup by creating a positive environment which is characterized by reciprocal support. Further, moderation and simple slope analyses indicate that the use of only direct and only indirect communication helps in particular to build up resources in cases of social support and to a greater degree reduce demands in cases of role conflict. That is to say that the type of communication used is important for the effects of leadership on work characteristics. In particular, a consistent type of communication is important to influence work characteristics and convey a feeling of clarity concerning how work is defined. Likewise, depending on the type of communication, effects from leadership behavior on perceived stress are stronger when only direct communication is used for transformational leadership, and when only indirect communication is applied in transactional leadership. This goes in line with findings on task-oriented leadership i.e., transactional leadership, which revealed that this pattern of leader behavior is to a lesser degree related to communication than transformational leadership (de Vries et al., 2010). Hence, transactional behaviors do depend on the precision of communication, which can be achieved optimally via indirect communication like email. Specific information on working tasks and detailed feedback can be given in written form with no need for personal conversation. Empirical results have also revealed that contingent reward is effective when leader-follower distance is high (Howell et al., 2005). Likewise, communication via email

offers a feeling of autonomy because the employee can decide when to read and when to respond to the message of the supervisor, which leads to less perceived stress. Transformational leadership is characterized by assured, supportive and expressive communication behaviors, which are best achieved via direct communication (de Vries et al., 2010). Directly talking to followers is important to create a group identity, and to consider the individual background of each person. With regards to followers' performance, transformational leadership is, in particular, linked to high performance when distance is low, and does not show this link when distance is high. These results emphasize the need for close interaction between leader and follower (Howell et al., 2005). Finally, analysis of moderated mediational effects shows that the relationship between transactional leadership with perceived stress via social support only exists when communication takes place. The same pattern shows up for the relationship between transformational leadership and perceived stress via the mediator role conflict. In this case, leaders have to communicate with their followers to ensure the positive effect of their behaviors.

4.6.2 Limitations and Future Directions

This study lacks several limitations that directly lead to implications for future research. First, some of the constructs were assessed using single-item scales. Indeed, research shows that single-item measures have the potential to display adequate reliabilities (Wanous, Reichers, & Hudy, 1997) when relevant constructs are rather homogeneous (Loo, 2002). As this is the case in the present study and, furthermore, results of the pre-study show appropriate fits concerning construct and criterion-related validity of the shortened questionnaires as well as good reliability with respect to correlations between short and long versions of the scales, constraints resulting from the shortened questionnaires used here can be minimized. Secondly, the study only relies on one source with respect to data collection which increases the risk of common rater effects (Podsakoff et al., 2003). Following Courtright et al. (2015) repeated-measure research designs using within-person analysis, like diary studies, attenuate problems concerning same-source aspects of measurement. Confirmatory factor analysis revealed that regardless of the day of the week a model with only one method factor always displayed poor model fit (for Monday: $\chi^2(91) =$

760.07, $p < .01$, comparative fit index (CFI) = .45, root mean square error of approximation (RMSEA) = .15, standardized root mean residual (SRMR) = .15; for Tuesday: $\chi^2 (91) = 916.30$, $p < .01$, CFI = .49, RMSEA = .16, SRMR = .13; for Wednesday: $\chi^2 (77) = 587.43$, $p < .01$, CFI = .47, RMSEA = .18, SRMR = .16; for Thursday: $\chi^2 (91) = 1083.38$, $p < .01$, CFI = .45, RMSEA = .19, SRMR = .14; for Friday: $\chi^2 (77) = 555.38$, $p < .01$, CFI = .51, RMSEA = .18, SRMR = .15) indicating less potential threat by of common method variance. Likewise, participants provided information via self-reporting on their level of perceived stress and job demands and resources together with an external assessment of their direct leaders' behavior. However, this method is appropriate to gather information about the respective constructs because participants are best suited to report observations they have made on their supervisor as well as on their own feelings of stress since they are the core subjects of these behavioral aspects. Nevertheless, future research should rely on a multimodal assessment of the respective constructs combining self-reporting with objective measurements of work stress as already introduced in the context of social support (Evans & Steptoe, 2001). Similarly, a recording of the daily leader-follower interaction via smartphones is conceivable to collect objective information about email contact, interaction time and frequency. Thirdly, this study only assessed how communication in the daily interaction between leader and follower took place. Future studies should rely on the content of the communication and focus on what leaders say to their employees and how this affects their level of work stress. As "quality of interaction may not necessarily be related to quantity of interaction" (Antonakis & Atwater, 2002, p. 687), future research should address this aspect of communication in the leadership process.

Beside these limitations, the diary design of this study comprises several advantages. On the one hand, the assessment of leader behavior on a daily basis reduces potential biases that may occur in the process of subjective leader ratings. Since there are multiple ratings of leader behavior within one working week, the influence of negative leader-follower interactions on these ratings is reduced. If, for instance, one negative situation occurs by way of exception and on the same day the follower makes a general, trait-like rating of the leader behavior, this situation might negatively influence the general impression of the leader. With the diary design, the ratings "may be a more accurate reflection of the leadership behaviors shown by the leader

compared with leadership behavior measured at one point in time” (Breevaart, Bakker, Hetland, Demerouti et al., 2014, p. 13). On the other hand, the assessment of perceived stress is more accurate because the daily measurement buffers potential recall biases which can occur within the assessment of subjective work stress (Ohly, Sonnentag, Niessen, & Zapf, 2010). All in all, the measurement of specific constructs close to the event makes the measurement more independent of psychological states (Bolger, Davis, & Rafaeli, 2003).

4.6.3 Practical Implications

The results of the study lead to several managerial implications. As we know that leader behavior directly influences followers’ levels of work stress, it is crucial to implement positive leader behaviors (transactional and transformational leadership) in an organization and to reduce the occurrence of stress-supporting behaviors (*laissez-faire*). Leadership training, therefore, provides a promising method to develop managers to behave in a more transformational and transactional manner, while training has also proven to be effective (Abrell et al., 2011; Barling et al., 1996).

Furthermore, organizations should focus more on social support as an important work characteristic. A supportive atmosphere within teams and the organization has shown to be an important aspect in the context of work stress (Viswesvaran et al., 1999). Also, leaders may promote socially supportive behaviors by focusing on their function as a role model, which, in turn, is strongly related to transformational leadership behaviors.

Results regarding communication show that it is important to communicate consistently. It is not so much the type of communication used that matters; rather it is important to use one type of communication consistently and to adapt communication in accordance with leadership styles. For transformational leaders, direct communication is crucial and for transactional leaders, indirect communication is a suitable means of interacting with followers. Creating a technical framework and training managers is a simple opportunity to foster different communicator styles inside one organization with reference to favored outcomes.

4.6.4 Conclusion

The present study contributes to the literature of leadership by implementing a diary study to lend a closer look at the leader-follower interaction together with consequences on followers' level of work stress. The diary design adds value not only on a methodological basis in the case of quality of the data collected, but also on a theoretical basis by looking at the processes in leader-follower interaction with direct attention paid to actual behaviors. It shows that job resources play an important role in the interrelationship between leader and follower and, likewise, the type of communication proves to be an important aspect in this relationship.

5. Study 3 - Two Processes of Leadership on Stress: Independent Influence of Full-Range Leadership Dimensions on Hair Cortisol and Perceived Stress

5.1 Introduction

The relationship between the behavior of a line manager and employees' level of work stress is investigated in various studies that take into account different leadership styles and indicators of stress. Depending on the leader behavior, work stress can either be magnified or mitigated (Schyns & Schilling, 2013; Skakon et al., 2010). However, in the existing literature, most studies only consider the impact of one specific leadership style that does not implement a theoretical leadership framework, which includes different but theoretically connected leadership constructs. Until now, only a few studies have conducted a systematic comparison of the consequences of different leadership constructs on employees' level of work stress (cf. Gregersen et al., 2014).

To address this limitation and to present a more balanced perspective on the role of leadership in the context of work stress, the full-range leadership theory is applied, which covers three different leadership constructs (Bass, 1985) i.e., laissez-faire (LF), transactional (TAL) and transformational (TFL) leadership. By considering recent criticism concerning the construct of transformational leadership (van Knippenberg & Sitkin, 2013), a consideration of transformational leadership on a detailed level, using the concept proposed by Podsakoff et al. (1990), is advisable. In addition, a mediational framework is implemented to specify the effects of leader behavior on work stress through the lens of the job demands-resources (JD-R) model (Demerouti et al., 2001). This specifies how leaders affect followers' well-being, and sets the focus on leadership processes.

This study is different from recent studies, which focus solely on the use of subjective indicators of stress. It extends this research tradition by applying an objective biological criterion for the assessment of work stress, namely cortisol. Therefore, following Hoffman, Woehr, Maldagen-Youngjohn, and Lyons (2011), the methodo-

logical strength of this study is characterized by the combination of subjective follower ratings and an objective measure of work stress.

In summary, this study contributes to the existing literature in a number of ways. Firstly, literature on the full-range leadership theory is assessed in detail to reach conclusions on the consequences of specific leadership behaviors on followers' level of work stress. By applying the JD-R model, inferences in the mediating mechanisms of leadership behavior can be presented to show how leadership behavior has an effect on work stress. Secondly, with respect to work-stress literature, the application of an innovative biomarker of stress is investigated in the context of organizational research. And finally, the simultaneous use of an objective as well as a subjective stress indicator enables important insights into the field of stress research.

