

Different Angles on Transformational Leadership:  
Its Antecedents, Relatives, and Consequences  
in Self and Other Perception

**Dissertation**

Submitted to the

Faculty of Business, Economics and Social Sciences

TU Dortmund University

Dortmund

In partial fulfillment of the requirements

for the degree of

Doctor rerum politicarum

Submitted by

Claudia Krüger

19.09.2012

Reviewer

1. Prof. Dr. Jens Rowold

2. Prof. Dr. Hartmut Holzmüller

## **Preface**

This dissertation bases upon research I undertook during the three years I was a teaching and research assistant at the Chair of Human Resource Development and Change Management at the Center for Higher Education (formerly Center for Continuing Education) of the TU Dortmund University, Germany. During this time, I profited strongly from discussions with researchers in Dortmund as well as at various conferences. I am grateful to all who supported my work in that way. In particular, I would like to thank Jens Rowold, who supervised my dissertation, and my colleagues, Carolin Abrell, Lars Borgmann, Kai Bormann, and Susanna Krisor who supported me in many respects throughout this intensive and vivid period.

I heartily thank my family and friends who have accompanied me – through life, on board, and through the particular journey of finalizing this dissertation. Their continuous love and friendship helped me to stay patient in the doldrums and to act level-headed in the storm, to learn from their experiences and to pass on my knowledge, to accept the given parameters and to make the best of it.

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## I. Summary

Effective leadership has been a major topic in economic, psychological, and social sciences that constantly gets much attention in research as well as in practical contexts. This is due to the enormous impact of leadership on individual and organizational consequences. In the last decades, leadership research has favored transformational leadership as a specific behavioral approach to describe effective leadership in organizations. Indeed, transformational leadership was found to promote subjective and objective leadership outcomes, e.g., employees' job satisfaction and sales performance. However, crucial questions around the paradigm of transformational leadership are still unanswered. Therefore, the overall purpose of this dissertation is to shed light on transformational leadership from different angles in order to fill the troublesome research gaps around this demonstrably effective leadership process.

On the one hand, transformational leadership is investigated within a comprehensive process model of leadership that incorporates its antecedents as well as its consequences. A series of models have been developed recently, which commonly assume that individual characteristics of the leader, so called dispositions, influence leadership behavior, which, in turn, affects performance criteria. So far, the empirical evaluation of these models has not yet received sufficient attention. Those few studies that included transformational leadership yielded inconsistent findings with respect to its antecedents and consequences. In view of the leadership behavior itself and related leadership styles, transformational leadership was originally formulated as distinct from transactional leadership. Whereas transactional leaders motivate their followers through the transaction of rewards and achievements, appealing to their individual goals, transformational leaders transform the individual goals and values of their followers through an inspiring vision of the future that encourages them to perform above their individual goals for the sake of the organization. However, in spite of this clear theoretical distinction, substantive correlations between these leadership styles have frequently been observed, challenging their discriminant, and thus, construct validity.

On the other hand, this dissertation focuses on the methods of measurement that are typically applied to assess leadership behavior, its antecedents, and consequences. The rating perspectives of supervisors' self-ratings and followers' other ratings, hence, constitute a second class of angles in studying transformational leadership. Drawing on

methodological assumptions about the interplay of trait and method components in the measurement of constructs, it is argued that the previous handling of these ratings in leadership research contains severe weaknesses that might have led to false conclusions about the relationships of leadership behavior with its antecedents, relatives, and consequences. For example, the dispositional basis of transformational leadership was questioned after meta-analytic findings had revealed only weak correlations with personality traits. A powerful statistical technique, namely the confirmatory factor analysis (CFA) of multitrait-multimethod (MTMM) data, is applied in this dissertation to control for the method effects of self and other ratings when investigating the associations between transformational leadership, its antecedents, relatives, and consequences. By this means, the correlations between the constructs can be disentangled from the method effects of rating perspectives.

In order to elucidate the concept of transformational leadership with respect to these different angles, three research questions were formulated: (1) To what extent can the discriminant validity of transformational leadership and transactional leadership be established if the method effects of self and follower ratings are controlled for? (2) What true-score correlations between transformational leadership and particular personality traits can be identified if the method effects of self and follower ratings on the assessment of personality traits and leadership behavior are controlled for? (3) Does transformational leadership mediate the effects of personality traits on subjective and objective indicators of leadership effectiveness if the method effects of self and follower ratings on the assessment of personality traits and leadership behavior are controlled for? Each of these questions serves as the hook for one empirical study.

*Study 1* (“*A multitrait-multimethod analysis on the discriminant validity of transformational leadership*”) focuses on the discriminant validity of transformational and transactional leadership. The participants of nine samples, including 178 supervisors and their 834 followers, completed the German version of the Transformational Leadership Inventory (TLI). Self-ratings and aggregated observer ratings were analyzed using CFA-MTMM techniques. To this end, the factorial structure was firstly confirmed for both rating perspectives and across them. In the subsequent MTMM analysis, controlling for the method effects reduced the correlations between leadership constructs from a high to a small resp. medium level. Thus, transformational and transactional leader-

ship could be empirically discriminated. Likewise, the subscales of transformational leadership (Articulating a Vision, Providing an Appropriate Model, Fostering the Acceptance of Group Goals, High Performance Expectations, Individualized Support, Intellectual Stimulation) and transactional leadership (Contingent Reward) were found to be distinguishable when method effects of rating perspectives were partialled out. Due to the capabilities of the CFA-MTMM technique, the indicators' variance could be partitioned in trait, method, and error components. By this means, very strong method effects could be revealed as the latent method factors of self and follower ratings accounted for almost one half of the indicators' variance. Moreover, substantial differences between self and observer ratings could be observed considering the absolute score level of ratings. In accordance with previous findings, the average TLI scores were higher for self-ratings. Therefore, facilitating leadership ratings in practical issues, separate norms are provided for self and follower ratings. Additionally, the impact of individual and organizational variables on leadership ratings was investigated. In contrast to previous findings, no systematic group differences were found for the supervisor's gender, his/her hierarchical level (lower, middle, higher), and the type of organization (private vs. public). Thus, no specific norms were developed for these subgroups.

Study 2 and Study 3 were conducted as a two-study investigation that focuses on the process model of leadership. In order to overcome methodological weaknesses that might have impaired previous empirical studies, Study 2 and Study 3 take the method effects of measurement into account. Thus, a process model was evaluated that postulates transformational leadership to mediate the relationship between personality traits and leadership effectiveness while controlling for the method effects of rating perspectives. In a companywide survey, self-ratings from 162 supervisors and other ratings from their 1,263 followers were collected on three personality traits (achievement, extraversion, and emotional stability) and on transformational leadership. In *Study 2* (“*A multitrait-multimethod analysis on the dispositional basis of transformational leadership*”), rating perspectives were modeled as method factors in an MTMM analysis so that true-score correlations of the latent trait factors could be revealed. All three personality traits, constituting relevant, work-related dispositions of the supervisor, showed substantial latent correlations with transformational leadership, which considerably exceeded the cross-method zero-order correlations of prior research. In *Study 3* (“*Predict-*

*ing subjective and objective leadership effectiveness in a mediator model*”), the latent factor scores for the personality traits and for transformational leadership were entered in a mediator model in order to predict subjective and objective measures of leadership effectiveness. Within the personality traits that were modeled as distal predictors, achievement and extraversion directly predicted transformational leadership and indirectly predicted followers’ job satisfaction. Achievement, in addition, indirectly predicted the objective criterion of a unit’s achieved sales profit. Transformational leadership, as a proximal predictor, fully mediated these relations between personality traits and leadership effectiveness.

Summarizing the results of all three studies, several theoretical as well as methodological insights were gained. Due to the stringent consideration of measurement methods, the discriminant validity of transformational leadership and its theoretically distinct relative, i.e. transactional leadership, could be established empirically. Furthermore, also in contrast to previous research, its dispositional basis could be affirmed. Personality traits accounted for a substantial part of variance in transformational leadership. Finally, the relationship between transformational leadership and subjective as well as objective measures of effectiveness could be assured independently of measurement methods. Remarkably, the impact of personality traits was fully mediated by transformational leadership, indicating the relevance of actual behavior in particular situations. Although more research is still needed on the psychological processes that take place in the process of leadership, the current findings provide important knowledge on the variables’ interplay. Drawing on the strong method effects, future research should likewise account for systematic measurement effects and base conclusions on true-score correlations.

Considering the instruments that were applied in the empirical studies, the results strongly support – and enlarge – their utility. The factorial validity of the TLI was impressively confirmed for self and follower ratings. Moreover, separate norms were developed that facilitate its application in practical settings for individual leadership feedback. For the assessment of personality traits, a work-related instrument was used (Business-focused Inventory of Personality - 6 Factors, BIP-6F) that provided a common frame of reference and, by this, contributed to the methodologically sound analyses and to the validity of the results.

Further implications for human resource (HR) practice were derived based on the findings relating transformational leadership to its precedent personality traits and its subsequent outcomes. Leaders with high levels of achievement and extraversion are more likely to lead transformationally and, thus, effectively. Consequently, the dispositional basis should be accounted for in personnel selection settings and transformational leadership should be promoted in leader development. The strong method effects of self and other ratings, which were revealed with respect to the convergence as well as to the congruence of ratings, also have implications for organizational leadership issues. Indeed, HR practitioners already account for the different rating perspectives when they use 360-degree feedback systems in leader development. As both angles contain unique information, only covering both or even more perspectives yields a comprehensive picture of the leader in focus and his/her behavior.

Leadership research in general, as well as transformational leadership in particular, is a complex issue. In order to achieve enlightening insights, different perspectives have to be kept in mind. On the one hand, transformational leadership plays a central role in the process of leadership. Leaders bring along stable individual differences like personality traits that determine who they are and influence how they lead, presumably in interaction with their experiences and the actual situation. Their behavior, in turn, affects relevant outcomes regarding their followers' reactions as well as the branch's economic success. On the other hand, when investigating leadership phenomena, including their antecedents and consequences, it does matter who is questioned, the leaders themselves or their followers. The interactional nature of leadership also becomes manifest in the way it is viewed from different angles.

## **II. Zusammenfassung**

Effektive Personalführung ist ein zentrales Thema in der Organisationspsychologie, ebenso wie in den Wirtschafts- und Sozialwissenschaften, das nach wie vor viel Aufmerksamkeit in Forschung und Praxis erfährt. Ursache hierfür ist der enorme Einfluss, den das Phänomen Führung auf individuelle wie auf organisationale Größen ausübt. In den letzten Jahrzehnten hat die so genannte transformationale Führung in der Führungsforschung eine herausragende Rolle gespielt. Sie stellt einen verhaltensorientierten Ansatz dar, um effektive Führung in Organisationen zu beschreiben. Tatsächlich zeigen Studien, dass sich transformationales Führungsverhalten positiv auf subjektive und objektive Kriterien auswirkt, wie zum Beispiel Mitarbeiterzufriedenheit und Verkaufserfolg. Gleichwohl sind zentrale Aspekte des Paradigmas transformationaler Führung noch immer ungeklärt. Das übergeordnete Ziel dieser Dissertation ist es daher, transformationale Führung aus verschiedenen Blickwinkeln zu beleuchten, um einige besonders bedauerliche Forschungslücken zu füllen, die diesen nachweislich wirksamen Führungsprozess umgeben.

Zum einen wird hierzu ein umfassendes Prozessmodell herangezogen, das es erlaubt, transformationale Führung in Zusammenhang mit ihren Antezedenzen ebenso wie mit ihren Konsequenzen zu erforschen. Eine Reihe solcher Modelle wurde in den letzten Jahren vorgestellt, die in ähnlicher Weise postulieren, dass individuelle Merkmale der Führungskraft als Antezedenzen ihr konkretes Führungsverhalten beeinflussen, welches sich wiederum auf organisationale Konsequenzen auswirkt. Die empirische Überprüfung dieser Modelle hat bislang noch zu wenig Aufmerksamkeit erfahren. Die wenigen Studien, die transformationales Führungsverhalten explizit als zentrales Element im Führungsprozess berücksichtigt haben, ergaben in Hinblick auf ihre Antezedenzen und Konsequenzen widersprüchliche Befunde. Mit Blick auf das Führungsverhalten selbst und verwandte Führungsstile ist festzuhalten, dass transformationale Führung ursprünglich in Abgrenzung zu transaktionaler Führung konzipiert wurde. Während transaktionale Führungskräfte ihre Mitarbeiter motivieren, indem sie Belohnungen für Leistungen austauschen („Transaktion“), und somit an deren individuelle Bedürfnisse appellieren, formen transformationale Führungskräfte die Ziele und Werte ihrer Mitarbeiter um („Transformation“), indem sie diese mittels einer inspirierenden Zukunftsvision dazu anregen, sich über ihre persönlichen Ziele hinaus zugunsten der Organisation zu enga-

gieren. Trotz der klaren theoretischen Unterscheidung wurden häufig substanzielle Korrelationen zwischen diesen beiden Führungsstilen ermittelt, die ihre diskriminante Validität und somit ihre Konstruktvalidität in Frage stellen.

Zum anderen nimmt diese Dissertation die Erhebungsmethoden in den Blick, die typischerweise eingesetzt werden, um Führungsverhalten sowie dessen Antezedenzen und Konsequenzen zu erfassen. Die Beschreibungsperspektiven der Selbsteinschätzung durch die Führungskräfte und der Fremdeinschätzung durch die Mitarbeiter bilden daher als Messmethoden eine zweite Klasse von Blickwinkeln, die bei der Erforschung transformationaler Führung berücksichtigt werden. Forschungstheoretische Überlegungen über das Zusammenwirken der zu erfassenden Merkmale und der genutzten Messmethoden bei der Erfassung psychologischer Konstrukte geben Grund zu der Annahme, dass der bisherige Umgang mit Selbst- und Fremdeinschätzungen deutliche Schwächen aufweist. Diese Schwächen wiederum können zu Fehlschlüssen über den Zusammenhang von Führungsverhalten, seinen Antezedenzen und Konsequenzen geführt haben. Zum Beispiel wurde angezweifelt, dass transformationale Führung durch Merkmale und Veranlagungen, sog. Dispositionen, der Führungskraft beeinflusst wird, nachdem sich meta-analytisch nur schwache Korrelationen zwischen selbsteingeschätzten Persönlichkeitseigenschaften und fremdeingeschätztem Führungsverhalten ergeben hatten. Das leistungsstarke statistische Verfahren der konfirmatorischen Faktorenanalyse (CFA) von Multitrait-Multimethod-Daten (MTMM) wird in dieser Dissertation genutzt, um die Methodeneffekte der Selbst- und Fremdbeschreibung zu kontrollieren, während die Beziehungen zwischen transformationaler Führung, ihren Antezedenzen, ihr verwandter Führungsstile und ihren Konsequenzen untersucht werden.

Um das Konzept der transformationalen Führung unter Berücksichtigung dieser verschiedenen Blickwinkel zu ergründen, wurden drei Forschungsfragen formuliert: (1) Inwieweit kann die diskriminante Validität von transformationaler und transaktionaler Führung nachgewiesen werden, wenn die Methodeneffekte von Selbstbeschreibung und Fremdbeschreibung kontrolliert werden? (2) Welche bereinigten Korrelationen können zwischen transformationaler Führung und Persönlichkeitsmerkmalen ermittelt werden, wenn die Methodeneffekte von Selbstbeschreibung und Fremdbeschreibung auf die Erfassung von Persönlichkeitseigenschaften und Führungsverhalten kontrolliert werden? (3) Inwiefern mediiert transformationale Führung die Einflüsse von Persön-

lichkeitseigenschaften auf subjektive und objektive Kriterien des Führungserfolgs, wenn die Methodeneffekte von Selbstbeschreibung und Fremdbeschreibung auf die Erfassung von Persönlichkeitseigenschaften und Führungsverhalten kontrolliert werden? Jede dieser Forschungsfragen bildet den Ausgangspunkt einer von insgesamt drei empirischen Studien.

*Studie 1* („Eine Multitrait-Multimethod-Analyse zur diskriminanten Validität transformationaler Führung“) verfolgt in erster Linie die Frage nach der diskriminanten Validität transformationaler und transaktionaler Führung. In neun Stichproben mit insgesamt 178 Führungskräften und deren 834 Mitarbeitern konnten Daten zur deutschsprachigen Version des Transformational Leadership Inventory (TLI) gewonnen werden. Die Selbstbeschreibungen und die aggregierten Fremdbeschreibungen wurden mittels der CFA-MTMM-Methodik analysiert. Hierzu wurde die Faktorenstruktur des TLI zunächst getrennt und über beide Beschreibungsperspektiven hinweg geprüft und bestätigt. In der anschließenden MTMM-Analyse verringerten sich durch die Kontrolle der Methodeneffekte die erneut hohen Korrelationen zwischen den Führungskonstrukten auf ein geringes bzw. mittleres Niveau. Transaktionale und transformationale Führung konnten somit empirisch voneinander abgegrenzt werden.

In ähnlicher Weise gelang die empirische Differenzierung der Subskalen transformationaler Führung (Zukunftsvision, Vorbildfunktion, Gruppenziele, Hohe Leistungserwartungen, Individuelle Unterstützung, Intellektuelle Anregung) und transaktionaler Führung (Bedingte Belohnung), indem die Methodeneffekte der Beschreibungsperspektiven herauspartialisiert wurden. Das CFA-MTMM-Verfahren erlaubte es darüber hinaus die Varianz der Indikatoren in Komponenten aufzuteilen, die jeweils entweder auf die gemessenen Konstrukte („traits“), auf die Methoden oder auf Messfehler zurückzuführen sind. Auf diese Weise ließen sich sehr starke Methodeneffekte aufdecken, die sich darin zeigten, dass die Methodenfaktoren der Selbst- und Fremdbeschreibung für fast die Hälfte der Indikatorenvarianz verantwortlich waren. Darüber hinaus wiesen Selbst- und Fremdbeschreibung deutliche Unterschiede in der absoluten Höhe der Einschätzungen auf. In Übereinstimmung mit früheren Befunden waren die durchschnittlichen TLI-Werte in der Selbstbeschreibung höher. Um die Erfassung von Führungsverhalten in der Praxis zu unterstützen, wurden daher separate Normen für Selbstbeschreibungen und Fremdbeschreibungen durch Mitarbeiter entwickelt. Hierbei

wurde auch der mögliche Einfluss individueller und organisationaler Merkmale auf die Einschätzungen geprüft. Im Unterschied zu früheren Studien fanden sich jedoch keine systematischen Gruppenunterschiede in Hinblick auf das Geschlecht der Führungskraft, ihre Führungsebene (niedrig, mittel, hoch) sowie den Typ der Organisation (privatwirtschaftlich vs. öffentlich). Es werden daher keine spezifischen Normen für diese Subgruppen ausgewiesen.

Studie 2 und Studie 3 wurden als Doppelstudie durchgeführt, die sich vor allem mit dem Führungsprozessmodell befasst. Um die methodischen Schwächen früherer Arbeiten zu überwinden, wurden dabei die Methodeneffekte der Messung explizit in die Analysen eingebunden. Das heißt, es wurde ein Prozessmodell empirisch geprüft, das transformationale Führung als Mediator zwischen Persönlichkeitseigenschaften der Führungskraft und Führungseffektivität postuliert und zugleich die Methodeneffekte der Beschreibungsperspektiven kontrolliert. In einer unternehmensweiten Befragung wurden Selbstbeschreibungen von 162 Führungskräften und Fremdbeschreibungen ihrer 1263 Mitarbeiter erhoben, jeweils in Hinblick auf drei Persönlichkeitsmerkmale (Leistungsstreben, Extraversion und emotionale Stabilität) und transformationale Führung.

In *Studie 2* („*Eine Multitrait-Multimethod-Analyse zur dispositionellen Basis transformationaler Führung*“) wurden die Beschreibungsperspektiven als Methodenfaktoren in einer MTMM-Analyse modelliert, so dass die bereinigten Korrelationen der latenten Trait-Faktoren ermittelt werden konnten. Die drei Persönlichkeitseigenschaften, die relevante, berufsbezogene Dispositionen der Führungskraft darstellen, wiesen jeweils substantielle latente Korrelationen mit transformationaler Führung auf, die deutlich über diejenigen zuvor in der Literatur berichteten, einfachen Korrelationen hinausgingen, die über verschiedene Erhebungsmethoden hinweg ermittelt worden waren.

In *Studie 3* („*Ein Mediatormodell zur Vorhersage subjektiver und objektiver Führungseffektivität*“) wurden die latenten Faktorwerte der Persönlichkeitseigenschaften und der transformationalen Führung in ein Mediatormodell eingebunden, um subjektive und objektive Maße der Führungseffektivität vorherzusagen. Von den Persönlichkeitsmerkmalen, die als distale Prädiktoren modelliert wurden, zeigten Leistungsstreben und Extraversion direkte Effekte auf transformationale Führung und indirekte Effekte auf die Arbeitszufriedenheit der Mitarbeiter. Leistungsstreben konnte zudem auch das objektive Kriterium des Vertriebs Erfolgs der Abteilung indirekt vorhersagen. Transforma-

tionale Führung als proximaler Prädiktor mediierte diese Zusammenhänge zwischen Persönlichkeitsmerkmalen und Führungseffektivität jeweils vollständig.

In der Zusammenfassung der Ergebnisse aller drei Studien ließen sich mehrere theoretische und methodische Erkenntnisse ableiten. Durch die stringente Berücksichtigung der Messmethoden konnte die diskriminante Validität der transformationalen Führung und ihres nächstverwandten Führungsstils, der transaktionalen Führung, empirisch belegt werden. Darüber hinaus gelang es – im Unterschied zu vorangegangenen Studien – die dispositionelle Basis der transformationalen Führung nachzuweisen: Persönlichkeitsdispositionen erklären einen substanziellen Anteil der Varianz transformationaler Führung. Schließlich konnte der Zusammenhang zwischen transformationaler Führung und subjektiven ebenso wie objektiven Erfolgsmaßen bestätigt werden, und zwar unabhängig von der Messmethode. Der Einfluss der Persönlichkeitseigenschaften wurde dabei vollständig durch das transformationale Führungsverhalten mediiert. Ausschlaggebend für den Führungserfolg ist somit das konkrete Verhalten der Führungskraft in bestimmten Situationen. Obwohl weitere Forschung vor allem in Hinblick auf die psychologischen Prozesse erforderlich ist, die innerhalb des Führungsprozesses ablaufen, liefern die aktuellen Befunde wichtige Erkenntnisse betreffend das Zusammenwirken der Modellelemente. Aufgrund der starken nachgewiesenen Methodeneffekte sollte künftige Forschung unbedingt die systematischen Effekte der Messung berücksichtigen und Schlussfolgerungen auf bereinigte Korrelationen gründen.

Die aktuellen Ergebnisse unterstreichen und erweitern die Nützlichkeit der Instrumente, die in den empirischen Studien eingesetzt wurden: Die faktorielle Validität des TLI konnte eindrücklich bestätigt werden, sowohl für Selbstbeschreibungen durch Führungskräfte als auch für Fremdbeschreibungen durch Mitarbeiter und über diese beiden Perspektiven hinweg. Für diese beiden Versionen wurden separate Normen entwickelt, die den Einsatz des TLI in der Praxis unterstützen. Zur Erfassung der Persönlichkeitseigenschaften wurde ein explizit berufsbezogenes Fragebogenverfahren eingesetzt (Bochumer Inventar zur berufsbezogenen Persönlichkeitsbeschreibung - 6 Faktoren, BIP-6F), das den Teilnehmern einen einheitlichen Bezugsrahmen liefert und damit zu den anspruchsvollen methodischen Analysen und der Aussagekraft ihrer Ergebnisse beigetragen hat.

Auf der Basis fundierter Ergebnisse zum Zusammenhang transformationaler Führung mit zugrunde liegenden Persönlichkeitseigenschaften und erfolgskritischen Konsequenzen wurden weitere Implikationen für die Praxis des Personalmanagements abgeleitet. Bei Führungskräften mit einer hohen Ausprägung in Leistungsstreben und Extraversion zeigte sich eine höhere Wahrscheinlichkeit für transformationales und somit effektives Führungsverhalten. Zum einen sollte diese dispositionelle Basis daher in der Personalauswahl Berücksichtigung finden und zum anderen sollte transformationales Führungsverhalten in der Personalentwicklung aktiv gefördert werden. Implikationen für die organisationale Praxis ergeben sich auch aus den starken Methodeneffekten von Selbst- und Fremdbeschreibung, die sowohl in Hinblick auf ihre geringe korrelative Konvergenz als auch hinsichtlich der Inkongruenz in der absoluten Höhe der Einschätzungen ermittelt werden konnten. Tatsächlich tragen Personalexperten diesen unterschiedlichen Beschreibungsperspektiven bereits Rechnung, indem sie 360-Grad-Feedbacksysteme in der Entwicklung von Führungskräften nutzen. Da die Betrachtungswinkel jeweils einen eigenständigen Informationsbeitrag leisten, kann ein umfassendes Bild der Führungskraft und ihres Verhaltens nur gewonnen werden, wenn ihre eigene Perspektive und die ihrer Mitarbeiter sowie ggf. weitere Perspektiven erfasst werden.

Führungsforschung im Allgemeinen ist ebenso wie transformationale Führung im Speziellen ein komplexes Thema. Um aufschlussreiche Einsichten zu gewinnen, müssen verschiedene Perspektiven kombiniert werden. Zum einen spielt transformationale Führung eine zentrale Rolle im Führungsprozess: Führungskräfte bringen stabile individuelle Dispositionen wie Persönlichkeitseigenschaften mit, die bestimmen, wer sie sind, und beeinflussen, wie sie führen, mutmaßlich in Wechselwirkung mit ihren Erfahrungen und der aktuellen Situation. Ihr Verhalten wiederum wirkt sich auf die Ergebnisse des Führungsprozesses aus, die sowohl Reaktionen ihrer Mitarbeiter als auch den Erfolg der Abteilung umfassen. Zum anderen ist es in der Erforschung des Phänomens Führung, ihrer Antezedenzen und Konsequenzen von Bedeutung, *wer* befragt wird, die Führungskräfte selbst oder ihre Mitarbeiter. Die interaktive Natur von Führung wird auch in der Weise offenkundig, in der sie aus unterschiedlichen Blickwinkeln gesehen wird.

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## VI. List of Abbreviations

ACH	achievement
AD	average deviation index
AGFI	adjusted goodness-of-fit index
AV	Articulating a Vision
BIP-6F	Business Focused Inventory of Personality - 6 Factors
cf.	compare (lat. confer)
CFA	confirmatory factor analysis
CFA-MTMM	confirmatory factor analysis of multitrait-multimethod data
CR	Contingent Reward
CTCM	correlated trait-correlated method
CU	correlated uniqueness
<i>df</i>	degree(s) of freedom
$E_{ij}$	nonsystematic measurement error of the variable $X_{ij}$
e.g.	for example (lat. exempli gratia)
EST	emotional stability
et al.	and others (lat. et alii)
EXT	extraversion
<b>f</b>	female
$f^2$	effect size
FAG	Fostering the Acceptance of Group Goals
FFM	five-factor model
FRLT	full-range leadership theory
GFI	goodness-of-fit index
HPE	High Performance Expectations
HR	human resources
ht-hm	heterotrait-heteromethod
ht-mm	heterotrait-monomethod
i.e.	that is (lat. id est)
ibid.	in the same place
ICC	intraclass correlation coefficient

IS	Individual Support
ISN	Intellectual Stimulation
<b>JS</b>	job satisfaction
<b>m</b>	male
<i>M</i>	mean
<i>M<sub>j</sub></i>	measurement method <i>j</i> , used to measure <i>X</i>
<i>M<sub>j'</sub></i>	measurement method <i>j'</i> , used to measure <i>Y</i>
MLQ	Multifactor Leadership Questionnaire
MPR	multisource performance rating
mt-hm	monotrait-heteromethod
mt-mm	monotrait-monomethod
MTMM	multitrait-multimethod
<i>N</i>	sample size
<i>n</i>	size of subsample
<i>ns</i>	nonsignificant
<b>p.</b>	page
PAM	Providing an Appropriate Model
PC	performance criterion
PLS	partial least square
prim. hs.	primary high school
<b>r</b>	correlation coefficient
<i>r</i>	absolute value of correlation coefficient
<i>R</i> <sup>2</sup>	determination coefficient
<i>r<sub>c</sub></i>	correlation corrected for unreliability
<i>r<sub>latent</sub></i>	coefficient of latent correlation
<i>r<sub>latent</sub></i>	absolute value of latent correlation
<i>r<sub>wg</sub></i>	index of interrater agreement
<i>r<sub>XY</sub></i>	observed correlation between <i>X</i> and <i>Y</i>
resp.	respectively
<b>SD</b>	standard deviation
sec. hs.	secondary high school
SP	sales profit
SRMR	standardized root mean square residual

$t_1$	first time of measurement
$t_2$	second time of measurement
$T_i$	true score $i$
TF	transformational leadership
TLI	Transformational Leadership Inventory
ULS	unweighted least squares
vs.	versus
$X$	observed score
$X_{ij}$	observed score (cf. Equation (1))
$y$	years
$Y$	observed score
$\alpha$	Cronbach's alpha
$\beta$	standardized regression coefficient
$\beta_{\text{ind}}$	standardized regression coefficient of indirect effect
$\lambda_{XM_j}$	effect of the method $M_j$ on $X$
$\lambda_{XT_X}$	reliability index of $X$
$\lambda_{YM_j}$	effect of the method $M_j$ on $Y$
$\lambda_{YT_Y}$	reliability index of $Y$
$\rho_{T_X T_Y}$	true-score correlation of $X$ and $Y$
$\rho_{M_j M_{j'}}$	correlation between the methods $M_j$ and $M_{j'}$

## 1. Introduction

*He was gentlemanly, steady, tractable, with a thorough knowledge of his duties; and in time, when yet very young, he became chief mate of a fine ship, without ever having been tested by those events of the sea that show in the light of day the inner worth of a man, the edge of his temper, and the fibre of his stuff; that reveal the quality of his resistance and the secret truth of his pretences, not only to others but also to himself.*

Conrad, 1900, p. 8

*What would Captain Schettino have done if he was a good leader?* The sinking of the Costa Concordia cruise ship was perceived and discussed in the newspapers as complete and all-time failing of the captain, Francesco Schettino (Naeau, 2012; Viggiano & Mackenzie, 2012). However, it is not without precedent (Jessen, 2012). Lord Jim, the tragic title character in Joseph Conrad's famous novel, served as a mate on a ship full of pilgrims named *Patna* when he learned about the nature of personal failure, completing the foreshadowing of his literary portrait above. When the ship sprang a leak and was about to sink, Jim abandoned the ship and its passengers just as his captain. They were picked up and Jim was brought to court and penalized for his dereliction of duty. The precedent of *Patna* and her dishonorable crew in turn was presumably the pilgrim ship *Jeddah* that suffered the same fate in 1880, a few years before Conrad wrote his novel. Fortunately, the majority of passengers was saved and survived in all of these cases. However, the loss of lives was too great each time. Moreover, the crew's "every man for himself"-conduct is evidently not the exception but the norm in last centuries' maritime disasters (Elinder & Erixson, 2012). Therefore, the question becomes of vital importance: What makes leaders fail in the hour of truth? And, vice versa, how can good leaders be identified?

Research trying to predict human behavior relies on dispositional characteristics of the individual and on characteristics of the particular situation. Concerning the latter, situations are described with regard to trait-relevant cues (Tett & Burnett, 2003) and to their strength (Mischel, 1977). Both of these situational attributes influence the degree to which the situation *or* individual characteristics predominantly shape the behavior, constituting an interactional approach in the person-situation debate (Kenrick & Funder, 1988).

According to Mischel (1977), strong situations provide clear, unambiguous cues about appropriate behavior, forcing almost everyone to behave in a similar manner. The impact of individual difference is minimized and the behavior can be predicted based on the situation. However, individual characteristics do not vanish in strong situations. But they only break through if they reach an exceptionally low or high level. Weak situations, on the contrary, provide only ambiguous cues, allowing for more variability in how people respond. Thus, in weak situations, different people behave quite differently. That is to say, their behavior is determined by their individual differences, i.e. their traits, and by the trait-relevant cues of the situation.

Thus, what are maritime crisis situations like? Do they resemble strong or weak situations? Actually, the captain's conduct in these situations is even required by law. Nevertheless, current and literature examples have provided exceptions from law-abiding behavior, captains failing to be the last to leave the ship. Two conclusions are possible: Firstly, a drastic naval accident might resemble a strong situation that forces almost everyone to save his own life regardless of whatever the law says. In life-threatening situations behavioral alternatives are generally minimized to those that increase the probability of surviving, not rarely fleeing. If this was the case, no written rules of conduct could help. Instead, as only few people with an exceptional level of certain traits deviate from the uniform reaction triggered by a strong situation, efforts are required to identify those few already prior to the hour of truth. Drawing on the long-lasting history of leader trait research, personality traits would certainly be in the first row of promising individual differences that can predict this uncommon behavior (Judge, Piccolo, & Kosalka, 2009). Secondly, those situations might reflect weak situations, in which trait-relevant cues can be perceived that activate individual characteristics, which in turn, define the individual reactions. Again, personality traits would be

among the usual suspects to predict behavior (Tett & Burnett, 2003). Furthermore, as personality traits are defined to be stable across time and situations, leaders should be selected due to those traits. In sum, regardless whether dramatic crises constitute strong or weak situations, leader personality traits are always promising predictors of desirable leadership behavior.