5.2 Theoretical Background

5.2.1 Measurement of Stress via Biological Indicators

The inclusion of biomarkers in the measurement of well-being, especially its negative side i.e., stress has a long tradition. There are several stress indicators that have been validated within different studies and analysis contexts. In recent years cortisol has become the major neuroendocrine indicator of stress in scientific literature and is the most studied hormonal indicator in the human body (Ganster & Rosen, 2013). Cortisol is a glucocorticoid hormone that is released by the adrenal cortex as a result of stimulation of the hypothalamic-pituitary-adrenal (HPA) axis. The HPA axis initiates the release of cortisol throughout the body (Ganster & Rosen, 2013) as a response to appraisal, threats, or negative consequences. These can be physiological or psychosocial in nature. This activation of the HPA axis leads to a cascade of hormonal reactions, starting with the release of corticotropin releasing hormone (CRH), which stimulates the anterior pituitary gland to secrete adrenocorticotropin hormone (ACTH). This reaction triggers the adrenal cortex to release cortisol into the bloodstream (Dickerson & Kemeny, 2004). Cortisol is especially indicative of stress and is influenced by daily stressors. Daily stressors cause higher cortisol levels in comparison to stress-free days (Stawski, Cichy, Piazza, & Almeida, 2013). Furthermore, meta-analytic findings support these substantial associations

between cortisol and stress (Dickerson & Kemeny, 2004). Focusing on the measurement aspects, three methods are widely used to detect cortisol levels in the human body: serum, blood and saliva. These methods suffer several disadvantages, like high dependency on the measurement context, or high daily fluctuations of cortisol levels. They are therefore not representative of ordinary cortisol secretion (Hellhammer et al., 2007). Over the last five years, an innovative method has proved promising for the detection of cortisol in the human body. The method uses extraction of cortisol concentration from hair. In comparison to traditional measurement procedures (blood, urine, saliva), this new method has several advantages. Hair cortisol provides a stress-focused window into the past. Assuming an average hair-growth rate of one centimeter a month, it covers a recent period of time (Stalder & Kirschbaum, 2012) and does not record a single point measure of acute stress (Russell, Koren, Rieder, & van Uum, 2012; Staufenbiel, Penninx, Spijker, Elzinga, & van Rossum, 2013). Because of its retrospective nature, hair cortisol is not affected by situational characteristics like reaction to acute stress (Stalder & Kirschbaum, 2012) and it is independent of circadian rhythm and daily variations in the cortisol level (Staufenbiel et al., 2013). Only a small amount of hair is needed to provide a sample; the sampling procedure is non-invasive (Stalder & Kirschbaum, 2012) especially with regards to the subjective level of invasiveness (Russell et al., 2012). The sampling procedure e.g., cutting hair strands near to the scalp, does not cause stress by itself (Russell et al., 2012). Hair samples only require simple storage conditions under which they can be preserved for up to six or more months (Russell et al., 2012; Stalder & Kirschbaum, 2012). Because of the sample collection available to research assistants, problems of non-adherence can be reduced (Stalder & Kirschbaum, 2012).

Studies highlighting the validity of hair cortisol as a high-quality measure of stress focus on three main aspects. Firstly, there are differential effects in animal studies showing a connection between highly stressful conditions and hair cortisol changes (Stalder & Kirschbaum, 2012). Likewise Sharpley, McFarlane, and Slominski (2012) observe a direct link between the level of cortisol in hair (fur) and the animal's experience of stress. Secondly, studies using human samples show correlations between high chronic stress exposure and hair cortisol (Staufenbiel et al., 2013) in high-stress conditions like demanding working environments (e.g. shift work or unemployment), for people who have experienced serious life events, for those expe-

riencing chronic pain, and in the context of sport. It is concluded that “in a broad area of research, recent and/or ongoing stress generally seems to be associated with increased hair cortisol” (Staufenbiel et al., 2013, p. 1225). Thirdly, results concerning the psychoendocrine covariance between perceived stress and hair cortisol are hitherto inconsistent. There is a balance between studies supporting a direct fit between objective and subjective criteria and between studies that do not support this paradigm (Staufenbiel et al., 2013). In comparison with traditional matrices, Stalder and Kirschbaum (2012) reveal significant positive associations between hair cortisol and accumulated salivary cortisol levels. In summary, more research is needed to provide reliable statements on the psychoendocrine covariance in this nascent research area.

Stress research in the context of leadership. In the context of leadership research, the implementation of objective biological biomarkers of stress is missing in current practice. Hitherto, no study has been published using biological measures of work stress. Likewise, in the broader field of organizational behavior, biological findings are only gradually being taken into account. Nevertheless, there is an increasing need to combine biological and psychological research traditions to better integrate and advance knowledge in the organizational context (Arvey & Zhang, 2015). This research gap is closed by this study, which combines both research strands and combines knowledge from the field of stress measurement with that from the field of leadership research. Therefore, hair cortisol is used as an innovative and promising method to display a stress focused window into the past to better understand the influence a line manager has on employees’ level of work stress on both a psychological and biological basis.

5.2.2 Definition of Leadership Constructs

Full-range leadership theory. The full-range leadership theory (FRLT) proposed by Avolio and Bass (1991) comprises three types of leadership behaviors: transformational, transactional, and laissez-faire. The FRLT in its original form is represented by nine distinct factors (Avolio & Bass, 1991): five transformational factors, three transactional factors and one (non-transactional) laissez-faire factor. In this study, the conceptualization of transformational and transactional leadership by Podsakoff et al. (1990) is used, resulting ultimately in an eight-factor model of full-

range leadership. The three main types of leadership behaviors differ in their consideration of level of leader activity, and can be ordered on a continuum ranging from highly active to totally passive (Antonakis & House, 2013). Laissez-faire is classified as the absence of leadership, meaning the leader does not engage in leader activity, whereas transactional leadership - based on contingent reward - subsumes typical management behaviors like setting objectives and monitoring outcomes. Transformational leadership, however, is the most active type of leader behavior, and aims at a transformation of values to enhance followers' performance (Bass, 1985). These effects have been reproduced on a meta-analytical basis (Jackson et al., 2013; Judge & Piccolo, 2004; Wang et al., 2011), and show that transformational leadership behavior outperforms transactional and laissez-faire, with the last example proving the most ineffective type of leader behavior.

Laissez-faire. This leader type is characterized by the avoidance of making decisions, of use of authority, and of taking responsibility (Antonakis et al., 2003). Furthermore, laissez-faire leaders are ineffective, frequently absent, and passive, which results in failure to arrange work tasks, meddling in problems, and causing conflicts between employees (Bass, 1985). This behavior is the least effective type of management, and is associated with low job satisfaction and poor regard of the leader (Judge & Piccolo, 2004).

Transactional leadership. Following Podsakoff et al. (1990) transactional leadership is best represented as contingent reward. This leader behavior includes reconciling requirements, tasks, and rewards. Transactional leadership is defined as an exchange process by setting objectives and monitoring outcomes. Leaders provide material or psychological support to clarify roles and assign tasks to fulfill contractual obligations (Antonakis et al., 2003). They clearly communicate expectations so that their followers can deliver performance. This results in enhanced follower performance (Wang et al., 2011), job satisfaction (Judge & Piccolo, 2004) and commitment (Jackson et al., 2013).

Transformational leadership. Transformational leaders engage in proactive behavior to raise followers' awareness of the collective interests of the group or organization (Antonakis et al., 2003). They motivate followers to work for the benefit of the group or organization and help them to achieve extraordinary goals. Transfor-

mational leadership has been linked to higher follower motivation, employee commitment, job satisfaction and performance (Jackson et al., 2013; Judge & Piccolo, 2004). Transformational leadership is conceptually defined by six distinct behaviors (Podsakoff et al., 1990): *Identifying and articulating a vision* describes leaders acting and talking in a consistent manner. They set an example of the basic values of the organization, and identify new opportunities for the group that are articulated within an attractive and emotive vision for the future. This vision is abstract as it comprises the values and objectives of all followers to accentuate similarities. It delivers guidance for the future, and provides a rationale for behavior; this leads to employee trust and enthusiasm. This facet of transformational leadership is comparable with Bass' (1985) concept of inspirational motivation. *Providing an appropriate model* means that transformational leaders represent a model for their employees that is consistent with the values the leader represents (Podsakoff et al., 1990). Providing an appropriate model is associated with idealized influence (Bass, 1985), as is the following dimension of transformational leadership: *Fostering the acceptance of group goals* describes a leader creating an identity to motivate the group to work towards a common objective. This behavior promotes cooperation while interests of followers are encouraged. *High performance expectations* are characterized by outstanding expectations within the group. Leaders place trust in their followers to strive for excellence and quality. As with identifying and articulating a vision, high performance expectations are linked with inspirational motivation (Bass, 1985). *Providing individualized support* means that leaders identify, cater for, and respect their followers' needs. Leaders are concerned about personal feelings while setting objectives and allocating tasks. This transformational leadership behavior corresponds with individualized consideration (Bass, 1985). With *intellectual stimulation* leaders encourage their followers to question inflexible patterns of thinking, thus stimulating constructive thinking and idea generation. Followers are inspired to participate in and contribute to group behaviors. This leader behavior overlaps with intellectual stimulation as defined by Bass (1985).

5.3 Hypotheses

5.3.1 Consequences of Leadership Behaviors on Employees' Stress

When it comes to the consequences of leader behavior for followers' work stress, there are varying results with respect to the aforementioned leadership constructs. In general, a good leader may provide support in times of high workload and challenging circumstances to support his followers and to encourage them to cope with these stressful situations (Bass, 1985; Skakon et al., 2010). Transforming personal concerns into an effort to achieve group goals and handle challenging situations are important leader initiatives. They help followers cope with stress and its effects (Bass & Riggio, 2006). In particular, transformational leaders use these strategies to support their followers by providing innovative solutions to problems. Transactional leaders, focusing on established structures and processes, clarify followers' expectations and provide certainty. However, these transactional behaviors may not support the problem-solving abilities of followers. Leaders engaging in laissez-faire behaviors do not offer support or problem-solving strategies at all (Bass, 1990b).

Research on the relationship between laissez-faire behavior and followers' level of work stress consistently exposes the negative outcomes of this type of non-leadership. Generally, a direct relationship between laissez-faire and poor health is observed, which can be explained due to the cumulative occurrence of stressors at work (Skogstad et al., 2007; Skogstad, Hetland et al., 2014). Laissez-faire leaders do not provide a clear structure for their followers' and neither clarify expectations nor provide feedback to them, as a result, these behaviors pose a main cause of workplace stressors, which are essential to the occurrence of follower stress (Kelloway et al., 2005).

Transactional leader behaviors instead result in the reduction of work stress (Gregersen et al., 2014, 2014; Sosik & Godshalk, 2000; Stordeur et al., 2001). Specifically, transactional behaviors foster a sense of security by assigning tasks and specifying procedures so that followers know what they have to do and how they have to behave. In sum, transactional leader behaviors aim at providing a source of

comfort by clarifying rules as well as expectations, and therefore, reduce uncertainty and strain.

In their large-scale study of different consequences of leadership behaviors on well-being and physical health, Zwingmann et al. (2014) investigate the health-promoting effect of transformational leadership using a sample of 90,000 employees. This exceeds the sample size of the previous three meta-analyses on leadership outcomes by a factor of ten (DeGroot, Kiker, & Cross, 2000; Judge & Piccolo, 2004; Wang et al., 2011). Results show that transformational leader behaviors promote health regardless of followers' cultural background. Effects of leader behaviors on well-being range from $r = .35$ to $r = .50$ for TFL, from $r = .38$ to $r = .48$ for TAL and from $r = -.19$ to $r = -.43$ for LF. The same effects show up for physical health; for TFL, effects range from $r = .16$ to $r = .34$, for TAL from $r = .14$ to $r = .33$, and from LF from $r = -.15$ to $r = -.29$. In addition, multiple studies report health-promoting effects of TFL (Arnold et al., 2007; Kelloway et al., 2012) as well as stress-reducing effects (Hetland et al., 2007; Liu et al., 2010; Seltzer et al., 1989). It becomes especially apparent that providing support and ensuring empowerment helps employees to cope with stressful situations.

Most studies analyzing the stress-related outcomes of transformational leadership focus on TFL as a whole. They do not distinguish its detailed dimensional level, except in work completed by Rowold and Schlotz (2009), and Franke and Felfe (2011), who explored the effects of transformational leadership dimensions on employee work stress. Supported by the arguments of van Knippenberg and Sitkin (2013), there is a necessity for a more differentiated consideration of the transformational leadership construct. The strong heterogeneity of transformational leader behaviors rooted in the six facets following the Podsakoff et al. (1990) definition calls for a more content-related as well as behavior-oriented interpretation of transformational leadership.

Classification of transformational leader behaviors. To structure the derivation of this hypothesis and to set a framework to interpret the aforementioned findings, an effect-oriented as well as content-related classification of transformational behaviors is required. Keeping in mind that charismatic leadership behaviors may have positive and coincidentally negative consequences on followers (Howell

& Shamir, 2005; O'Connor, Mumford, Clifton, Gessner, & Connelly, 1995), a clear distinction of leader behaviors into two categories is suitable. On a content-related level, the facets of transformational leadership can be grouped into two broad categories with respect to their influence on followers' level of work stress. On the one hand, there are stress-reducing patterns of behavior, which are characterized by social and group-oriented conduct. On the other hand, there are the facets of transformational leadership that place demands on cognition. These are, conversely stress-promoting. The transformational leadership dimensions of providing an appropriate model, fostering the acceptance of group-goals, and providing individualized support can be allocated to the social and group-oriented conduct of transformational leadership. Core characteristics of the leadership facet providing individualized support are offering personal coaching and teaching, treating followers as individuals (Hater & Bass, 1988), and paying attention to individual differences (Yammarino et al., 1993). Along with providing an appropriate model and fostering the acceptance of group goals, all three dimensions present leadership aspects, which are appropriate assistance behaviors to help followers to deal with challenging situations and to cope with stress. This includes the communication of meaning and purpose of potentially challenging situations; consequently, stressful experiences are reframed (Rowold & Schlotz, 2009).

On the other hand, high performance expectations, identifying and articulating a vision, and intellectual stimulation place cognitive demands of transformational leadership, which lead to higher levels of work stress. High performance expectations encourage extra effort and, with that, the pressure to perform. The line manager focuses on peak performance, and does not take the employees' current state of mind into consideration. For example, high performance expectations have been shown to enhance the detrimental effect of unfinished tasks on rumination as well as sleep, because employees fear falling short of leaders' expectations (Syrek & Antoni, 2014). Likewise, identifying and articulating a vision inspires followers to pursue challenging goals (Tepper & Percy, 1994), which can result, when expectations are perceived as hardly achievable, in mental overload (Franke & Felfe, 2011). Thinking in new ways and departing from safe paths is characteristic of intellectual stimulation (Yammarino et al., 1993). This is in turn connected to followers investing extra effort. Put together, transformational leadership that imposes cognitive demands leads

to extra effort. Consequently, the work stress of followers increases. In summary, these conclusions result in the first hypothesis:

Hypothesis 1: The behavior of the direct leader is associated with employees' work stress on an objective and subjective level of measurement. The leadership constructs of (a) transformational (social and group-oriented) and (b) transactional leadership are negatively correlated with indicators of work stress, whereas (c) laissez-faire and (d) transformational leadership (cognitive demands) are positively correlated with indicators of work stress.

5.3.2 Mediation Model of Leadership Behaviors

In trying to explain how the behavior of the leader impacts on followers, the job demands-resources model of Demerouti et al. (2001) provides a promising framework. Following this theoretical framework, there are two different categories of working condition that influence employee well-being. In their literature review, Bakker and Demerouti (2007) summarize current definitions and findings on these two broad working conditions: job demands refer to those aspects of the job that require sustained effort or skills, like work pressure, emotional demands, or role ambiguity. Thus, job demands are associated with certain physiological or psychological costs, which lead as a consequence to sleeping problems, exhaustion, and impaired health. Job resources by contrast refer to those aspects of the job that reduce job demands or associated costs, and help to achieve goals. For example, social support, performance feedback, and autonomy are known to lead to higher work engagement, more job-related learning, and organizational commitment. The JD-R model comprises two processes. One impairs health, and the other fosters motivation.

Focusing on the job demands-resources framework to account for how a leader affects work stress, the general trend shows a strong impact on followers' interpretation of work experiences. There is a particular link between job characteristics in the job demands-resources framework (Zhang et al., 2014). Hence, the absence of leadership i.e., laissez-faire behavior, is linked to greater job demands. However, transactional as well as transformational behaviors reduce job demands, and promote the existence of job resources.

Hitherto, there has been little empirical evidence on the mechanisms linking leadership behavior to employees' work stress. Regarding laissez-faire behavior Skogstad, Hetland et al. (2014) found that laissez-faire leadership is a source of subordinate role ambiguity and in the main increases the occurrence of stressors at work. Further, Skogstad et al. (2007) found that the relationship between laissez-faire and distress is mediated by three types of stressors: role conflicts, role ambiguity, and conflicts with coworkers. Leaders not engaging actively in their role as line manager do not succeed in creating calm and stress-free working conditions.

For transactional leader behaviors, a decrease in followers' emotional exhaustion can be observed when the perception of organizational justice - as a job resource - is promoted. Zhang et al. (2014) found that transactional leaders promote followers' perception of organizational justice and additionally, in a recent study, Gaudet, Tremblay, and Doucet (2014) showed that procedural justice fully mediated the relationship between transactional leadership behaviors and emotional exhaustion. In general, the contingent behavior of leaders results in a fair working environment that allows followers to overcome stressful situations, because the perception of organizational justice is strongly associated with experiencing distress (Elovainio, Kivimäki, & Helkama, 2001). With regard to job demands it is concluded that transactional leaders "provide avenues of coping with stressors" (Zhang et al., 2014, p. 680) and therefore encourage their followers to work on despite negative working conditions. Transactional leaders help their followers to deal with job demands at work (Stordeur et al., 2001) and support them to clarify possible difficult situations. This, in summary, ensures that contingent leader conducts go in line with motivated subordinates who continue working, although hindering factors impede their functioning since potential supporting mechanisms of work are not emphasized.

Linking transformational leader behaviors to job resources, these conducts support followers' perceptions of justice (Gaudet et al., 2014; Zhang et al., 2014) and role clarity (Nielsen et al., 2008). Subordinates appreciate aspects of work that lead to achieving goals and that, in turn, reduce health-impairing job characteristics. With regards to job demands, this pattern of behaviors reduces the occurrence of stressors at work. In particular, role conflicts are reduced by supportive leaders, while leaders who have unreasonably high expectations tend worsen the situation (Podsakoff et al.,

1996). In conclusion, the content-related social and group-oriented aspects of transformational leadership (IS and PAM) reduce subordinates' role conflicts, whereas aspects demanding cognitive engagement (ISN and HPE) exaggerate them. Current literature indicates that transformational leadership negatively influences job demands and positively influences job resources (Fernet, Trépanier, Austin, Gagné, & Forest, 2015). Further, job demands mediate the relationship between transformational leadership and burnout (Stordeur et al., 2001) as well as well-being (Nielsen et al., 2008). By facilitating followers' abilities and problem solving skills, subordinates gain confidence that they can cope with upcoming difficulties to overcome possible job demands (Bass, 1985).

Summarizing this rationale, it is shown that leaders have an impact on their followers' perceptions of job responsibilities (Piccolo & Colquitt, 2006; Zhang et al., 2014) while actively engaging in the role as a line manager reduces job demands and increases job resources. A passive and demanding leadership style does not enhance the availability of job resources and does not reduce job demanding factors that impose great demands on employees. This results in the second hypothesis:

Hypothesis 2: The relationship between leadership constructs and employees' level of work stress (subjective and objective) is positively mediated by the job demands-resources dimensions of (a) role conflict and negatively mediated by (b) organizational justice.

Figure 5 summarizes the present research model of this study and visualizes the interconnections between the different variables included.

5.4 Method

5.4.1 Sample and Data Collection

The sample consisted of 129 participants, 98 of them were female (76%). Mean age was 32.52 years ($SD = 12.08$) and ranged from 17 to 62.

Most of the participants worked full time (56%) and had spent less than three years (49%) working under their line manager. Participants came from a diverse set

of occupations; 63% were in a regular employment relationship, 5% were civil servants; and 23% were students. 43% of the sample had at least a certificate of secondary education, and 30% a university degree. In addition, all participants provided information on their line manager's leadership behavior, and their own perceived level of stress via questionnaire as well as a hair sample.

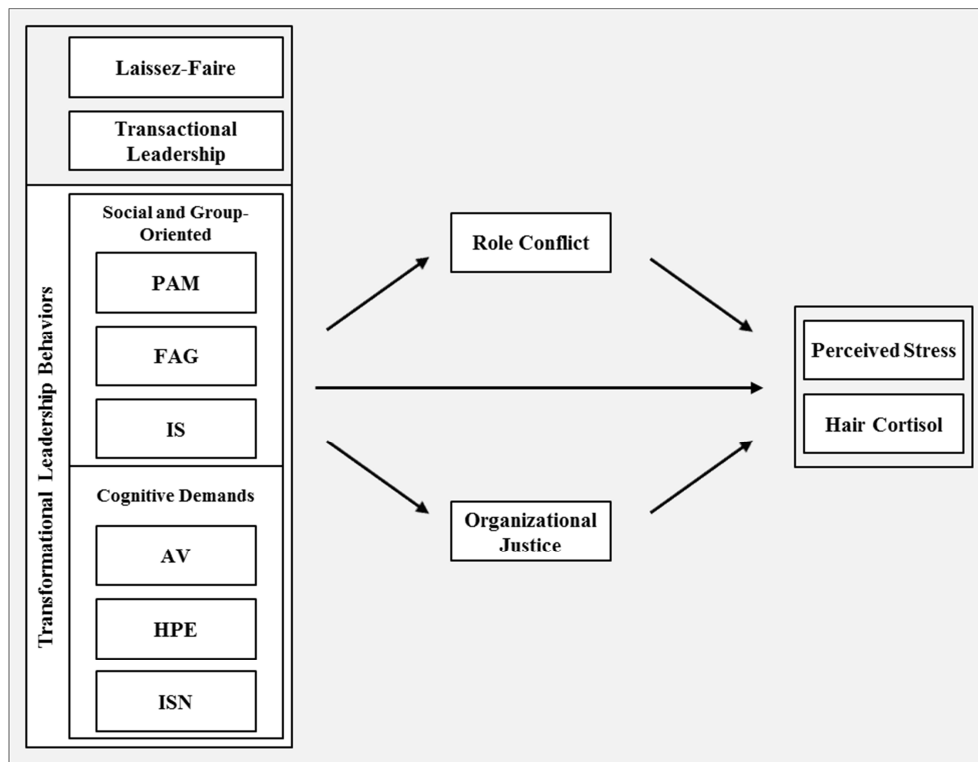


Figure 5. Proposed Relationships among Study Variables of Study 3.