I argue that managerial crisis situations are not substantially different from naval crises. Usually it is not the survival of humans that is menaced but “only” the investors’ capital as well as the employees’ jobs. However, the conduct of managers, for example during the financial crisis in 2008, strikingly reminds me of fleeing crew members who try to save their own lives, neither the ship nor the passengers. These situations do not require – that can be learned from the sad reality of financial crises and maritime disasters – a codifiable body of rules so that the captain leaves last. Instead, a particular pattern of personal characteristics is in demand. How can we find individuals with such a personality? Or can the desirable behavior be learned? Josef Ackermann, one of the big players in the international financial sphere, who – like many others in the first row – the financial crisis could do no harm, answers this question with a definite “No”: “Die richtige Persönlichkeit kann alles lernen. Persönlichkeit aber kann man nicht lernen”<sup>1</sup> (Eigendorf & Jost, 2011).

Before the naval analogy is left, one further remark should be added concerning the subjectivity of perception, which proves to be highly relevant in those dramatic moments. In court, Lord Jim describes his own behavior as if he did not have any alternative. Likewise, the statements of Captain Schettino have found strong incomprehension and vehement protest. For example, Schettino pointed out that he himself initiated the last maneuver, approaching Isola del Giglio, in order to give the passengers the chance to swim ashore (Witte, 2012). Other crew members disagreed that Schettino gave any order to approach the island. Indeed, simulation studies have shown that the residual speed, the prevailing wind, and the current can solely account for the vessel’s route. Therefore, in terms of intrapersonal conditions for desirable leadership behavior, we should not lose sight of the subjectivity of such behaviors. The rating perspective

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<sup>1</sup> “The right personality can learn everything. Personality, however, cannot be learned.”, author’s translation.

plays a major role if an interactional phenomenon like leadership is investigated, even if the situation is less dramatic.

Fortunately, most of daily leadership situations are less dramatic and involve less severe consequences. At least, this seems to be the case. In sum, however, they are presumably even more crucial like, for example, the decision to navigate the Costa Concordia not along the defined shipping route but to perform the sail-past, which was too close to Isola del Giglio this time and caused the devastating collision with the rock Le Scole. Before taking water had led to a life-threatening, i.e. potentially strong, situation, individual dispositions, others' expectations, and numerous characteristics of the situation have all the more played a role. Therefrom, the hour of truth takes place before the hour of failure. And the various weak decisions, which account for the emergence of a crisis, are rather crucial. Thus, what makes a leader succeed in the long run? What kind of leadership is effective? Indeed, the significance of good leadership was never challenged since antiquity (Plato & Jowett, 1901) and much research has attended the question of which leadership behavior causes the collective to flourish or founder (Judge et al., 2009).

Extensive leadership research has yielded the concept of transformational leadership, which proved to be particularly favorable (Judge & Piccolo, 2004). Transformational leaders motivate their followers through an inspiring vision in order to get them to perform beyond their individual duties. Thus, transformational leaders differ qualitatively from transactional leaders who rely on a quid-pro-quo approach of exchanging rewards for achievements. However, previous research could not empirically confirm the differentiation between transformational leadership and transactional leadership, thus challenging their construct validity. Furthermore, the extent to which stable individual traits account for transformational leadership behavior could not be consistently determined. This dissertation addresses these unanswered research questions by the means of three empirical studies that account for the different perspectives of leaders and followers when rating the leaders' behavior.

## **1.1 Goals of the Dissertation and Research Questions**

The overall purpose of this dissertation is to shed light on transformational leadership from different angles, in order to elucidate this demonstrably effective leadership process. On the one hand, these different angles affect the time perspective of transformational leadership as its antecedents, its concurrent relatives, and its consequences are examined. On the other hand, different angles are applied on the measurement of transformational leadership. Supervisors' self-ratings and their followers' other ratings represent different perspectives on the leaders' behavior, both providing unique insights. Studies on transformational leadership should account for these different perspectives and their effects on the measurement of leadership behavior.

This dissertation combines the different temporal angles with these different perspectives. In particular, the following goals are pursued. The first goal is to investigate the construct validity of transformational leadership in order to empirically support its distinction from transactional leadership. Secondly, the dispositional basis of transformational leadership is explored in order to identify stable personality traits that stimulate leaders to show transformational behaviors. The third goal of this dissertation is to support previous findings on the predictive power of transformational leadership. Unlike previous research, the three studies that are conducted for the purpose of accomplishing these research goals control for the methods of self and follower ratings that are used to measure leadership behavior and its antecedents. Taking both of these rating perspectives into account affords new and significant insights into the leadership process.

The specific research questions that go along with these goals are derived in the following. They constitute the research framework of the three empirical studies that are presented in this dissertation.

Transformational leadership (Bass, 1985) is considered to be the best validated leadership style today (Yukl, 2006). Transformational leaders motivate their followers through an inspiring vision, individual support and intellectual stimulation (Podsakoff, MacKenzie, Moorman, & Fetter, 1990). A multitude of empirical studies and meta-analyses (cf. Judge & Piccolo, 2004; Lowe, Kroeck, & Sivasubramaniam, 1996) has shown that transformational leadership fosters a variety of desirable outcomes across

cultures, nations, and organizational settings. Followers who ascribe their leader a high level of transformational behaviors are more satisfied with their job and more motivated (Judge & Piccolo, 2004), are more affectively committed to their organization (Meyer, Stanley, Herscovitch, & Topolnytsky, 2002), show more organizational citizenship behavior (Podsakoff, 2000), and a higher level of job performance (Geyer & Steyrer, 1998b; MacKenzie, Podsakoff, & Rich, 2001).

Transformational leadership was conceptualized as opposed to transactional leadership at first (Burns, 1978). Transactional leaders guide their followers by announcing and exchanging rewards for efforts and accomplishments. Therefore, the two leadership styles can be contrasted with respect to the motives they try to appeal to in followers. While transactional leaders address followers' individualistic self-interests of getting rewarded, transformational leaders appeal to their emotional needs of identification and to their moral values. Later on, the styles were described as distinct but not mutually exclusive (Bass, 1985). That is to say, transformational leadership is supposed to build on and to go beyond transactional leadership. Instruments that were constructed to assess the individual level of transactional and transformational leadership strongly drew on factor analyses extracting independent factors for the leadership styles. However, in spite of their clear theoretical discrimination, empirical studies failed to support their discriminant validity. Strong correlations were repeatedly found challenging the assumption of distinct constructs, for example, an average population correlation of .80 in the meta-analysis of Judge and Piccolo (2004).

This lack of discriminant validity menaces several aspects regarding the paradigm of transactional and transformational leadership. Firstly, the validity of instruments that pretend to measure distinct leadership styles is questioned. Secondly, the parsimony of these instruments is debatable if multiple items of different scales measure the same constructs. Thirdly, beyond the issue of leadership questionnaires, the essential understanding of the constructs is challenged. What does the substantial amount of shared variance stand for if the theoretical descriptions account only for small distinct proportions? Fourthly, the incremental validity of transformational leadership beyond transactional leadership, as stated in the augmentation hypothesis, might have been empirically underestimated due to the common variance portion. Fifthly, just as it is the case with subsequent outcomes, distinct correlations with preceding constructs are difficult to

determine. If precise hypotheses are formulated for personality traits predicting transformational leadership that do not hold for transactional leadership, how can they selectively be tested in the case of overlapping leadership styles? Finally, how can the two leadership styles purposefully be trained if an increase in one style is generally related to an increase in the other style? Thus, the discriminant validity of transactional and transformational leadership is an urgent issue in current leadership research.

Measuring leadership styles with questionnaires constitutes one possible reason for the lack of discrimination. Drawing on the concept of trait-method unit (Campbell & Fiske, 1959), literature on common method variance has shown that measuring different constructs with the same source can induce an overestimation of relationships (cf. Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Usually, transactional and transformational leadership are concurrently measured by follower ratings. Therefore, the portion of shared variance might – at least in part – be due to the shared measurement method. Likewise, Brown and Keeping (2005) have shown that followers' affect towards their leader substantially influences the measurement of transformational leadership and its relationships with other constructs. Therefore, the question arises to what extent the substantial amount of shared variance of transactional and transformational leadership is due to (a) shared measurement methods or (b) construct overlap.

Study 1 sheds light on the discriminant validity of transactional and transformational leadership by investigating their relationship while, at the same time, controlling for method effects. For this purpose, a powerful statistical procedure is applied. Multi-trait-multimethod (MTMM) data are collected on the two leadership styles by collecting self and follower ratings. Subsequently, confirmatory factor analyses (CFA) of the MTMM data are conducted that allow for controlling the method effects of the two measurement perspectives. By this means, method effects can be partialled out and true-score correlations between the latent constructs can be attained. Thus, the following research question is investigated in Study 1.

Research Question of Study 1:

*To what extent can the discriminant validity of transformational leadership and transactional leadership be established if the method effects of self and follower ratings are controlled for?*

Transformational leadership was conceptualized as a behavioral leadership approach. That is to say that the attributes of transformational leadership describe the observable behavior of a leader. Unlike the leader trait approach, they do not resemble stable individual characteristics of the leader like personality traits. Focusing on observable behaviors implies that these behaviors can be trained. Indeed, training programs have been developed (Bassi & McMurrer, 2007; Engelen & Brettel, 2011) and have shown to augment the individual level of leaders' transformational leadership (Abrell, Rowold, Mönninghoff, & Weibler, 2011; Barling, Weber, & Kelloway, 1996). In contrast to this behavioral conceptualization, the personal attributes of transformational leaders strongly resembles those of charismatic leaders. Indeed, transformational and charismatic leadership are sometimes used synonymously (House & Shamir, 1993). According to the theory of Conger and Kanungo (1987; 1998), followers are more likely to attribute charisma to a leader who enthusiastically advocates a vision, who acts in unconventional ways, takes personal risks to achieve the vision, and who inspires them with emotional appeals. These leader attributes strongly suggest that the leader's personality might play an important role in the development and exhibition of charismatic or transformational behaviors. Consequently, sound hypotheses have been formulated and empirically tested in order to establish the dispositional basis of transformational leadership.

The question "Are transformational leaders born or made?" (Judge & Bono, 2000, p. 752) has been pursued enthusiastically. The possibility to identify transformational, thus effective, leaders in an early stage initiated a series of empirical work linking personality traits with transformational leader behavior. These efforts came to a disenchanting peak in the meta-analysis of Bono and Judge (2004), who included 384 correlations between the personality traits of the five-factor model (FFM) and transactional and transformational leadership. Although medium size population correlations were found for extraversion and neuroticism, the coefficients for the other personality factors varied considerably across studies. In sum, personality traits accounted for only 9 % of the variance in transformational leadership. Bono and Judge figured out some possible reasons for these disappointing results. First of all, the posited relationships might have overestimated the dispositional basis of transformational leadership. Transformational behavior might be rather malleable and transient, or, in other words, independent of

stable personality. Hence, a leader exhibits more or less transformational leadership according to his/her experiences, his/her followers, or the particular situation. I argue that before researchers should quit the pursuit of the dispositional basis of transformational leadership, other plausible reasons should be carried out that might have obscured significant relationships. For example, as a second possible reason, Bono and Judge challenged the broad personality traits of the five-factor framework that might have masked substantial relationships of narrower traits with leadership behaviors. Therefore, Study 2 applies personality traits that are, in part, narrower than the Big Five and, in addition, measured within a work-related frame of reference. Foremost, though, the method effects of rating sources that might have attenuated the coefficients in the meta-analyses are controlled for in Study 2. Indeed, Bono and Judge exclusively included studies that measured personality traits of leaders and leadership behaviors from different sources. Remarkably, they highlighted this procedure as a particular strength of their meta-analysis as they avoided percept-percept-inflation. However, heteromethod correlations suffer from systematic method effects that can attenuate the observed relationships below the true-score correlations (Conway & Lance, 2010). Thus, the weak correlations revealed by Bono and Judge might be – at least in part – due to the combination of self and follower ratings for the assessment of personality traits and transformational behaviors. Study 2 aims at overcoming these methodological constraints by applying the CFA-MTMM procedure on self and follower ratings of personality traits and transformational leadership. By partialling out the method effects of rating perspectives, the true-score correlations between personality traits and transformational leadership can be identified. Thus, the following research question is addressed.

Research Question of Study 2:

*What true-score correlations between transformational leadership and particular personality traits can be identified if the method effects of self and follower ratings on the assessment of personality traits and leadership behavior are controlled for?*

Even though the dispositional basis of transformational leadership lacks empirical foundation, as noted above, several mediator models have recently been developed that build on this relationship (Antonakis, 2011; DeRue, Wellman, Nahrgang, & Humphrey, 2011; Hogan & Kaiser, 2005; Judge & Long, 2012; Zaccaro, Kemp, & Bader, 2004). These models similarly postulate transformational leader behavior to mediate the rela-

tionship between personality traits and leadership effectiveness. Hence, these models integrate trait orientated approaches of job performance and behavioral leadership paradigms. Drawing on trait-activation theory (Tett & Guterman, 2000), traits represent mere behavioral tendencies that ought to be activated in specific situations in order to exhibit their impact. In contrast, leader behaviors, if shown, are supposed to influence outcomes directly. If these mediator models could be confirmed, the validity of personality traits (e.g., Barrick & Mount, 1991; Salgado, 1997) can be explained via the exhibition of successful situation-specific behavior. Vice versa, the confirmation of specific personality traits that can predict transformational behavior could help to identify leaders with a high probability of transformational behaviors that in turn enhance leadership effectiveness. Unfortunately, however, only sparse empirical work has been conducted on these models so far, yielding highly inconsistent findings (De Hoogh, Den Hartog, & Koopman, 2005; Lim & Ployhart, 2004; Van Iddekinge, Campbell, & Putka, 2009). As these studies, again, combined different rating sources to assess leader personality as distal and transformational leadership behavior as proximal predictors of leadership effectiveness, they share the same methodological weaknesses as the ones described above. Therefore, Study 3 controls for the method effects of rating perspectives when empirically testing the mediator model. This is achieved by building on the results of Study 2. The latent factor scores of personality traits and of transformational leadership are extracted from the MTMM analysis of Study 2 and are subsequently incorporated into the comprehensive mediator model of leader effectiveness in Study 3. By this means, the direct and indirect effects within the model can be tested independently of the systematic method effects of rating perspectives. In order to broaden the scope of validity, subjective as well as objective indicators of leadership effectiveness are included in Study 3. Primarily, Study 3 addresses the following research question.

Research Question of Study 3:

*Does transformational leadership mediate the effects of personality traits on subjective and objective indicators of leadership effectiveness if the method effects of self and follower ratings on the assessment of personality traits and leadership behavior are controlled for?*

## 1.2 Outline of the Dissertation

The primary objective of this work is to explore the nature of transformational leadership, which has been the most popular leadership paradigm among researchers for three decades now (Felfe, 2006; Judge & Bono, 2000). This aim will be reached by elucidating the relationships the central construct of transformational leadership holds with (1) other leadership behaviors adjacent to transformational leadership, (2) personality traits predicting the occurrence of transformational leadership, and (3) measures of organizational performance as consequences of transformational leadership. Insights in the interplay of these variables will be gained by applying multitrait-multimethod analyses as a specialized statistical procedure that allows for disentangling the interrelationships of variables from the methods that are used to measure them. Thus, it allows for determining reliable estimations of these relationships even if the underlying rating data are confounded by strong method effects.

The empirical work was done by three studies that constitute the core of this dissertation (Table 1). The specific theoretical background, the methods and findings, as well as a thorough discussion of results are provided within every single study. Prior to them, an overall theoretical background is presented that explicates the fundamentals of the research questions outlined above. The dissertation concludes with an overall discussion that summarizes the empirical results and their consequences.

Table 1. Overview of the Chapter structure

<b>Chapter</b>	<b>Content</b>
1	Introduction, goals, and research questions, outline of the dissertation
2	Theoretical background
3	Study 1 <i>A multitrait-multimethod analysis on the discriminant validity of transformational leadership</i>
4	Study 2 and Study 3 <i>A multisource mediator model of leadership effectiveness</i>
5	Overall discussion

In *Chapter 2*, delineating the overall theoretical background, leadership research is shortly reviewed at first, beginning with some statements on the relevance of leadership. After starting in this general manner, the paragraph concludes with bringing the best established leadership theories into focus. Next, previous approaches are summarized that tried to aim for determining the dispositional basis of leadership. This topic has always been discussed with passion as it promises to reveal strategies to find the best leaders early and reliably. Here, some global remarks on individual differences as antecedents of specific behaviors are made. Particularly, models are picked up that incorporate the impact of situational strength on the relationship between individual differences and leadership behavior.

In Study 1, outlined in *Chapter 3*, the focus is on the construct validity of transformational leadership. Previous findings particularly menaced its discriminant validity with respect to transactional leadership. These two leadership styles were formulated as theoretically distinct and clearly discriminable. However, empirical studies have consistently yielded a substantive correlation (Bycio, Hackett, & Allen, 1995; Judge & Piccolo, 2004) that challenges the distinction between the two leadership styles (Moors, 2012; Rafferty & Griffin, 2004). Self and follower ratings of transformational and transactional leadership behavior are analyzed via multitrait-multimethod analyses in order find out whether the common variance is due to construct overlap or to shared measurement methods. Usually follower ratings are applied to assess leaders' behaviors. As works on common method bias have shown, the use of the same rating sources for different variables can result in considerably overestimated correlations (Cote & Buckley, 1987, Cote & Buckley, 1988; Crampton & Wagner, 1994; Podsakoff et al., 2003; Williams, Cote, & Buckley, 1989; Williams & Brown, 1994). The true-score correlation of transformational and transactional leadership can be obtained by collecting additional self-ratings and modeling the two rating sources as method factors in an MTMM design.

In *Chapter 4*, Study 2 and Study 3 are depicted in conjunction because Study 3 builds on the findings of Study 2. Using a similar proceeding as Study 1, Study 2 investigates the relationship between transformational leadership and some personality traits. Contrary to the considerations described above, which support the dispositional basis of leadership, only weak and inconsistent findings were reported on the links between

transformational leadership and personality (Bono & Judge, 2004). Again, MTMM analyses of self and follower ratings are implemented to find out how strong transformational leadership correlates with personality traits if method effects are partialled out.

The MTMM analyses of Study 2 are used to calculate latent factor scores for the personality traits and for transformational leadership. These scores are utilized in the subsequent Study 3. Here, transformational leadership constitutes the center of a comprehensive mediator model that includes its antecedents as well as its consequences (Antonakis, 2011; DeRue et al., 2011; Hogan & Kaiser, 2005; Judge & Long, 2012; Zaccaro et al., 2004). Personality traits are modeled as distal and leadership behaviors as proximal predictors of leadership effectiveness. Thus, transformational leadership is assumed to mediate the impact of stable individual differences on organizational performance outcomes. The posited paths within the mediator model are empirically tested via structural equation modeling.

The present work ends with a concluding discussion on the overall merits and limitations of the three studies in *Chapter 5*. Likewise, implications for research and practice are presented.

## 2. Theoretical Background

Leadership has been one of the most debated issues in the social sciences (Avolio, Sosik, Jung, & Berson, 2003; Bass, 1990). Actually, descriptions of good leadership go back to antiquity, for example to the works of Lao-tzu, Homer, Plato, and Aristotle (cf. Zaccaro et al., 2004). In spite of its long and unsettled history, the significance of leadership was seldom buried in oblivion. Today, the topic even regains special attention. “In the best of times, we tend to forget how urgent the study of leadership is. But leadership always matters, and it has never mattered more than it does now” (Bennis, 2007, p. 2). The acceleration of progress, developments, and failures affects the social interaction. The less everyone knows about what will happen next and where to go, the louder is the call for powerful and effective leaders.

Since empirical studies highlighted its relevance for organizational success, organizational psychology made an enormous and continuing effort in analyzing the characteristics of effective leadership. Therefore, *Chapter 2.1* will give a short overview of leadership research. Today, behavioral approaches are in the first row, particularly the paradigm of transactional and transformational leadership, which is examined in Study 1. For a long time, trait approaches played a dominant role in leadership research. Therefore, this line of leadership research will be in the center of attention in *Chapter 2.2*, namely trait paradigms that search for individual dispositions that differentiate effective from ineffective leaders. Here, some fundamental assumptions on how stable individual traits influence behavior in specific situations are stated. As the early identification of successful leaders on the basis of stable traits is still an urgent issue, numerous studies have tried to relate personality traits to transformational leader behavior. Moreover, recent theories integrate behavioral and trait-orientated leadership approaches in process models of leadership. These models, which are also briefly described in *Chapter 2.2*, postulate transformational leadership behavior to mediate the effects of personality traits on leadership effectiveness. So far, however, the results have been disappointing, both regarding the dispositional basis of transformational leadership and regarding the integrating mediator models. I argue that the research methods of measurement may account for these unfruitful findings. Therefore, in *Chapter 2.3*, the scientific measurement of leadership is considered. Some problems are figured out that are typically inherent in empirical leadership research and that might have attenuated previ-

ous estimations of the relationship between leadership variables. Building on the fundamental assumptions of psychological measurement, a procedure is sketched that is applied in the empirical work of this dissertation in order to overcome these problems, the confirmatory factor analysis of multitrait-multimethod data. In particular, this procedure is used to reliably determine the discriminant validity of transactional and transformational leadership in Study 1, the relationship of personality and transformational leadership in Study 2, and the mediating role of transformational leadership in a comprehensive model of leadership effectiveness in Study 3. Those parts of the overall theoretical background that constitute the particular basis of the three empirical studies are presented in detail within the studies in *Chapter 3* and *Chapter 4*.

## **2.1 Research on Leadership**

“There are almost as many definitions of leadership as there are persons who have attempted to define the concept” (Stogdill, 1974, p. 259). Although the number has even increased since Stogdill’s conclusion and although these definitions differ in referring to traits, behaviors, interactions, roles, relationships, and positions, the majority of definitions agrees on leadership as an influential process that is exerted over other people in order to guide and structure actions and relationships in a group or organization (Yukl, 2009).

Focusing on empirical research on leadership, trait theories constitute a first cornerstone. They tried to differentiate leaders from non-leaders and furthermore effective leaders from ineffective ones. The promise of being able to identify effective leaders in an early stage of development fostered the pursuit of stable and valid characteristics. Some of the models and findings are depicted in *Chapter 2.2*. However, trait theories of leadership run through a changeful history (Day & Zaccaro, 2007; Zaccaro et al., 2004) and were firstly hit by the literature reviews in the 1940s (Bird, 1940; Gibb, 1947; Jenkins, 1947; Mann, 1959; Stogdill, 1948). Stogdill (1948), for example, identified some typical characteristics of leaders, e.g., intelligence, self-confidence, and activity, but failed to support his fundamental assumption that a person must possess a specific set of traits to become an effective leader. Instead, he figured out that “persons who are leaders in one situation may not necessarily be leaders in other situations” (Stogdill, 1948, p. 65). Thus, these reviews challenged the relevance of traits and made leadership re-

searchers look for alternative theories of leadership effectiveness, i.e. situational and behavioral theories.

The so called Ohio State studies, which Stogdill himself conducted with his colleagues (Stogdill, 1950), as well as the Michigan Leadership studies (Katz, Maccoby, & Morse, 1950), conducted approximately at the same time, were supposed to develop taxonomies of leadership behavior. Two broad categories were described that resemble relatively independent classes of leader behaviors, i.e. initiating structure and consideration. Initiating structure or task-oriented behaviors involve planning and scheduling the work, assigning tasks to subordinates, coordinating activities, providing necessary resources, maintaining standards of performance, and giving feedback on the accomplishment. Consideration or relations-oriented behaviors contain supporting and helping subordinates, acting friendly and showing concern for their feelings, allowing considerable autonomy and being willing to accept suggestions from followers. These two factors still resemble well-known categories of leader behaviors even though research on them has decreased since the late 1970s. However, meta-analyses (Fisher & Edwards, 1988; Judge, Piccolo, & Ilies, 2004; Piccolo et al., 2012) revealed substantial relationships linking consideration with follower satisfaction and initiating structure with performance measures.

Other lines of research that emerged out of the trait disappointment were situational approaches and contingency theories that focused on the situational conditions of effective leadership. For example, Fiedler's contingency model (Fiedler, 1967) claims to select leaders so that their individual and stable leadership style matches the specific situation. Further situational approaches were formulated by Hersey and Blanchard (situational leadership theory; Hersey & Blanchard, 1974), House (path-goal theory; House, 1971), and Vroom and Yetton (leader-participation model; Vroom & Yetton, 1973).

Since the 1980s, emotional aspects of leadership gained attention and promoted the formulation of several leadership theories. Within these approaches a preliminary distinction can be made between rather behavioral and rather value-based approaches (Yukl, 2009), even though their differences and overlaps deserve scientific clarification. For transformational leadership (Bass, 1985), for example, the leader's behavior is at the heart of the theory, although the value-based vision and the transformation of fol-

lowers' values are emphasized. On the other hand, charismatic leadership (Conger & Kanungo, 1987), authentic leadership (Avolio, Gardner, Walumbwa, Luthans, & May, 2004), and ethical leadership (Brown, Trevino, & Harrison, 2005) focus on leader values rather than behavior. These emerging value-based theories still lack strong empirical support and integration into existing leadership research.

Among the behavioral approaches on the contrary, transformational leadership behavior is at the cutting edge of current leadership research (Piccolo et al., 2012). It has proven to be the most effective leadership behavior in a multitude of organizational studies. Research on transformational leadership builds on the full-range leadership theory (FRLT) as formulated by Bass (1985). The FRLT discriminates between three leadership styles, i.e. laissez-faire, transactional, and transformational leadership. As each of these styles refers to several subdimensions, they are regarded as second-order factors. Studies on the factor structure, however, have revealed highly inconsistent findings (e.g., Avolio, Bass, & Jung, 1999; Heinitz, Liepmann, & Felfe, 2005; Tepper & Percy, 1994; Yukl, 1999). Most of them were conducted with the most widely used leadership questionnaire, the Multifactor Leadership Questionnaire (MLQ; Bass, 1985; Bass & Avolio, 2000). Based on a literature review, Podsakoff et al. (1990) presented a slightly different model with respect to the subdimensions of transformational leadership. The questionnaire that was developed along this model, the Transformational Leadership Inventory (TLI; Podsakoff et al., 1990), has proven its worth in recent empirical studies (Herold, Fedor, Caldwell, & Liu, 2008). Particularly in its German version, encouraging findings were gained on the construct validity of the TLI (Heinitz & Rowold, 2007). Therefore, it might overcome some of the problems the MLQ encountered with respect to its factor structure (Bycio et al., 1995; Geyer & Steyrer, 1998a; Heinitz et al., 2005; Tejada, Scandura, & Pillai, 2001; Yukl, 1999). Consequently, the TLI will be utilized in the empirical studies of this dissertation. However, when explaining the leadership styles in the following, the original and widely used model of Bass (1985) will also be considered.

In contrast to transactional and transformational leadership, *laissez-faire leadership* is defined as absence of leadership. Exhibiting laissez-faire, the leader is physically or figuratively absent. He/she ignores problems and avoids taking responsibility for de-

cisions or projects. Also, he/she is indifferent about his subordinates and ignores their needs.

*Transactional leadership* is in accordance with the so called management by objectives, which was a hot topic in human resources management for several decades. Transactional leaders motivate their followers by establishing goals and task requirements. Bass and Avolio (2000) differentiate between three aspects of transactional leadership, i.e. Contingent Reward, Active Management by Exception, and Passive Management by Exception. Leading by Contingent Reward means to promise rewards for achieving goals, to monitor the followers' performance and to exchange rewards for accomplishments. Corresponding to Active Management by Exception, the leader actively looks for mistakes and takes action to correct and to avoid mistakes. Passive Management by Exception implies to intervene only in response to obvious deviations.

*Transformational leadership* incorporates a class of behaviors exhibited by the leader that motivate followers by means of a value-based, inspiring vision of the future. Instead of establishing an individual exchange process, higher-order needs of followers are activated that induce them to transcend their own goals for the sake of the organization. The model of Bass and Avolio (2000) contains four different aspects of transformational leadership, namely Idealized Influence, Individualized Consideration, Inspirational Motivation, and Intellectual Stimulation. Podsakoff et al. (1990) distinguish six subdimensions. Three of them, i.e. Articulation a Vision, Providing an Appropriate Model, and Fostering the Acceptance of Group Goals, constitute the "core" transformational leadership activities. Additionally, with providing Individual Support and Intellectual Stimulation, two aspects of transformational leadership are constituted that directly resemble subdimensions in Bass' model. Finally, Podsakoff et al. include High Performance Expectations in their model of transformational leadership behavior. The terms of transformational and charismatic leadership are occasionally used synonymously, whereas Bass originally defined charisma as "a necessary ingredient of transformational leadership" that fosters the followers' personal identification, "but by itself it is not sufficient to account for the transformational process" (1985, p. 31).

In terms of the interplay of the three overarching leadership styles, Bass (1985) made several assumptions that were empirically tested. First, from laissez-faire, over transactional, up to transformational leadership, Bass posited an increasing amount of

activity the leader has to show and, at the same time, an increasing amount of effectiveness (Figure 1). Thus, transformational leadership is supposed to be the most effective leadership behavior and, in fact, can enhance the employees' performance beyond the effects of transactional leadership, which is stated as augmentation hypothesis.

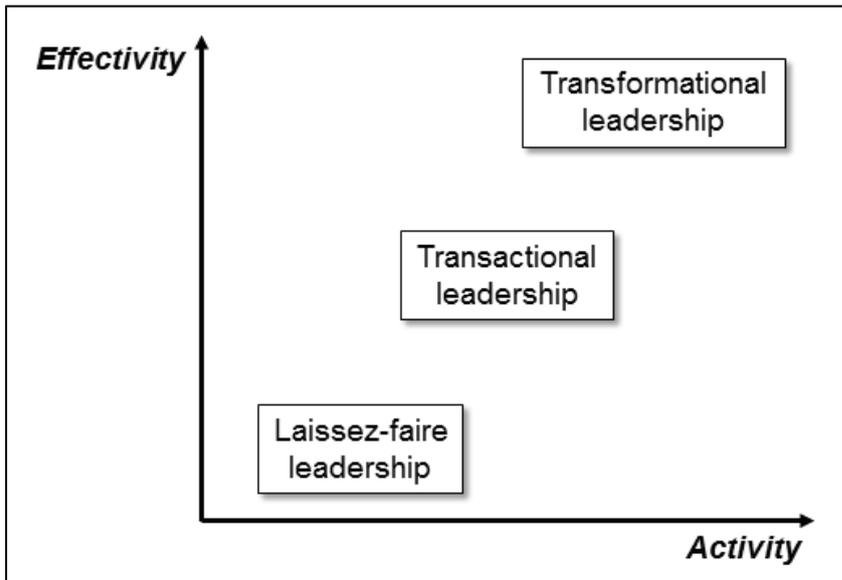


Figure 1. Full-range leadership theory (according to Bass & Avolio, 1994)

A multitude of studies (e.g., Bass, Avolio, Jung, & Berson, 2003; MacKenzie et al., 2001) and meta-analyses (Judge & Piccolo, 2004; Lowe et al., 1996) corroborated this assumption. For transactional and transformational leadership, positive correlations with outcome criteria were observed whereas laissez-faire leadership used to show a negative correlation. Within these studies, transformational leadership was found to be a valid predictor of subjective and objective indicators of leadership effectiveness. Additionally, it was shown that transformational leadership augments organizational performance beyond transactional leadership (Judge & Piccolo, 2004; Lowe et al., 1996). Therefore, the criterion validity of the FRLT, and of transformational leadership in particular, was impressively confirmed. Second, the FRLT assumes that the leadership styles are independent dimensions. That is to say, a leader might exhibit a certain level of transactional leadership and a similar or a completely different level of transformational leadership. It is thus possible that a supervisor leads transactionally and transformationally at the same time, that he/she exhibits only one of these leadership styles, or none. This assumption is in contrast to the original description of transactional and

transformational leadership by Burns (1978), who depicted them as opposite styles. Considering these questions of construct validity, empirical studies have frequently contradicted both of these models. Transactional and transformational leadership showed substantive positive correlations with each other and negative correlations with laissez-faire (Avolio et al., 1999; Judge & Piccolo, 2004; Vandenberghe, Stordeur, & D'hoore, 2002). Indeed, the correlation between transactional and transformational leadership was often so strong that the empirical distinction between these leadership styles can be questioned (Moors, 2012). Thus, the FRLT enjoys great scientific popularity even though its construct validity could not be established. This drawback is of crucial significance as the construct validity should confirm what is actually measured (Nunnally & Bernstein, 1994) and its empirical proof is an indispensable prerequisite for an effective utilization of the leadership theory.

In sum, transformational leadership is considered to be one of the best validated behavioral leadership approaches today (Yukl, 2006). However, some aspects within and around the full-range model of leadership deserve scientific clarification and, among them, the discriminant validity of transformational and transactional leadership is a matter of serious concern. Therefore, a sophisticated methodological approach will be applied to this question in Study 1. In the following, antecedents of effective leadership behavior are illuminated, which will be investigated in Study 2 and Study 3.

## **2.2 The Dispositional Basis of Leadership**

Considerable advancements have been realized in the description of leadership behaviors (cf. Chapter 2.1). Additionally, instruments have been developed that can reliably assess these behaviors, for example, via self-ratings of supervisors and observer ratings of subordinates (cf. Chapter 2.3). Furthermore, these ratings have proven to be valid predictors of subjective and objective leadership effectiveness (cf. Chapter 2.1). Regardless of these considerable advancements in predicting leadership performance, the following question is still unanswered: If it is what he/she does, i.e. leadership behavior, that makes a leader successful, in how far does this behavior depend on what he/she is like, i.e. his/her personality? It is still unclear whether the effective leadership behaviors rely on merely innate traits or on learned rules of conduct. Drawing on the prosperous model of transformational leadership, for example, training intervention programs claimed and confirmed the possibility to develop transformational leaders

(Abrell et al., 2011; Avolio, Reichard, Hannah, Walumbwa, & Chan, 2009; Barling et al., 1996; Kelloway, Barling, & Helleur, 2000). However, supporters of the trait approach emphasize that effective leaders can be identified in an early stage of their individual development based on stable individual characteristics. Therefore, the impact of traits on the exhibition of effective leader behavior is an important aspect for human resources (HR) management. If stable individual attributes were decisive for leadership effectiveness, efforts should be made on the selection of leaders according to their individual level on certain traits. If, however, crucial leader behaviors could be developed, human resources investments should concentrate on training and coaching interventions.

Apart from the unsolved question of the relative impact of traits and experiences on leadership behavior, recent studies have focused on the interplay of traits and behaviors in the prediction of leadership effectiveness. Therefore, the dispositional basis of a promising leadership style, like transformational leadership, is of particular importance and will be investigated in Study 2 and Study 3. In the following, a short historical review of trait leader research is provided along some ostensive statements. Subsequently, drawing on a consensus on the definition and a utile structure of traits, the current state of research is depicted.

“The emergence of leadership itself is proof of individual differences” and therefore “it is of no surprise that the earliest conceptions of leadership focused on individual differences” (Judge et al., 2009, p. 855). The long history of trait research in leadership can be traced back to the ancient Greeks, who wondered about strategies for selecting successful leaders (cf. Antonakis, Day, & Schyns, 2012). Indeed, Plato already believed in stable individual differences that differentiate leaders from non-leaders: “There will be discovered to be some natures who ought to [...] be leaders in the State; and others who are not born to be [leaders], and are meant to be followers rather than leaders” (Plato & Jowett, 1901, p. 175). The modern research on leader traits began with the great man hypothesis of Thomas Carlyle (1907, p. 18): “The history of the world was the biography of great man.” Consequently, research focused on the personal qualities that influence the emergence and the success of leaders (Bowden, 1926; Kohs & Irle, 1920; Terman, 1904). The self-confident proceeding of leader trait researchers – “the approach to the study of leadership has usually been and perhaps must always be through

the study of traits” (Cowley, 1928, p. 144) – continued until the 1940s. Stogdill’s seminal review (1948) reflects the first tipping point in the history of research on leader individual differences (Zaccaro, 2012). Stogdill found that personal characteristics like capacity (e.g., intelligence, alertness, judgment), achievement (e.g., scholarship, knowledge), responsibility (e.g., initiative, persistence, self-confidence), and participation (e.g., activity, sociability, cooperation) are associated with emergent leadership. However, the situation (e.g., skills, needs, and interests of followers, objectives to be achieved) was revealed as another important factor. Therefore, Stogdill (1948) concluded that “leadership is not a matter of [...] the mere possession of some combination of traits” (p. 66). Furthermore, he recommended “that an adequate analysis of leadership involves not only a study of leaders, but also of situations” (p. 65). This conclusion, however, was overly harshly interpreted in the following (cf. House & Aditya, 1997). Indeed, trait approaches fell in disgrace and situationism gained influence in leadership research (Zaccaro, 2012). The skepticism regarding trait explanations of leader emergence and leadership effectiveness continued until the 1980s, when re-analyses of the early leader trait reviews revealed that individual differences account for up to 80 % of the variance in leadership ratings (Kenny & Zaccaro, 1983; Lord, de Vader, & Alliger, 1986; Zaccaro, Foti, & Kenny, 1991). Thus, traits can actually explain differences in the behavior and performance of leaders. These findings marked off the second tipping point of the leader trait perspective according to Zaccaro (2012). Moreover, they constituted the basis for the process models of leadership effectiveness that integrate behavioral and trait-orientated leadership approaches (see below).

Recent studies that use genetic approaches to determine the dispositional basis of leadership support the significance of stable individual differences. Results indicate that genetic factors account for 30 % to 60 % of the variance in leadership emergence, leadership behavior, and leadership effectiveness (Arvey, Rotundo, Johnson, Zhang, & McGue, 2006; Arvey, Zhang, Avolio, & Krueger, 2007; Johnson et al., 1998; Johnson, Vernon, Harris, & Jang, 2004). As “genetic sources of personality traits are [...] well established” (Judge & Long, 2012, p. 185), it was concluded that “a significant part of the heritability of leadership is no doubt due to the heritability of individual differences associated with leadership” (Judge et al., 2009, p. 860; cf. Ilies, Gerhardt, & Huy, 2004).

Drawing on these remarkable findings on the genetic sources of behavior, the well-known discussion on nature versus nurture was picked up. After the dismissal of individual differences by Mischel (1968), trait research *in general* regained influence since the 1980s, paralleling the specific development of *leader* trait research as described above. Today, the interactional models dominate personality theory, postulating a conjunction of nature *and* nurture (Plomin & Asbury, 2005). However, behavioral genetics have provided findings that stress the “nature *of* nurture” (Plomin & Asbury, 2005). That is to say, “even seemingly situational variables often have a genetic source”, because “people’s genes cause them to select themselves into, or to be selected into, different environments” (Judge et al., 2009, p. 860). Consequently, leaders are supposed to be born, as genetic predispositions like personality traits, predispose them to seek leadership positions (Judge et al., 2009). Thus, the question of *which* personality traits characterize effective leaders arises. Before the current state of research is depicted, some remarks are given on the formal definition of individual differences in general and particularly of personality traits.

Individual differences, or *traits* in general, were defined as “psychological or biological characteristics [...] [that] (a) are measurable, (b) vary across individuals, (c) exhibit temporal and situational stability, and (d) predict attitudes, decisions, or behaviors and consequently outcomes” (Antonakis, 2011, p. 270). *Leader traits*, in particular, were accordingly defined as “relatively stable and coherent integrations of personal characteristics that foster a consistent pattern of leadership performance across a variety of group and organizational situations” (Zaccaro et al., 2004, p. 104). Hence, leader traits comprise individual differences like cognitive abilities, skills, personality, motives, and temperament. Usually, leader trait studies focused on some of these characteristics. For example, intelligence, “the most ‘successful’ trait in applied psychology” (Schmidt, 2009, p. 4), was found to be related to leadership in several meta-analyses (Judge, Colbert, & Ilies, 2004; Lord et al., 1986). However, an emphasis in previous research was on personality as some argued that “personality is the most potent source of individual differences in leadership” (Kaiser & Hogan, 2007, p. 179). Therefore, this dissertation will focus on personality traits as predictors of effective leadership behaviors. Personality traits refer to “an individual’s enduring and distinctive patterns of feeling, thinking, and behaving” (Cervone & Pervin, 2008, p. 8; cf. Jackson, Hill, & Rob-

erts, 2012; Mischel, Shoda, & Ayduk, 2008). Therefore, they are seen as particularly stable (House, Shane, & Herold, 1996). Stable characteristics, in turn, are especially popular if reasons for failure are in demand, let it be said, a ship's sinking or a company's ruin. They offer an alleged assurance that the failure could have been foreseen and that it can be prevented in future just by hiring another person in charge. Research on the reasons why leaders fail revealed an estimated base rate of 50 % incompetent managers (DeVries, 1992; Milikan-Davies, 1992). Among the critical incidents of inept management, exaggerated agreeableness ("unwillingness to exercise authority, reluctant to confront problems and conflict") and tyrannizing their subordinates ("treats employees as if they were stupid") were the most frequent complaints (Milikan-Davies, 1992).

Despite an enormous research effort on the particular traits that foster effective or ineffective leadership behavior, the results were disappointing due to the lack of an underlying personality theory (House & Aditya, 1997). Within the last two decades a consensus on the five-factor model of personality (Digman, 1990) as a taxonomic structure has emerged. Five factors have been described that proved to be detectable in different personality inventories (McCrae & Costa, 1987) and cultures (De Fruyt, McCrae, Szirmák, & Nagy, 2004): neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. Consequently, these five factors were utilized to organize traits that were investigated in different studies in order to summarize the findings. By this means, meta-analyses revealed substantial relationships of these factors with a multitude of organizational outcomes, for example with job performance (Barrick, Mount, & Judge, 2001) and job satisfaction (Judge, Heller, & Mount, 2002). These encouraging results have fostered research on the dispositional basis of leadership behaviors in the 1990s (Lowe & Gardner, 2000). By examining the relationship between FFM-structured personality and leadership, Judge et al. (2002) found out that the FFM-traits had a multiple correlation of  $R = .53$  with leader emergence and of  $R = .39$  with leadership effectiveness. However, the subsequent meta-analysis that focused on the relationship between FFM-traits and *transformational* leadership disappointed the expectations (Bono & Judge, 2004). Extraversion and neuroticism were revealed as significantly related to transformational leadership. However, the corrected correlations were, at best, moderate in magnitude, and in total, the five factors of personality accounted for only 9 % of the variance in transformational leadership behavior. Fortunately, these findings did not

cause leader trait research to stumble again. Instead, efforts on theoretical and methodological advancements enabled the approximation of a possible third tipping point (Zaccaro, 2012) that might remark a forthcoming renaissance of the trait theory of leadership (Antonakis et al., 2012). As both groups of advancements will be considered in the empirical studies of this dissertation, they are depicted subsequently.

The theoretical advancements have led to a series of similar mediator models of leadership effectiveness (Antonakis, 2011; DeRue et al., 2011; Hogan & Kaiser, 2005; Judge & Long, 2012; Zaccaro et al., 2004), also called “process models of leadership” (Antonakis et al., 2012, p. 647) or “multistage models of leader individual differences” (Zaccaro, 2012, p. 723). According to these models, leader traits constitute the distal predictors and leader behaviors the proximal predictors of leadership effectiveness. That is to say, leader behaviors mediate the impact of leader traits on leadership effectiveness (Figure 2).

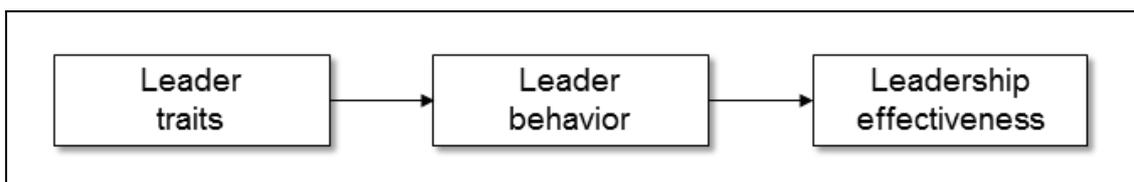


Figure 2. General mediator model of leadership effectiveness

These models are appreciated as they integrate trait-orientated and behavioral approaches on leadership effectiveness, and by this, can explain “how and why leader individual differences influence leadership [...] outcomes” (Zaccaro, 2012, p. 723). The common elements and differences of the mediator models will be described in detail in Chapter 4. Here, some overarching remarks should be given on the way these models reflect the current interactional theories, positing behavior as a function of individual *and* situational characteristics (Dinh & Lord, 2012).

According to these models, leader traits and situational elements may interact in several ways. First, mentioned above as “nature of nurture”, heritable dispositions can cause people to seek specific situations. For example, leader-like predispositions may cause people to seek situations that allow for exhibiting leader behaviors (Judge et al., 2009). Second, situations contain specific cues that can activate particular traits, i.e.

trait-relevant cues (trait activation theory, Tett & Burnett, 2003; Tett & Guterman, 2000). Thus, dispositions like individual differences are considered as “tendencies to respond to situations” (House et al., 1996, p. 205). That is to say, dispositions do not manifest themselves in all situations but can be triggered by situations. For example, a company party can evoke behavior that is in accordance with a high level of extraversion. In this situation, an extraverted leader will possibly chat cheerfully and laugh out loud. However, in another situation like an exit interview he might behave reservedly and calmly. Nevertheless, the individual traits remain an important predictor of behavior as different people will behave consistently differently in these situations. The extraverted leader will, for example, in a team meeting, directly address his subordinates more often than an introverted leader.

Third, the strength of the situation determines the extent to which trait-relevant cues activate particular traits, thus the extent to which individual differences are reflected in the actual behavior. Strong situations decrease the impact of individual differences, as they tend to be perceived in the same way and trigger the same behavior due to severe extrinsic rewards (Mischel, 1977). Life-threatening situations are typically strong situations. However, pursuing the example for extraversion, a funeral would make every participant keep silent. Weak situations, in contrast, allow for expressing individual differences that are activated by trait-relevant cues (Tett & Burnett, 2003).

Fourth, individual traits may influence the perceived strength of situations. If, for example, a situation is perceived as life-threatening, trait-relevant cues will be overseen. Finally, individual differences may influence the choice of situations that differ in relevance to particular traits and in situational strength. Although the mediator models of leadership effectiveness allow for interactional mechanisms like these, much research is needed to examine the relative importance of these potentially influential factors. Study 3 focuses on the impact of three personality traits on transformational leadership behavior, which is assumed to mediate their effects on leadership outcomes.

The methodological advancements that could be reached in current leader trait research (Antonakis et al., 2012) contain the concurrent assessment of self and observer ratings of relevant constructs (Colbert, Judge, Choi, & Wang, 2012). Chapter 2.3 elucidates the underlying assumptions that favor multisource ratings. These reasons also

constitute the basis of the statistical procedure that is used in the empirical studies of this dissertation, the multitrait-multimethod analysis.

### **2.3 Overcoming the Limited Angles of Rating Perspectives**

Although research on personality traits and research on leadership behaviors have both provided substantial contributions to the prediction of managerial performance, they have been unrelated for a long time. Only the recent mediator models of leadership effectiveness (cf. Chapter 2.2) were able to integrate these valuable approaches. Furthermore, the foci of research on personality and on leadership behavior have been conventionally connected with different measurement perspectives.

On the one hand, personality research predominantly relies on self-reports (Colbert et al., 2012). Some remarkable validities have been yielded for self-ratings of certain personality traits, for example regarding job performance (Barrick et al., 2001; Ones, Dilchert, Viswesvaran, & Judge, 2007). However, due to some measurement problems of self-reports, their usefulness has been questioned several times (e.g., Morgeson et al., 2007b; Podsakoff & Organ, 1986). On the other hand, leadership behavior was traditionally viewed as an interactional phenomenon (Judge et al., 2009) and therefore measured by means of ratings by organizational members (Brown & Lord, 2001). In fact, significant validities have been found for follower ratings of leadership behavior predicting work-related outcomes (Judge & Piccolo, 2004; Judge et al., 2004).

These considerable achievements in both lines of research provide the first reason to rely on the respective traditional measurement perspectives. Moreover, the discussion on common method variance fostered the use of multisource ratings in previous studies that aimed at evaluating the integrative mediator model of leadership effectiveness. However, the results have been inconsistent and disappointing when different sources have been used to assess the model's variables (Brown, Bryant, & Reilly, 2006; De Hoogh et al., 2005; Lam & O'Higgins, 2012; Lim & Ployhart, 2004). Thus, the theoretical progress that was initiated by the development of integrative mediator models is thwarted by the recommended use of multisource ratings in the evaluation of just these mediator models. Drawing on the seminal argument of trait-method units in the measurement of psychological constructs (Campbell & Fiske, 1959), it can be argued that the modest relationships between personality and leadership may be, in part, due to the use

of different measurement methods. The underlying assumptions that lead to the recommended use of multitrait-multimethod analyses are outlined in the following.

Both of the measurement perspectives mentioned above, self and observer ratings, implicate several problems regarding their accuracy (Colbert et al., 2012). On the one hand, self-reports can be biased due to self-deception (Paulhus, 1991). If individuals do not have an accurate view of themselves, this may be due to a lack of perspective (Colbert et al., 2012). That is to say, as individuals get used to their own traits, they may not be able to detect them precisely, just like fish are said to find it difficult to perceive water (Funder, 1995; Kolar, Funder, & Colvin, 1996). If individuals have an accurate view of themselves, situational or motivational constraints may cause them to intentionally bias their self-ratings, for example in the case of personnel selection circumstances (Ones, Reiss, & Viswesvaran, 1996; Zerbe & Paulhus, 1987).

On the other hand, observer ratings can only be accurate if the observer has the opportunity to observe the respective behavior or trait expression (Funder, 1995). Drawing on the different elements of personality as defined above, patterns of feeling and thinking are less observable and, thus, cannot be rated as accurately by others as behavioral tendencies. If observers have an accurate view of the trait or behavior, just as it was the case with self-ratings, response distortion may skew the ratings (Moors, 2012; Oh, Wang, & Mount, 2011). Observer ratings, hence, are subject to methodological weaknesses in a similar way as self-ratings. However, they have shown a reasonable level of accuracy and validity (Connelly & Ones, 2010; Connelly & Hülshager, 2012; Helzer & Dunning, 2012). Moreover, in hierarchical analyses, self and other ratings were found to increment the validity of the respective other perspective in predicting individual behavior (Colbert et al., 2012; Oh & Berry, 2009; Vazire & Mehl, 2008). Therefore, both rating perspectives contribute to the prediction of work-related outcomes beyond each other. These findings are in accordance with the assumptions of the socio-analytic theory (Hogan & Holland, 2003), which describes the difference between self and observer ratings in terms of identity and reputation. Accordingly, self-ratings capture an individual's perception of himself, i.e. his/her identity. On the other hand, observer ratings assess others' perceptions of the individual, i.e. his/her reputation.

In organizational practice, 360-degree feedback systems are applied to overcome the subjectivity of rating perspectives. These appraisal systems combine ratings from

supervisors, subordinates, peers, and customers to get, for example, a comprehensive view of a leader's performance. Research on these ratings revealed a considerably low level of agreement, particularly between self and other ratings (Atwater & Yammarino, 1997; Fleenor, Smither, Atwater, Braddy, & Sturm, 2010; Yammarino & Atwater, 1993). They show only a moderate level of covariance (Connolly, Kavanagh, & Viswesvaran, 2007; Conway & Huffcutt, 1997) and congruence (Harris & Schaubroeck, 1988; Tsui & Ohlott, 1988). Self-ratings typically tend to be more optimistic than other ratings (Helzer & Dunning, 2012), which has been explained by leniency bias (Podsakoff & Organ, 1986). Beyond this discrepancy regarding the absolute level of ratings, the low level of covariance refers to qualitative differences between the rating perspectives. In addition to the perspective-specific sources of bias depicted above, further effects may decrease the agreement of self and other ratings, for example attributional phenomena like the overattribution effect (Jones, 1979; Nisbett & Ross, 1980; Ross, 1977).

The low level of self-other agreement induces further difficulties if it is not a case of individual leadership feedback but a matter of investigating the relationship between variables. The use of same source versus multisource research designs has extensively been discussed under the label of common method bias. Although academic views have begun to get more diversified (Conway & Lance, 2010), common method bias still holds as a severe menace of all self-report research (Campbell, 1982; Pace, 2010). Correlations between two variables that were both measured with the same method are suspected of being inflated due to systematic measurement error (Podsakoff et al., 2003). The shared variance of common methods offers a rival explanation for the observed correlation, and thus, may cause false conclusions. Seeking to overcome this menace, researchers have developed strategies to avoid common method variance. One recommendation (Podsakoff et al., 2003), which has been followed frequently, was data collection from different sources. For example, while followers rate the leader's behavior, he/she himself/herself rates his personality, and team performance is rated by the leader's supervisor (e.g., De Hoogh et al., 2005). However, this strategy overshoots the mark. As all of these ratings contain systematic measurement error, the combination of these ratings will systematically underestimate the true-score correlation of constructs (Cote & Buckley, 1988; Williams & Brown, 1994). Thus, both relying on same source

relationships and on multisource correlations does not reveal the true-score correlation of variables.

The idea to take the measurement method into account when investigating the relationship between two variables traces back to the seminal work of Campbell and Fiske (1959). They pointed out that “each test [...] is a trait-method unit, a union of a particular trait content with measurement procedures not specific to that content” (p. 81). Consequently, “the systematic variance among test scores can be due to responses to the measurement features as well as responses to the trait content” (ibid.). In order to evaluate the convergent and discriminant validity of a test, it is therefore required to get measures of several traits with several methods. The resulting pattern of relationships can be ordered and analyzed along the multitrait-multimethod matrix (Figure 3) defined by Campbell and Fiske (1959). Accordingly, the monotrait-heteromethod correlations on the validity diagonal need to be sufficiently large to establish convergent validity. In contrast, the heterotrait-monomethod coefficients should be rather low in terms of discriminant validity.

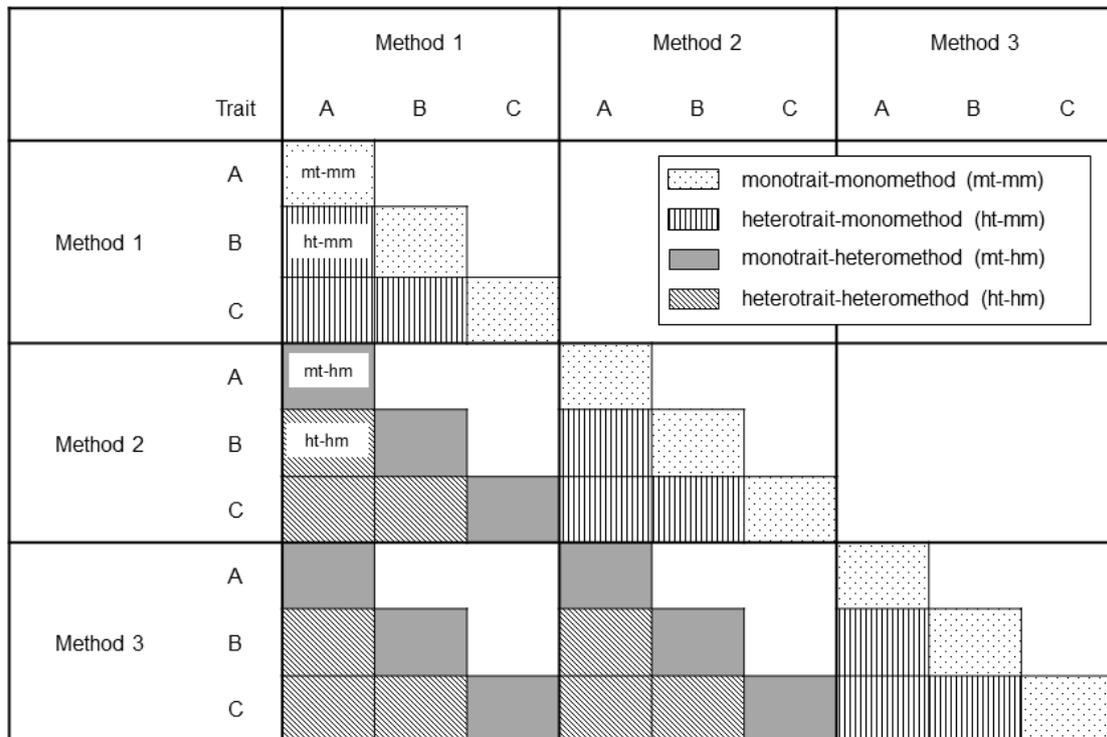


Figure 3. Scheme of the multitrait-multimethod matrix

Campbell and Fiske themselves (1959) as well as subsequent studies have shown that the intuitive requirements are seldom met. In particular, the monotrait-heteromethod correlations are frequently not substantially higher than the heterotrait-heteromethod values. Thus, even though the MTMM matrix is easily calculated and intuitively interpreted, there are only heuristic rules to evaluate the construct validity of measures (Geiser, Eid, Nussbeck, Lischetzke, & Cole, 2010). Furthermore, the MTMM matrix was criticized for relying on observed rather than latent constructs (Marsh, 1993). Statistical achievements of the last decades permit to analyze MTMM data with structural equation modeling (Marsh, 1993; Marsh & Hocevar, 1988). By this, unsystematic measurement error can be taken into account and specific hypotheses on the traits' and methods' relations can be empirically tested (Widaman, 1985).

Several approaches were developed that differ in the way they account for systematic method effects (e.g., Eid, 2000; Kenny & Keshy, 1992; Lance, Woehr, & Meade, 2007; Marsh, 1989). Due to some compelling advantages (cf. Chapter 4.2) the correlated trait-correlated method (CTCM) model is widely used (Lance, Hoffman, Gentry, & Baranik, 2008) and recommended (Lance, Noble, & Scullen, 2002; Podsakoff et al., 2003). In the CTCM model, each indicator is a linear combination of a latent trait factor, a latent method factor, and an error variable (Figure 4). The trait factors are correlated and so are the method factors. Between these two groups, however, no correlations are included in the model. If each trait-method unit is represented by two or more indicators, as is the case in Figure 4, this model allows for three types of conclusions. First, the variance of the observed indicators can be portioned into trait, method, and error components. By this, the strength of method effects can be identified. Second, modeling the methods of measurement as latent factors allows for partialling out method effects. Thus, confirmatory factor analyses of MTMM data allow for determining the relationships between the latent trait factors that are not influenced by the measurement methods, i.e. the true-score correlations of the constructs. Third, individual factor scores for the latent trait factors can be related to further constructs outside the CTCM model. For example, the criterion related validity of constructs can be determined independently of the measurement method.

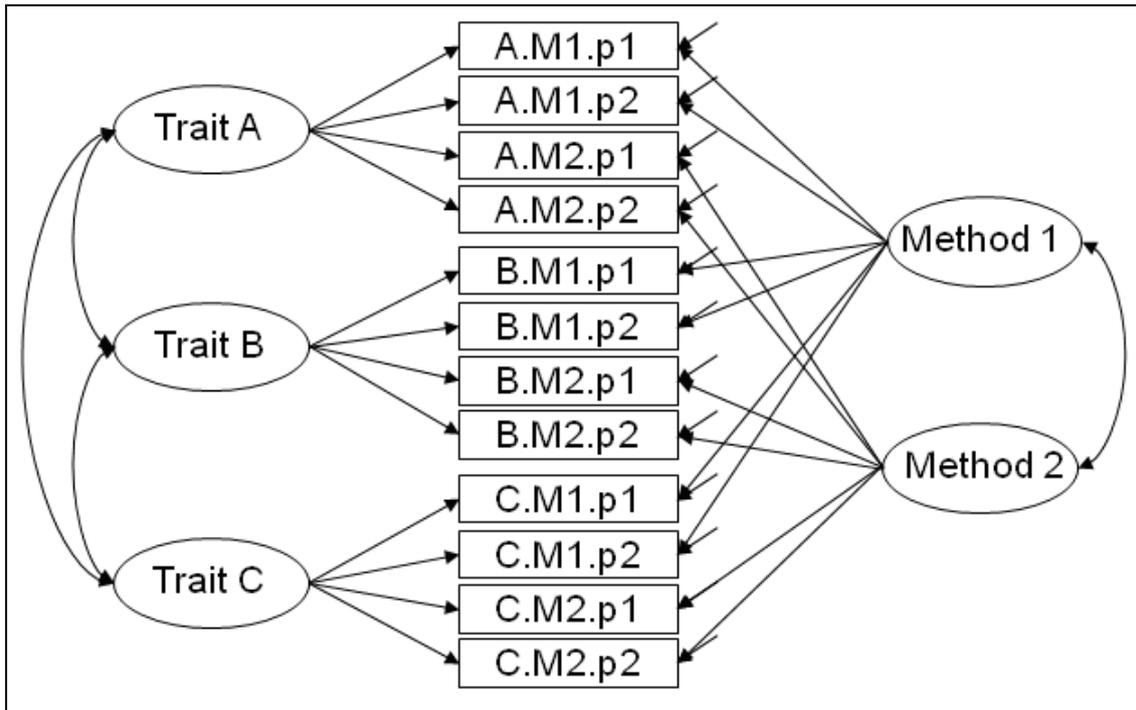


Figure 4. Scheme of the correlated trait-correlated method (CTCM) model. For each trait-method unit two parcels are included in the model (p1 and p2).

Self and observer ratings reflect measurement methods that have frequently been used in MTMM analyses (Lance et al., 2008). Due to the advancements of the CFA-MTMM, the systematic measurement errors of these methods can be taken into account when examining the constructs' relationships. Drawing on this procedure, this dissertation overcomes the different angles of rating perspectives in the analyses of transformational leadership and the relationship to its antecedents, its relatives, and its consequences. By means of confirmatory factor analyses of MTMM data, i.e. self and follower ratings of personality traits and leadership styles, this dissertation determines the true-score correlation of transformational and transactional leadership in Study 1, and of transformational leadership and particular personality traits in Study 2. Furthermore, the latent factor scores of the personality traits and of transformational leadership are integrated in a mediator model of leadership effectiveness in Study 3.

### **3. Study 1: A Multitrait-Multimethod Analysis on the Discriminant Validity of Transformational Leadership<sup>2</sup>**

#### **3.1 Study 1: Introduction**

Over the past two decades, research and practice increasingly focused on the transformational and transactional leadership paradigm (Bass & Bass, 2008; Rowold & Heinitz, 2007). While transformational leaders motivate their followers by means of a value-based, inspiring vision of the future, transactional leaders rely on a quid-pro-quo approach to leadership and exchange tasks and rewards with their respective followers. Despite its broad scientific acceptance, this clear theoretical differentiation still lacks consistent empirical support. Transformational and transactional leadership show substantive correlations in a number of studies (e.g., Bycio et al., 1995) as well as in meta-analyses (Judge & Piccolo, 2004). Therefore, the discriminant validity of these two leadership constructs could not yet be empirically established.

A similar problem was observed within the construct of transformational leadership. The Multifactor Leadership Questionnaire (MLQ; Bass, 1985; Bass & Avolio, 2000, for the latest version MLQ-5X Short; Rowold, 2005, for the German version) as well as the Transformational Leadership Inventory (TLI; Podsakoff et al., 1990; Heinitz & Rowold, 2007 for the German version) assess several subscales of transformational leadership (e.g., Individual Consideration, Intellectual Stimulation) in order to further differentiate leaders' behavior. These subscales were developed through factor analyses but high intercorrelations remain to question their differentiability (Heinitz & Rowold, 2007; Lowe et al., 1996).

Analyzing the possible sources of these high intercorrelations, two classes can be separated: On the one hand, substantive overlap of the constructs might cause the observed covariance. This intuitive, nearby assumption would unmask the subscales of transformational leadership as at least being partially redundant. On the other hand, the shared variance of the constructs could rely on the shared methods that were typically

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<sup>2</sup> A similar version of this work was published in the Journal of Personnel Psychology (Krüger, Rowold J., Borgmann L., Staufenberg K., and Heinitz (2011); reproduced by permission from Journal of Personnel Psychology 2011; Vol. 10(2): 49-60 © 2011 Hogrefe Publishing www.hogrefe.com DOI: 10.1027/1866-5888/a000032). The co-authors of the published version partly supported data collection. I completed the present version of this work independently and on my own.

used to assess them. Generally, the leaders' behavior is rated by his or her subordinates within one questionnaire. This same-source same-method bias could have inflated the observed correlations. The multitrait-multimethod (MTMM) approach (Campbell & Fiske, 1959) is the most important technique for dividing and clarifying the different sources of shared variance.

Consequently, and for the first time, the present study uses the MTMM approach to explore the discriminant validity of transactional and transformational leadership scales as well as the discriminant validity of facets within transformational leadership. In order to exclude same-source bias from the intercorrelations, the leadership constructs were assessed by multiple rating perspectives. In sum, applying the MTMM approach, the first research goal of Study 1 was to contribute to the important issue of discriminant validity of transformational and transactional leadership, as assessed by the TLI.

Apart from this question of validity, a potential application of the measurement of transformational leadership is explored in this study: Assuming substantial differences between self and follower ratings of leadership behavior, specific norms are needed for the use of the TLI. Aside from the raters' perspective, further individual and organizational variables are considered that might affect leadership ratings. Consequently, the second goal therefore was to investigate the effects of the rating perspective as well as supervisors' and organizations' characteristics on the average leadership scores. Finally, based on these findings, specific norms – where necessary – are provided for the TLI, using data from nine independent samples acquired in Germany.