PAM = providing an appropriate model; FAG = fostering the acceptance of group goals; IS = providing individualized support; AV = identifying and articulating a vision; HPE = high performance expectations; ISN = intellectual stimulation.

Participants were recruited by research assistants who contacted people from their personal network. The research assistants monitored the hair sample collection and reminded the participants to fill out the questionnaires. Data collection took part on two separate occasions with a three-week time gap. In the first instance, participants provided information on demographics, control variables, the three leadership constructs and the job demands-resources dimensions. In the second instance, the hair samples were collected and participants' level of perceived stress was measured.

Hair samples were carefully put in aluminum foil and collected by the research assistants. All hair samples were collectively analyzed at the laboratory of the chair of biopsychology at Dresden University of Technology in Germany.

5.4.2 Measures

Laissez-faire. Four items were used for the assessment of laissez-faire (sample item: “My supervisor tries to avoid decisions”; cf. (Rowold, 2011; Rowold & Borgmann, 2014). I used a response format ranging from 1 (*I strongly disagree*) to 5 (*I strongly agree*) for all leadership measures. Cronbach’s alphas for all study variables are listed in Table 13.

Transactional leadership. Transactional leadership was measured using four items from the Transformational Leadership Inventory (TLI; Podsakoff et al., 1996; Podsakoff et al., 1990) validated in a German sample by Heinitz and Rowold (2007). The TLI has received strong support for its construct validity, that is it represents an invariant factor structure to distinctively display transactional as well as transformational leader behaviors (Krüger et al., 2011). The elements of the TLI represent contingent reward following the theoretical definition of Podsakoff et al. (1990). A sample item was, “My supervisor provides me with positive feedback if I perform well.”

Transformational leadership. Transformational leadership was assessed with the remaining 22 items from the TLI. The TLI measures six transformational leadership facets: Identifying and articulating a vision (AV; 5 items; sample item, “My supervisor paints an interesting picture of the future for our group”); providing an appropriate model (PAM; 3 items; “My supervisor provides a good model for me to follow”); fostering the acceptance of group goals (FAG; 4 items; “My supervisor gets the group to work together for the same goal”); high performance expectations (HPE; 3 items; “My supervisor shows us that he/she expects a lot from us”); providing individualized support (IS; 4 items; “My supervisor shows respect for my personal feelings”); and intellectual stimulation (ISN; 3 items; “My supervisor challenges me to think about old problems in new ways”).

Distinctiveness of leadership constructs. Maximum likelihood confirmatory factor analysis with IBM SPSS AMOS 22 indicates that the expected eight-factor

model (LF, TAL, AV, PAM, FAG, HPE, IS, and ISN) fits the data reasonably well, $\chi^2(377) = 582.02, p < .01$; root-mean-square error of approximation (RMSEA) = .06; standardized root mean residual (SRMR) = .07; comparative fit index (CFI) = .93. The eight-factor model exceeds a three-factor model that comprises the three leadership constructs (LF, TAL and TFL; $\chi^2(402) = 965.44, p < .01$, RMSEA = .10, SRMR = .09, CFI = .80) as well as a one-factor model of leadership ($\chi^2(405) = 1146.21, p < .01$, RMSEA = .12, SRMR = .09, CFI = .74).

Job demands-resources dimensions, role conflict, and organizational justice. A German version of Colquitt's (2001) Organizational Justice Scale developed by Herrmann et al. (2012) was used to assess job resources. One of the five statements is, "My outcome is justified and related to my performance." Job demands as well as resources were measured by a five-point-response format ranging from 1 (*I strongly disagree*) to 5 (*I strongly agree*). An adapted version of the Role Conflict and Ambiguity Scale by Rizzo et al. (1970), also introduced by Herrmann et al. (2012), was used to measure job demands. A sample of the 5-item scale is, "I often receive incompatible directions on how I should do my job."

Perceived strain. The Irritation Scale of Mohr et al. (2006) provided information on participants' perceived strain. Eight items in the German version (Mohr, Müller et al., 2005; Mohr, Rigotti et al., 2005) with a response format ranging from 1 (*I strongly disagree*) to 7 (*I strongly agree*) were applied. The Irritation Scale consists of two subscales - emotional irritation ("When I come home tired after work, I feel rather irritable") and cognitive irritation ("Even at home, I often think of my problems at work"). Instructions for the scale were adapted, so that participants were asked to think about their mean perceived level of stress over the previous three months.

Hair cortisol. The hair samples were cut close to the scalp from the posterior vertex region of the head. Three-centimeter-long hair strands were analyzed to represent one mean stress value. According to the average hair growth rate of 1 cm per month (Wennig, 2000) the hair samples represent the hair cortisol level of the previous three months. Hair samples were analyzed using a commercially available immunoassay with chemiluminescence (CLIA, IBL-Hamburg, Germany). The biochemical procedure used in hair analysis follows the laboratory protocol described in

Kirschbaum, Tietze, Skoluda, and Dettenborn (2009). A critical review of the different analysis procedures is provided by Gow, Thomson, Rieder, van Uum, and Koren (2010).

Hair cortisol values are positively skewed, so log-transformation was used to ensure normal distribution. All hypothesis tests regarding hair cortisol are based on the log-transformed data, whereas the descriptive statistics of hair cortisol are based on the raw scores.

Controls. In the present research literature on the measurement of cortisol in human hair there is an ongoing discussion about variables, which may be associated with hair cortisol concentration. Recent articles on possible confounding variables (Dettenborn, Tietze, Kirschbaum, & Stalder, 2012; Wosu, Valdimarsdóttir, Shields, Williams, & Williams, 2013) conclude that hair cortisol values are relatively robust and independent of confounding variables. In this sample, none of the confounding variables had a significant influence on hair cortisol concentration (gender, age, body mass index, frequency of hair washing, cosmetic hair treatment, use of hair products, current medication, all p 's > .05).

5.5 Results

The mean raw hair cortisol level was 11.58 pg/mg ($SD = 13.22$). The highest observed value was 83.64 pg/mg and the lowest 0.50 pg/mg. The descriptive statistics are comparable to means and standard deviations of several other studies using hair cortisol as a biomarker of stress (Kirschbaum et al., 2009; Raul, Cirimele, Ludes, & Kintz, 2004; Stalder, Steudte, Alexander et al., 2012; Stalder, Steudte, Miller et al., 2012).

Looking at the construct of irritation to measure perceived stress, a mean value of 3.15 ($SD = 1.44$) was observed. Mean perceived stress levels ranged from 1 to 7. These values are comparable to the norms presented by Mohr, Müller et al. (2005) with a mean sum-score of 24.79 ($SD_{\text{sum}} = 9.71$) based on a norm sample of 4030 individuals in comparison with a mean sum-score of 25.12 ($SD_{\text{sum}} = 11.51$) in this sample.

Table 13. *Study 3: Means (M), Standard Deviations (SD), and Correlations*

| | <i>M</i> | <i>SD</i> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|--------|----------|-----------|--------|--------|--------|--------|--------|--------|-------|-------|--------|-------|-------|
| 1. LF | 2.41 | 1.24 | (.90) | | | | | | | | | | |
| 2. TAL | 3.35 | 1.07 | -.58** | (.87) | | | | | | | | | |
| 3. PAM | 2.93 | 1.04 | -.71** | .63** | (.77) | | | | | | | | |
| 4. FAG | 3.25 | 1.08 | -.68** | .67** | .78** | (.90) | | | | | | | |
| 5. IS | 3.52 | 1.06 | -.59** | .66** | .68** | .60** | (.91) | | | | | | |
| 6. AV | 2.98 | 0.98 | -.69** | .67** | .76** | .86** | .53** | (.89) | | | | | |
| 7. HPE | 3.56 | 0.91 | -.02 | .05 | .00 | .13 | .31** | .25** | (.67) | | | | |
| 8. ISN | 3.00 | 0.97 | -.57** | .56** | .70** | .69** | .52** | .71** | .09 | (.81) | | | |
| 9. OJ | 3.09 | 0.96 | -.48** | .55** | .52** | .58** | .45** | .58** | .04 | .54** | (.76) | | |
| 10. RC | 2.27 | 0.80 | .43** | -.43** | -.40** | -.43** | -.37** | -.36** | .02 | -.22* | -.34** | (.64) | |
| 11. PS | 3.16 | 1.44 | .30** | -.33** | -.26** | -.18* | -.33** | -.21* | .07 | -.14 | -.12 | .41** | (.92) |
| 12. HC | 2.07 | 0.83 | .22* | -.17 | -.21* | -.31** | -.18* | -.13 | .12 | -.17* | -.34** | .19* | .07 |

Note. $N = 129$. LF = laissez-faire; TAL = transactional leadership; PAM = providing an appropriate model; FAG = fostering the acceptance of group goals; IS = providing individualized support; AV = identifying and articulating a vision; HPE = high performance expectations; ISN = intellectual stimulation; OJ = organizational justice; RC = role conflict; PS = perceived strain; HC = hair cortisol (log-transformed). Internal consistency coefficients (Cronbach's alphas) are reported in the parentheses on the diagonal.

* $p < .05$; ** $p < .01$.

Table 13 presents means, standard deviations, and correlations among the study variables. As shown in the diagonal of Table 13, all variables display acceptable degrees of internal consistency. Consistent with prior research, correlations among study variables generally show the same direction and magnitude. There is a stress-increasing effect from laissez-faire behavior on a subjective as well as objective level, and a stress-reducing effect from transactional leadership behavior. The different transformational leadership dimensions reduce followers' work stress, apart from HPE, which has no influence on either stress construct. In addition, AV does not correlate with hair cortisol; nor does ISN with perceived stress.

To test the hypotheses, hierarchical regression analyses were conducted using IBM SPSS Statistics 22.0. As a first step, laissez-faire was entered in the regression equation along with transactional leadership in the second step of analysis. In the third step, the six facets of transformational leadership were entered. Finally, the mediators were added in the last step of the hierarchical regression. Table 14 summarizes the results.

Looking at the regression results (see Table 14 step 4 of Model 1) neither LF ($b = 0.07, ns$) nor TAL ($b = 0.02, ns$) had a direct effect on hair cortisol, when controlling for all leadership constructs simultaneously. Conversely, the regression coefficients of two facets of transformational leadership, AV ($b = 0.47, p < .01$) and FAG ($b = -0.51, p < .01$) were significant, implying that transformational leadership both increases and decreases followers' objective level of stress, which partially supports hypotheses 1a and 1d.

In contrast, for perceived stress (see Table 14 step 4 of Model 2) only fostering the acceptance of group goals influenced followers' level of work stress ($b = 0.43, p < .05$ (one-tailed)), whereas none of the other transformational leadership facets had a significant influence on perceived stress. Moreover LF ($b = 0.16, ns$) and TAL ($b = -0.25, ns$) did not influence perceived stress directly.

Table 14. *Study 3: Results of Regression Analyses*

| Variable | Model 1: Hair cortisol | | | | Model 2: Perceived strain | | | |
|-------------------|------------------------|--------------------------|----------------|----------------|---------------------------|---------------|---------------------------|--------------------------|
| | Step 1 | Step 2 | Step 3 | Step 4 | Step 1 | Step 2 | Step 3 | Step 4 |
| Step 1 | | | | | | | | |
| LF | 0.15* (0.06) | 0.12 [†] (0.07) | 0.09 (0.08) | 0.07 (0.08) | 0.35** (0.10) | 0.19 (0.12) | 0.23 (0.15) | 0.16 (0.14) |
| Step 2 | | | | | | | | |
| TAL | | -0.05 (0.08) | -0.04 (0.10) | 0.02 (0.10) | | -0.31* (0.14) | -0.32 [†] (0.17) | -0.25 (0.17) |
| Step 3 | | | | | | | | |
| PAM | | | 0.01 (0.13) | 0.00 (0.13) | | | -0.11 (0.22) | -0.05 (0.22) |
| FAG | | | -0.56** (0.14) | -0.51** (0.13) | | | 0.35 (0.24) | 0.43 [†] (0.23) |
| IS | | | 0.12 (0.11) | 0.12 (0.11) | | | -0.27 (0.19) | -0.26 (0.19) |
| AV | | | 0.44** (0.16) | 0.47** (0.16) | | | -0.06 (0.28) | -0.14 (0.27) |
| HPE | | | 0.13 (0.09) | 0.12 (0.09) | | | -0.01 (0.16) | -0.01 (0.15) |
| ISN | | | -0.03 (0.11) | 0.01 (0.11) | | | 0.17 (0.19) | 0.02 (0.18) |
| Step 4: Mediators | | | | | | | | |
| OJ | | | | -0.26** (0.09) | | | | 0.19 (0.15) |
| RC | | | | 0.03 (0.10) | | | | 0.59** (0.17) |
| R^2 | .05 | .05 | .19 | .25 | .09 | .13 | .17 | .26 |
| ΔR^2 | .05* | .00 | .14** | .06* | .09** | .04* | .04 | .09** |
| F | 6.47 | 3.39* | 3.54** | 3.85** | 12.69** | 9.12** | 3.12** | 4.06** |

Note. $N = 129$. Unstandardized regression coefficients are reported (with standard errors in parentheses). LF = laissez-faire; TAL = transactional leadership; PAM = providing an appropriate model; FAG = fostering the acceptance of group goals; IS = providing individualized support; AV = identifying and articulating a vision; HPE = high performance expectations; ISN = intellectual stimulation; OJ = organizational justice; RC = role conflict.

[†] $p < .05$ (one-tailed); * $p < .05$; ** $p < .01$ (two-tailed).

Using the procedure outlined by Preacher and Hayes (2004), the indirect effects of laissez-faire ($b = 0.03$, $SE = 0.03$, ns) and transactional leadership ($b = -0.05$, $SE = 0.03$, $p < .01$) via role conflict on hair cortisol were both non-significant (cf. Table 15 Model 1). Likewise, the indirect effects of the transformational leadership dimensions via role conflict on hair cortisol were non-significant (for PAM, $b = -0.04$, $SE = 0.03$, ns ; for FAG, $b = -0.02$, $SE = 0.03$, ns ; for IS, $b = -0.04$, $SE = 0.03$, ns ; for AV, $b = -0.05$, $SE = 0.03$, ns ; for HPE, $b = 0.00$, $SE = 0.02$, ns ; for ISN, $b = -0.03$, $SE = 0.02$, ns).

Considering the mediating influence of organizational justice on hair cortisol (cf. Table 15 Model 1), significant indirect effects for LF ($b = 0.10$, $SE = 0.04$, $p < .05$) as well as TAL ($b = -0.15$, $SE = 0.05$, $p < .05$) occurred (hypothesis 2b). Also, for the transformational leadership facets nearly all indirect effects were significant (for PAM, $b = -0.13$, $SE = 0.05$, $p < .05$; for FAG, $b = -0.10$, $SE = 0.04$, $p < .05$; for IS, $b = -0.11$, $SE = 0.04$, $p < .05$; for AV, $b = -0.19$, $SE = 0.06$, $p < .05$; for HPE, $b = -0.01$, $SE = 0.03$, ns ; for ISN, $b = -0.16$, $SE = 0.05$, $p < .05$). These results indicate that organizational justice functions as a mediator between leadership and hair cortisol (hypothesis 2b).

Looking at the connection between leadership style and perceived stress via role conflict, significant indirect effects for LF ($b = 0.17$, $SE = 0.05$, $p < .05$) and TAL ($b = -0.19$, $SE = 0.06$, $p < .05$) showed up (hypothesis 2a; cf. Table 15 Model 2). For the transformational leadership construct (for PAM, $b = -0.20$, $SE = 0.06$, $p < .05$; for FAG, $b = -0.23$, $SE = 0.07$, $p < .05$; for IS, $b = -0.16$, $SE = 0.06$, $p < .05$; for AV, $b = -0.20$, $SE = 0.06$, $p < .05$; for HPE, $b = 0.01$, $SE = 0.06$, ns ; for ISN, $b = -0.13$, $SE = 0.06$, $p < .05$) role conflict was also a significant mediator (hypothesis 2a).

On the other hand, the indirect effects for LF and TAL with organizational justice as a mediator for perceived stress were both non-significant (for LF, $b = -0.02$, $SE = 0.06$, ns ; for TAL, $b = 0.06$, $SE = 0.07$, ns) not supporting hypothesis 2b (cf. Table 15 Model 2). Similarly, for transformational leadership no indirect effect was significant (for PAM, $b = 0.02$, $SE = 0.07$, ns ; for FAG, $b = -0.02$, $SE = 0.08$, ns ; for IS, $b = 0.02$, $SE = 0.06$, ns ; for AV, $b = 0.00$, $SE = 0.08$, ns ; for HPE, $b = -0.01$, $SE = 0.02$, ns ; for ISN, $b = -0.04$, $SE = 0.08$, ns).

Table 15. *Study 3: Results of Bootstrap Analyses of Indirect Effects*

| | Model 1: Hair cortisol | | | | Model 2: Perceived strain | | | |
|------------|------------------------|------|-------|-------|---------------------------|------|-------|-------|
| | b | SE | LLCI | ULCI | b | SE | LLCI | ULCI |
| LF via RC | 0.03 | 0.03 | -0.01 | 0.09 | 0.17 | 0.05 | 0.08 | 0.23 |
| TAL via RC | -0.05 | 0.03 | -0.11 | 0.01 | -0.19 | 0.06 | -0.33 | -0.08 |
| PAM via RC | -0.04 | 0.03 | -0.10 | 0.01 | -0.20 | 0.06 | -0.36 | -0.10 |
| FAG via RC | -0.02 | 0.03 | -0.08 | 0.03 | -0.23 | 0.07 | -0.40 | -0.12 |
| IS via RC | -0.04 | 0.03 | -0.11 | 0.00 | -0.16 | 0.06 | -0.33 | -0.07 |
| AV via RC | -0.05 | 0.03 | -0.12 | 0.00 | -0.20 | 0.06 | -0.36 | -0.10 |
| HPE via RC | 0.00 | 0.02 | -0.03 | 0.04 | 0.01 | 0.06 | -0.09 | 0.14 |
| ISN via RC | -0.03 | 0.02 | -0.08 | 0.00 | -0.13 | 0.06 | -0.27 | -0.02 |
| LF via OJ | 0.10 | 0.04 | 0.04 | 0.18 | -0.02 | 0.06 | -0.14 | 0.08 |
| TAL via OJ | -0.15 | 0.05 | -0.26 | -0.06 | 0.06 | 0.07 | -0.08 | 0.20 |
| PAM via OJ | -0.13 | 0.05 | -0.23 | -0.05 | 0.02 | 0.07 | -0.13 | 0.17 |
| FAG via OJ | -0.10 | 0.04 | -0.19 | -0.03 | -0.02 | 0.08 | -0.18 | 0.15 |
| IS via OJ | -0.11 | 0.04 | -0.20 | -0.05 | 0.02 | 0.06 | -0.09 | 0.16 |
| AV via OJ | -0.19 | 0.06 | -0.31 | -0.09 | 0.00 | 0.08 | -0.16 | 0.18 |
| HPE via OJ | -0.01 | 0.03 | -0.08 | 0.04 | -0.01 | 0.02 | -0.09 | 0.02 |
| ISN via OJ | -0.16 | 0.05 | -0.27 | -0.08 | -0.04 | 0.08 | -0.21 | 0.13 |

$N = 129$. Bias-corrected confidence intervals (CIs) are set at 95% from the bootstrap analyses with 1,000 bootstrap resamples.

LLCI = lower level confidence interval; ULCI = upper level confidence interval; LF = laissez-faire; TAL = transactional leadership; PAM = providing an appropriate model; FAG = fostering the acceptance of group goals; IS = providing individualized support; AV = identifying and articulating a vision; HPE = high performance expectations; ISN = intellectual stimulation; OJ = organizational justice; RC = role conflict.

Results considering the mediation processes indicate that organizational justice consistently mediates the relationship between all leadership constructs and hair cortisol, whereas role conflict mediates the relationship between leadership constructs and perceived stress.