## **3.2 Study 1: Theoretical Background**

### **The Transformational Leadership Inventory**

One instrument for the assessment of transformational and transactional leadership is the Transformational Leadership Inventory, developed by Podsakoff and colleagues (Podsakoff et al., 1990). The TLI uses 26 items to assess six subscales of transformational leadership, that is, Articulating a Vision, Providing an Appropriate Model, Fostering the Acceptance of Group Goals, High Performance Expectations, Individualized Support, and Intellectual Stimulation. In addition, the TLI includes one scale for the assessment of transactional leadership, Contingent Reward. The TLI has been vali-

dated in at least five empirical studies (Heinitz & Rowold, 2007; MacKenzie et al., 2001; Podsakoff, MacKenzie, & Bommer, 1996; Podsakoff et al., 1990; Rowold, Borgmann, & Heinitz, 2009). These studies support the factorial and criterion-oriented validity and adequate levels of reliability for both the English and the German version of the instrument.

However, the subscales of transformational leadership are highly intercorrelated, a problem also known when it comes to other instruments assessing transformational leadership. For the Multifactor Leadership Questionnaire (Bass & Avolio, 2000), another well established questionnaire measuring transformational leadership, strong intercorrelations between the transformational subscales are reported from Avolio, Bass, and Jung (1999; mean intercorrelation = .80), Vandenberghe, Stordeur, and D'hoore (2002; .89) and Lowe et al. (1996; .79 in a meta-analysis). Correlations of a similar strength were observed between transformational and transactional leadership.

In this study, the TLI was used instead of the MLQ for several reasons: First, the MLQ still holds some measurement problems, particularly concerning its factor structure (e.g. Avolio et al., 1999; Heinitz et al., 2005; Yukl, 1999). The TLI, on the other hand, only considers one transactional scale, Contingent Reward. But it seems to bring along a more robust structure that was replicated more reliably in different samples and for different rating perspectives. Second, the TLI (26 items) is shorter than the MLQ (45 items in the MLQ-5X Short) and hence, it is preferred especially in organizational contexts. Consequently, the practical use of the instrument is even supposed to increase as norms are provided within this study to support its applicability.

### **Construct Validity of Transformational Leadership**

Concerning theoretical challenges, the high intercorrelations between transformational and transactional leadership contradict the assumptions of the full-range leadership model which clearly postulates distinct constructs (Avolio, 1999). Hence, the relative large portion of shared variance can be regarded as a deficit in discriminant validity. This is an important limitation, as discriminant validity is a cornerstone of construct validity. Furthermore, the unique effects of transformational and transactional leadership are hardly separated and their incremental validities for outcome measures (e.g., subordinates' satisfaction, extra effort, and performance) cannot be detected reliably. For practical issues, highly overlapping constructs in a questionnaire imply redun-

dancy and therefore inefficiency. Accordingly, the structure of the MLQ is still discussed with regard to its debatable parsimony (Den Hartog, van Muijen, & Koopman, 1997; Heinitz et al., 2005). In order to overcome these theoretical and practical limitations, it is necessary to further clarify the inherent factorial structure of transformational leadership and its relationship to transactional leadership. Study 1 tries to meet these challenges by taking the different perspectives of self and other ratings into account using an MTMM design.

### **Potential Effects on Leadership Ratings**

Focusing on the different perspectives brings forward another practical issue. A short and valid instrument like the TLI can profitably be used by human resource practitioners to give detailed feedback to supervisors (e.g., for purposes of 360-degree assessment or training). But accurate feedback is only possible if norms are available to evaluate the aggregated answers of the managers themselves and their respective followers. Consistent with intuitive assumptions, empirical evidence shows that individuals rate themselves more favorable than they are rated by others (e.g., Atwater & Yammarino, 1997; Harris & Schaubroeck, 1988). Thus, at least for the different perspectives, separate norms are assumed to be required for the TLI.

In addition, some further individual and organizational variables should be inspected concerning their influence on the average leadership ratings. For example, Eagly and colleagues (2003) found female leaders exhibiting significantly more transformational leadership than their male colleagues. These gender-specific differences showed very small effect sizes. Nevertheless, given the importance of gender equity, and given the difficulties of women having access to top management positions (i.e., the “glass ceiling” effect), it seems important to explore potential gender differences in the TLI scales.

Another characteristic of leaders is their hierarchical level within the organization (e.g., top management vs. middle management vs. first-level supervisor). From a theoretical perspective, it might be argued that managerial functions and experiences may vary with the hierarchical level of the leader. For example, providing individualized support, one facet of transformational leadership, should be more frequent at lower levels since the direct interaction between leader and led is among the key tasks of lower-level managers. In line with this argumentation, prior empirical research found that at

lower levels, transformational leadership was observed more frequently than at higher levels of the organization (cf. Lowe et al., 1996).

Organizations can be characterized either as being public or private organizations. Public organizations are often highly bureaucratic and, as a consequence, established and stable structures, policies and regulations limit the possible influence of transformational leadership (Antonakis, Avolio, & Sivasubramaniam, 2003; Javidan & Waldman, 2003).

Thus, in addition to the rating perspective, the effects of supervisors' gender and the hierarchical level as well as the effects of the type of organization (public vs. private) on the TLI scores were investigated. If any of these potential effects could be observed, specific norms for the respective groups should be generated.

### **3.3 Study 1: Method**

#### **Samples and Procedures**

In order to enhance external validity of results, an effort was made to obtain several samples for the purpose of Study 1. For the profit and the nonprofit sector, data from four and five, respectively, independent organizations located in Germany, were collected. For the profit sector, samples of employees from a railway company (#1), a company specialized on human resource programs (sample #2) and from senior physicians of a university hospital (#3) were drawn. In addition, a newspaper sample (#4, for a more detailed description see below) was acquired. For the nonprofit section, a sample of pastors from the roman-catholic church was drawn (sample #5). Next, several orchestras with their conductors (#6) and several members of police departments (sample #7) participated in the study. So did employees from governmental agencies involved in local administration and courts (sample #8). Additionally, a snowball sample (#9) of nonprofit supervisors and their followers was acquired. Overall, these nine samples represent a wide variety of profit and nonprofit organizations.

For all samples (except for the newspaper sample, #4, and the snowball sample, #9), the respective organizations were contacted. The goal of the study was communicated to the participants. Supervisors took part voluntarily and invited their followers to deliver their ratings. For matching supervisors' and followers' data, each respondent

had to provide the name of the supervisor in focus. Data were collected via an online survey. Respondents filled out the survey during work time and voluntarily. As for the newspaper sample (#4), participants were recruited via a newspaper article, which included a link to the survey. Each participant was asked whether he/she was a member of a profit or nonprofit organization. Respondents who indicated membership in nonprofit organizations were excluded since only employees from profit organizations were included in this sample. Each person participating in the survey had the opportunity to take part in a lottery. The participants of the snowball sample (#9) were contacted via e-mail and asked to follow a link and to complete the questionnaire. A lottery was organized here, too. Only supervisors and their followers from nonprofit organizations were included in this sample. In the newspaper sample (#4) and in the snowball sample (#9), the participants had the opportunity to invite their followers if they were leaders, or to invite their supervisor if they took part as a follower. The demographic characteristics of the nine samples are summarized in Table 2.

### **Questionnaire**

As mentioned above, the TLI (Podsakoff et al., 1990) is a well-established instrument for the assessment of six scales of transformational and one scale of transactional leadership. The six scales of transformational leadership are (1) Articulating a Vision (AV, five items, e.g., "... paints an interesting picture of the future for our group."), (2) Providing an Appropriate Model (PAM, three items, e.g., "... provides a good model to follow."), (3) Fostering the Acceptance of Group Goals (FAG, four items, e.g., "... encourages team members to be 'team players'."), (4) High Performance Expectations (HPE, three items, e.g., "... will not settle for second best."), (5) Individualized Support (IS, four items, e.g., "... shows respect for my personal feelings."), and (6) Intellectual Stimulation (ISN, three items, e.g., "... has stimulated me to think about old problems in new ways."). As transactional scale, Contingent Reward is measured (CR, four items, e.g., "... commends me when I do a better than average job."). For the follower rating, the items were preceded by the phrase "The person I describe ..."; in the self-rating of the supervisors, the pronoun "I" was shown above the items. The items were to be answered on a five-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). In this study, a German validated version of the TLI

Table 2. Study 1: Demographic and organizational characteristics of samples

	Followers										Supervisors											
	N		Sex [%]		Age [y]		Tenure [y]		Education [%]		N		followers / supervisor		Sex [%]		Age [y]		Tenure [y]		hierachical level [%]	
	f	m	M	SD	M	SD	M	SD	prim. hs	sec. hs	uni	M	SD	f	m	M	SD	M	SD	lower	middle	higher
<i>(A) Profit Samples</i>																						
(1) Railway company	37	19	81	44.3	9.5	16.7	10.4	38	19	43	5	7.4	1.7	0	100	45.8	6.8	21.0	12.9	60	40	0
(2) HR company	192	66	34	40.7	9.5	6.0	4.7	11	7	82	35	5.5	3.0	66	34	45.5	8.1	10.9	6.1	-	-	-
(3) Senior physicians	84	-	-	-	-	-	-	-	-	-	10	8.4	9.8	-	-	-	-	-	-	-	-	-
(4) Newspaper sample	83	67	33	36.2	10.4	8.4	7.8	45	30	25	48	1.7	1.3	29	71	42.4	9.5	10.7	8.3	67	33	0
<i>(B) Nonprofit Samples</i>																						
(5) Roman-cath. pastors	76	65	35	44.3	8.7	11.9	9.3	30	17	52	12	6.3	5.4	42	58	47.8	7.0	13.8	7.3	-	-	-
(6) Orchestras	77	56	44	30.8	15.8	11.4	11.5	40	39	21	7	11.0	4.5	17	83	35.7	13.2	15.0	8.9	-	-	-
(7) Police departments	161	8	92	44.8	8.1	16.4	10.4	32	17	51	39	4.1	4.1	0	100	47.5	5.7	14.1	8.0	21	49	31
(8) Governm. agencies	105	47	53	41.5	10.1	11.3	10.1	27	10	64	15	7.0	4.2	33	67	49.4	5.3	9.0	6.3	7	80	13
(9) Snowball	19	37	63	33.7	8.5	9.5	7.6	37	21	42	7	2.7	1.9	0	100	45.1	10.8	12.6	4.7	43	43	14
Total	834	46	54	40.5	11.0	10.9	9.7	29	17	54	178	4.7	4.5	29	71	45.2	8.5	12.1	7.8	25	54	22

Note. f = female; m = male; prim. hs. = primary high-school; sec. hs. = secondary high school. Dashes indicate cases where the respective organization detained from providing information about the respective variable.

(Heinitz & Rowold, 2007) was utilized. In several empirical studies, this version demonstrated adequate levels of internal consistency estimates per scales, as well as adequate levels of factorial and criterion-oriented validity (Heinitz & Rowold, 2007; Rowold et al., 2009).

### **Preliminary Analyses**

For the MTMM analysis 178 self-ratings of supervisors and 834 follower ratings of their respective followers were matched. For the followers belonging to the same supervisor it was checked if the ratings are sufficiently homogeneous as to be aggregated. The interrater agreement was evaluated using  $r_{wg}$ , ICC(1) and ICC(2) (LeBreton & Senter, 2008). The average  $r_{wg}$  ranged for the seven scales from .66 to .77, with five of the scales above the cut point for high agreement of .70 ( $M = .73$ ). For teams with three or more followers, ICC(1) varied between .32 and .49 ( $M = .41$ ) and ICC(2) between .59 and .75 ( $M = .67$ ), with indices significantly different from zero for all scales ( $F = 2.43 - 3.92$ ; all  $p < .01$ ). Therefore, followers' ratings of the same supervisor showed satisfactory levels of agreement and were aggregated as mean.

The descriptive characteristics for the self-ratings and the aggregated follower ratings are summarized in Table 3. Internal consistencies estimates (Cronbach's alpha) were higher for the follower ratings but given the small number of items per scale (i.e., 3 - 5) still acceptable for the self-ratings as well (Cortina, 1993). As expected, medium to high zero-order intercorrelations were found between the transformational leadership scales as well as between transactional (CR) and transformational leadership, confirming the above described problems of discriminant validity.

### **CFA and Invariance Analyses**

In the first step of confirmatory factor analyses (CFA) the measurement model is tested separately for the follower rating and the self-rating. In the target model each of the seven trait factors is linked to its corresponding items. Due to the high number of indicators, the items were combined into two parcels per scale (Bandalos, 2002; Landis, Beal, & Tesluk, 2000), resulting in 14 measures for the follower ratings and 14 measures for the self-ratings.

Table 3. Study 1: Descriptive statistics, internal consistencies ( $\alpha$ ), and correlations for aggregated follower ratings and self-ratings

	Aggregated follower ratings		Supervisors' self-ratings		Correlations								
	<i>M</i>	<i>SD</i>	$\alpha$	<i>M</i>	<i>SD</i>	$\alpha$	AV	PAM	FAG	HPE	IS	ISN	CR
Articulating a Vision (AV)	3.36	0.75	.93	3.56	0.66	.83		.57**	.52**	.55**	.15*	.64**	.33**
Providing an Appropriate Model (PAM)	3.38	0.73	.83	3.70	0.57	.62	.78**		.45**	.39**	.23**	.44**	.33**
Fostering the Acceptance of Group Goals (FAG)	3.56	0.82	.93	4.00	0.60	.79	.86**	.76**		.37**	.19**	.44**	.39**
High Performance Expectations (HPE)	3.46	0.63	.70	3.45	0.77	.68	.44**	.26**	.28**		.00	.38**	.34**
Individualized Support (IS)	3.91	0.72	.92	4.13	0.65	.62	.70**	.72**	.73**	.06		.19**	.32**
Intellectual Stimulation (ISN)	3.23	0.71	.87	3.60	0.60	.67	.79**	.71**	.69**	.32**	.54**		.37**
Contingent Reward (CR)	3.66	0.81	.92	3.89	0.65	.76	.77**	.71**	.78**	.32**	.77**	.64**	

Note.  $N = 178$ . Correlation coefficients below the diagonal represent correlations for aggregated follower ratings, those above the diagonal represent correlations for self-ratings; \*  $p < .05$ , \*\*  $p < .01$ .

### **MTMM Analysis**

The MTMM analysis was conducted as a confirmatory factor analysis (e.g., Marsh, 1989). The TLI scales were modeled as trait factors, and the two rating perspectives were modeled as method factors. Each indicator loads on its trait factor (one of seven TLI scales) and on the respective method factor (self vs. follower rating). Applying a correlated trait-correlated method (CTCM) model, the trait factors are allowed to correlate, as do the method factors. However, between these two groups of factors no intercorrelations are permitted. The variance of one error was fixed to 0.1 following the guidelines of Chen and colleagues (Chen, Bollen, Paxton, Curran, & Kirkby, 2001). This procedure yielded an overidentified model with 301 degrees of freedom.

Figure 5 illustrates the basic principle underlying the CTCM model. An omnibus test based on Small's statistics (Looney, 1995) revealed a significant violation of the multivariate normality ( $\chi^2 = 164.56$ ,  $df = 56$ ,  $p < .001$ ). The unweighted least squares (ULS) discrepancy function was used as estimation procedure as it is robust (a) for use with data that are not normally distributed, and (b) with relatively small sample sizes (Byrne, 2001; Ximénez, 2006).

Several fit indices were computed to assess model fit. In addition to the  $\chi^2$ -values, the goodness-of-fit (GFI) and the adjusted GFI (AGFI) were calculated. For these indices, a value of .90 as minimum was postulated for appropriate fit (Hu & Bentler, 1995). The standardized root mean square residual (SRMR) was considered as well, with values below .08 indicating good fit (Hu & Bentler, 1999).

Apart from the fit indices that are provided, a CFA-MTMM allows to partition the variance of the indicators into trait, method, and error components (cf. Bagozzi, Youjae, & Phillips, 1991). Squaring the factor loading, their relative portions were calculated.

### **Development of Norms**

For practical use of the TLI, norms are necessary so that the individual scores can be judged against those of a relevant comparison group. Several variables were identified that might affect the average score level of transformational and transactional leadership. For the rating perspective (self vs. follower), the supervisor's gender, the hierarchical level (lower, middle, higher), and the type of organization (profit, nonprofit), it

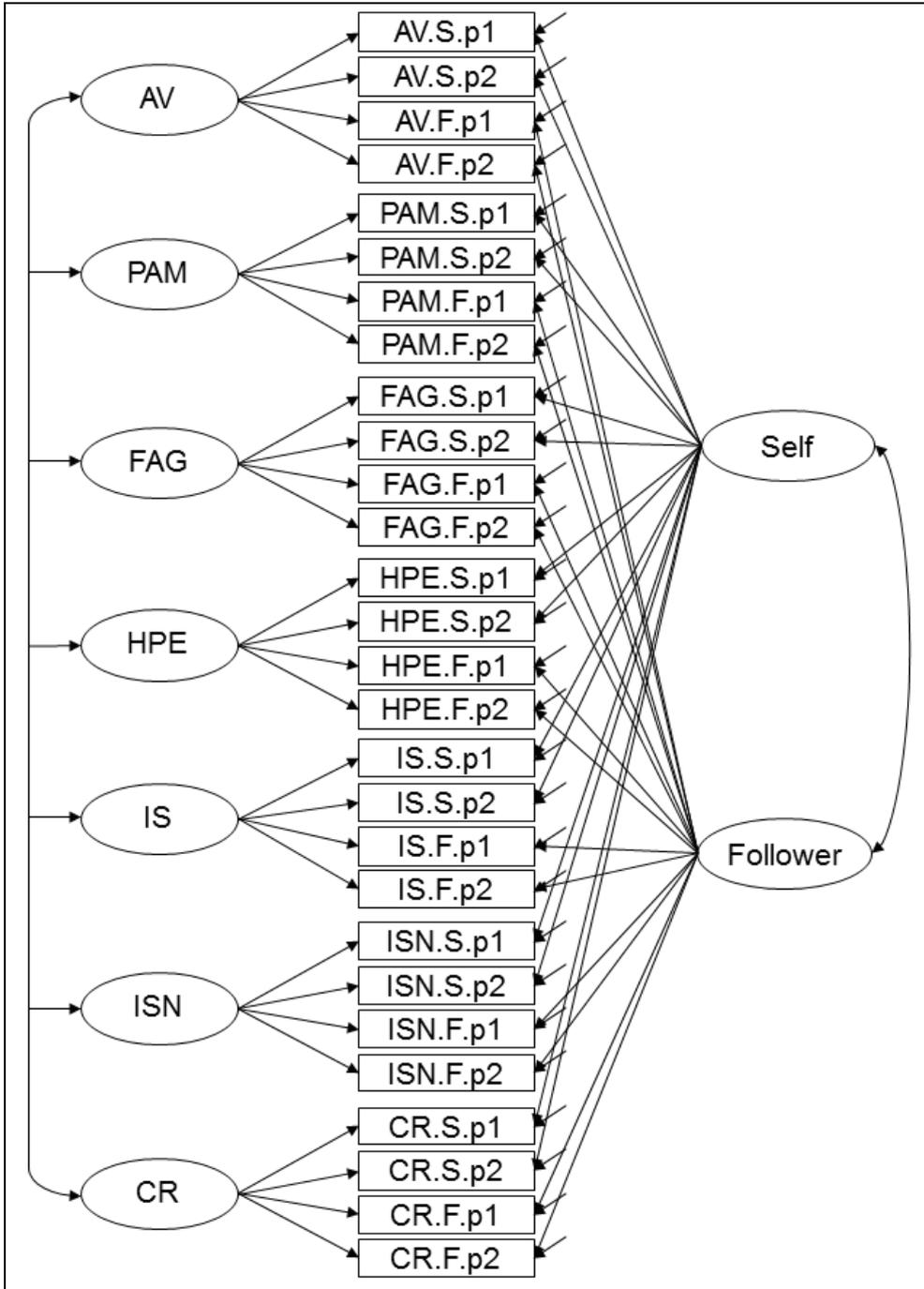


Figure 5. Study 1: CTCM model for TLI scales. AV = Articulating a Vision; PAM = Providing an Appropriate Model; FAG = Fostering the Acceptance of Group Goals; HPE = High Performance Expectations; IS = Individualized Support; ISN = Intellectual Stimulation; CR = Contingent Reward. For each trait-method unit two parcels are included in the model (p1 and p2). For the sake of clarity not all inter-correlations are depicted. The curved lines between the trait factors indicate that all trait factors are allowed to correlate.

was checked via variances of analysis if the respective subgroups show significant differences in the seven TLI scales. Based on these findings, specific norms ( $T$ -values with a mean of 50 and a standard deviation of 10) were developed where significant differences could be observed.

### 3.4 Study 1: Results

#### Factorial Validity and Invariance

Before conducting the MTMM analysis, the factorial validity of the measurement model was tested separately for the self-ratings of supervisors and the ratings of their followers. As described above, two item parcels per scale were used as indicators. The fit indices in Table 4 confirm the measurement model for both perspectives.

In the second step, factorial invariance across perspectives was tested. Within the different forms of factorial invariance, configural invariance is the most basic one (Steenkamp & Baumgartner, 1998; Vandenberg & Lance, 2000). It assumes that the indicators measure the same leadership scale across rating perspectives. Therefore, it postulates that the specified model has the same nonzero and zero factor loadings for both perspectives. The next form of factorial invariance is metric invariance, where the

Table 4. Study 1: Results of confirmatory factor analyses

	$\chi^2$	$df$	GFI	AGFI	SRMR
<i>Step (1) Measurement model</i>					
Follower rating, seven factors	3.199	56	1.00	1.00	0.02
Self-rating, seven factors	9.434	56	0.99	0.98	0.04
<i>Step (2) Invariance analyses (follower vs. self-rating)</i>					
Configural invariance	12.633	112	1.00	0.99	0.02
Metric invariance	55.238	126	0.99	0.98	0.05
<i>Step (3) MTMM analyses</i>					
CTCM	58.938	301	0.99	0.98	0.05

*Note.* GFI = goodness-of-fit index, AGFI = adjusted goodness-of-fit index, SRMR = standardized root mean square residual.

factor loadings are required to have the same loadings across rating perspectives. The multigroup CFA revealed a good model fit in both steps of the invariance analyses (Table 4), confirming the configural and the metric invariance. In sum, these results give strong support for the applicability of the MTMM analysis to the present data.

### **MTMM Analysis**

The MTMM analysis itself was modeled as CTCM and revealed very good fit indices, GFI = .99, AGFI = .98, SRMR = .05 (Table 4). Further analyses of the model gave insight into factor loadings and the various variance sources. As summarized in Table 5, for each indicator the proportions of variance that were due to trait, method, and error were calculated by squaring the factor loadings. As numerous indicators had high loadings on the method factors, strong method effects could be observed. Averaged across the indicators, a considerable portion of their variance (45 %, see last row of Table 5) was explained by the method of self versus follower rating.

The correlations between the latent trait variables (i.e., leadership constructs) were used to explore the discriminant validity of the TLI scales (Table 6). As a result of the substantial method effects, dramatical changes could be observed comparing these latent correlations with the observed ones (Table 2). Within one rating perspective, the zero-order correlations reached on average a high level (Cohen, Cohen, West, & Aiken, 2002), indicating the lack of discriminant validity. The six subscales of transformational leadership showed an average correlation of mean  $|r| = .62$  for follower ratings and mean  $|r| = .38$  for self-ratings, respectively. Between the transformational subscales and transactional leadership, an average correlation of mean  $|r| = .69$  and mean  $|r| = .35$  could be observed for follower and self-ratings, respectively. In total, for all seven TLI scales, the average correlations equaled mean  $|r| = .64$  and mean  $|r| = .37$ , respectively.

However, controlling for the method factors, the correlations decreased to a small to medium level. Within the transformational subscales, the mean latent correlation equaled mean  $|r_{\text{latent}}| = .19$ . Between these subscales and transactional leadership, an average latent correlation of mean  $|r_{\text{latent}}| = .21$  could be identified. Finally, the total average latent correlation between the seven subscales was calculated at mean  $|r_{\text{latent}}| = .20$ . The latent method factors of self and follower rating showed a small latent correlation of  $r_{\text{latent}} = .22$  (Table 6).

Table 5. Study 1: Sources of variances in the CTCM model for each indicator (for parcel 1 / parcel 2, respectively)

	Trait	Method	Error
<i>Follower rating</i>			
Articulating a Vision	.15 / .09	.77 / .78	.05 / .08
Providing an Appropriate Model	.34 / .05	.58 / .72	.04 / .16
Fostering the Acceptance of Group Goals	.13 / .22	.71 / .77	.12 / .01
High Performance Expectations	.36 / .28	.07 / .08	.26 / .43
Individualized Support	.02 / .02	.67 / .66	.17 / .17
Intellectual Stimulation	.25 / .32	.53 / .40	.13 / .17
Contingent Reward	.00 / .00	.81 / .71	.12 / .22
<i>Self-rating</i>			
Articulating a Vision	.13 / .19	.58 / .47	.15 / .15
Providing an Appropriate Model	.00 / .00	.46 / .24	.20 / .40
Fostering the Acceptance of Group Goals	.05 / .09	.43 / .39	.24 / .21
High Performance Expectations	.37 / .13	.24 / .15	.25 / .74
Individualized Support	.48 / .59	.06 / .10	.25 / .15
Intellectual Stimulation	.00 / .01	.36 / .47	.24 / .33
Contingent Reward	.67 / .14	.35 / .16	.10 / .24
Mean	.18	.45	.21

Table 6. Study 1: Estimated correlations among latent factors

	AV	PAM	FAG	HPE	IS	ISN	CR	SR	FR
<i>Trait factors</i>									
Articulating a Vision (AV)									
Providing an Appropriate Model (PAM)	-.05								
Fostering the Acceptance of Group Goals (FAG)	.27	.06							
High Performance Expectations (HPE)	-.53	.08	-.01						
Individualized Support (IS)	-.23	-.06	-.22	.29					
Intellectual Stimulation (ISN)	.32	.35	.09	-.06	-.21				
Contingent Reward (CR)	.24	.14	.24	.09	-.31	.24			
<i>Method factors</i>									
Self-rating (SR)	-	-	-	-	-	-	-	-	-
Follower rating (FR)	-	-	-	-	-	-	-	-	.22

*Note.* As the MTMM was conducted as correlated trait-correlated method model, correlations are allowed within the two groups of factors but not between them.

### Development of Norms

First, the descriptive statistics of the seven TLI scales were examined for the total sample (Table 7). Absolute values for skewness varied among the scales for follower and self-ratings between 0.10 and 0.88 and between 0.17 and 0.66, respectively. Those for kurtosis ranged from 0.32 to 0.48 and from 0.02 to 0.50, respectively. As none of the values indicated a substantial deviance from a normal distribution (Muthén & Kaplan, 1985), the TLI scales can be regarded as normally distributed. The internal consistencies (Cronbach's  $\alpha$ ; Table 7) of the seven TLI scales supported the notion that transformational and transactional leadership can be assessed with acceptable levels of reliability (.68 - .90 for follower ratings and .62 - .83 for self-ratings).

Table 7. Study 1: Descriptive statistics and Cronbach's  $\alpha$  for TLI scales in norm samples

	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	$\alpha$
<i>Follower ratings (N = 834)</i>					
Articulating a Vision	3.30	0.88	-0.38	-0.33	.89
Providing an Appropriate Model	3.30	0.96	-0.38	-0.38	.82
Fostering the Acceptance of Group Goals	3.49	0.98	-0.52	-0.32	.90
High Performance Expectations	3.48	0.82	-0.10	-0.48	.68
Individualized Support	3.76	0.95	-0.88	0.38	.89
Intellectual Stimulation	3.16	0.94	-0.19	-0.41	.85
Contingent Reward	3.55	1.04	-0.53	-0.48	.89
<i>Self-ratings (N = 178)</i>					
Articulating a Vision	3.56	0.66	-0.34	0.05	.83
Providing an Appropriate Model	3.70	0.57	-0.23	0.23	.62
Fostering the Acceptance of Group Goals	4.00	0.60	-0.48	-0.02	.79
High Performance Expectations	3.45	0.77	-0.27	-0.27	.68
Individualized Support	4.13	0.65	-0.63	-0.50	.62
Intellectual Stimulation	3.60	0.60	-0.17	-0.41	.67
Contingent Reward	3.89	0.65	-0.66	0.26	.76

In order to identify those variables that have significant effects on the TLI scales, group means were compared for rating perspective (follower vs. self-rating), supervisors' gender, the hierarchical level (lower, middle, higher), and type of organization (profit vs. nonprofit). As expected, the average TLI scores were significantly higher for the self-ratings than for the follower ratings, except for High Performance Expectations where no significant difference could be observed (Table 8). For the individual and organizational variables, only very few significant differences could be found between the subgroups of gender, hierarchical level, and type of organization. Therefore, specific norms were developed for self versus follower ratings, but not for any of the other subgroups (see Table 15 in Appendix A: Norms for the German TLI).

### **3.5 Study 1: Discussion**

The results of the present study should be discussed with two different foci: On the one hand, focusing on the instrument that was used, the TLI, several implications can be described. Furthermore, norms were provided that enable the application of the German version in practical issues and the interpretation of individual results. On the other hand, the results can be regarded in terms of their theoretical implications for the transformational/transactional leadership theory. Limitations of this study and suggestions for a future research agenda are discussed within the two paragraphs.

#### **Implications for Leadership Theory**

For the first time in leadership research, scales measuring aspects of the theoretically discrete constructs of transformational and transactional leadership could be discriminated empirically. This outcome could be achieved although the subscales of transformational and transactional leadership showed considerable zero-order correlations in this study, corresponding to previous findings. Utilizing the CFA-MTMM methodology to analyze self and follower ratings, substantive method effects could be observed. These method effects were identified as source of shared variance between the leadership constructs that has limited their discriminate validity. Controlling for the method effects, the correlations between the scales decreased considerably, yielding discriminant leadership constructs.

As a first limitation of the study, it should be pointed out that the reduction of correlations was achieved on the level of leadership scales. A striking evidence for the con-

Table 8. Study 1: Comparisons of means for groups, divided according to rating perspective, supervisor's gender, hierarchical level, and type of organization

	N	AV		PAM		FAG		HPE		IS		ISN		CR	
		M	SD												
Rating perspective	834	3.30	0.88	3.30	0.96	3.49	0.98	3.48	0.82	3.76	0.95	3.16	0.94	3.55	1.04
Follower rating	178	3.56	0.66	3.70	0.57	4.00	0.60	3.45	0.77	4.13	0.65	3.60	0.60	3.89	0.65
Self-rating		13.15**		28.37**		44.89**		0.14		24.18**		36.08**		16.97**	
<i>F</i> (1, 1010)															
<i>Follower rating (N = 834)</i>															
Supervisor's gender	234	3.23	0.96	3.27	1.03	3.54	1.04	3.46	0.74	3.84	0.98	3.09	0.97	3.65	1.03
Female	503	3.37	0.82	3.38	0.90	3.56	0.89	3.51	0.85	3.84	0.84	3.16	0.88	3.60	0.98
Male		4.42*		1.98		0.07		0.62		0.01		0.82		0.36	
<i>F</i> (1, 735)															
Hierarchical level of supervisor	65	3.31	0.74	3.37	0.76	3.70	0.81	3.25	0.68	3.83	0.80	3.24	0.88	3.71	0.91
Lower	157	3.27	0.77	3.41	0.95	3.58	0.86	3.35	0.79	3.97	0.83	3.11	0.86	3.69	0.98
Middle	103	3.55	0.75	3.62	0.86	3.52	0.81	3.86	0.85	3.85	0.81	3.23	0.80	3.65	0.95
Higher		4.60*		2.18		0.93		17.11**		1.02		0.87		0.11	
<i>F</i> (2, 322)															
Type of organization	396	3.27	0.97	3.23	1.00	3.42	1.08	3.49	0.81	3.74	1.03	3.21	1.03	3.54	1.11
Profit	438	3.34	0.80	3.36	0.91	3.55	0.87	3.47	0.83	3.79	0.87	3.11	0.84	3.57	0.97
Nonprofit		1.23		4.13*		3.53		0.04		0.55		2.32		0.19	
<i>F</i> (1, 832)															
<i>Self-rating (N = 178)</i>															
Supervisor's gender	48	3.70	0.64	3.76	0.53	4.12	0.53	3.55	0.75	4.22	0.57	3.67	0.59	4.04	0.58
Female	118	3.53	0.65	3.68	0.56	3.98	0.60	3.43	0.75	4.11	0.67	3.58	0.59	3.84	0.68
Male		2.20		0.65		1.90		0.89		1.11		0.79		3.22	
<i>F</i> (1, 164)															
Hierarchical level of supervisor	17	3.39	0.73	3.57	0.50	3.81	0.70	3.26	0.81	3.88	0.72	3.39	0.52	3.59	0.51
Lower	37	3.28	0.70	3.66	0.65	4.00	0.55	3.22	0.73	4.09	0.71	3.46	0.53	3.86	0.70
Middle	15	3.79	0.39	3.76	0.60	3.87	0.65	3.64	0.67	4.13	0.51	3.89	0.51	3.85	0.54
Higher		3.17*		0.38		0.65		1.86		0.70		4.45*		1.17	
<i>F</i> (2, 66)															
Type of organization	98	3.63	0.66	3.77	0.53	4.00	0.61	3.59	0.76	4.16	0.66	3.63	0.62	3.91	0.69
Profit	80	3.47	0.65	3.61	0.60	4.01	0.58	3.28	0.74	4.10	0.64	3.57	0.57	3.86	0.60
Nonprofit		2.63		3.59		0.01		7.49*		0.37		0.37		0.24	
<i>F</i> (1, 176)															

Note. AV = Articulating a Vision; PAM = Providing an Appropriate Model; FAG = Fostering the Acceptance of Group Goals; HPE = High Performance Expectations; IS = Individualized Support; ISN = Intellectual Stimulation; CR = Contingent Reward; \*  $p < .05$ , \*\*  $p < .01$ .

struct validity of transformational and transactional leadership would require at least two further steps: First, within the two constructs, convergent validity has to be shown for the respective subscales. However, as transactional leadership in the TLI only consists of one scale, Contingent Reward, the conclusions are strictly speaking limited to this facet. Next, the results have to be replicated with other samples and with other instruments. In particular, it should be explored whether the scales of transformational and transactional leadership of the MLQ could be separated via MTMM analyses. It has to be examined carefully if the problems concerning its factorial structure could also be alleviated in this manner. Furthermore, replicating the results with other instruments could help to evaluate to what extent the present results might have been influenced by the item-parcel assignments within the already short TLI scales.