Finally, considering the psychoendocrine covariance between perceived stress and hair cortisol, no association between the subjective and objective indicators on a correlational basis was found ($r = .07, ns$).

5.6 Discussion

5.6.1 Impact of Leader Behaviors on Stress Levels

The general objective of this study was to explore the role leadership behaviors have on employees' work stress in cases of perceived subjective as well as biological objective stress. Results support the notion that full-range leader behavior influences followers' level of work stress. Meaningful relationships between the two transformational leadership conducts fostering the acceptance of group goals and identifying and articulating a vision with hair cortisol have been found. With this, results indicate the stress-reducing effect of more social and group-oriented transformational leadership behavior in comparison to the stress-promoting influence of leadership styles that demand much cognitive input. Beyond that, only fostering the acceptance of group goals had a significant effect (one-tailed) on followers' level of perceived stress. Noticeably, this was in the other direction to hair cortisol i.e., the behavioral pattern of transformational leadership both increased and decreased the stress level of followers.

Moreover, looking at the mediational paths outlined by the job demands-resources model, a divergent pattern of results occurred. Organizational justice as a job resource functioned as a mediator for the relationship between leader behaviors and hair cortisol, whereas, with respect to the perceived level of work stress, role conflict mediated this relationship. This indicates an independent process of leadership behavior on psychological and biological indicators of work stress. Going back to the JD-R model, which hypothesizes a health-impairing and a motivational factor

in work stress (Demerouti et al., 2001), the two indicators of stress can be assigned to these two processes. Job resources seem to affect the motivational pathway of the JD-R model. In this study, the measure of perceived stress via questionnaire may represent a short to mid-term measure of work stress (Mohr, Müller et al., 2005), whereas the cortisol measure via hair may represent a long term (three-month) stress measure (Stalder & Kirschbaum, 2012). Therefore, job resources seem to have a stress-protecting function, which occurs on a long-term basis. The effects of organizational justice do not directly influence the perceived state of stress but impinge on long-term levels of stress. In contrast, job demands instantly increase employees' level of work stress, because the negative effects of role conflict occur in a manner specific to the situation. They hinder followers as they try to engage in tasks and to concentrate on their work, which stops them meeting expectations. Whilst job demands may influence the perceived level of work stress, job resources may have a greater effect on stress in the long run. This observation goes in line with the buffering effect of job resources over job demands (Bakker, Demerouti, & Euwema, 2005). That is, job resources may have buffered the impact of job demands on work stress in the long run.

5.6.2 Psychoendocrine Stress Response

In this study, no psychoendocrine covariance was observed. Furthermore, results of leader behavior on followers' stress differ with regard to the two implemented stress measures. Besides methodological reasons such as recall biases or the temporal congruence of hair cortisol and perceived stress (discussed in the following section), the theoretical issues of the correspondence of perceived and physiological stress should be taken into account. Results indicate two different stress systems: one psychoendocrine physiological system and another subjective-psychological stress response system. In the literature, an association between subjective and biological measures of stress is observed for cardiovascular as well as endocrine measures of stress (Campbell & Ehlert, 2012; Duchesne & Pruessner, 2013). Therefore, a strong association between acute psychological and physiological stress was expected. However, Schlotz et al. (2008) concluded that the subjective-psychological stress response precedes the HPA axis response, which plays a key role in the secretion of

cortisol. They describe the different dynamics of these two systems which differ in that the endocrine response lags behind the psychological response. While the subjective reaction occurs within seconds, the objective stress reaction occurs 15-20 minutes after the onset of a stressor (Campbell & Ehlert, 2012; Engert et al., 2011). Nevertheless both "psychological and endocrine responses represent indicators of the same construct" (Schlotz et al., 2008, p. 793). However, these patterns of results are mainly based on findings from the traditional matrices of cortisol (Kudielka, Hellhammer, & Wüst, 2009). Hair cortisol reflects a long-term cortisol secretion (Stalder & Kirschbaum, 2012) and cannot be considered interchangeably with the other measurement methods (Holland, Frings-Dresen, & Sluiter, 2012). In summary, more research is needed to establish the relationship between perceived stress and hair cortisol. This notion supports the argument that job resources have a health-promoting effect in the long run, whereas job demands influence the followers' level of work stress instantaneously.

5.6.3 Limitations and Future Directions

As in all empirical research, there are inherent limitations associated with the design of this study. The cross-sectional character of this research limits the ability to draw on causal inferences. Another limitation is that the design only provides a snapshot of the effects of leader conduct on followers' level of work stress. Future research should focus on the long-term effects of leader behaviors as well as a long-term assessment of employees' stress levels to build a strong connection between actual leader behavior and associated stress levels. As Stalder, Steudte, Miller et al. (2012) show strong test-retest associations between repeated hair cortisol assessments across different time periods, these findings suggest a high level of individual stability in hair cortisol concentrations. They report a lack of an association between changes in hair cortisol and self-reported stress. Applying these results to this study, the length of the supervisor-follower interaction should be considered in future research to account for this issue.

Psychological factors that can affect the perception of stress were not taken into account in this study. Possibly, these factors, like coping-style, resilience or self-efficacy, may attenuate the influence the leader behavior has on the perception of

stress within both stress means (Lazarus, 2000). Further research should control for these personal factors of followers and consider that the objective stress reaction may differ within individuals. Therefore the determination of a baseline biological stress level is desirable to take deviations from this baseline into account.

The use of hair cortisol as a biological marker of stress in the field of organizational research is an innovative approach. However, the validity of this novel method is still actively under debate (Staufenbiel et al., 2013) especially with focus on the psychoendocrine covariance. Yet anticipatory and retrospective biases should be taken into account, which can affect the subjective evaluation of the psychological state. In this study, a mean perceived stress value was reported by the participants. Future studies should focus on event and time-sampling procedures, such as experience sampling or diary studies. These techniques rely less on memory and are thought to be less subject to retrospective biases (Ganster & Rosen, 2013). Therefore they may diminish cognitive biases to help participants to evaluate their long-term level of perceived stress reliably.

In addition, our study has strengths that should be noted. By measuring the stress construct with two different methods (an objective and a subjective measure), common source effects (Podsakoff et al., 2003) can be reduced. Furthermore, the temporal separation between the predictor and the criterion was used to reduce the effects of the measurement context. The application of different scale anchors for the leadership constructs and perceived stress accounts for item-characteristic effects. Further research should pursue this approach by combining and integrating various measures of work stress to expedite the validation of hair cortisol as an adequate indicator of work stress.

5.6.4 Practical Implications

The results reported have several clear managerial implications. To sensitize leaders and make them aware that their behavior has a direct effect on their followers' level of work stress is a key conclusion of this study. Leaders play a key role in the stress levels of their employees and they should be informed about the possible consequences of their behaviors. By applying conducts from the full-range leadership theory, different stress-related effects should be taken into account and leader behav-

ior should be considered carefully. Consequences of leader behavior seem to be two-sided. There are on the one hand positive outcomes with respect to desirable organizational criteria (Judge & Piccolo, 2004; Wang et al., 2011), but on the other hand these gains seem to be accompanied by an increase in stress-related side effects. Therefore, organizations should create options for employees to cope with stressful situations. Stress reduction and prevention methods can provide helpful conditions enabling both efficiency and health (Lamontagne et al., 2007).

The presence of stressors and resources at work determines the occurrence of work stress. This notion can be introduced to teams. Organizational justice as a resource should be promoted whereas role conflicts should be stopped as they emerge. Role conflicts have been identified as an important organizational stressor and consequences regarding physical symptoms such as gastrointestinal problems and sleep disturbances are well known (Nixon et al., 2011). Beyond that, the positive effect of organizational justice on different performance measures is well documented (Cohen-Charash & Spector, 2001). As a result, both aspects of the JD-R model should be regarded as important characteristics of the job, which should be pushed in the right direction by the line manager.

5.6.5 Conclusion

This study contributes to the literature by combining research on stress-related outcomes of leader behaviors with innovative measures of work stress. By applying the full-range leadership framework, the simultaneous influence of distinctive leadership behavior patterns on followers' levels of work stress could be observed. Leaders play an important role in affecting the stress levels of their employees. Providing job resources and reducing job demands is crucial for leaders to support their followers. This study is set apart from recent studies that solely focus on the use of subjective indicators of stress, and extends this research tradition by applying an objective biological measure to the assessment of work stress. As cortisol is an important biomarker of stress in the clinical research area, there is a need to implement objective markers of stress in management research.

6. Overall Discussion

The intent of this dissertation was to investigate leaders' impact on followers' levels of work stress. I started describing the genesis of stress-related leader behaviors and moved on describing its outcomes. With this, I wanted to paint an encompassing model of stress-related leadership research to scrutinize (1) which factors affect leader behaviors, (2) how leader behaviors influence work stress, (3) through which mechanisms these effects can be explained, and (4) when these effects occur. My dissertation takes further steps towards providing new and deepened insights into origins of leadership, its consequences, as well as core mediating and moderating mechanisms within this process. All in all, results of my three empirical studies support the idea that leader behavior and work stress are strongly interconnected: Work stress functions both as antecedent and as outcome of leadership behavior.

In short, the key finding of the dissertation is that leaders' behaviors have important consequences for followers' stress levels (on a subjective as well as objective level of measurement). Furthermore, these leader behaviors are impaired by stress leaders experience themselves.

Study one revealed that transformational leadership behaviors are impaired by leader stress. Further, leaders' transformational leadership behaviors reduced follower burnout, and the relationship between leader stress and follower burnout was mediated by transformational leadership behaviors. Study two showed that leader behaviors have significant effects on followers' levels of stress on a day-to-day basis. In the way that laissez-faire behavior increased followers' daily levels of stress and transactional as well as transformational leader behaviors reduced it. These effects were mediated by job resources, but not by job demands. Additionally, type of communication functioned as a moderator in the relationship between leaders' behaviors, job resources and work stress. Type of communication also moderated the mediational framework within study two. Study three revealed significant effects between leader behaviors and subjective work stress as well as the hair cortisol concentration of followers. For hair cortisol job resources functioned as a mediator, whereas for perceived stress job demands mediated the effect of leader behaviors on work stress.

Taken together, my three studies have unique benefits that add richness and complexity to the understanding of why, how and when leaders influence followers levels of work stress.

In the following, I summarize main findings of my three empirical studies and relate findings to existing theory. I revisit my five research questions and describe which contributions can be inferred from my research project. Thereafter, I focus on limitations and directly link them to implications for future research. Then, implications for practitioners are outlined.

6.1 Summarization of Findings and Contribution

My contribution to the field of leadership is to outline a detailed and comprehensive model of stress-related antecedents as well as consequences of full-range leadership behaviors. All in all, my dissertation contributes to existing theory by shedding light into the interrelation between leadership behaviors and its stress-related consequences by providing a detailed assessment of potential outcome variables. The replication and extension of findings on the basis of different, innovative measurement approaches reveals robust effects between study variables. Further, by scrutinizing the mediation model, I enable a better understanding of how leaders influence the stress levels of their followers. Combined with the specification of when this influence is particularly strong and when it is not, my dissertation provides an encompassing research model in the field of leadership as well as stress research. From a methodological perspective, my three empirical studies are characterized by approaches to control for different sources of method bias. I made use of procedural remedies to reduce the likelihood of potentially biasing method effects (Podsakoff et al., 2003; Podsakoff et al., 2012). Firstly, I obtained measures of predictor and criterion variables from different sources (cf. study one and two). Secondly, I temporarily separated predictor and criterion variables (cf. study three). Thirdly, I tried to eliminate common scale properties by presenting questions referring to different constructs on different pages of the questionnaires as well as by using different scale formats (different number of anchor points per scale) for the diverse study variables (cf. study one, two, and three). Fourthly, I only used validated measures of existing and already published scales that are balanced concerning negative and positive

items. Further, I made use of statistical remedies to rule out potential method effects. I implemented the latent method factor technique to estimate if relations between study variables exist due to the existence of one first-order method factor (cf. study one and two).

Findings of the three empirical studies will be outlined in detail within the next paragraphs of this chapter.

I conducted study one to examine my first research question to scrutinize whether leader stress influences the occurrence of transformational leadership behavior (RQ 1: *Does leader stress function as an antecedent of transformational leadership behavior?*). Results showed that the more stress a leader experienced, the less transformational behaviors were displayed to followers. Stress seems to have a negative impact on leader behaviors by inhibiting core skills and requirements of performing high quality leader behaviors. Consistent with findings from stress research, leaders' ability to build trusting relations is restricted (George, 2000), leaders' cognitive resource capacity is diminished, and also feedback processing, decision making and strategic thinking are impaired by stress (Starcke & Brand, 2012). With regard to the conservation of resource theory, stress leads to depleted resources of leaders in such a way that no more resources are left to perform adequate leader behaviors. With resource loss in front of them, leaders strive to inhibit this loss and, therefore, avoid behaviors that require resource investment (Hobfoll, 1989, 2001). Alike, when leaders adapt to stressful conditions, they shift the focus of attention to their personal needs, ignoring needs of their followers. This finding is in line with stress research that has revealed that stress results in egocentric patterns of behavior and, contemporaneously, the reduction of cooperative interactions (Epley et al., 2004) i.e., supportive leadership behaviors.

All three empirical studies helped me to gain a better understanding of my second research question dealing with the stress-related consequences of the full-range leadership behaviors (RQ 2: *Which impact do full-range leadership behaviors have on employees' levels of work stress?*). The three studies replicate and extend findings that highlight the importance of leader behaviors for followers' stress levels. Looking at the simple direct effects, results clearly show that laissez-faire leads to

increased stress levels of followers, whereas transactional as well as transformational leadership lead to decreased levels of follower stress.

More specifically, laissez-faire leaders who do not interact at all with their followers and who may not even provide support for them represent a root cause of followers' work stress. This finding is in line with existing research that consistently demonstrated the stressful consequences of this type of non-leadership. Laissez-faire behavior results in the cumulative occurrence of stressors at work (Skogstad et al., 2007) and represents a principal cause of workplace stressors (Kelloway et al., 2005). Generally, I can conclude that laissez-faire characterized by a lack of support for followers is strongly related to poor health. Contrarily, transactional leaders who motivate their followers and who clarify expectations, roles, and tasks, and who give psychological support, ensure that their followers feel well led and have a clear understanding of what they have to do. This results in a feeling of security and, consequently, less stress for followers. Therefore, I infer that transactional leader behavior is a health-promoting type of leadership. Equally, transformational leadership characterized by the empowerment of followers' abilities to achieve goals is related to health-promoting consequences for followers. Reframing possible stressful situations into challenging demands (Conger & Kanungo, 1998; Conger et al., 2000; Rowold & Schlotz, 2009) together with appropriate assistance behaviors helping followers to deal with these challenging situations and to cope with stress (Yammarino et al., 1993) empowers followers confidence to manage and overcome stressful situations (Bass, 1985; Bass & Riggio, 2006). However, study three of my dissertation indicates that a more detailed description of transformational leadership is necessary to explain the stress-related impact of this pattern of leader behavior. This notion will be outlined in the following paragraph.

Study three helped me to create new insights on the stress-related impact of the transformational leadership behavior pattern (RQ 3: *Which impact do transformational leadership behavior facets have on employees' levels of work stress?*). Following and implementing recent criticism of van Knippenberg and Sitkin (2013), who called for a more detailed assessment of transformational leadership, study three enabled me to make a detailed conclusion regarding the impact of different transfor-

mational behavior facets. This is especially important as to now no study has examined the relation between follower stress - from a biological perspective - and the different transformational behavior facets. Results are twofold as there are some aspects of transformational leadership that have a stress-reducing effect on followers, and some that have a stress-promoting effect. In particular, identifying and articulating a vision is positively related to followers' objective stress levels (i.e. stress-promoting), whereas fostering the acceptance of group goals is negatively related to it. Surprisingly, the stress-reducing effect of fostering the acceptance of group goals turned into a stress-promoting effect when perceived stress was the dependent variable. This notion shows that it is not only important to differentiate between different measures of stress (short- vs. long-term measures), but to also differentiate between the distinct dimensions of transformational leadership that are assumed to lead to various consequences. This goes in line with previous research demonstrating different stress-related consequences of transformational leadership with regards to different temporal-oriented indicators of stress (Rowold & Heinitz, 2008). Similarly, existing research has displayed differential effects between the different facets of transformational leadership (Franke & Felfe, 2011). Transformational leaders may exaggerate transforming followers to higher goals so that followers will experience more stress (Yukl, 1999). Moreover, transformational behaviors may result in pressure to perform so that followers might put more energy into work and spent less attention to personal needs (Seltzer et al., 1989), which results in more stress for followers. Contrarily individual consideration and support may lead to a reduction of stress. Hence, results of my dissertation open the field for a more detailed assessment of the transformational leadership construct highlighting the distinct influence of each transformational behavior facet. Likewise, results of my studies call for a more detailed differentiation between stress measures. The impact of some aspects of the transformational leader behavior may be health-hampering in short, but health-promoting in the long run. However, this conclusion does not hold true for each of the six transformational leadership dimensions. More research is needed to conclusively outline transformational leadership facets impact on work stress.

Study two and three helped me to get a better understanding of the mediation model of leadership behavior influence (RQ 4: *How do leadership behaviors impact employees' levels of work stress?*). Results of the two studies reveal that the mediators function independently of the leadership constructs. Two job resources could be identified that mediated the impact of leader behaviors on stress-related outcomes: social support as well as organizational justice. Social support mediated the relation between laissez-faire as well as transformational leadership with perceived stress and organizational justice mediated the relation between laissez-faire, transactional as well as transformational leadership with the biological indicator of stress. Besides, only in study three role conflict - representing a job demand - functioned as a mediator for the relation between leadership behaviors and perceived stress. This effect did not show up in the day-level-oriented study two. Findings correspond to the argumentation of the previous paragraph were I called for a more detailed analysis of leadership impact with regard to different time-referenced stress indicators. The day-level perspective in study two represents a rather short term perspective than the variable perceived stress assessed in study three. Thus, a clear differentiation between short- and long-term effects of leader behavior on follower stress is mandatory.

Linking the behavior of the leader to the occurrence of job resources and job demands, two perspectives can be considered. On the one hand, leaders may act as a resource or equally as a stressor - in cases of job demands. This is the case for laissez-faire leaders who are a source of subordinates' role ambiguity (Skogstad et al., 2007). Likewise transformational leaders may be a direct resource for followers as they foster growth and development of them (Perko et al., 2016). On the other hand, leaders may shape the perception and interpretation of job demands and resources. Transactional leaders do this by providing avenues of coping with stressors (Zhang et al., Stordeur 2014) and transformational leaders do this by accentuating positive aspects of stressful situations and buffering negative ones (LePine et al., 2015).

Study two helped me to draw conclusions on the moderating model of leadership behaviors (RQ 5: *When do leadership behaviors impact employees' levels of work stress?*). I focused on type of communication as moderator to outline through which means of communication leaders optimally reach their followers to affect their

levels of stress. Results show that to affect job resources and demands, leaders should make use of either only direct or only indirect communication. Particularly, a consistent type of communication is important to influence work characteristics and to convey a feeling of clarity concerning how work is defined. The same applies for the relation of leadership behaviors on perceived stress. These effects are stronger when transformational leaders use only direct communication and when transactional leaders use only indirect communication. These findings correspond to recent research (de Vries et al., 2010) that demonstrated that transactional behaviors building on preciseness and clarity of communication can be optimally conveyed via indirect means of communication like email. Though, transformational behaviors building on assured and expressive communication are optimally achieved via direct means of communication. Nevertheless, future research is needed to clearly outline the moderation model of leadership and work stress.

6.2 Limitations and Implications for Future Research

Although the limitations of the three empirical studies have been discussed within chapters three to five, I will outline main limitations of my research project that are applicable to all three empirical studies. On a methodological basis, the main aspects that are common within all studies refer to causality of conclusions, multi-modal measurement of constructs, and sample collection. Also on a content-related basis, main limitations as well as implications for future research focus on the dimensional level of transformational leadership, the level of assessment of leadership impact, exploring antecedents of leader stress, and inclusion of control variables.

On a methodological basis, firstly, the survey design of my three studies was cross-sectional in nature and, therefore, I cannot infer the causative directionality between predictor and criteria observed. In other words, I cannot rule out the possibility that relations exist vice versa to proposed relations among study variables. I assumed that leader behavior influences followers' levels of work stress. However for example, it is possible that individuals experiencing low levels of work stress are more actively included in working tasks by their leader. As a result, the leader interacts more closely in a transformational manner with them, because the leader perceives followers to be more capable of the motivating aspects of transformational

leadership. Hence, stress-free followers perceive their leaders as highly transformational. Though, given the vast empirical database of independently observed effects in the context of leader behaviors with follower outcomes, I believe the causal direction as depicted in my model is more likely. Still, it is impossible for me to rule out all alternative temporal explanations without a repeated-measures longitudinal design or a quasi-experimental study. Therefore, it is necessary to replicate findings within either a longitudinal design or an experimental setting to ascertain the validity of my conclusions (Shadish, Cook, & Campbell, 2002). Consequently, an examination of hypotheses with longitudinal and experimental designs should be the method of choice to further rule out concerns regarding the ambiguity of causal directions between study variables.