Before explicating some further aspects for future research topics, some implications of the results should be described. Controlling for method effects in a MTMM analysis yielded differentiable leadership constructs. As consequence for the theory of transformational and transactional leadership, this finding can at last elucidate why the theoretically discrete constructs remain to show substantial correlations. The presented procedures and results show why such observed zero-order correlations do not inevitably menace the discriminant validity of the constructs. Leadership researchers thus can now have more confidence in the construct validity of the transformational/transactional leadership theory. As implication for their future research work, it can be recommended to use several rating perspectives in order to be able to control for method effects. Practitioners frequently heed this advice already by collecting 360-degree ratings from different perspectives and comparing these ratings for the individual leaders.

Implementing such a multisource design in a research context, the present study yielded discriminant leadership constructs. Future research could build on and extend this kind of methodological approach in at least three ways: First, other rating perspectives should be regarded and analyzed in MTMM studies, for example peer ratings and ratings from the supervisor of the leader in focus. In this way, the unique effects of the different perspectives could be analyzed. Second, as for the perspectives, the differences between the latent traits (Table 5) could be further analyzed – for example, to what extent are the different scales influenced by the different perspectives. Third, the relationships of latent (i.e., multisource variance controlled for) transformational and transac-

tional leadership constructs with other individual or organizational variables can be analyzed. For example, the contribution of these latent constructs to the prediction of individual outcomes (e.g., affective commitment) and objective performance data (e.g., branch-level profit) could be investigated: Do these latent constructs show lower correlations to subjective satisfaction measures as the common source variance is controlled for? Will latent leadership constructs contribute more or less to the prediction of objective data if the effects of the specific perspectives are not an issue any more? Research questions like these are addressed in Study 3. Additionally, the incremental validities of the leadership constructs could be specified more reliably.

### **Implications for the TLI**

Concerning the TLI, its factorial structure was confirmed again, replicating prior research (e.g., Heinitz & Rowold, 2007). However, the present study went beyond prior research by providing evidence for its factorial validity for the two perspectives of self and follower ratings. Also, factorial invariance of these perspectives was supported for the first time.

In contrast to their invariant structure, self and follower ratings showed significant differences in average score level. In accordance with previous findings, supervisors evaluate their own leadership behavior more favorable than do their respective followers. The TLI scores are thus higher for the self-rating than for the follower rating, indicating the demand for specific norms for the two rating perspectives. The supervisor's gender had no significant effect on the TLI scores, nor did the hierarchical level, nor the type of organization (public vs. private). As this lack of significance might partly be due to the limited sample sizes within subgroups, the observed differences are described with respect to their effect sizes and in the light of previous findings.

Concerning follower ratings, at least slightly higher levels of transformational leadership were expected for female supervisors, particularly for Individualized Support (Eagly et al., 2003). Apart from sample size, in this study, female and male leaders did not show any difference at all in their followers' ratings of Individualized Support ( $M = 3.84$  for both groups, Table 8). For the other scales as well, no gender differences reached the level of a small effect size (Cohen, 1988).

For leaders at lower hierarchical levels, the meta-analysis of Lowe et al. (1996) revealed higher scores of transformational leadership although the authors expected the reverse. In the present data, the follower ratings increased with the hierarchical level of the supervisor for some scales and decreased for others. For Individualized Support, the construct for which Lowe et al. (1996) found the greatest effect, almost no differences could be observed (Table 8).

For the impact of the type of organization on the amount of transformational leadership, it was argued that within public organizations, bureaucratic structures may limit transformational leadership behavior in comparison to private companies. While Lowe et al. (1996) found – contrary to the expectations – greater mean scores of transformational leadership in public organizations, the present data showed hardly any differences.

In sum, the group comparisons of the follower ratings revealed fewer differences than expected. Future research should clarify which context or sampling factors moderate the occurrence and magnitude of the differences (for a detailed discussion on possible context factors and psychological mechanisms see Antonakis et al., 2003; Eagly et al., 2003; Lowe et al., 1996). For this study, the samples themselves and the selection procedure of leaders and their followers might have played a role.

For the self-ratings of the supervisors, greater differences could be observed between the subgroups of the supervisor's gender, hierarchical level, and type of organization. The differences did not reach a level of significance as the sample sizes were too small. For small effects ( $d = .20$ ), an a priori power analysis (Faul, Erdfelder, Lang, & Buchner, 2007) yielded appropriate sample sizes of  $N = 620$  and  $858$  for the common levels of power of .80 and .90, respectively. Given the follower perspective as common way of leadership assessment, the present results for the self-ratings cannot be contrasted with findings of systematic group comparisons or meta-analyses. Together with the small sample size, they should, therefore, be regarded as first step toward detailed analyses of self-rated transformational leadership in future research.

As no reliable group differences could be found, specific norms were developed only for the two rating perspectives. These norms allow practitioners to use the TLI in organizational settings and to give individual feedback to supervisors who described

their own behavior and/or who were described by their followers. However, as norms for the German TLI were developed for the first time, they should be used with caution (for norm tables and instructions for the application of the norms see Appendix A: Norms for the German TLI).

### **Conclusion**

Even after more than two decades of research on the transactional/transformational leadership paradigm, the straight consideration of different rating perspectives allowed for substantial progress in theory and practice: According to the results of this study, these two crucial leadership constructs can be differentiated empirically. Moreover, the German TLI shows an invariant factor structure across rating perspectives, and finally, its application, including the norms, enables practitioners to measure transactional and transformational in individual assessments via self and follower ratings.

## 4. Study 2 and Study 3: A Multisource Mediator Model of Leadership Effectiveness

### 4.1 Study 2 and Study 3: Introduction

What makes a leader effective? Throughout the long history of leadership research, scientists and practitioners have determined several characteristics of the leader, the situation, the followers, and the organization that influence the outcomes of leadership processes. For the last three decades, the behavior paradigm of leadership has been in the focus of leadership research and practice. Among these behavioral leadership theories, the full-range leadership theory (Bass & Avolio, 1994), building on transformational and transactional leadership (Bass, 1985), is at the cutting edge (Judge & Bono, 2000). Empirical evidence from a multitude of studies and several meta-analyses confirmed that transformational leader behaviors are valid predictors of leadership effectiveness (e.g., Bass et al., 2003; Judge & Piccolo, 2004; Lowe et al., 1996). Thus, what makes a leader *transformational*?

Personality traits are defined as stable characteristics of a person that influence behavior across situations. For this reason, traits have been in demand for predicting effective, particularly transformational leadership behavior. Indeed, encouraging meta-analytical findings have shown that personality traits like extraversion can predict leadership emergence and leadership effectiveness (Ensari, Riggio, Christian, & Carlsaw, 2011; Judge et al., 2002). Likewise, assumptions have been derived that link transformational leadership with personality traits, starting with Bass (1998): “When it comes to predicting transformational leadership and its components, there is no shortage of personality expectations” (p. 122). Disappointing though, “however, the empirical support has been spotty” (ibid.). The latest meta-analysis of Bono and Judge (2004) came to a similar conclusion, “overall, our results linking personality with ratings of transformational and transactional leadership behaviors were weak” (p. 906), as the Big Five personality factors explained only 9 % of the variability in transformational leadership.

I argue that previous findings like these on the dispositional basis of transformational leadership are of limited validity because the potential strength of correlations was restricted in two ways. First, method effects have presumably attenuated the ob-

served correlations because the dissimilar methods of self and follower ratings were combined. Second, the framework of the five-factor model (FFM) is in part too broad to detect relationships with specific leadership behaviors. To overcome these limitations, Study 2 addresses these issues as follows. First, by statistically controlling for rater source effects, reliable estimates of the relationship between transformational leadership and pivotal personality traits can be revealed. This is achieved by confirmatory factor analyses (CFA) of multitrait-multimethod (MTMM) data. That is to say, rating data of personality traits and leadership behavior are collected with two different methods, i.e. self and follower ratings. These data are analyzed via structural equation models that allow for differentiating the variance components of the data that are either due the constructs of personality and leadership or to the measurement methods. Second, I depart from the five-factor model in terms of the factors' broadness and with regard to their measurement. That is to say, I draw partly on personality traits that are less broad than the Big Five, and I assess personality traits by work-related scales.

Study 3 builds on the findings of Study 2 and, at the same time, goes beyond these advances. The relationships that are identified between personality traits and transformational leadership in Study 2 are integrated into a comprehensive mediator model of leadership effectiveness in Study 3. Several mediator models of leadership effectiveness have been developed recently (cf. Antonakis et al., 2012). They similarly all postulate a range of leaders' individual differences as distal predictors and leadership behaviors as proximal predictors of effectiveness (Antonakis, 2011; DeRue et al., 2011; Hogan & Kaiser, 2005; Judge & Long, 2012; Zaccaro et al., 2004). This means that leader behaviors like transformational leadership are assumed to mediate the relationship between personality traits, such as leaders' individual characteristics, and measures of leadership effectiveness. Study 3 presents and evaluates a mediator model that is in accordance with this common ground. In doing so, it fosters the development of an integrative leadership theory (Avolio, 2007), which combines existing research on behavioral leadership paradigms and trait-orientated approaches (cf. meta-analyses on the validity of the five-factor model of personality for managers, Barrick & Mount, 1991; Salgado, 1997). In addition to this theoretical contribution, empirical research on the mediator model is substantially enlarged with regard to the following aspects: Firstly, reliable estimates of the relationships between personality traits and transformational

leadership behavior are used that are not distorted by method effects. Next, subjective as well as objective indicators of leadership effectiveness are applied. Finally, the mediator model is empirically tested within a business sample of high external validity.

Chapter 4 is structured in the following way: Firstly, the theoretical background for both studies is depicted (*Chapter 4.2*). To begin with, variants of the mediator model of leadership effectiveness are described, which provides the conceptual framework of the two studies. Previous research on this model produced inconsistent findings. I argue that this is at least in part due to using a combination of different rating sources without controlling for method effects. Consequently, the way in which the different rating sources may have influenced previous findings is illustrated, as well as an approach to overcome these method effects, which is implemented in Study 2. Next, I take a detailed look at the elements of the mediator model, i.e. leadership effectiveness, leadership behavior, and personality traits as direct antecedents of behavior as well as indirect predictors of effectiveness. At this point, a short overview of previous research on the dispositional basis of leadership in general and transformational leadership in particular is provided. Also, I show to what extent the five-factor model as a framework of personality may have attenuated the relationship between personality traits and leadership behaviors, and how I address this case with respect to the substance and the measurement of personality traits. The elements are postulated to be linked according to the mediator model. Thus, hypotheses are presented, which are tested in Study 3. As both studies rely on the same sample, its complete description is presented in the method section of Study 2 (*Chapter 4.3.1*). The procedures applied as well as the results are depicted separately (*Chapter 4.3.2* for Study 2 and *Chapter 4.4.2* for Study 3). Likewise, the results are summarized and discussed, indicating specific limitations and avenues for future research (*Chapter 4.3.3* for Study 2 and *Chapter 4.4.3* for Study 3). Following the discussion of Study 3 (*Chapter 4.4.4*), a general discussion offers a concluding integration of results and points out implications for theory and practice (*Chapter 4.5*).

## 4.2 Study 2 and Study 3: Theoretical Background

### **Basic assumptions of the Mediator Model: Variants and Their Empirical Evaluation**

Recently, some models have been developed that integrate trait and behavioral theories of leadership effectiveness. To give an overview of the current state of research, I outline the most recognized mediator models and, as far as available, results of their empirical tests. It is a common factor across these models that a distinction is made between distal and proximal predictors of leader effectiveness (Antonakis et al., 2012). Distal attributes have an indirect impact on effectiveness, whereas proximal constructs have a more direct effect. As Hoffman, Maldagen-Youngjohn and Lyons (2011) pointed out, a variety of terms was used to name these classes of predictors, i.e., distal versus proximal (Zaccaro, 2007), trait-like versus state-like (Hoffman et al., 2011; Judge & Long, 2012), immutable versus malleable (Day & Zaccaro, 2007), and traits versus skills (Kirkpatrick & Locke, 1991). With regard to the distal predictors, some researchers focus on personality traits and motives, whereas others include cognitive abilities like intelligence, and demographic characteristics like gender or age. With regard to the proximal predictors, previous models differ in the extent of comprising knowledge and skills, behaviors, and ascribed attributes.

A set of comprehensive models that focused on *skills* as proximal predictors was developed by Mumford, Zaccaro and colleagues (Mumford, Zaccaro, Harding, Jacobs, & Fleishman, 2000; Mumford, Zaccaro, Harding, Fleishman, & Reiter-Palmon, 1993; Zaccaro, 2007; Zaccaro et al., 2004). In these skills-based models, leadership behavior and effectiveness rely on a range of skills like expertise, knowledge, social appraisal and problem solving skills, which are postulated to play an essential role in solving leadership problems. According to the models, the acquisition of these skills is in turn strongly influenced by trait-like attributes of leaders like cognitive abilities, personality, motives and values (Kirkpatrick & Locke, 1991). As these models comprise a wide range of distal and proximal predictors of leadership effectiveness, comprehensive empirical tests have been limited to selected parts of them (Borman, Hanson, Oppler, Pulkos, & White, 1993; Chan & Drasgow, 2001; Connelly et al., 2000; Hendricks & Payne, 2007; Ng, Ang, & Chan, 2008; Van Iddekinge et al., 2009).

Lately, Antonakis (2011) has introduced an integrative trait process theory that picks up the skills-based explanation for leadership effectiveness as actuality route. In this ascription-actuality trait theory of leadership, another explanation is added, the ascription route. On this route, individuals emerge as leaders via the ascription of traits that are assumed to predict effectiveness. As outcomes are typically attributed to leaders in charge, the assumption of valid traits becomes self-fulfilling.

In accordance with Antonakis (2011), the recent frameworks of DeRue et al. (2011) and Judge and Long (2012), both postulate that the impact of traits on leadership outcomes is mediated either by leader behavior or by followers' attributions and identification processes. Others, however, focus only on the behavioral route (Hogan & Kaiser, 2005). In line with this, De Rue et al. (2011) tested some of the linkages meta-analytically and revealed support (a) for leader behaviors as key mediator between leader traits and effectiveness and (b) for transformational leadership as the most consistent proximal predictor across outcome criteria.

Some research has been conducted that focused on these elements. On the one hand, emotional intelligence was investigated as a trait-like antecedent of transformational leadership and subsequent effectiveness. However, inconsistent findings were gained regarding the relevance of emotional intelligence. While Lam and O'Higgins (2012) found transformational leadership to fully mediate the relationship between leaders' emotional intelligence and followers' job satisfaction, Brown et al. (2006) could neither support the impact of emotional intelligence on transformational leadership nor on typical outcome measures. Furthermore, Cavazotte, Moreno, and Hickmann (2012) revealed that the direct effect of emotional intelligence on transformational leadership becomes non-significant when ability and personality measures are incorporated in the model. On the other hand, studies investigated the personality traits of the five-factor model as distal predictors of leadership effectiveness.

As the significance of measurement methods is in the center of the present study, two of these works should be mentioned that applied multisource ratings for the assessment of leader traits, behaviors, and outcomes. Lim and Ployhart (2004) found that follower ratings of transformational leadership mediated the relationship between leaders' self-ratings for three of the five FFM personality factors, i.e. extraversion, emotional stability, and (negatively) agreeableness, and supervisor ratings of team performance.

De Hoogh et al. (2005), however, utilizing different rating sources to assess leader personality traits, leader behaviors, and leadership effectiveness, could neither confirm the postulated links between the Big Five factors of personality and transformational leadership nor between transformational leadership and effectiveness.

As these results, particularly the latter, contradict a well-established association, they underline the need to control for method effects due to different rating sources. The concept of method effects, as well as the approach to control for them that is utilized in the present study, is depicted below. Subsequently, a mediator model is formulated that assumes, in accordance with the outlined models (Antonakis, 2011; DeRue et al., 2011; Hogan & Kaiser, 2005; Judge & Long, 2012), transformational leadership to mediate the relationship between leader personality traits and leadership effectiveness.

#### **Methodological Pitfalls in the Mediator Model: Self and Follower Ratings as Measurement Methods**

When different rating sources were used, only weak correlations were found between traits, behaviors, and effectiveness measures. For example, the meta-analysis of Bono and Judge (2004), resulting in small correlations between the five factors of personality and transformational leadership, included only studies in which leadership behaviors were captured by observer ratings. The personality variables, in contrast, were generally self-rated by leaders. As a result of the discussion on common method bias, measuring all variables in a study with self-report questionnaires has become unpopular (Campbell, 1982). At the same time, combining different methods has come more and more into vogue as it reduces method specificity, i.e., systematic error that is associated with a specific method (Eid & Diener, 2006). However, some basic principles are frequently overlooked that deserve closer examination in order to unscramble the dogma of method effects.

*To what extent do different measurement methods influence observed correlations?* Literature on common method bias indicates that correlations between different constructs that were measured with the same method are potentially inflated by common method variance (Pace, 2010; Podsakoff et al., 2003). Consequently, correlations between personality traits and leadership variables that were both assessed with self-reports are suspected of being inflated as are correlations solely based on follower ratings. So far, researchers have addressed this issue by combining two different methods,

typically in terms of self-rated personality measures of the supervisors and leadership ratings of their followers. This policy, however, operates under the premise that avoiding common method biases reveals true correlations. The line of argument that refutes this claim traces back to the seminal work of Campbell and Fiske (1959). They pointed out that “each test [...] is a trait-method unit” (p. 81). In other words, a test score is a composite of effects due to the trait of interest and effects due to the particular method used. As an extension of classical test theory, an observed score  $X_{ij}$  can therefore be described as

$$X_{ij} = T_i + M_j + E_{ij} \quad (1)$$

with  $T_i$  reflecting the  $i$ th true score,  $M_j$  the  $j$ th measurement method, and  $E_{ij}$  the nonsystematic measurement error. Given the traditional assumptions that  $T_i$ ,  $M_j$ , and  $E_{ij}$  are uncorrelated, the variance in  $X_{ij}$  can accordingly be separated into three independent components, trait variance, method variance, and non-systematic error variance. The relative proportion of these components has been subject to empirical studies. This evidence revealed that the amount of method variance varies considerably across constructs (Crampton & Wagner, 1994), with abstract constructs like attitudes and personality measures containing on average 25 % method variance (Cote & Buckley, 1987). A similar proportion was determined for self-reported affect and perceptions at work (Williams et al., 1989). Remarkably, trait variance accounted on average for only 30 % to 48 % of the observed variance. To what extent does this substantial amount of method variance affect the observed relationship between variables?

The observed correlation  $r_{XY}$  between two observed measures  $X$  and  $Y$  that were measured with two different methods  $M_j$  and  $M_{j'}$  can be represented as:

$$r_{XY} = \lambda_{XT_X} \lambda_{YT_Y} \rho_{T_X T_Y} + \lambda_{XM_j} \lambda_{YM_{j'}} \rho_{M_j M_{j'}} \quad (2)$$

where  $\lambda_{XT_X}$  and  $\lambda_{YT_Y}$  represent the reliability indices of  $X$  and  $Y$ , respectively,  $\rho_{T_X T_Y}$  represents the true-score correlation of  $X$  and  $Y$ ,  $\lambda_{XM_j}$  and  $\lambda_{YM_{j'}}$  represent the effects of the methods  $M_j$  and  $M_{j'}$  on  $X$  and  $Y$ , respectively, and  $\rho_{M_j M_{j'}}$  represents the correlation between the methods  $M_j$  and  $M_{j'}$ . The extent to which the observed correlation between the variables  $X$  and  $Y$  equals the true-score correlation of  $X$  and  $Y$  depends on the reliability of the measures, the correlation between the methods, and the extent to which the meth-

ods effect the measurement of  $X$  and  $Y$ . Here the following is applicable: Unsystematic, i.e. random, measurement errors always attenuate the relationship, whereas systematic measurement errors can inflate or deflate the relationship between two measures depending on the correlation between the methods. If the correlation between the methods is higher than the correlation between latent traits<sup>3</sup>, the observed correlation will be inflated. On the other hand, method effects attenuate the observed relationship if the correlation between the methods is lower than the correlation between the latent traits (Cote & Buckley, 1988; Williams & Brown, 1994).

Based on the usual proportions of method variance as reported before (Cote & Buckley, 1988), it can be concluded that even for perfectly correlated variables ( $\rho_{T_x T_y} = 1.00$ ), the observed correlations hardly reach the level of  $r = .50$  due to systematic and random measurement error. On the other hand, similar methods can yield correlation coefficients up to .20, even if the latent traits are completely uncorrelated ( $\rho_{T_x T_y} = .00$ ; Podsakoff et al., 2003). Williams and Brown (1994) further investigated these relations in a simulation study. For latent traits with a correlation of .50, they showed that the value of the observed correlation can range between .14 and .72, depending on the percentage of measurement error, the percentage of method variance, and the correlation between the methods. In particular, the method factor correlation strongly influenced the observed correlation, deflating it by up to 64 % or inflating it by up to 44 %. Therefore, correlations between test scores can be either due to trait similarity or to shared method variance (Campbell & Fiske, 1959).

To the extent that research focuses on traits, the shared method variance represents systematic measurement error. As systematic error variance provides a rival explanation for correlations, it can influence empirical results seriously, and thus, distort the conclusions (Campbell & Fiske, 1959). Consequently, observing weak correlations between two constructs that were measured with different methods should raise the question to what extent the weak correlation is due to a weak correlation of latent traits or to uncorrelated, dissimilar methods. Thus, this question should be addressed whenever

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<sup>3</sup> While Campbell and Fiske (1959) named this part of the observed measure “trait”, others referred to it as “theoretical construct” (Williams & Brown, 1994), “true score” (Lance, Dawson, Birkelbach, & Hoffman, 2010), or otherwise. As I will use *multitrait-multimethod* analyses to determine these parts of my measures, I go along with the trait concept. However, to make clear that I refer to the part of the measure that is neither due to systematic method effects nor to unsystematic measurement error, I use the term “latent trait”.

er small correlations are observed between personality traits and transformational leadership behaviors that were measured with different methods, i.e. self-ratings versus follower ratings.

*To what extent do self and other ratings represent similar methods?* The level of agreement between self and other ratings (i.e., self-other agreement) of performance and leadership measures was subject to extensive research on multisource feedback ratings (e.g., Atwater & Yammarino, 1997; Fleenor et al., 2010). Results of this line of research should be briefly summarized in order to gain an impression of the similarity of self and other ratings.

Focusing on correlations between self and other ratings, two meta-analyses revealed only moderate coefficients for performance ratings. The corrected correlations between self-ratings and ratings from other sources ranged between .29 and .36 (Conway & Huffcutt, 1997; Harris & Schaubroeck, 1988). For self-ratings and subordinate ratings, in particular, only a small correlation was found (.14; Conway & Huffcutt, 1997). Similarly, research on leader-member exchange revealed that leaders' and followers' perceptions of the quality of their relationship typically show only low to moderate levels of convergence, indicating an amount of shared covariance between 10 % and 20 % (Zhou & Schriesheim, 2010).

This lack of agreement was found to generalize across ratings on skills, leadership behaviors, performance, and personality traits (Harris & Schaubroeck, 1988; Tsui & Ohlott, 1988). Altogether, self and other ratings typically correlate between .30 and .60 (Hough & Furnham, 2003), with personal acquaintance increasing self-other agreement (Connolly et al., 2007; Starzyk, Holden, Fabrigar, & MacDonald, 2006). Work colleagues, including subordinates, showed only medium to low acquaintance, resulting in lower levels of self-other agreement compared to other information sources like family members or friends (Connelly & Ones, 2010).

Apart from correlational analyses, the low level of self-other rating agreement becomes visible in two further lines of research. First, self and other ratings show differential and incremental validities in predicting diverse criteria (Connelly & Ones, 2010; Oh & Berry, 2009; Oh et al., 2011; Vazire & Mehl, 2008), representing unique sources of variance. Second, several studies meta-analyzed MTMM matrices in order to determine

the relative proportion of trait and method variance. The proportion of variance that was attributable to methods was considerably higher if raters or rating sources were considered as measurement methods, as for example in multisource performance ratings, than if test forms or occasions of measurement constituted the method factors. It could be observed that particularly the method factors of self and other ratings showed very small correlations (Lance et al., 2008), indicating strong rater source effects.

Thus, surprising or not, self and other ratings turned out to be dissimilar methods in numerous studies and for a range of different constructs. Therefrom, Oh et al. (2011) concluded that it is important to disentangle the validity of constructs from the measurement methods that were used. As pointed out, the small correlation of self and follower ratings compromises the observed correlation between variables that were measured with these different methods. Therefore, there is good reason to control for these method effects when investigating the relationship between personality traits and leadership behavior.

*What procedures are recommended to control for method effects?* When it comes to method effects, common method variance is most frequently discussed. Usually this term stands for the undesirable overestimation of correlations due to common methods. As common raters or common sources appear to be one of the major causes of common method variance, Podsakoff et al. (2003) recommend collecting the measures of predictor and criterion variables from different sources. The typical procedure of measuring personality traits with self-ratings and leadership behavior as follower ratings acts in pursuance of this advice. However, as argued above, dissimilar methods like self and other ratings can substantially attenuate the observed correlation below the true-score correlation. Because heteromethod correlations suffer not only from unsystematic measurement error, as do monomethod correlations, but additionally from systematic method effects, the estimates may even be less accurate than monomethod correlations (Lance, Dawson, Birkelbach, & Hoffman, 2010). With regard to the significance of the observed correlation, monomethod correlations may suffer from a higher probability of a Type-I error while heteromethod correlations may suffer from higher probability of a Type-II error (Conway & Lance, 2010). Hence, the small correlations found between self-rated personality traits and follower ratings of transformational leadership may be due to unsystematic errors and the uncorrelated measurement methods.

If the procedural remedy of collecting multisource rating data is followed, a series of statistical techniques is applicable that control for common method variance (Podsakoff et al., 2003). Among these, the confirmatory factor analysis of multitrait-multimethod data stands out on the strength of several advantages. This technique provides a structural equation model for measures of multiple traits that were obtained using multiple methods. If multiple indicators are modeled for each trait-method unit, the following advantages can be realized.

First, the CFA-MTMM allows for examining the effects of several method factors, e.g., self and other rating. Second, it does not require the direct measurement of the hypothesized method biases, e.g., social desirability, halo, leniency. Third, traits as well as methods are modeled as latent factors. It therefore accounts for unsystematic measurement error and, hence, distinguishes between unsystematic errors, systematic method effects, and trait effects. As all of these elements are modeled, it allows for quantifying the strength of the method effects and for removing them from correlational estimates. The true-score correlation of the two variables  $X$  and  $Y$  can be determined as the correlation between the latent trait factors of  $X$  and  $Y$  (Conway & Lance, 2010). By this means, the CFA-MTMM allows for examining whether the observed correlations are due to method effects or true construct level correlations (Chang, Connelly, & Geeza, 2012). Fourth, the method effects that are modeled by the indicators' paths on method factors can be tested empirically. Fifth, the latent trait and method factors can be linked to other variables (Eid, Lischetzke, & Nussbeck, 2006), e.g., in order to examine their criterion validity. Two disadvantages of the CFA-MTMM technique consist in potential problems with model identification and in ignoring Trait X Method interactions (Podsakoff et al., 2003). Nonetheless, the CFA of MTMM data represents "the most straightforward and powerful approach" (Brannick, Chan, Conway, Lance, & Spector, 2010, p. 414) in order to deal with potential method effects. However, measuring the variables of interest, not only once but with different methods, is time-consuming and costly. In field settings of organizational research, it is frequently even impractical. If those data are obtainable, collecting them from different sources and applying CFA-MTMM procedures to analyze them is recommended (Podsakoff et al., 2003). Recent studies applied this procedure on self and observer ratings, and revealed encouraging findings on the structure and validity of personality traits (Chang et al., 2012; Colbert et al., 2012).

Therefore, in Study 2, self and follower ratings of personality traits and transformational leadership behavior are collected. A CFA-MTMM is applied to these data in order to reveal the true-score correlation between personality traits and leadership behavior. Furthermore, individual latent factor scores are saved. In Study 3, these latent factor scores are included in a comprehensive mediator model of leadership effectiveness. In this way, the mediator model can be empirically evaluated by simultaneously controlling for method effects.

### **Elements of the Mediator Model: Derivation of Hypotheses**

As described above, recent mediator models refer to transformational leadership behavior as the key mediator between personality traits and leadership effectiveness (DeRue et al., 2011). Based on these conceptual advances and on existing research on these models, a specific mediator model is developed (Figure 6) and will be evaluated through tests of a series of hypotheses that postulate the individual paths. To derive these hypotheses in the following, the different elements of the model as well as their interrelationships are described from right to left.

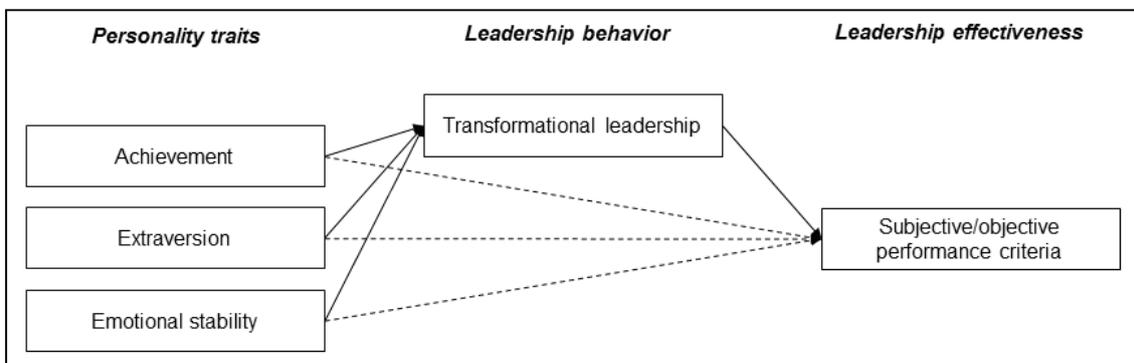


Figure 6. Study 2 and Study 3: Mediator model of leadership effectiveness. The direct effects of personality traits on performance criteria (dotted lines) were not postulated but modeled to test for full vs. partial mediation.

**Leadership effectiveness.** Traditionally, measures of leadership effectiveness are divided into subjective and objective indicators. Subjective performance criteria span for example followers' ratings of satisfaction with the leader, overall job satisfaction, or willingness to exert extra effort. Objective performance criteria, on the other hand, re-

semble “hard” outcomes as group or organization performance. There is a debate about the extent to which subjective, follower related outcomes, e.g., follower motivation and attitudes, really measure leadership effectiveness (Hoffman et al., 2011; Morgeson et al., 2007a). For example, leader emergence as one of these subjective criteria was criticized because research on “how leaders are regarded [...] tells us little about leading effective teams” (Kaiser, Hogan, & Craig, 2008, p. 102). Judge et al. (2009) argue that both subjective and objective measures of leadership effectiveness are relevant and important perspectives, and that each has its own advantages and drawbacks. Typically, subjective measures are suspected of being influenced by rater effects, e.g., interpersonal liking (Brown & Keeping, 2005; Tsui & Barry, 1986). Objective measures, on the other hand, have their own problems, including contamination, because the unit’s financial success, for instance, depends on many factors which are unrelated to the effectiveness of leader behavior (Judge & Long, 2012). Therefore, at best, studies should include diverging criteria (DeRue et al., 2011; Yukl, 2009), subjective follower ratings (Hoffman et al., 2011) as well as objective outcome measures, and particularly with respect to objective indicators, they should ensure proper time lags between predictor and criterion (Judge & Long, 2012). Consequently, the present study incorporates one subjective criterion, i.e. followers’ ratings of job satisfaction, and one objective outcome, i.e. sales profit measured four months after the leadership ratings.

**Leadership behavior.** Leader behaviors include “behaviors, states, and styles displayed when making decisions, executing strategies, and interpersonally connecting with others” (Judge & Long, 2012, p. 197). After Stogdill’s seminal work on leader traits (Stogdill, 1948) had disappointed researchers in their ambition to uncover dispositional attributes that differentiate effective from ineffective leaders, behavioral approaches emerged. The first scientific leadership studies that focused on behavioral indicators of effective leadership took place as Ohio State studies (Stogdill, 1950) and yielded two factors, i.e. initiating structure and consideration. Although these categories of leadership behaviors have decreasingly received attention in leadership research over the decades, they have been meta-analytically connected to important leadership outcomes recently (Judge et al., 2004).

Today, the full-range leadership theory (Bass & Avolio, 1994) provides the most widely used taxonomy for describing leader behaviors. It builds on the paradigm of

transformational and transactional leadership. Burns (1978) and Bass (1985) originally described transformational leadership as distinct from transactional leadership. Instead of appealing to individual needs and *transacting* rewards contingent on achieving agreed outcomes, transformational leaders motivate their followers to perform beyond expectations via an inspiring vision, strong identification processes, and individual support. According to Podsakoff and colleagues, transformational leadership is multidimensionally described along six key behaviors (Articulating a Vision, Providing an Appropriate Model, Fostering the Acceptance of Group Goals, High Performance Expectations, Individualized Support, Intellectual Stimulation; Podsakoff et al., 1990; Podsakoff et al., 1996) that share substantial overlap (Heinitz & Rowold, 2007) with the four behavioral dimensions constituted by Bass (Idealized Influence, Inspirational Motivation, Intellectual Stimulation, Individualized Consideration; Bass, 1985). By means of these behaviors, transformational leaders point out the organizational relevance of task outcomes, *transform* their followers' values and attitudes, and thus, *lead* them to exceed their individual goals for the benefit of the team and for the whole organization. In accordance with the theory's assumptions, transformational leader behaviors proved to augment the effects of transactional leadership on subjective and objective performance measures (Judge & Piccolo, 2004; Lowe et al., 1996), as for example, followers' job satisfaction and motivation (Judge & Piccolo, 2004), their affective commitment to the organization (Meyer et al., 2002), their organizational citizenship behavior (Podsakoff, 2000), creativity (Shin & Zhou, 2003), and sales performance (MacKenzie et al., 2001).

Within the mediator model of leadership effectiveness, the findings on the validity of transformational leadership were inconsistent when method effects of different ratings sources were not controlled for (De Hoogh et al., 2005; Lim & Ployhart, 2004). It follows that research is needed that analyzes the impact of transformational leadership on subjective and objective outcomes and simultaneously controls for systematic measurement variances. Drawing on the motivational processes that establish the effectiveness of transformational leadership, I postulate with regard to the mediator model:

*H1: Transformational leadership will be positively related to subjective and objective measures of leadership effectiveness.*

Despite its broad validation concerning organizational effectiveness criteria, some aspects within and around the full-range leadership theory deserve scientific clarification (cf. Antonakis & House, 2002; Yukl, 2006). Among them, the dispositional basis of transformational leadership is still the object of lively discussions and research efforts.

***Personality traits as distal predictors of effectiveness: Direct effects on leadership behavior.*** The amount of variance in leadership behavior as well as in leadership effectiveness that is due to individual traits has been controversially debated for decades (cf. Day & Zaccaro, 2007). The great man theory (Carlyle, 1907) forms a first highlight among the empirical approaches, determining traits that differentiate effective from ineffective leaders. Forty years later, Stogdill (1948) already included 124 trait studies in his influential review. He identified some relevant traits, like intelligence, initiative, persistence, and self-confidence, but failed to support his basic premise of an irremissible set of traits for effective leaders. The lack of consistency and Stogdill's conclusion, however, were overly harshly interpreted (cf. Lord et al., 1986; Zaccaro et al., 2004) and misunderstood (cf. House & Aditya, 1997). In fact, Stogdill's result that "leadership is not a matter [...] of the mere possession of some combination of traits" (p. 66) heralded a moratorium on the study of leadership traits (cf. Antonakis & House, 2002) and the promotion of behavioral and situational approaches.

The revitalization of leader trait perspectives began in the 1980s with the statistical reexamination of the early leader trait reviews (Zaccaro et al., 2004). By this means, Lord et al. (1986) worked out that "personality traits are associated with leadership perceptions to a higher degree and more consistently than the popular literature indicates" (p. 407). Building on rotation design studies, the proportion of trait-based variance in leadership ratings was estimated at between 49 % and 82 % (Kenny & Zaccaro, 1983; Zaccaro et al., 1991). In addition to personality, leader attributes in this line of research include further individual differences such as cognitive abilities, skills, and expertise (cf. Kirkpatrick & Locke, 1991). However, the hope was renewed that "effective leaders may be identifiable at a relatively early age on the basis of their personality profile" (House, Spangler, & Woycke, 1991, p. 391). The meta-analysis of Judge et al. (2002) focused on the Big Five personality factors as predictors of leadership. Revealing a multiple correlation of .48, the study gave substantial support for the relationship between personality and leadership behavior.

Although the currently predominant approach of transformational leadership was conceived as behavioral paradigm, its dispositional basis is being continuously challenged, and thus, the question “Are transformational leaders born or made?” (Judge & Bono, 2000, p. 752) remains unanswered. In particular, the charismatic component of transformational leadership, which is occasionally used synonymously (House & Shamir, 1993), refers to a trait quality and therefore, it also contributed to the resurgence of trait approaches (Zaccaro et al., 2004). At the very least, it suggests that some people are more likely to exhibit transformational leadership behaviors than others. Research efforts have consequently been made to explore the relationships between personality traits and transformational leadership (e.g., Avolio et al., 1996; Davies, 2004; House et al., 1991; Judge & Bono, 2000). Bono and Judge (2004) reviewed this research meta-analytically, taking the five-factor model as personality framework. Extraversion ( $\rho = .24$ ) and neuroticism ( $\rho = -.17$ ) crystallized as the strongest and most consistent correlates of transformational leadership. In total, however, Bono and Judge were disappointed with the small trait-based variance proportion in leadership ratings ( $R^2 = .09$ ). Discussing these results, they challenged the five-factor model as one possible explanation for the weak associations.

Despite its broad validation and its merit in meta-analytical projects, the five-factor model of personality has been criticized as an explanatory framework (Block, 1995; Hough, 1992). Part of these critiques is related to the bandwidth-fidelity dilemma (Cronbach & Gleser, 1965). Although the use of broad versus narrow personality traits is still debated for personnel selection purposes, a consensus emerged that in personnel research, predictors should match criteria in terms of specificity (Ones & Viswesvaran, 1996; Schneider, Hough, & Dunnette, 1996). That is to say, broad traits like the five factors are preferable in terms of predicting broad criteria like overall job performance (Ones & Viswesvaran, 1996), while narrow facets outperform broad traits in predicting specific behaviors (Paunonen & Ashton, 2001). In accordance with this consensus, I argue that at least some of the five factors might be too broad to determine the dispositional basis of one specific class of behaviors, i.e., transformational leadership (Bono & Judge, 2004). With regard to work-related criteria, it was especially the factor conscientiousness that caused concern as it confounds the two aspects of achievement and dependability (Hough, 1992, Hough, 1997; Hough & Furnham, 2003; Moon, 2001;

Schneider et al., 1996), or even a higher number of facets (Costa & McCrae, 1995; Dudley, Orvis, Lebiecki, & Cortina, 2006; Hogan & Ones, 1997; Saucier & Ostendorf, 1999; Stewart, 1999). Achievement turned out to be an especially valid facet of conscientiousness, particularly with respect to criteria such as managerial task performance (Dudley et al., 2006) and career success (Sutin, Costa, Miech, & Eaton, 2009), and in contrast to other facets like order and cautiousness (Ones et al., 2007). Confounding two or more facets with differential validities might have masked the overall relationship between conscientiousness and performance criteria as well as between conscientiousness and transformational leadership. Therefore, the present study capitalizes on one of the two facets of conscientiousness, namely achievement, to predict transformational leadership behavior.

*Achievement.* According to the FRLT, transformational leadership demands the leader to get strongly involved with active leadership behaviors towards the followers. Compared to laissez-faire and to transactional leadership, it is characterized by the highest level of leader's activity. Individuals with a high level of achievement striving have a strong sense of direction and are willing to work hard to achieve their goals (Costa & McCrae, 1992). Thus, presumably, they are willing to make an effort to lead as effectively as possible in order to achieve challenging unit objectives. Identifying a vision and setting high performance standards for the team members constitute two key behaviors of transformational leadership (Podsakoff et al., 1990). Additionally, achievement-motivated individuals are highly persistent in the pursuit of goals (Goldberg, 1990; McClelland, Atkinson, Clark, Lowell, & E. L., 1958). This disposition may help leaders to provide an appropriate model (Podsakoff et al., 1990) when goal achievement requires endurance.

Unfortunately, the empirical evidence for the relationship between achievement and transformational leadership is markedly less clear. Most of the studies incorporated the overall Big Five factor of conscientiousness, which includes some other facets besides achievement. This may be the reason why the meta-analysis of Bono and Judge (2004) yielded strongly varying correlations for conscientiousness and transformational leadership across studies. Explicitly referring to the predictive power of narrower measures, Judge and Bono (2000) could not show a significant relationship between any of the conscientiousness facets and transformational leadership. However, like the ma-

majority of studies, they measured personality via supervisor self-reports, and leadership behavior via follower ratings. Considering the strong theoretical arguments and the serious effects of different rating perspectives, I postulate for the mediator model:

*H2: Achievement will be positively related to transformational leadership.*

*Extraversion.* In contrast to conscientiousness, previous research, though not unanimous, is somewhat clearer regarding extraversion as a dispositional antecedent of transformational leadership (cf. Bass, 1990; Davies, 2004). Extraverted individuals are described as warm, gregarious, assertive, active, energetic, excitement seeking, and optimistic (Costa & McCrae, 1992). These characteristics are typically linked to social (Costa & McCrae, 1988) and charismatic leadership (Bass, 1985; House, 1977). Firstly, extraverts experience and express positive emotions (Watson & Clark, 1997), a quality which helps them to motivate their followers through articulating an inspiring vision. Furthermore, the facets of sociability, i.e. the degree to which a person needs or enjoys interactions with others (Hogan & Hogan, 1995), and affiliation, i.e. having and valuing warm personal relationships (Depue & Collins, 1999), enhance transformational behaviors like individual support for followers and fostering the acceptance of group goals (Podsakoff et al., 1990). Finally, as extraverts tend to seek out and enjoy change (Eysenck & Eysenck, 1975), they are supposed to exhibit intellectual stimulation. In support for these considerations, meta-analyses revealed that extraversion is the strongest and most consistent correlate of leadership, i.e. a composite of leader emergence and leadership effectiveness (Judge et al., 2002;  $\rho = .31$ ), and the strongest correlate of transformational leadership (Bono & Judge, 2004;  $\rho = .24$ ). Thus, considering the mediator model, I postulate:

*H3: Extraversion will be positively related to transformational leadership.*

*Emotional stability.* Emotional stability, self-confidence, self-esteem, or adjustment, all indicating low neuroticism (Costa & McCrae, 1992), were, from the beginning, identified as essential characteristics of transformational leaders (Bass, 1990; House, 1977). A high level of emotional stability helps them to present a positive, compelling, and inspiring view of the future (Yukl, 1998) and to instill the faith in this future in their followers (Shamir, Arthur, & House, 1994), to set high performance standards and to convince followers that these ambitious goals are attainable, to challenge the

status quo and to take risks in situations of change, to resolve interpersonal conflicts and to foster group coherence (Kirkpatrick & Locke, 1991).

In the meta-analysis of Bono and Judge (2004), neuroticism stuck out as the most consistent correlate of transformational leadership across studies, with 95 % of the variability due to sampling error and  $\rho = -.17$ . Therefore, I postulate regarding the mediator model:

*H4: Emotional stability will be positively related to transformational leadership.*

*Contextual measurement of personality.* In sum, I chose two of the Big Five factors, namely extraversion and emotional stability, as well as one facet of conscientiousness, namely achievement, to apply in the current study. However, in contrast to usual applications of the five-factor model, a particular measurement approach was utilized that builds on the contextual nature of personality (Sheldon, Ryan, Rawsthorne, & Ilardi, 1997; Wood & Roberts, 2006). Previous research has shown that individuals vary systematically in their personality between roles, for example their role “at home” versus “at work” (Heller, Ferris, Brown, & Watson, 2009). Providing a specific frame of reference, for example in a questionnaire, activates a particular role. Studies on the frame-of-reference effect have shown that the work-related validity of personality tests can be increased by providing an “at work” frame of reference (Shaffer & Postlethwaite, 2012). Appending a contextual reference to the statement in the questionnaire gave all participants a common frame of reference, which reduced error variance and, thus, significantly increased the validity of the items (Heller et al., 2009; Hoffman et al., 2012; Robie, Schmit, Ryan, & Zickar, 2000; Schmit, Ryan, Stierwalt, & Powell, 1995). This gain in validity was confirmed as incremental validity beyond noncontextual items, namely for context-specific items of conscientiousness (Bing, Whanger, Davison, & VanHook, 2004) and extraversion (Hunthausen, Truxillo, Bauer, & Hammer, 2003). Hence, by providing a work-role-based measure of personality, a further attenuating effect could be removed from the relationship between personality traits and transformational leadership. Consequently, within the current study, the three personality traits of achievement, extraversion, and emotional stability were to be measured by means of work-related items.

*Personality traits as distal predictors of effectiveness: Indirect effects on leadership effectiveness.* An enormous body of literature militates in favor of substantial effects of personality traits on leadership effectiveness (e.g., Judge et al., 2002; Kirkpatrick & Locke, 1991). Before some arguments will be picked up that address the question of direct vs. indirect effects in the mediator model of leadership effectiveness, some empirical findings should be presented, focusing on the personality traits of the current study, achievement, extraversion, and emotional stability.

These three personality traits have belonged to the usual suspects of beneficial leader traits since the beginning of leader trait research (Antonakis, 2011; Kirkpatrick & Locke, 1991). Achievement motivation was related to leadership effectiveness in a number of studies (e.g., Arvey et al., 2006), in early qualitative reviews of effective leadership traits (House & Aditya, 1997; Yukl, 2009), as well as in early versions of the mediator model (Kirkpatrick & Locke, 1991). In a meta-analysis on 16 trait-like predictors of leadership effectiveness, Hoffman et al. (2011) found achievement motivation and self-confidence, indicating high emotional stability, to be two of the strongest distal predictors of leader effectiveness, with  $\rho = .28$  and  $.24$ , respectively. Predicting a composite of leadership emergence and effectiveness, Judge et al. (2002) revealed substantial corrected population correlations for achievement, extraversion, and emotional stability, with  $\rho = .35$ ,  $.31$ , and  $-.24$ , respectively. In their large scale study, Hough and colleagues (Hough, Eaton, Dunnette, Kamp, & McCloy, 1990) demonstrated that achievement, surgency, and emotional stability showed the strongest correlations with supervisory and peer ratings of effort and leadership. Surgency was measured with scales of dominance and energy level, and therefore represents a substantial part of extraversion. In a similar way to the methodological approach of the present study, Connelly and Hülshager (2012) used latent factors of the Big Five that captured the common variance of traits from different ratings perspectives to predict job performance. Within the FFM, conscientiousness and emotional stability were the strongest predictors, with  $\beta = .50$  and  $.30$ , respectively. Finally, the outstanding meta-analyses on the validity of the five-factor model of personality revealed that, for managers, conscientiousness and extraversion strongly correlate with performance criteria (Barrick & Mount, 1991; Salgado, 1997).

The hypotheses stated above relate personality traits to transformational leadership and this, in turn, to leadership effectiveness. How can this mediating function of transformational leadership be comprehensively explained? Transformational leadership is successful because it comprises flexible reactions to specific leadership situations. For example, the transformational facet of individual support depicts a flexible course of action towards different followers. At the same time, the facet of fostering group goals requires that the leader emphasizes common characteristics and goals of team members. Personality traits on the contrary are defined as individual differences that influence persons' behavior *across* situations. Thus, searching for the dispositional basis of transformational leadership initially seems little conducive. How can cross-situational traits predict situation-specific behavior?

Models of person-situation interaction (Mischel, 1977; e.g., the trait activation theory, Tett & Burnett, 2003; Tett & Guterman, 2000) resolve this intuitive contradiction. According to them, personality traits are propensities, i.e. latent predispositions or behavioral tendencies, which affect the probability of certain behaviors across situations. However, the actual situation affects the manifestation of a particular trait into behaviors through the activation of this trait by trait-relevant cues. Only when such cues are salient, will the trait manifest into the expected set of behaviors. Vice versa, if a situation does not activate a particular trait, the respective behaviors will not be exhibited. Hence, the impact of traits on outcomes is limited by the interplay of traits and situations that is reflected in the actual behavior. For example, extraverted individuals are more likely to talk enthusiastically about the future and to provide an inspiring vision. Thus, they are more likely to engage in transformational leader behavior. However, if the actual situation does not activate, or even distracts from, exhibiting behaviors like these, the trait extraversion will not have an impact on leadership effectiveness.

Thus, distal attributes like traits have an indirect impact on effectiveness, whereas proximal predictors like leader behaviors have a more direct effect (Hoffman et al., 2011). Empirical analyses of these relationships should therefore reveal stronger correlations for proximal than for distal predictors. In summary, personality traits do not contradict the organizational demand for situation specific leadership behavior. Indeed, cross situational traits like achievement and emotional stability may enhance the activation of appropriate, e.g., transformational, behaviors that in turn result in success.

To what extent do previous findings support this mediation assumption? By means of meta-analytical evaluations of their integrative model, DeRue et al. (2011) showed that proximal leader behaviors account for more variance in leadership effectiveness than distal traits, supporting the mediating function of leader behaviors. In particular, transformational behaviors mediated the impacts of extraversion and conscientiousness on leadership effectiveness. Using a measure for emotional intelligence that conceptually overlaps with extraversion, Lam and O'Higgins (2012) were able to confirm that transformational leadership fully mediates the relationship between managers' emotional intelligence and employee job satisfaction. However, the mediation hypothesis did not hold for the other outcome criteria, employee performance, organizational commitment, and job stress. For the complete five-factor model of personality, it could be shown that transformational leadership mediates the relationship between the FFM and team performance (Lim & Ployhart, 2004). The mediation was full in the context of maximum performance, but partial in the typical context. Remarkably, findings similarly contradict the assumption of full mediation if skill-based proximal predictors of effectiveness are modeled instead of leader behaviors (Hoffman et al., 2011; Van Iddekinge et al., 2009). Drawing on the arguments above, I postulate full mediation. In order to test this assumption, I check simultaneously for direct effects of personality traits on measures of leadership effectiveness. As the somewhat inconsistent findings rely on data that combined different measurement methods, I strive to overcome these inconsistencies by applying latent factor scores for personality traits and transformational leadership behavior.

*H5: The effects of a) achievement, b) extraversion, and c) emotional stability on leadership effectiveness will be fully mediated by transformational leadership.*

In summary, previous research on the relationship between personality traits and transformational leadership is extended within Study 2 in two ways. First, including extraversion and emotional stability, the two personality traits are comprised that proved to be the most valid predictors of transformational leadership. However, departing from the five-factor model of personality, only one facet of conscientiousness is incorporated, namely achievement. Furthermore, a work-related frame of reference is provided within the measurement of these three personality traits. Second, a CFA-MTMM is applied on self and follower ratings of personality traits and transformational

leadership behaviors. By this means, the size of method effects can be identified, the method effects can be removed from the observed correlations, and thus, the true-score correlations can be estimated. Based on these true-score correlations and the latent factor scores, a mediator model is tested in Study 3 that postulates transformational leadership to mediate the impacts of achievement, extraversion, and emotional stability on subjective and objective measures of leadership effectiveness.

### **4.3 Study 2: A Multitrait-Multimethod Analysis on the Dispositional Basis of Transformational Leadership**

#### **4.3.1 Study 2: Method**

##### **Sample and Procedure**

Data were collected in 2010 within the context of a companywide survey of supervisors and their followers. The survey took place within a bottom-up feedback process. Supervisors were offered an individual report and aligned leadership trainings. The company belongs to the electrotechnical industry and forms the German subsidiary of a global player. It has about 2,500 employees, 230 of them in executive positions. All of them were invited to complete an online survey, either the self-rating version for supervisors or the parallel follower rating version. All managers except the CEO had the opportunity to attend both versions, as executive and as direct report of their own supervisor. All managers filled out the self-rating version. About half of the followers participated, resulting in  $n = 1,263$  follower ratings. However, due to missing values,  $n = 162$  self-ratings of supervisors and  $n = 1,034$  follower ratings could be used for the analyses.

Supervisors were mostly male (85 %) and aged between 25 and 62 years ( $M = 42.3$ ,  $SD = 8.9$ ). They had worked in the company for 12.4 years ( $SD = 7.9$ ) and had 6.4 direct reports ( $SD = 5.9$ ) on average. One half of them (52 %) rated themselves as low level, 37 % as middle, and 11 % as top level managers. As is typical for the electrotechnical industry, the followers as well were predominantly male (78 %). They were aged between 18 and 62 years and on average slightly younger than the supervisors ( $M = 37.9$ ,  $SD = 10.5$ ). For the followers, the average employment duration was 9.0 years ( $SD = 7.8$ ) and the mean tenure with the current supervisor was 3.9 years ( $SD = 4.2$ ).

## Measures

**Personality.** The Business Focused Inventory of Personality - 6 Factors (BIP-6F; Hossiep & Krüger, 2012) is a German questionnaire for the assessment of six personality factors, combining aspects of motivation, work style, and constitution. Within the instructions, a work-related frame of reference is provided and participants are requested to answer the items with regard to their professional context. For the purpose of this study, only the following three factors were utilized: (1) Achievement was assessed with the BIP-6F factor Engagement. It captures the commitment to professional goals, i.e. career orientation, performance expectations and competition orientation (e.g., “I thrive on problems that are difficult to solve.”). (2) Extraversion corresponds to the BIP-6F factor Social Competence (correlation corrected for unreliability  $r_c = .82$ ; Hossiep & Krüger, 2012). It measures the social activity of persons, including their socializing ability, empathy and enthusiasm (e.g., “I am better at getting along with people than most.”). (3) Emotional stability is in accordance with the BIP-6F factor Stability ( $r_c = -.73$ ; Hossiep & Krüger, 2012). It is defined as robustness under demands and stresses, comprising the aspects of imperturbability, self-confidence and tolerance for stress and frustration (e.g., “Past failures don’t bother me anymore.”). In the follower survey, the BIP-6F version for other rating was used. These items were all preceded by the phrase “The person I describe ...”, and continued with the particular formulation, e.g., “...thrives on problems that are difficult to solve”. In both versions, eight items per scale were to be answered on a six-point Likert-type scale ranging from 1 (*completely untrue*) to 6 (*completely true*). For the follower ratings, internal consistencies for the three factors were .73, .95, and .92, respectively. In the supervisor ratings, the alpha coefficients (.79, .80, .68) were also acceptable to good, accounting for the purpose of the instrument, assessing broad, rather than homogenous personality domains.

**Transformational leadership.** The Transformational Leadership Inventory (TLI; Podsakoff et al., 1990) was used in its German version validated by Heinitz and Rowold (2007) and in Study 1. The questionnaire includes six subscales for transformational and one scale for transactional leadership. In the present study, only the total scale for transformational leadership was computed, consisting of 22 items (e.g., “provides a good model to follow”). As within the personality questionnaire, items in the follower ratings were preceded by the phrase “The person I describe ...”; in the self-rating of the supervi-

sors, the pronoun “I” was shown above the items. Participants rated the items on a five-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). For self and follower rating versions, internal consistencies were high with .87 and .96, respectively.

### **Analyses**

Before conducting the MTMM analysis, the following steps were carried out. First, the follower ratings belonging to the same supervisor were aggregated and, for this purpose, checked for homogeneity. The interrater agreement was evaluated by means of  $r_{wg}$ , AD, ICC(1), and ICC(2) (LeBreton & Senter, 2008). For  $r_{wg}$ , measuring the proportional reduction in error variance (James, Demaree, & Wolf, 1993), the values of the three personality traits and transformational leadership ranged from .75 to .86, all indicating strong agreement (LeBreton & Senter, 2008). The average deviation index (AD; Burke, Finkelstein, & Dusig, 1999) estimates agreement in the metric of the original answer scale. For the three personality factors, assessed on a six-point scale, the average values between 0.67 and 0.71 all met the criterion, not exceeding 1.00. For transformational leadership, the AD value of 0.58 being smaller than 0.80, met the criterion for five-point scales. ICC(1) values, measuring the interrater reliability, were significant for all scales ( $F = 2.51 - 4.03$ , all  $p < .01$ ). The indices ranged between .34 and .50 ( $M = .42$ ) for teams with three or more followers, all exceeding the threshold for appropriate values (Bliese, 2000). The reliability of group means was confirmed by measures of ICC(2), varying between .60 and .75 ( $M = .68$ ), and thus, all exceeding the cutoff value of .60 (Ostroff & Schmitt, 1993). In summary, the interrater analyses show that a substantial part of the variance in the ratings is due to team membership, and therefore, they give strong support for the aggregated group mean as a reliable measure of the personality and leadership variables, assessed via follower ratings.

Second, the measurement model was tested separately for self and follower ratings. The target model consists of four latent variables, i.e. transformational leadership and three personality traits. The corresponding items were combined into two parcels per scale (Bandalos, 2002; Landis et al., 2000), resulting in a total number of eight indicators for self-ratings and eight indicators for follower ratings. Afterwards, these two measurement models were checked for invariance across rating perspectives via multigroup analyses.

Finally, the MTMM analysis was likewise conducted as confirmatory factor analysis (Marsh, 1989). Transformational leadership behavior and the three personality traits, i.e. achievement, extraversion, and emotional stability, were modeled as trait<sup>4</sup> factors, while the two rating perspectives, i.e. self and follower ratings, were modeled as method factors. A correlated trait-correlated method (CTCM) model was applied, hence the trait factors were allowed to correlate, and so were the method factors. Between the two groups of factors no correlations were permitted (Figure 7). The unweighted least squares (ULS) discrepancy function was used for estimation since an omnibus test based on Small's statistics (Looney, 1995) revealed a significant violation of multivariate normality ( $\chi^2 = 159.11, df = 32, p < .01$ ).

The model fit of the measurement models, of the invariance analyses, as well as of the MTMM model was evaluated by means of several fit indices. Good model fit was assumed if the goodness-of-fit index (GFI) and the adjusted GFI index (AGFI) exceeded .90 (Hu & Bentler, 1995). Additionally, the standardized root mean square residual (SRMR) was calculated, with values below .08 indicating good model fit (Hu & Bentler, 1999).

### 4.3.2 Study 2: Results

In Table 9 the complete multitrait-multimethod correlation matrix is reported, which describes the correlational relationships between the variables within and across rating perspectives.

Confirmatory factor analyses were used to verify the measurement model separately for the two rating perspectives. The fit indices supported the factorial validity of the model, for self-ratings as well as for follower ratings (Table 10). In the model for self-ratings one error variance had to be fixed to 0.1, following the guidelines of Chen et al. (2001). The subsequent invariance analyses revealed that the two measurement models show configural invariance. As a result, it can be assumed that the indicators meas-

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<sup>4</sup> Please note that the concept of *trait* is used in two different ways within this study. First, *personality* traits are described as stable individual attributes in contrast to leadership *behaviors*. Second, within the MTMM analysis *trait factors* are differentiated from *method* factors. Here, the true score of the measures is labeled as *trait*, thus, as different from the *method* part of variance. This is applied to the personality traits as well as to transformational leadership behavior, resulting in three *trait factors* of personality traits as well as one *trait factor* of transformational leadership behavior.

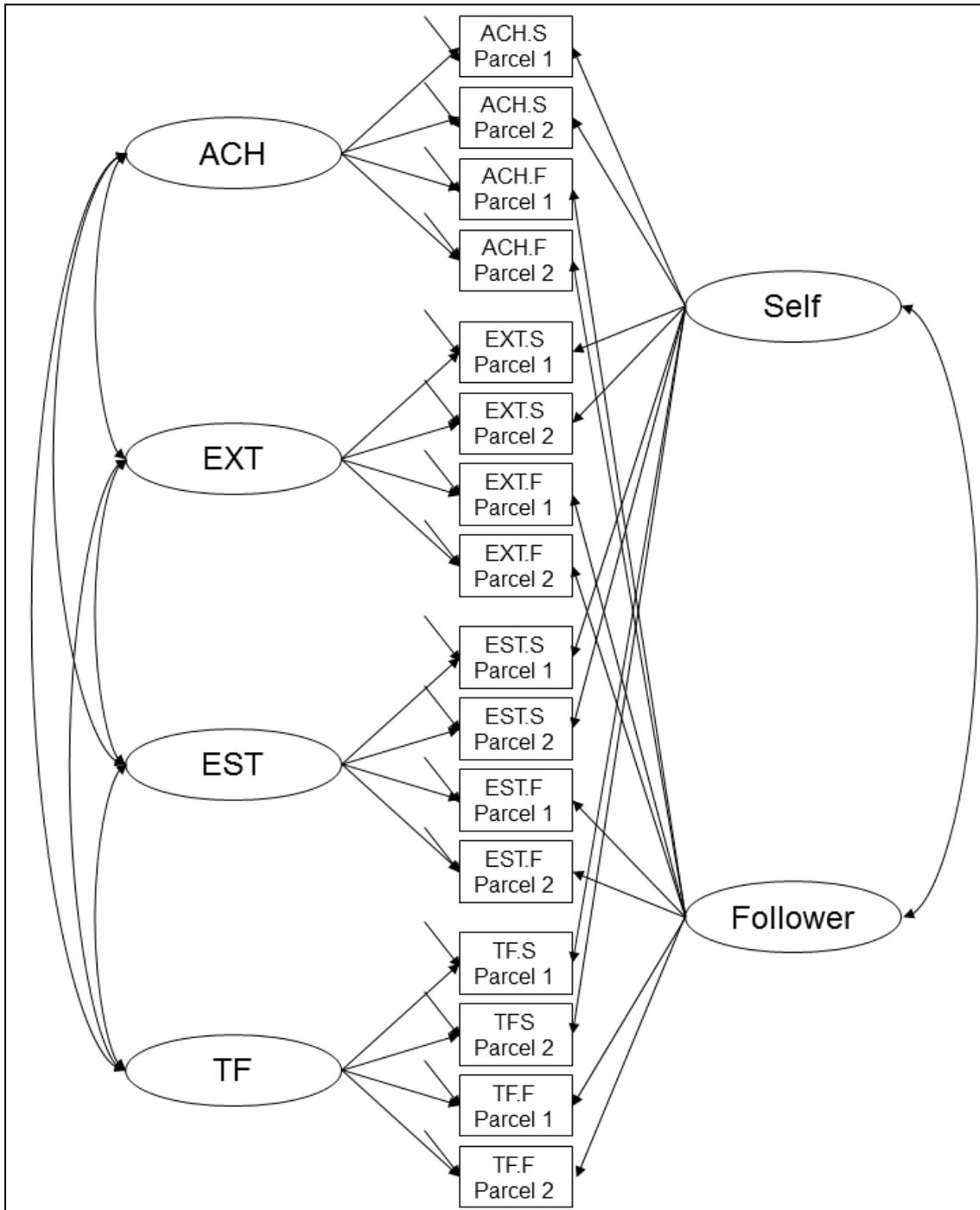


Figure 7. Study 2: Multitrait-multimethod confirmatory factor analysis model of four correlated traits (i.e., the three personality factors of achievement (ACH), extraversion (EXT) and emotional stability (EST) and one leadership style, transformational leadership (TF)) and two correlated methods (self-rating and follower rating).

Table 9. Study 2: Descriptive statistics, internal consistencies, and correlations for aggregated follower ratings and self-ratings

	<i>M</i>	<i>SD</i>	Aggregated follower ratings <sup>1</sup>				Supervisors' self-ratings			
			ACH	EXT	EST	TF	ACH	EXT	EST	TF
<i>Aggregated follower ratings</i>										
Achievement (ACH)	4.13	0.61	(.73)							
Extraversion (EXT)	4.32	0.88	.53**	(.95)						
Emotional stability (EST)	4.68	0.85	.58**	.81**	(.92)					
Transformational leadership (TF)	3.58	0.65	.61**	.89**	.79**	(.96)				
<i>Supervisors' self-ratings</i>										
Achievement (ACH)	4.66	0.66	.26**	.01	.08	-.02	(.79)			
Extraversion (EXT)	4.30	0.79	.21**	.12	.06	.04	.38**	(.80)		
Emotional stability (EST)	4.45	0.69	.03	-.06	.03	-.08	.39**	.43**	(.68)	
Transformational leadership (TF)	4.09	0.40	.23**	.13	.11	.09	.54**	.45**	.44**	(.87)

Note. *N* = 162. <sup>1</sup>Alpha coefficients indicate internal consistencies of non-aggregated follower ratings. \*\* *p* < .01.

ure the same constructs across rating perspectives, and that the data are suitable for MTMM analyses.