Secondly, although I applied different measurement approaches within my empirical studies, my three studies are not free from potential method bias influences. For the assessment of leadership behavior via questionnaire data it is reasonable that followers may be unable to remember frequency and quality of displayed behaviors of their leader, because they mostly have to think about a long, recent period of time (Yukl, 2013). Also, these leader behavior ratings might be influenced by interpersonal factors between leaders and those they lead or, equally, temporary changes in the mood of followers (Brown & Keeping, 2005). In addition, a further problematical aspect within each study is that at least two variables of interest were rated by the same person. Future research might, thus, consider other ways to assess the different variables included in my studies (leadership behavior, job-demand resources, and work stress). For example, the measures could be collected and validated using a multitrait-multimethod matrix design (Campbell & Fiske, 1959) to yield valid and reliable conclusions. Conclusively, future research should collect ratings of all study variables at separate points in time and from separate sources to obtain a better estimate of interrelations and to go beyond what has been done in my dissertation.

Thirdly, I drew back on a sampling strategy at hands of research assistants to ensure participants' adherence to the demanding sampling procedures applied within all three studies. Consequently, I can justify this strategy, which has been demonstrated to yield representative samples (Demerouti & Rispens, 2014; Wheeler, Sha-

nine, Leon, & Whitman, 2014) and has been applied in previous research projects (Breevaart et al., 2015; Harold & Holtz, 2015). As participants were drawn from multiple organizations in several industries, I cannot assert that the sample is representative of any definable population and has, therefore, limited external validity. Yet, future studies should replicate findings with a larger set of workers controlling for occupations and organizations where participants worked as well as what function they had. Nonetheless, a diverse sample, as collected in my studies, may help me to rule out the fact that characteristics of the work shared by all employees of the same organization cannot influence the experience of work stress and its interrelation with full-range leadership behaviors.

On a content-related basis, firstly, a more detailed assessment of transformational leadership was only applied within study three. Therefore, the application of a detailed analysis is important in future research as it is crucial to understand antecedents and consequences of the specific transformational behavioral dimension to offer a more precious description of this pattern of leadership. In particular, a day-level assessment of the transformational leadership construct on a dimensional level is necessary to estimate how frequent the single transformational facets are used by leaders to influence their followers. By definition identifying and articulating a vision is assumed to occur less frequently than providing individualized support, because in the daily business routine the presentation of long-term goals, missions, and visions may be less important than the spontaneous reaction to occurring problems (Johnson et al., 2012). Nevertheless, this notion has not been studied in current research on day-level leadership. Additionally, it is important to extend the mediation model for each leadership dimension and to test its transferability to a more detailed assessment of the transformational leadership behavior pattern. Future research should assess if the mediation model applies in the same manner for the individual dimensions as it applies for the overall construct (van Knippenberg & Sitkin, 2013).

Secondly, the level of leadership assessment within my three studies solely focuses on dyadic processes. However, leadership is a group phenomenon in which leaders might not behave equally towards all followers (Yukl, 2013). Thus, my studies neglect group processes with regards to stress-related consequences of leader behaviors. This instance has been recently criticized and a general call for more explic-

itly incorporating multiple levels of analysis was made to allow for comprehensive inferences regarding leadership theory (Yammarino, Dionne, Uk Chun, & Dansereau, 2005). Therefore, future research should consider the group level of analysis to outline how leaders may affect followers' perceptions of core work characteristics to test if leaders influence on follower health is equal within the different levels of analysis (Nielsen & Daniels, 2012).

Thirdly, although study one revealed that leader stress influences leadership behaviors, it still remains unclear why leaders are stressed and, furthermore, if they experience more stress than their followers. Consequently, it is important to explore antecedents of leader stress. Future studies need to consider the origins of leader stress to investigate if either a crisis situation affects the whole organization - which spills over on every employee including the leader itself - or if only the leader experiences stress that operates on leadership behavior. A clear specification of antecedents of stress levels would enable a more differentiated picture of how and if stress impairs high-quality leader behaviors.

Fourthly, to rule out possible third variable influences to explain findings, future research should control for factors that may affect individuals' perception of the stress reaction. Possibly, trait affect or neuroticism may attenuate the influence the leader behavior has on the perception of stress (Lazarus, 2000). This raises the question of whether the behavior of the leader predicts unique variance in followers' work stress above and beyond neuroticism and trait negative affect. Further research should demonstrate the incremental validity of leader behaviors to enable more valid conclusions.

6.3 Implications for HR Practitioners

Findings of my dissertation imply several measures for practitioners to capitalize from my research project and to gain benefits for organizations. Reducing stress-related correlates of followers (as well as leaders) is important for organizations. I demonstrated that leaders are in a unique position to create positive emotional and motivational contexts for followers and, consequently, affect their followers levels of stress. I extend previous research by showing that leader behavior helps to explain levels of work stress among followers. Building on my findings, there are two

broad categories of measures that can be derived for organizational leaders. One relates to employees that will be chosen to fill a leadership role in future (i.e. personnel selection) and one relates to employees of organizations that already fill a leadership role (i.e. personal development). Besides, I will start to outline practical measures for individuals to deal with stress at work by using stress prevention and stress management techniques.

As stressed leaders display less high quality leadership behaviors, it seems to be important to support managers (as well as employees) with methods and tools of stress prevention as well as intervention. A recent meta-review article has demonstrated that stress management interventions may yield to positive outcomes (Goldgruber & Ahrens, 2010). Particularly, cognitive-behavioral interventions help individuals to cope with distress. These interventions are characterized by enabling individuals to proactively as well as reactively respond to stress by identifying and practicing more functional behavioral responses towards negative thoughts and feelings (Richardson & Rothstein, 2008). Following Gerber et al. (2013) the redesign of work or the reduction of demands (job-level prevention), as well as the improvement of communication and the development of conflict management skills (person-level prevention) have been shown to be suitable means of stress prevention.

With regard to personnel selection for leaders there are numerous of different selection procedures in organizational practice. On the basis of the seminal work of Schmidt and Hunter (1998), a test of general mental ability is the method of choice to predict overall job performance. Further, the highest validity of the selection procedure can be achieved by combining general mental ability measures with either structured interviews or integrity tests. The same applies for the selection of effective leaders since intelligence and leadership are interrelated (Judge, Colbert, & Ilies, 2004). Nevertheless, others have shown that personality traits i.e., extraversion and conscientiousness, had incremental effects above leader intelligence (Judge, Bono, Ilies, & Gerhardt, 2002). Hence, building on research on the dispositional basis of effective leader behaviors, organizations should focus on personality traits and cognitive ability measures to select leaders (Bono & Judge, 2004; Judge & Bono, 2000).

With regard to personal development of leaders, leadership training has been shown to be a promising method to improve the behavior of leaders towards follow-

ers. Particularly, training leaders in high quality leadership techniques i.e., transformational leadership behaviors, has been demonstrated to be effective in general (Abrell et al., 2011; Barling et al., 1996; Parry & Sinha, 2005) as well as to be effective with a focus on occupational health and individual well-being (Kelloway & Barling, 2010). These training programs may be accompanied by multisource feedback procedures to assess a baseline of already displayed high-quality leader behaviors and to estimate need for leadership training. In these multisource feedback procedures, regularly, the leadership behavior of the person in focus is rated by (the leaders) themselves, their direct followers, their peers, and their direct supervisors (e.g. 360° feedback). This method provides a thorough approach to define weaknesses and strengths of leaders and has also been shown to enhance leader performance (Atwater, Roush, & Fischthal, 1995; Kelloway, Barling, & Helleur, 2000; Smither, London, & Reilly, 2005; Thach, 2002). These leadership development approaches, furthermore, lead to favorable financial returns on investment (Avolio et al., 2010). Therefore, organizations should not hesitate to introduce leadership training and feedback to optimize the leadership culture.

6.4 Conclusion

My dissertation represents an important step towards a better understanding of stress-related antecedents and consequences of full-range leadership behaviors. Specifically, identifying stress-related antecedents of (transformational) leadership behavior takes us closer to understanding the role stress may play in organizations. At the same time, my dissertation helps us to gain important insights into stress-related consequences of (full-range) leadership behavior together with crucial mediating mechanisms within this relation. Results showed that stress impairs leaders' behaviors, which has important consequences on followers' stress levels (on a subjective as well as objective level of measurement). Taken together, my dissertation helps to close current research gaps and to extend knowledge in the context of stress-related origins as well as outcomes of supervisor behaviors. This will guide future research into a more detailed understanding of an encompassing model of leadership and work stress.

7. References

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8. Appendix A: Instruments Applied in Study 1 to Study 3

Table 16. *Instruments Applied in Study 1 to Study 3*

| Construct | Instrument | Number of items | Study 1 | Study 2 | Study 3 | Original publication |
|---|---------------------------------------|-----------------|---------|---------|---------|-----------------------------|
| <i>Leadership behaviors</i> | | | | | | |
| Laissez-faire | | 4 | x | x | x | Rowold (2011) |
| Transactional leadership | Transformational Leadership Inventory | 4 | x | x | x | Podsakoff et al. (1990) |
| Transformational leadership behaviors | Transformational Leadership Inventory | 22 | x | x | | Podsakoff et al. (1990) |
| Identifying and articulating a vision (AV) | | 5 | | | x | |
| Providing an appropriate model (PAM) | | 3 | | | x | |
| Fostering the acceptance of group goals (FAG) | | 4 | | | x | |
| High performance expectations (HPE) | | 3 | | | x | |
| Providing individualized support (IS) | | 4 | | | x | |
| Intellectual stimulation (ISN) | | 4 | | | x | |
| <i>Job demands-resources dimensions</i> | | | | | | |
| Organizational justice | Organizational Justice Scale | 5 | | | x | Colquitt (2001) |
| Role conflict | Role Conflict and Ambiguity Scale | 5 | | x | x | Rizzo et al. (1970) |
| Social support | SALSA | 1 | | x | | Udris and Rimann (1999) |
| <i>Work stress</i> | | | | | | |
| Perceived strain | Irritation Scale | 8 | x | x | x | Mohr, Rigotti et al. (2005) |
| Burnout | Copenhagen Burnout Inventory | 6 | x | | | Kristensen et al. (2005) |