The MTMM analysis itself was modeled as CTCM and yielded an excellent fit to the data with GFI = .99, AGFI = .99, and SRMR = .05 (Table 10). As trait and method factors are not allowed to correlate with each other in the CTCM model and, at the same time, measured by multiple indicators, it is possible to part the variance of the manifest indicators into separate proportions of systematic trait effects, systematic method effects, and unsystematic measurement errors (Eid et al., 2006). For the current data, the factor loadings of the indicators on the latent trait and method factors were squared in order to calculate the relative variance sources (Widaman, 1985). On average, the indicators' variance could be decomposed into a trait percentage of .25, a method part of .46, and a residual of .15 (Table 11). Thus, the average variance proportions of the methods factors were much higher than the variance parts of the traits factors, indicating very strong method effects.

Table 10. Study 2: Results of confirmatory factor analyses

	$\chi^2$	<i>df</i>	GFI	AGFI	SRMR
<i>Step (1) Measurement model</i>					
Follower rating - four factors	0.74	14	.99	.99	.02
Self-rating - four factors	3.25	15 <sup>a</sup>	.99	.98	.06
<i>Step (2) Invariance analyses (follower vs. self-rating)</i>					
Configural invariance	3.61	28	.99	.99	.04
<i>Step (3) MTMM analyses</i>					
CTCM model	13.44	82	.99	.99	.05

*Note.* CTCM = correlated trait correlated method, GFI = goodness-of-fit index, AGFI = adjusted goodness-of-fit index, SRMR = standardized root mean square residual.

<sup>a</sup> In the measurement model for self-ratings one error variance had to be fixed.

Table 11. Study 2: Sources of variances in the CTCM model for each indicator (for parcel 1 / parcel 2, respectively)

	Trait	Method	Error
<i>Follower rating</i>			
Achievement	.45 / .50	.20 / .23	.16 / .11
Extraversion	.04 / .06	.88 / .85	.07 / .07
Emotional stability	.32 / .20	.62 / .66	.04 / .11
Transformational leadership	.04 / .09	.82 / .84	.06 / .03
<i>Self-rating</i>			
Achievement	.16 / .25	.23 / .24	.35 / .24
Extraversion	.77 / .25	.12 / .33	.10 / .26
Emotional stability	.05 / .01	.47 / .4	.33 / .34
Transformational leadership	.39 / .45	.16 / .34	.07 / .04
Mean	.25	.46	.15

Due to the purpose of the current study, only the correlations between transformational leadership and the personality traits are described in the following. However, observed intercorrelations of all variables are reported in Table 9 while the true-score correlations of all latent factors are to be found in Table 12. Within the follower ratings very high zero-order correlations could be observed between transformational leadership and achievement, extraversion, and emotional stability with  $r = .61, .89, \text{ and } .79$  (all  $p < .01$ ), respectively. Somewhat smaller but still substantive zero-order correlations were calculated for the self-ratings (.54, .45, .44; all  $p < .01$ ). In contrast, only small correlations were found between self-rated transformational leadership and follower ratings of personality (.23\*\*, .13 ns, .11 ns). For the conventional combination of self-rated personality and follower ratings of leadership, hardly any relationships could be found (-.02, .04, -.08; all ns). By the means of the MTMM analysis, correlations between the latent trait factors of personality traits and of transformational leadership could be estimated, which are corrected for method effects. Here, substantial coefficients emerged again between transformational leadership and the personality traits of achievement, extraversion, and emotional stability with  $r_{latent} = .60, .42, \text{ and } .38$ , respec-

tively (Table 12). The latent method factors of self and follower ratings show only a small correlation with  $r_{latent} = -.10$ , indicating their mutual independence.

Table 12. Study 2: Estimated correlations among latent factors

<i>Trait and method factors</i>	ACH	EXT	EST	TF	SR	FR
Achievement (ACH)						
Extraversion (EXT)	.41					
Emotional stability (EST)	.46	.29				
Transformational leadership (TF)	.60	.42	.38			
Self-rating (SR)	-	-	-	-		
Follower rating (FR)	-	-	-	-	-.10	

*Note.* As the MTMM was conducted as correlated trait-correlated method (CTCM) model, correlations are allowed within the two groups of factors but not between them.

### 4.3.3 Study 2: Discussion

The aim of Study 2 was to elucidate the dispositional basis of transformational leadership. In contrast to previous studies, the correlations between transformational leadership and specific personality traits were determined as true-score correlations by controlling for effects of the measurement methods. For that purpose, an MTMM analysis was applied on self and follower ratings of transformational leadership behavior and of three personality traits, namely achievement, extraversion, and emotional stability. The CFA confirmed a very good fit of the correlated trait-correlated-method model to the data. Decomposing the indicators' variance yielded very strong method effects; indeed almost one half of the variance was due to measurement methods. Consequently, the correlations between the latent trait factors differed substantially from zero-order correlations across rating perspectives. Removing the method effects in the CFA-MTMM revealed a strong latent correlation between transformational leadership and achievement. Furthermore, medium-size latent correlations were found between transformational leadership and extraversion as well as emotional stability.

In this section, the specific results are discussed in detail, including the limitations of this study and directions for future research. Implications for practitioners are presented within the general discussion of Study 2 and Study 3 (Chapter 4.5).

Although developed as behavioral theory, the dispositional basis of transformational leadership was picked out as a central theme from an early date (cf. Avolio & Gibbons, 1988). The opportunity to identify effective leaders before assigning them to executive functions fueled the pursuit of stable individual differences that could predict transformational leadership behaviors. Initially, some encouraging results were gained (e.g., Judge & Bono, 2000); however, the meta-analytical conclusions were disappointing (Bono & Judge, 2004). In order to avoid common method bias, these analyses were based on studies combining self-rated measures of personality with follower ratings of leadership behavior. The zero-order correlations of the present study confirm that, if, as in previous studies, different sources are applied, no relationships can be observed between transformational leadership and personality traits. In contrast, if method effects that are due to the different rating perspectives are removed by the means of a CFA-based MTMM analysis, substantial correlations can be found between the latent trait factors.

I found extraversion and emotional stability to be positively related to transformational leadership ( $r_{latent} = .42$  and  $.38$ , respectively). This is in agreement with the initial hypotheses of Bono and Judge (2004) and also with their most strongly identified associations. However, in their meta-analysis even these corrected correlations were small ( $\rho = .24$  for extraversion and  $\rho = -.17$  for neuroticism). Controlling for method effects, the present study was able to reveal correlation coefficients that are considerably stronger and thus more nearly correspond to the theoretical expectations. For conscientiousness, the meta-analysis disclosed a considerable amount of variance within the results of the single studies that was not due to sampling error. Therefore, Bono and Judge (2004) were not able to reveal a reliable estimate for the relationship between conscientiousness and transformational leadership. Focusing on the facet of achievement within the present study resulted in the strongest latent correlation with transformational leadership ( $r_{latent} = .60$ ). Confounding achievement with other facets in the broad factor of conscientiousness may have masked this significant association in previous studies. The latent correlations found in the present study imply that, if effects of the measurement

methods are controlled for, people who strive for achievement, who are extraverted and emotionally stable, are more likely to exhibit transformational leadership. Even though the moderate to strong latent correlations support my hypotheses linking achievement, extraversion, and emotional stability to transformational leadership, the CFA-MTMM does not offer significance tests on the latent correlations. Thus, the posited paths will be tested in Study 3.

The pre-eminent contribution of achievement is in line with personality research on the particular validity of achievement in the prediction of job performance (Dudley et al., 2006; Sutin et al., 2009). From this, the question arises of whether these findings result from an indirect effect that achievement may exhibit through transformational leadership on leadership effectiveness. The indirect effects of achievement, extraversion, and emotional stability will be investigated in Study 3.

So far, only the correlations between transformational leadership and the personality traits have been discussed. However, the trait factors of the personality traits also show moderate latent intercorrelations between .29 and .46. Therefore, in the prediction of transformational leadership behavior, the three personality traits may substantially overlap. The total amount of variance in transformational leadership behavior that is due to personality traits will be questioned in Study 3, as well as the incremental impact of every single personality trait.

Partitioning the variance revealed a very large amount of method variance of 46 %. That is to say, almost one half of the variance in the manifest indicators is due to the rating perspective of self-rating versus follower rating. Previous estimates ranged between 23 % method variance for job performance measures, 25 % for personality measures, and 41 % for attitudes (Cote & Buckley, 1987; Williams et al., 1989). For the particular rating perspectives of self-ratings and follower ratings in multisource performance ratings, Conway (1996) reported method components of 29 % and 35 %, respectively. Narrowing the analyses to studies that modeled different rating sources as method factors, Lance et al. (2010) reported even stronger method effects with variance proportions between 65 % and 77 %. The average proportion of 46 % in the current study lies in the upper part of these ranges. It therefore stresses the importance of controlling for method effects when collecting multisource ratings in order to investigate the relationship of two variables. As can be derived from formula (2), the relative

amount of method variance in the variables, i.e.,  $\lambda_{XM_j}$  and  $\lambda_{YM_j}$ , strongly influences the observed correlation between two measures. Indeed, increasing the amount of method variance potentiates the effect of the correlation between the methods,  $\rho_{M_jM_j}$ , on the observed correlation  $r_{XY}$  (cf. Williams et al., 1989). If the correlation between the methods is small, as it is the case for self and follower ratings, the observed correlation is additionally attenuated.

Indeed, only a small latent correlation of -.10 was found between the method factors, confirming the considerable independence of self and follower ratings previously established (Colbert et al., 2012; Connelly & Ones, 2010; Conway & Huffcutt, 1997; Harris & Schaubroeck, 1988). It therefore corroborates the need for analyzing multi-source data via multitrait-multimethod procedures. Only controlling for measurement methods and removing their effects from the observed correlation can reveal the true-score correlation of constructs. The present study has successfully chosen this path and thus, it has revealed substantive relationships between transformational leadership behavior and three personality traits. However, it was beyond the scope of the present study to seek out the reasons for low self-other agreement. Future research should address this issue by building on theoretical approaches (Hogan & Holland, 2003) and empirical findings (Mount & Scullen, 2001; Ng, Koh, Ang, Kennedy, & Chan, 2011) that already exist. In addition, the factor scores of the latent method factors could be utilized in further studies, relating the rater source factors to relevant measures outside the core CFA model. It was by this means that Lance and colleagues (Lance, Baxter, & Mahan, 2006; Lance, Teachout, & Donnelly, 1992) as well as Hoffman and Woehr (2009) found out that the usually strong rater source effects in multisource performance ratings do not only represent undesirable method variance but valid components of rater performance (cf. Lance et al., 2008).

In the present study, the amount of method variance varied considerably across the different indicators (Table 11). This finding refers to two lines of research that should be combined in future. First, several studies investigated to what extent self and other ratings show differential levels of convergent correlations for different personality constructs (McCrae & Costa, 1987). It was argued that the personality constructs differ in attributes like visibility, observability, and evaluativeness, and that these attributes influence the differences between self and other ratings and their respective rating accu-

racy (Connelly & Ones, 2010; Vazire, 2010). Second, research on measurement methods suggests that method effects influence the measurement of different constructs to varying degrees (Podsakoff et al., 2003; Spector, 2006). Therefore, future studies may look for procedures that go beyond CTCM analyses by accounting for trait-method interactions.

Ignoring interactions between trait and method factors represents one of the study's limitations which are due to the CTCM model as it was applied to the MTMM data. Consequently, trait specific method effects could not be modeled (Eid, 2000). The CTCM model brings some further disadvantages, as outlined before (Lance et al., 2002; Podsakoff et al., 2003). Particularly, identification problems were encountered owing to the model's complexity (Brannick & Spector, 1990; Marsh, 1989; Marsh & Bailey, 1991). Due to these methodological weaknesses, other CFA models have been proposed to analyze MTMM data (e.g., Eid, 2000; Kenny & Kesby, 1992; Lance et al., 2007). For example, the correlated uniqueness (CU) model was recommended as a way out of estimation problems (Conway, 1998; Marsh, Byrne, & Craven, 1992; Scullen, 1999), at least when only one indicator per trait-method unit is modeled (Tomas, Hontangas, & Oliver, 2000). With two or more indicators per trait-method combination, as it is the case in the present study, the CTCM model performs better than the CU model and yields accurate estimates, particularly if the method factors do not correlate substantively (Tomas et al., 2000), which is also the case. As "the CU model is shown to have theoretical and substantive shortcomings" (Lance et al., 2002, p. 228), the CTCM model is superior as long as it is not underidentified. Therefore, the CTCM model is still considered the most faithful approach to analyze MTMM data according to Campbell and Fiske's conception of trait-method unit (Lance et al., 2002) and down to the present it represents the most widely accepted and implemented model (Lance et al., 2008).

Among the numerous advantages of the CFA-MTMM procedure, the possibility should again be mentioned of linking the latent trait factors that were modeled to other variables outside the MTMM model (Eid et al., 2006). In this way, for example, the criterion-related validity of the traits can be evaluated (Colbert et al., 2012). Study 3 takes this option as its starting point by utilizing the latent trait factors of the personality traits and of transformational leadership behavior to predict leadership effectiveness.

Before Study 3 is presented in detail, one further limitation should be outlined. In Study 2, several approaches were combined in order to seek out the maximum validity of personality traits predicting transformational leadership. Instead of the complete five-factor model only two factors, i.e. extraversion and emotional stability, were included as well as one facet of conscientiousness, i.e. achievement, all three of which had crystallized as valid predictors before. Additionally, these variables were measured by work-related items. Finally, MTMM data were collected for these variables from supervisors and followers and they were analyzed using a CFA-MTMM. On the one hand, combining these approaches demonstrated that substantial progress can be made in this way with regard to the dispositional basis of transformational leadership behavior. On the other hand, this strategy prevents me from identifying the relative impacts of these approaches on the results. Thus, future studies should use other measurement methods and other sets of personality traits. Specifically, the complete five-factor model should be implemented on its factor level as well as on its facet level in MTMM analyses of the relationship to transformational leadership.

#### **4.4 Study 3: Predicting Subjective and Objective Leadership Effectiveness in a Mediator Model**

##### **4.4.1 Study 3: Method**

###### **Sample**

As Study 3 is based on the findings of Study 2, the same sample was used. For the prediction of job satisfaction as a subjective indicator of leadership effectiveness, the total number of  $n = 162$  teams could be analyzed. Regarding the objective criterion, for only  $n = 21$  sales teams, consisting of 21 supervisors and their 96 subordinates, were the performance data obtainable. This subsample resembled the complete sample as described in Study 2 in terms of age, gender, and team size. In the sales subsample, no top level managers took part. Hence, 81 % of the sales supervisors rated themselves as low level, 19 % as middle level manager. The sales supervisors ( $M = 8.4$ ,  $SD = 6.4$ ) as well as their followers ( $M = 3.6$ ,  $SD = 4.2$ ) had on average a shorter employment duration than the total sample. Consequently, the mean tenure with current supervisor was also smaller ( $M = 2.0$ ,  $SD = 1.5$ ).

## Measures

**Personality and transformational leadership.** Factor scores of the corresponding latent trait factors were applied to measure the three personality constructs, i.e., achievement, extraversion, and emotional stability, as well as transformational leadership. Based on the results of the MTMM analysis in Study 2, the latent factor scores were estimated through regression imputation of the factor score weights of the parceled indicators. Accordingly, the effects of the method factors, i.e. self and follower rating, were partialled out, and, in Study 3, latent trait scores for the four constructs could be utilized which are free of method variance.

**Subjective performance.** Follower ratings of job satisfaction were used as a subjective indicator of leadership effectiveness. For its assessment, the scale from Neuberger and Allerbeck (1978) was implemented in the online survey. Thus, job satisfaction was measured concurrently to the personality traits and leadership behaviors at the first time of measurement ( $t_1$ ). In total, eight items capture the employees' satisfaction with several parts of their work environment (e.g., "I am satisfied with my colleagues") and their overall job satisfaction. Items were answered on a five-point Likert-type scale ranging from 1 (*very unsatisfied*) to 5 (*very satisfied*). Cronbach's alpha of .83 revealed high homogeneity of the scale. In order to match the level of analysis, follower ratings of job satisfaction were aggregated for supervisors. Indices showed strong agreement of ratings with an average  $r_{wg}$  of .86 (LeBreton & Senter, 2008), an average AD of 0.51, being smaller than 0.80 (Burke et al., 1999), and intraclass correlations significantly above zero ( $ICC(1) = .27, F = 2.13, p < .01; ICC(2) = .53$ ).

**Objective performance.** For the sales teams participating in the survey, an objective profit measure was provided by the company. For each sales team, consisting of a supervisor and his/her followers, a target figure for sales profit is fixed for every month. The achieved percentage of this target profit four months after the survey ( $t_2$ ) was utilized in the analyses.

## Analyses

The proposed mediator model (Figure 6) was investigated twice. In Model 1, job satisfaction was implemented as a subjective indicator of leadership effectiveness. In Model 2, the sales profit served as an objective performance criterion. The models were evaluated using partial least squares (PLS; Chin, 1998; Ringle, Wende, & Will, 2005), a

non-parametric structural equation modeling technique based on components rather than on covariances (Wold, 1985). Therefore, it allows for analyzing non-normal distributed data and small samples. All measures were modeled as single indicator latent variables, resulting in a traditional path analysis. In contrast to covariance-based techniques, the non-parametric approach does not offer overall fit indices. However, after estimating the path coefficients, a bootstrapping procedure was used to evaluate their statistical significance. In addition, the structural model was evaluated by means of the coefficient of determination  $R^2$  (Chin, 1998), indicating the amount of explained variance of each endogenous variable. Levels of  $R^2$  are to be interpreted with respect to the relevant research context (Hair, Sarstedt, Ringle, & Mena, 2012). The relative predictive power of the exogenous variables was assessed by their effect size  $f^2$  (Chin, 1998). According to Cohen (1988),  $f^2$  values of 0.02, 0.15 and 0.35 indicate weak, moderate, and strong effects, respectively. In Model 2, only a small sample of  $n = 21$  teams could be analyzed. In order to ensure an appropriate power despite this small sample size, Type I error rate was adjusted to .10 in Model 2 (Aguinis & Harden, 2009; Kerwin, 1992; Sauley & Bedeian, 1989).

Regarding the postulated mediation, the indirect effects were calculated and, due to the usually non-normal distribution of products, their significance was tested via the bootstrap approach recommended by Preacher and Hayes (2004; 2008). To test if the effects of the independent variables on the performance criteria are fully mediated as postulated or if the data are better described by partial mediation, the direct effects were additionally modeled. As no global fit indices are available for PLS analyses, the comparison of nested models, with and without the direct effects, is not possible. However, the significance of the direct effects can be used to explore the question of complete vs. partial mediation (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002).

#### **4.4.2 Study 3: Results**

Table 13 provides the descriptive statistics and zero-order intercorrelations of the variables in Model 1, predicting followers' job satisfaction ( $t_1$ ), and in Model 2, predicting sales profit ( $t_2$ ). In order to test the postulated hypotheses, the direct and indirect effects in the two models were investigated (Table 14).

Table 13. Study 3: Descriptive statistics and correlations for Model 1 predicting job satisfaction and Model 2 predicting the percentage of target sales profit

	Model 1		Correlations					Model 2	
	<i>M</i>	<i>SD</i>	ACH	EXT	EST	TF	SP	<i>M</i>	<i>SD</i>
Achievement (ACH)	5.80	0.89		.40 <sup>†</sup>	.07	.45*	-.01	6.15	0.52
Extraversion (EXT)	2.87	0.92	.47**		.10	.28	.12	3.20	0.82
Emotional stability (EST)	3.79	0.91	.48**	.26**		-.10	-.24	3.81	0.69
Transformational leadership (TF)	6.94	0.77	.71**	.43**	.32**		.36	6.99	0.56
Job satisfaction (JS)	3.66	0.47	.29**	.12	.20*	.31**			
Percentage of target sales profit (SP)								0.58	0.29

*Note.* Model 1:  $n = 162$ , Model 2:  $n = 21$ . Coefficients below the diagonal represent correlations for Model 1, those above the diagonal represent correlations for Model 2. \*\*  $p < .01$ , \*  $p < .05$ , <sup>†</sup>  $p < .10$ .

Table 14. Study 3: Direct and indirect effects in the mediator model for subjective (Model 1) and objective leadership performance (Model 2)

	Direct effects (effect size $f^2$ )		Indirect effects [confidence interval <sup>a</sup> ]
	TF	PC	PC
<i>Model 1 (n = 162, job satisfaction at t<sub>1</sub>)</i>			
Achievement	.66** (0.57)	.11 (0.83)	.08* [.01, .16]
Extraversion	.13* (0.03)	-.06 (.00)	.02* [.00, .05]
Emotional stability	-.03 (0.00)	.09 (0.01)	.00 [-.03, .01]
Transformational leadership	-	.24* (0.03)	-
<i>Model 2 (n = 21, sales profit at t<sub>2</sub>)</i>			
Achievement	.41 <sup>†</sup> (0.19)	-.24 (0.05)	.10 <sup>†</sup> [.00, .56]
Extraversion	.13 (0.02)	.11 (0.01)	.02 [-.02, .13]
Emotional stability	-.14 (0.03)	-.19 (0.04)	-.03 [-.21, .03]
Transformational leadership	-	.42 <sup>†</sup> (0.17)	-

*Note.* PC = performance criterion, i.e. job satisfaction at time of measurement 1 in Model 1 and achieved percentage of target profit at time of measurement 2 in Model 2; TF = transformational leadership. <sup>a</sup> Due to small sample size, Type I error rate was adjusted to .10 for Model 2, resulting in 95 % confidence interval for Model 1 and 90 % confidence interval for Model 2. \*\*  $p < .01$ , \*  $p < .05$ , <sup>†</sup>  $p < .10$ .

Transformational leadership showed a small ( $f^2 = 0.03$ ) but significant positive effect on job satisfaction in Model 1,  $\beta = .24$  ( $t = 2.51, p < .05$ ). In Model 2, the effect of transformational leadership on the objective performance criterion reached the level of a moderate effect ( $f^2 = 0.17$ ) with  $\beta = .42$  ( $t = 1.76, p < .10$ ). Thus, Hypothesis 1 was supported.

With regard to the personality traits, achievement exhibited a significant positive effect on transformational leadership in Model 1 as well as in Model 2,  $\beta = .66$  ( $t = 10.25, p < .01$ ) and  $\beta = .41$  ( $t = 1.94, p < .05$ ), respectively (Table 14). Therefore, Hypothesis 2 was supported. The effect size  $f^2$  of the direct effects was strong in Model 1 ( $f^2 = 0.57$ ) and moderate in Model 2 ( $f^2 = 0.19$ ). Extraversion showed a small ( $f^2 = 0.03$ ) but significant positive effect on transformational leadership in Model 1,  $\beta = .13$  ( $t = 2.28, p < .05$ ). In Model 2, the regression coefficient reached a level equal to that of a small effect,  $\beta = .13$  ( $f^2 = 0.02$ ), but was not significant ( $t = 0.83, ns$ ). Thus, Hypothesis 3 was only partially supported. For emotional stability, only small to non-existent relationships could be observed in the two models,  $\beta = -.03$  ( $t = 0.79, ns; f^2 = 0.00$ ) and  $\beta = -.14$  ( $t = 0.83, ns; f^2 = 0.03$ ), respectively, failing to reach a level of significance. Hence, Hypothesis 4 postulating a positive correlation between emotional stability and transformational leadership could not be supported. In total, the personality traits accounted for 24 % and 51 % of the variance in transformational leadership in the two models, respectively.

Finally, the indirect effects were investigated to test the mediation hypotheses. For achievement, small but significant indirect effects on performance criteria were revealed in both models,  $\beta_{ind} = .08$  ( $p < .05$ ) and  $\beta_{ind} = .10$  ( $p < .10$ ), respectively (Table 14), supporting Hypothesis 5a. Extraversion revealed a significant indirect effect on job satisfaction in Model 1,  $\beta_{ind} = .02$  ( $p < .05$ ). In Model 2, predicting objective performance, the indirect effect was equally high, but not significant,  $\beta_{ind} = .02$  ( $p > .10$ ). Therefore, Hypothesis 5b was only partially supported. Emotional stability exhibited no significant indirect effect in either of the two models. Hypothesis 5c thus was not supported.

The direct effects of the personality variables on leadership effectiveness were utilized to check for complete vs. partial mediation. These direct effects did not reach a level of significance in either model (Table 14), supporting the postulated complete mediation. However, in Model 2, the absolute values of the direct effects reached a notable

level, ranging from  $|.11|$  to  $|.24|$ . Therefore, eliminating the non-significant direct effects from the path model did not considerably change the  $R^2$ -value in Model 1, but did reduce the coefficient of determination in Model 2. In total, the predicting variables accounted for 12 % of the variance in job satisfaction (10 % without the direct effects of personality variables) and 21 % (13 %) of the variance in sales profit.

#### **4.4.3 Study 3: Discussion**

The goal of Study 3 was to empirically evaluate a mediator model of leadership effectiveness whilst controlling for method effects due to different rating perspectives. This was achieved by building on the latent factor scores of transformational leadership behavior and of three personality traits that resulted from the MTMM analysis in Study 2. Moreover, the direct and indirect model paths were evaluated with respect to subjective concurrent measures (Model 1) as well as objective subsequent measures (Model 2) of leadership effectiveness. Overall, the findings corroborate the mediator model, particularly with respect to achievement as distal and transformational leadership as proximal predictor of leadership effectiveness.

Transformational leadership behavior was confirmed as proximal predictor of leadership effectiveness in both models. That is to say, firstly, a higher level of supervisor's transformational leadership goes along with a higher level of followers' job satisfaction. Secondly, as a result of the longitudinal assessment of the objective outcome criteria, it can be concluded that transformational leadership promotes the unit's achieved target sales profit four months later ( $t_2$ ). These results are in line with an enormous body of literature on the validity of transformational leadership in predicting subjective and objective performance measures (meta-analytically, Judge & Piccolo, 2004; Lowe et al., 1996).

In terms of personality traits as antecedents of transformational behavior, achievement turned out to be especially valid. In the two models, achievement exhibited a moderate to strong positive effect on transformational leadership. While extraversion showed a small effect that was significant only in Model 1, no direct effects could be found for emotional stability predicting transformational leadership. As extraversion and emotional stability both showed moderate positive latent correlations with transformational leadership in Study 2, the reduced path coefficients in the joint mediator

model are presumably due to the intercorrelations of the latent trait factors (cf. Study 2,  $.29 < r_{latent} < .46$ ). In the present study, emotional stability did not show an incremental impact on transformational behavior beyond the traits of achievement and extraversion. This is in accordance with the findings of Van Iddekinge, et al. (2009). However, as other studies have supported the relevance of extraversion (DeRue et al., 2011) and emotional stability (Lim & Ployhart, 2004) as valid predictors of transformational leadership in a mediator model, further research is needed to determine the relative importance of these personality traits.

In order to overcome inconsistent findings that are based on the combination of different measurement methods without controlling for method effects, those future studies should also report true-score correlations as was done in the current work. In total, the personality traits were shown to explain one quarter (24 %, Model 1) to one half (51 %, Model 2) of the variance in transformational leadership. In contrast to the meta-analysis of Bono and Judge ( $R^2 = .09$ ; 2004), this finding strongly supports the dispositional basis of transformational leadership. In the present study, this could be revealed by controlling for the method effects of rating sources. Drawing on the latent factor scores, I was able to detect the true-score correlations between personality traits and transformational behavior. Thus, for the first time, the “true” impact of personality on transformational leadership could be determined independently from the method of measurement.

As posited, no significant direct effects could be observed for the personality traits on the subjective and objective measures of leadership effectiveness. Therefore, the level of mediation was confirmed as full, not partial, i.e., transformational leadership behavior fully mediates the relationship between personality traits and leadership effectiveness. Leaders with a high level of achievement exhibit more transformational leadership, which, in turn, results in higher sales profit four months later. For the prediction of followers’ job satisfaction, an additional indirect effect could be observed for extraversion. Leaders with high levels of achievement and extraversion show a greater degree of transformational leadership, which, in turn, leads to more satisfied followers. The full mediation observed is in line with the assumptions of the mediator model (DeRue et al., 2011). However, with respect to performance ratings, Van Iddekinge et al. (2009) found support for additional direct effects of conscientiousness and extraversion.

In this light, possible direct effects of the different personality traits should be further investigated with regard to different indicators of leadership performance.

It should be noted that an overall pattern of results could be observed in both models, with achievement as the strongest predictor of transformational leadership, extraversion exhibiting a smaller, and emotional stability showing no significant direct effect on leadership behavior. Likewise, the indirect effect of achievement via transformational leadership on leadership effectiveness was corroborated in the total sample in Model 1, predicting job satisfaction, as well as in the small subsample in Model 2, predicting sales profit. The noticeable congruence of Model 1 and Model 2 can be attributed to the validity of the subjective performance measure and to the robustness of results. In terms of the former, the current correlation of  $r = .33$  between job satisfaction and sales profit four months later corresponds to meta-analytical findings on the satisfaction-performance relationship (Judge, Thoresen, Bono, & Patton, 2001; Ricketta, 2008). In addition, it emphasizes the validity of subjective measures of organizational performance (Dess & Robinson, 1984). With respect to the latter, it was observed that, regardless of whether a subjective or an objective measure of leadership effectiveness was applied, achievement showed a substantive positive correlation with transformational leadership, which, in turn, predicted the respective performance criterion.

One further aspect should be pointed out regarding the objective performance criterion. In contrast to many studies (e.g., Hoffman et al., 2011; Judge & Piccolo, 2004; MacKenzie et al., 2001; Ross & Offermann, 1997; meta-analytically, Lowe et al., 1996), the relationship between transformational leadership and effectiveness was considerably greater in the present study for an objective measure of performance ( $\beta = .42$ ) than for job satisfaction as a subjective criterion ( $\beta = .24$ ). Consequently, the distal and proximal predictors accounted for only 12 % of the variance in job satisfaction but for 21 % of the variance in sales profit. This unusual pattern might be due to the fact that, again in contrast to the majority of previous studies, here, transformational leadership was measured as a latent construct within an MTMM model, and therefore, method effects of self and observer ratings were partialled out. I argue, for the following reasons, that this procedure may have decreased the correlation between transformational leadership and job satisfaction in Model 1 and, in addition, may have increased the correlation between transformational leadership and sales profit in Model 2.

First, transformational leadership as well as job satisfaction are typically measured via follower ratings, and therefore, their correlation may be inflated due to common method variance. Removing method variance from the predictor but not from the criterion may thus have decreased the correlation with subjective job satisfaction in Model 1. In Model 2, on the other hand, sales profit was used as criterion, i.e., an objective measure that is not affected by most of the sources of common method bias present in survey ratings (Podsakoff et al., 2003; Spector, 2006). Therefore, in studies that use leadership ratings to predict objective performance criteria, the measurement methods do not share method variance. This unshared variance – representing a small correlation between measurement methods – will attenuate the observed correlation because each measure contains method variance that is unshared with the other measures (Brannick et al., 2010; Conway & Lance, 2010; Williams & Brown, 1994). Accordingly, usually only small coefficients are observed if rating data are used to predict objective criteria like sales profit. In the current study, the percentage of method variance due to self and follower ratings was partialled out in Study 2, resulting in predictor scores that are free of method variance due to the rating perspective. Utilizing this latent trait factor of transformational leadership in Study 3 has decreased the deflation of the observed correlation. Thus, a higher correlation between transformation leadership and sales profit could be observed, which constitutes a better estimate of the true-score correlation between transformational leadership behavior and leadership effectiveness.

#### **4.5 Study 2 and Study 3: General Discussion**

Over the last years, different research groups have postulated similar mediator models to predict leadership effectiveness (Antonakis, 2011; DeRue et al., 2011; Hogan & Kaiser, 2005; Judge & Long, 2012; Zaccaro et al., 2004). The present study builds on this research by formulating a mediator model that shares their central assumptions. However, my empirical realization of this model goes beyond previous work in two aspects and thus provides an important contribution to current research. First, it overcomes methodological limitations by utilizing the latent factor scores of personality traits and transformational leadership behavior that were attained by a multitrait-multimethod analysis in Study 2. By this means, the relationships between personality traits and transformational leadership behaviors were neither distorted by the combination of common, nor different, rating sources. This procedure allowed for estimating

reliable model paths, with achievement and, at least in part, extraversion, predicting transformational leadership behavior. Furthermore, it allowed for determining the substantial amount of variance in transformational leadership that is due to these traits. Second, based on the latent factor scores of transformational leadership, the validity of this famous class of leadership behaviors could likewise be determined independently from method effects. As this was done with respect to subjective as well as objective measures of leadership effectiveness, a remarkable result could be obtained. In contrast to previous findings, the latent factor scores of transformational leadership that do not share the common method variance with follower ratings of leadership behavior accounted for a greater amount of variance in the objective indicator of sales profit than in the follower ratings of job satisfaction.

Considering the dispositional basis of leadership, the present study may prevent a repetition of history that would be of little merit. After the disappointing reviews in the 1940s (Gibb, 1947; Jenkins, 1947; Stogdill, 1948), traits were regarded as futile explanations for leadership processes and outcomes (cf. Day & Zaccaro, 2007). As the relationships were too small, and the amount of unexplained variance was too big, contingency theories came into vogue that accounted for situational moderators. However, re-analyses revealed that the “variability across studies [...] could be explained largely by methodological factors” (Lord et al., 1986, p. 402). Recently, the disappointing meta-analysis linking transformational leadership to personality traits (Bono & Judge, 2004) puts traits in jeopardy again. As the results of Study 2 and Study 3 show, this conclusion may well be as premature as the former one. There is no doubt that models accounting for person-situation interactions are urgently needed in order not to overgeneralize results again. However, the considerable amount of variance in transformational leadership that was found to be due to personality traits in the present studies allows, for the first time, for estimating the unexplained proportion that remains if method effects are controlled for. If they are not controlled for, the pursuit of situational moderators might result in methodological artifacts again.

### **Limitations and Avenues for Future Research**

Study 2 and Study 3 offer fundamental insights into the interplay of personality traits, leadership behaviors, and leadership performance. However, the focus was on elucidating these relations by controlling for systematic effects of the measurement

methods and, therefore, the psychological processes that underlie these relations were not investigated and demand further analyses (cf. Dinh & Lord, 2012). For example, with regard to the empirically well-established influence of transformational leadership behavior on the unit's performance, we still do not know what the well-motivated and satisfied followers of transformational leaders do: What do they do, differently from others, that makes them more effective and more successful?

With regard to the left side of the mediator model, three personality traits were identified in Study 2 that correlate positively with transformational leadership, namely achievement, extraversion, and emotional stability. In Study 3, achievement was found primarily to predict transformational leadership behavior. However, similarly to the unknown underlying mechanisms on the right side of the mediator model, we still do not know how achievement influences the exhibition of transformational leadership. There are several plausible ways that should be clarified in future research. For example, does the willingness to strive for challenging goals and to work hard advance the motive to practice an equally active and strenuous leadership style? And/or does it foster the acquisition of skills that are attributed to transformational leaders as was posited by the skills-based models of leadership (e.g., Mumford et al., 1993)?

Further to the left, the antecedents of achievement might be the subject of future research. Dispositional variables like personality traits can as well be differentiated as distal, middle-level, and proximal traits (Cantor, 1990; Judge & Kammeyer-Mueller, 2012). Middle-level traits function as mediating variables between stable decontextualized personality traits and behavioral manifestations of these individual differences that depend on the current context (Mischel & Shoda, 1995). Measuring personality traits by the means of contextual, work-related items, as is the case in the present studies, may have shifted the constructs to middle-level traits. Future studies should, therefore, incorporate noncontextual measures of personality traits in order to investigate the interplay between these differentially direct behavioral dispositions. In this context, MTMM analyses may be used to determine the relative proportions of variance in work-related measures that are due to the basic personality construct and to the occupational measurement method. For example, the work-related measure of extraversion and its classical FFM operationalization are found to correlate at .82 (Hossiep & Krüger, 2012) when corrected for unreliability. That is to say, known reliabilities were used to correct for

*unsystematic* measurement errors. However, in CFA-MTMM, the amount of *systematic* measurement variance could be determined if the different questionnaires were modeled as method factors. Replications of this study with classical FFM measures would also allow for determining the extent to which the stronger correlations between personality and leadership found in the present study trace back to the contextual items or to partialling out method variance via MTMM analyses.

Without doubt replication studies are needed, particularly with objective effectiveness measures, as only a subsample of  $n = 21$  could be analyzed in Study 3. Moreover, replications on different samples should apply other indicators for leadership effectiveness and other instruments. In the current work, three personality traits were included based upon previous findings. I recommend broadening the number and selection of personality measures in order to find out if further dispositional variables, e.g., well-proven constructs outside the five-factor model like self-monitoring (Day & Schleicher, 2006; Day, Schleicher, Unckless, & Hiller, 2002; Zaccaro et al., 1991), can contribute to the prediction of effective leadership behavior. Additionally, considering personality patterns (Foti, Bray, Thompson, & Allgood, 2012; Foti & Hauenstein, 2007) and curvilinear impacts of personality traits on leadership behaviors and outcomes (Le et al., 2011) might be fruitful approaches. For example, what level of achievement should be individually accompanied by what level of extraversion to reach an optimal level of transformational leadership with respect to a maximal level of effectiveness? Likewise, the impact of personality traits on a wider range of leadership behaviors should be analyzed. In doing so, the research model should control for method effects, particularly if leadership behaviors are investigated that draw on the subjective perception of followers like leader-member exchange (Nahrgang, Morgeson, & Ilies, 2009) or ethical leadership (Kalshoven, Den Hartog, & De Hoogh, 2011; Walumbwa & Schaubroeck, 2009).

Finally, I would like to encourage researchers to enlarge the mediator model of leadership effectiveness by accounting for potential moderators on the relationships between personality, leadership behavior, and effectiveness. Judge and Long (2012) proposed three categories of possible moderators. First, individual differences of leaders like gender or intelligence may interact with personality traits moderating the relationship between traits and behaviors (Hoffman et al., 2011). Second, individual differences

of followers like collective self-construal and job knowledge may moderate the relationship between leader styles and outcomes. And third, contextual differences like situation strength (Kaiser & Hogan, 2007), attributes of national cultures, or inter- and intraorganizational variables like organizational structure and hierarchical level may moderate the relationships between traits, behaviors, and outcomes (Hoffman et al., 2011, p. 370). First attempts have been made with interesting findings, for example regarding the organizational level (Hoffman et al., 2011), the dynamism of the work environment (De Hoogh et al., 2005), and the maximum vs. typical measurement of transformational leadership (Ployhart, Lim, & Chan, 2001) and performance (Lim & Ployhart, 2004). However, even including the moderating effects, the total amount of explained variance in leadership behavior remained small (Ployhart et al., 2001). This might be due to the different methods that were used to measure personality traits and leadership behavior. Therefore, approaches like these should be picked up and pursued by applying the advanced methods utilized in the current studies.

### **Practical Implications**

Study 2 and Study 3 used sophisticated statistical procedures that appear to pull the findings away from everyday organizational challenges. However, some appealing insights can be gained from a closer look at the disclosed relationships and even at the established method effects.

Transformational leadership was affirmed as a substantial predictor of leadership effectiveness, particularly in terms of objective indicators of effectiveness and even stronger than previously reported. Hence, leaders should be encouraged to exhibit transformational leader behaviors. Typically, HR practitioners do so via leader development programs. Finding evidence for the dispositional basis of transformational leadership provides the chance of already identifying transformational leaders during stages of employee or leader selection on the basis of stable personality traits. As personality traits accounted for a considerable amount of variance in transformational leadership, organizations, in search of transformational leaders, should look for applicants high in achievement striving and extraversion. However, an even greater amount of variance in transformational leadership was not due to personality traits. Hence, ample room remains for the impact of efficient development practices (Abrell et al., 2011; Barling et al., 1996; Day, 2000), or as Hoffman et al. (2011, p. 365) put it: “to some extent, [effec-

tive] leaders are born, not made. On the other hand, [...] to some extent, effective leadership can be developed.” Consequently, the trait-based and the developmental perspective on effective leadership should be combined. This might result, for example, in research on the moderating influences of personality traits on the effectiveness of training interventions (Colquitt, LePine, & Noe, 2000; Rowold, 2007) or in approaches to use personality inventories in individual development programs like executive coaching (McCormick & Burch, 2008).

The present study revealed strong method effects for the rating perspectives of supervisors’ self and followers’ other ratings. Implementing CFA-MTMM techniques, the method effects were removed in order to obtain true-scores correlations. However, partialling out method effects by confirmatory factor analyses of MTMM data is not a procedure that will be welcomed in HR departments. Nevertheless, the underlying idea and sampling procedure of collecting multisource behavior ratings is already acknowledged as 360-degree feedback programs. In terms of these programs, the present work stresses the subjectivity of ratings. Applying these programs, HR practitioners do not mistrust differences in ratings as contaminating bias, but see them as meaningful differences of complementarily valid perspectives (Lance et al., 2008; Tornow, 1993). That is to say, self and follower ratings may complement one another, for example in the assessment of leader behavior. As it was shown that multiperspectivity increases the predictive validity of ratings (Colbert et al., 2012; Connelly & Ones, 2010; Vazire & Mehl, 2008), practitioners can be reassured about proceeding in this manner.

Drawing on Hough and Oswald’s (2008) claim to overcome the confounding of constructs with measurement methods, one further proposal should be outlined that combines theoretical and practical implications. For practitioners, the validity of specific instruments is usually crucial, while, for researchers, the validity of the latent constructs is essential. The latter ones are interested in accumulating knowledge across implementation strategies and evaluation studies, and therefore, they use, for example, meta-analytical procedures. Over a long period, practitioners hesitated or refused to use self-report questionnaires as their validities were challenged as too small for practical purposes (Morgeson et al., 2007b). These concerns started to crumble when meta-analyses like the seminal one of Barrick and Mount (2001) were able to reveal substantial and cross-situational significant validities for personality traits by controlling for sampling

errors. However, controlling for method effects of ratings perspectives can reveal even stronger validities for the latent trait factors, up to twice the magnitude of meta-analytically estimated true-score validities (Connelly & Hülshager, 2012). Researchers should therefore continuously pursue the most valid constructs by drawing on sound methodological proceedings. Based on accumulated findings on construct and criterion related validities, instruments could be developed subsequently to measure these constructs in a way that maintains their validity and, at the same time, meets the requirements of HR processes in personnel selection and training. In this context, the work-related formulation of items might serve as a valuable approach.

Summarizing the implications for HR practitioners, two recommendations are derived. First, they would be well-advised to look for people with high levels of achievement and extraversion in order to get transformational leaders who will succeed. Second, they should keep in mind that, regardless of whether self or other ratings are used to measure personality traits or leadership behavior, the observed values are substantively influenced by the rating perspective. They should, therefore, choose the perspective according to the purpose of measurement and, if multiperspective ratings can be applied, they should use the emerging differences to raise, for example, leaders' awareness of the subjectivity of perception.

### **Conclusion**

What makes a leader effective? A multitrait-multimethod analysis of supervisors' self and follower ratings was used to disentangle the validity of personality traits and transformational leadership from the methods of measurement. Latent factor scores of personality traits and of transformational leader behavior were included in a mediator model that integrates dispositional and behavioral approaches in order to predict leadership effectiveness. Transformational leadership fully mediated the relation between personality traits and leadership effectiveness. Significant indirect effects were found for achievement and extraversion on followers' job satisfaction, as well as for achievement on sales profit as an objective effectiveness indicator. While these results advise HR practitioners to draw on stable individual differences in the selection of leaders, the strong method effects that were revealed for self-ratings versus follower ratings suggest the need to account conscientiously for rating source effects in future studies on the interplay of variables as well as in applied settings.

## 5. Overall Discussion

The overall purpose of this dissertation was to shed light on transformational leadership from different angles. Three empirical studies have been conducted to investigate crucial research questions that affect antecedents of transformational leadership, its relatives, and consequences. Moreover, throughout the analyses of these relationships, different rating perspectives were taken into account to disentangle method effects from observed associations.

In this concluding chapter, the major results of these studies are summed up at first. To this end, the findings of this dissertation are reported separately for the three empirical studies (*Chapter 5.1*). The implications of these findings are delineated in two subsequent chapters. Thus, the findings' contributions to current research are outlined in *Chapter 5.2*. Thereby, apart from the theoretical and methodological insights, the strengths of the present work are summarized. In *Chapter 5.3* limitations are described that point to future research questions. Finally, implications for practitioners are derived (*Chapter 5.4*) and a short conclusion is provided (*Chapter 5.5*).

### 5.1 Summarization of Findings

*Study 1* (“*A multitrait-multimethod analysis on the discriminant validity of transformational leadership*”) focused on the discriminant validity of transformational leadership. Applying a CFA-based multitrait-multimethod analysis on self and follower ratings, its construct validity could be approved in two ways. First, six subscales of transformational leadership could be empirically discriminated. The zero-order correlations of the transformational subscales ranged up to .64 in self-ratings and up to .86 in follower ratings, with an average correlation of .38 and .62, respectively. Controlling for method effects revealed latent correlations between the six trait factors that were much lower, with a maximum correlation of .53 and an average correlation of .19. Second, the average zero-order correlation between transformational and transactional leadership equaled .35 in self-ratings and .69 in follower ratings, confirming the lack of discriminant validity observed before. However, by partialling out unsystematic measurement error and systematic method effects, an average true-score correlation of .21 could be established, affirming the discriminant validity of transformational and transactional leadership for the first time.

The remarkable differences between the zero-order correlations and the latent correlations in the CFA-MTMM refer to the strong method effects that could be observed. The method factors of self and follower ratings accounted for almost one half of the indicators' variance (45 % on average). The trait factors could explain on average 18 % and unsystematic errors 21 %. Furthermore, the small latent correlation of .22 between the method factors confirmed the mutual independence of self and follower ratings.

In addition, Study 1 provides several important results regarding potential impacts on leadership ratings. First, the rating perspectives of self and follower ratings showed substantial differences in their average score level. In accordance with previous research, supervisors' self-ratings were on average higher, and thus more favorable, than their followers' ratings. This applied to six of the seven subscales, but not to High Performance Expectations, where no differences could be observed. Second, several individual and organizational variables did not substantially influence the average leadership ratings. Namely, for the supervisor's gender, his/her hierarchical level within the organization, and the type of organization (private vs. public) only small and unsystematic score level differences were found across leadership subscales, self-ratings, and follower ratings.

Finally, Study 1 endorses the validity of the leadership questionnaire that was used, the Transformational Leadership Inventory (Podsakoff et al., 1990; Heinitz & Rowold, 2007, for the German version). The factorial structure of the seven subscales, i.e. six transformational subscales and one transactional subscale, was clearly confirmed. Beyond previous research (Heinitz & Rowold, 2007), the factorial validity was confirmed for both rating perspectives, self and follower ratings, and across them. Invariance analyses supported the configural and metric invariance of the factorial structure.

*Study 2 ("A multitrait-multimethod analysis on the dispositional basis of transformational leadership")* focused on the dispositional basis of transformational leadership. Again, an MTMM model was applied in confirmatory factor analyses that fitted the data very well. Within the correlated trait-correlated method model, substantial latent relationships between the trait factors of transformational leadership and of three personality traits could be observed. That is, controlling for the method effects of self and follower ratings, empirical support for the dispositional basis of transformational

leadership could be gained. The strongest true-score correlation was found for achievement (.60), followed by medium-size true-score correlations for extraversion (.42) and emotional stability (.38).

Furthermore, just as in Study 1, the method factors of self and follower rating accounted for almost one half of the indicators' variance (46 %). Thus, the rating perspectives strongly influenced the individual scores on the indicators. Moreover, the rating perspectives influenced the zero-order correlations between leadership behavior and leaders' personality. As self and follower ratings, again, were only weakly correlated (-.10), the small correlation between the methods substantively attenuated the observed correlations between the constructs. Indeed, the remarkable true-score correlations between transformational leadership and the personality traits could be determined even though the zero-order correlations between self-rated personality and follower ratings of transformational leadership did not exceed the absolute value of .08.

*Study 3 ("Predicting subjective and objective leadership effectiveness in a mediator model")* integrated the results of Study 2 in a comprehensive mediator model of leadership effectiveness. Latent factor scores for three personality traits and for transformational leadership were derived from the MTMM analyses in Study 2 and implemented as distal and proximal predictors in the mediator model. The empirical evaluation of the model supported the direct effect of transformational leadership on leadership effectiveness. This applied to followers' job satisfaction, i.e. subjective leadership effectiveness ( $\beta = .24$ ), and to the achieved percentage of target sales profit four months after the survey, i.e. objective leadership effectiveness ( $\beta = .42$ ). In both models, achievement exhibited a considerable, significant direct effect on transformational leadership ( $\beta = .66$  and  $.41$ , respectively). Extraversion showed a small direct effect on transformational leadership in both models ( $\beta = .13$ ); but due to the small sample size in Model 2, predicting objective effectiveness, the effect was significant only in Model 1, predicting subjective effectiveness. For emotional stability no significant direct effects on transformational leadership could be observed in either of the two models. The indirect effects that were investigated between the personality traits and the indicators of leadership effectiveness paralleled these findings. Thus, significant indirect effects were revealed for achievement in both models, for extraversion only in Model 1, and for emotional stability in neither of the models. As the direct effects of personality traits on

leadership effectiveness did not reach a level of significance in either model, it could be inferred that transformational leadership fully mediated their effects. In total, the distal and proximal predictors accounted for 12 % of the variance in followers' job satisfaction and for 21 % of the variance in sales profit.

In summary, Study 3 confirmed the mediator model of leadership effectiveness by using method free scores of personality traits and leadership behavior. In particular, transformational leadership was found to fully mediate the effect of achievement on subjective and objective leadership effectiveness.

## **5.2 Contributions to Existing Research**

The results of the three studies depicted above contribute to current research in several ways. Some of these contributions refer to theoretical advancements, others to methodological insights.

### **Theoretical Contributions**

A comprehensive model of leadership was chosen to elucidate the role of transformational leadership, considering its antecedents and consequences. By this means, Study 3 has added important knowledge to the role transformational leadership plays in the current process models of leadership research (Antonakis, 2011; DeRue et al., 2011; Hogan & Kaiser, 2005; Judge & Long, 2012; Zaccaro et al., 2004). So far, most of the work on this comprehensive model has rendered a theoretical foundation. Only few studies have empirically evaluated the model so far (DeRue et al., 2011; Van Iddekinge et al., 2009). Even less included transformational or charismatic leadership (Brown et al., 2006; De Hoogh et al., 2005; Lam & O'Higgins, 2012; Lim & Ployhart, 2004). Unfortunately, these few studies revealed inconsistent findings, even on the otherwise well-established effectiveness of transformational leadership. Therefore, firstly, Study 3 provides an important contribution as it confirms the significant validity of transformational leadership within the mediator model, and at the same time, by controlling for method effects.

Actually, secondly, transformational leadership was again approved as a highly effective leadership style in Study 3. This finding is in accordance with a large body of research on the validity of transformational leadership (meta-analytically, Judge & Piccolo, 2004). However, Study 3 goes beyond previous research as latent factor

scores were used as indicators of transformational leadership, which were, thus, free of method variance. By this means, it could be revealed that the true-score correlation between transformational leadership and objective sales profit four month later was even greater than the true-score correlation with concurrent subjective followers' job satisfaction. In previous studies, the use of ordinary follower ratings of transformational leadership has presumably attenuated the predictive power for objective indicators and overestimated the same-source relationship with follower satisfaction. Study 3, hence, has even strengthened the organizational significance of transformational leadership.

On the left side, personality traits were included in the mediator model as antecedents of transformational leadership and, thus, as distal predictors of leadership effectiveness. Study 3 revealed that, thirdly, transformational leadership fully mediates the impact of achievement and of extraversion, at least regarding subjective performance indicators. That is to say, these personality traits indirectly affect leadership outcomes. Higher individual levels of achievement and extraversion are related to more transformational leadership, which, in turn, fosters the leader's subjective and objective success. The mere possession of certain traits does not account for leadership performance but it reinforces the likelihood of effective leadership behavior. This full mediation corresponds to the posited path in the process model of leadership (Antonakis et al., 2012; DeRue et al., 2011). The present findings, therefore, enhance confidence in this model and hopefully fuel further empirical tests.

Fourthly, remarkable findings were gained on the dispositional basis of transformational leadership. Three personality traits were included in the CFA-based MTMM analyses in Study 2 and in the mediator model in Study 3, i.e. achievement, extraversion, and emotional stability. Within the MTMM analyses of self and follower ratings, substantial correlations were found between transformational leadership and all three of these personality traits. Due to their intercorrelations, only achievement as the strongest correlate of transformational leadership and, in part, extraversion could be affirmed as antecedents with incremental validity within the mediator model. In total, the personality traits accounted for a substantial part of variance in transformational leadership in Study 3. Although previous research had supported the relevance of leader personality traits (Judge et al., 2002), studies on the dispositional basis of transformational leadership have revealed disappointing and inconsistent findings (Bono & Judge, 2004; De

Hoogh et al., 2005; Lim & Ployhart, 2004). Therefrom, Barling, Christie, and Hopton (2010, p. 198) concluded: „Consequently, personality traits can tell us more about who is likely to attain leadership positions than how individuals might lead once they must fulfill those roles.” Study 2 and Study 3, in contrast, implicate that personality traits, indeed, influence leadership behavior. This insight is based on the argument that the inconsistency of prior findings might be, at least in part, due to the combination of different rating sources, which might have considerably attenuated the observed correlations in previous studies. Controlling for method effects via MTMM analyses in Study 2 and Study 3 has removed this attenuating effect and revealed substantial support for personality traits as antecedents of transformational leadership. The significance of personality has seldom been challenged: „Personality matters – who leaders are determines how they lead, for better or worse“ (Kaiser & Hogan, 2007, p. 174). However, methodological weaknesses have prevented consistent findings so far. Therefore, the present studies provide an important contribution to this line of research.

Fifthly, for the first time, the discriminant validity of transformational and transactional leadership could be empirically established in Study 1. The full-range leadership theory currently dominates behavioral leadership research, with transformational leadership constituting the most effective leadership style. The benefit in leadership outcomes is explained by specific leadership behaviors which go beyond and are qualitatively different from a transactional proceeding. However, substantive intercorrelations between the theoretically well distinguished constructs of transactional and transformational leadership have menaced the construct validity of these leadership styles (Bycio et al., 1995; Judge & Piccolo, 2004). The substantive portion of shared variance was identified in studies relying on same-source data, typically follower ratings. By taking the rating perspectives of self and follower ratings into account and by partialling out the systematic effects of these measurement methods, a true-score correlation could be determined that was considerably lower than the usual zero-order correlations. Thus, the high intercorrelations that have previously been reported can be largely attributed to the shared methods and not to an overlap of constructs. Analyzing self and follower leadership ratings via MTMM analyses could, at last, affirm that the constructs of transformational and transactional leadership themselves are distinctive, just as theory has postulated.

Sixthly, subscales of transformational leadership could be empirically discriminated in a similar way. In contrast to previous research (Avolio et al., 1999; Lowe et al., 1996; Vandenberghe et al., 2002), the true-score correlations identified in Study 1 reached on average a small to medium level. Thus, theoretical assumptions positing distinct transformational classes of behavior could be empirically acknowledged. The structure of distinctive subscales of transformational and transactional leadership was additionally confirmed by confirmatory invariance analyses. The factorial structure was proved to be invariant across self and follower ratings even though these rating perspectives were widely independent and exhibited strong method effects. Hence, as the distinct classes of transformational behavior are present in self and follower ratings, both of these perspectives can be used in research and in organizational settings, for example, in order to analyze their relationship to further constructs or to evaluate leader development with respect to particular transformational facets.

Seventhly, in contrast to previous studies (Antonakis et al., 2003; Eagly et al., 2003; Lowe et al., 1996), the supervisor's gender, the hierarchical level (lower, middle, higher), and the type of organization (private vs. public) did not significantly influence the leadership ratings in Study 1. The present findings thus point out that the impact of these variables is not sufficiently clear. Therefore, more research is needed, for example, on variables that may moderate the effects of individual and organizational variables on leadership behavior. Certainly, it is a question of practical relevance which conditions promote or hinder transformational leadership.

### **Methodological Insights**

The present studies yielded some methodological insights future studies should consider. The CFA-based MTMM analyses in Study 1 as well as in Study 2 revealed strong method effects, i.e. almost one half of the indicators' variance was due to the rating perspectives of self and follower rating. Consequently, the latent correlations between the trait factors differed considerably from the respective zero-order correlations. Self and follower ratings were confirmed as dissimilar methods that show only small correlations. Thus, on the one hand, the combined use of these rating perspectives in multisource study designs substantially attenuates the observed relationships (Williams & Brown, 1994). On the other hand, single source studies might overestimate the constructs' relationships (Podsakoff et al., 2003). Therefore, a conscious use of multisource

ratings is required. It is neither the exclusive use of same-source data that guarantees reliable estimations of relationships nor is it the simple combination of different sources. Instead, the statistical procedures that are applied to the data must account for the different rating sources in a systematic manner. The studies of the present dissertation have shown that CFA-based MTMM analyses can accomplish these requirements.

Indeed, throughout the three empirical studies, the proceeding of MTMM analyses has proved its merit with regard to the following advantages. Firstly, true-score correlations between the variables could be determined by means of modeling unsystematic measurement errors and systematic measurement methods. This was possible although the particular reasons that account for the systematic measurement effects, i.e. effects of self-deception and response distortion in self and follower ratings, were unknown. Moreover, Study 2 has shown how MTMM analyses can be used to remove method effects from the construct scores in organizational survey data. These scores were used to predict relevant performance criteria of leadership effectiveness in Study 3 and, by this, enabled further findings. In summary, the collection of multimethod data and their analysis via CFA-MTMM techniques allow for determining the relationship of different constructs independently of the systematic effects of measurement methods. In a large number of research fields, this procedure could facilitate enormous contributions in order to disentangle method effects from correlations of true scores.

Finally, the current findings emphasize the validity of the instruments that were applied and, thus, recommend their further utilization in research settings. On the one hand, the factorial validity of the TLI was impressively confirmed, even with regard to the discriminant validity of the transformational and transactional subscales. On the other hand, the use of contextualized items in the assessment of personality traits has proven its worth. Even – and in particular – if powerful statistical methods are applied that can control for systematic and unsystematic measurement effects, contextualized measures might be specifically valuable because the common frame of reference increases trait variance, and reduces error variance (Hoffman et al., 2012).

### **Methodological Strengths of the Studies**

The most important strength of this dissertation is the identification of true-score correlations between the respective constructs, i.e. the subscales of transactional and transformational leadership in Study 1, achievement, extraversion, emotional stability,

and transformational leadership in Study 2, and, in addition to these personality traits and leadership behaviors, subjective and objective measures of leadership effectiveness in Study 3. Thus, the relationships that were revealed are neither affected by unsystematic measurement errors nor by systematic method effects of rating perspectives. Consequently, the relationships are neither overestimated due to common method variance nor underestimated due to the combination of dissimilar methods.

This achievement could be realized by the collection of multitrait-multimethod data and by the use of CFA-MTMM techniques. Actually, the advanced statistical procedures that were applied in the current studies constitute a second strength. The CTCM model that was used in Study 1 and in Study 2 is considered the most recommended procedure for analyzing MTMM data (Lance et al., 2002). In Study 3, partial least squares were applied as a non-parametric structural equation modeling technique that is particularly suitable for non-normal distributed data (Cassel, Hackl, & Westlund, 1999; Reinartz, Haenlein, & Henseler, 2009) and small samples (Hair, Ringle, & Sarstedt, 2011; Ringle, Sarstedt, & Straub, 2012).

Thirdly, all studies were conducted as field studies, with supervisors and their followers from real organizations taking part in the surveys. Thus, the studies in this dissertation go beyond previous research that, in part, has relied on laboratory studies with student participants (Colbert et al., 2012). The proceedings of the present work have rather strengthened the external validity of findings. Furthermore, different settings were combined as a heterogeneous sample from different organizations was used in Study 1, whereas, in Study 2 and in Study 3, supervisors and followers belonged to one organization. Thus, particularly in Study 1, results entail considerable generalizability.

Fourth, the questionnaires that were applied in the studies proved to be reliable and valuable instruments. Due to the small number of items per scale in the TLI (Heinitz & Rowold, 2007) and the broad personality domains that are captured in the BIP-6F (Hossiep & Krüger, 2012), the internal consistencies reached an acceptable to good level in all cases. Moreover, the measurement models based on two parcels per scale were confirmed for both instruments, and, for each of them, across rating perspectives.

Regarding the empirical evaluation of the mediator model in Study 3, the incorporation of a subjective as well as an objective indicator of leadership effectiveness consti-

tutes a further significant strength. Studies that solely rely on subjective measures were questioned whether they really capture leadership effectiveness (Hoffman et al., 2011; Kaiser et al., 2008; Morgeson et al., 2007a). However, both of these types of indicators have their own advantages and disadvantages (Judge et al., 2009). Therefore, at best, different criteria should be included (DeRue et al., 2011; Yukl, 2009). Although this recommended path causes extra effort, it was chosen for Study 3. In addition to the subjective ratings of followers' job satisfaction, the percentage of target sales profit was measured as objective criterion.

Finally, the objective performance indicator in Study 3 was measured four months after the survey. Thus, a proper time lag was ensured between the measurement of leadership behavior and the countable consequences in sales profit (Judge & Long, 2012). Moreover, the time lag constitutes a longitudinal design that facilitates – though not permits – causal conclusions.

### **5.3 Limitations and Avenues for Future Research**

Despite its valuable insights into relevant research topics, this dissertation also leaves some questions open. Within the discussion of each study (cf. Chapter 3.5, Chapter 4.5, and Chapter 4.9), a couple of limitations are depicted in detail. In the following, research questions are provided that deserve further scientific clarification regarding the elements within process models of leadership, regarding the functioning of these models, and, finally, regarding the method effects of self and other ratings.

#### **Elements in the Mediator Model of Leadership Effectiveness**

The process models of leadership that were formulated are capable of incorporating a wide range of dispositional antecedents, behavioral styles, and outcomes of leadership. Study 3 was one of the first to empirically evaluate the mediator model. However, obviously not all of these variables but only a small number of personality traits, one class of leadership behavior, and two measures of leadership effectiveness could be included. Therefore, research is needed that covers different piles of dispositions, behaviors, and outcomes.

Considering the antecedents of effective leadership behavior, studies are needed that broaden the range of personality traits – within and beyond the five-factor model of personality. As the FFM constitutes the most widely accepted framework, research is

particularly required that uses classical concepts and measures for the five factors and their facets.

In Study 2 and in Study 3, contextualized items were used to assess two of the FFM factors, i.e. extraversion and emotional stability, and one part of a further factor, i.e. achievement as part of conscientiousness. However, as several strategies were used to remove attenuating effects from the empirical relationship between personality traits and transformational leadership, the relative impact of these strategies on the rised coefficients could not be determined. Therefore, research is needed that can differentiate between the single effects of these promising strategies. For example, Hoffman et al. (2012) directly compared contextualized and standard scales for multisource performance ratings. Drawing on the same sort of CFA-MTMM techniques as applied in Study 2, they found out that contextualized items in multisource performance ratings increased the relative portion of trait variance, and decreased trait overlap and error variance. Likewise, standard scales and contextualized scales should be simultaneously applied in studies on the dispositional basis of leadership behavior in order to identify the relative impact of choosing the relevant traits, measuring them with contextualized instruments, and controlling for method effects.

With regard to leadership behavior, Study 1 could, for the first time, establish the discriminant validity of transformational and transactional leadership. However, there are many other approaches and theories of leadership behavior that substantially overlap and deserve conceptual and empirical discrimination (Piccolo et al., 2012). Moreover, the construct validity of leadership styles should be established with different instruments, i.e. methods (Campbell & Fiske, 1959). In Study 1, the discriminant validity of transactional and transformational leadership was supported via MTMM analyses of the Transformational Leadership Inventory (Podsakoff et al., 1990). Future research should replicate this important finding, first and foremost, with the most widely used questionnaire for FRLT assessment, the Multifactor Leadership Questionnaire (Bass & Avolio, 2000). Studies on the factor structure of the MLQ have revealed quite inconsistent findings (Avolio et al., 1999; Heinitz et al., 2005; Tepper & Percy, 1994), particularly with respect to the number of subscales. Therefore, the statistical methods that were successfully utilized in Study 1 should be applied to the MLQ and further leadership questionnaires in order to strengthen their construct validity.

Moreover, the enlightening findings on the dispositional basis of transformational leadership should be transferred to other leadership styles and relevant organizational behaviors. Drawing on a similar proceeding, the pitfalls of method effects could be avoided when investigating, for example, which personality traits foster the development and exhibition of transactional and laissez-faire leadership, of consideration and initiating structure, of organizational citizenship behavior or counterproductive work behavior.

On the right side of the mediator model, the assortment of leadership outcomes that is included in empirical studies should be reasonably enlarged. Even though Study 3 incorporated subjective as well as objective indicators of leadership effectiveness, only one in each case, thus two measures in total were incorporated. Future studies should, therefore, comprise further outcomes that equally cover subjective and objective indicators (Yukl, 2009), and, additionally, different levels of analyses (individual, leader-follower-dyad, team, organization; cf. Antonakis et al., 2012; DeRue et al., 2011), as well as different time perspectives (short-term and long-term effects of leadership behavior; cf. Judge & Long, 2012).

Finally, in order to get generalizable results, more studies with practicing leaders, i.e. not students, and large samples from a variety of organizations are needed (Antonakis, 2011). Due to constraints of the cooperating organization, the sample that was used to evaluate the mediator model predicting objective leadership effectiveness in Study 3 was particularly small.

### **Functionality of the Mediator Model of Leadership Effectiveness**

The formulation of process models of leadership has constituted a substantial advancement in leadership literature as they integrate dispositional and behavioral approaches. Study 3 has disclosed a promising way to empirically evaluate those models independently of effects of measurement methods. Nevertheless, a dark cloud hovers above the mediator model. The way, in which the processes take place within the model, as well as potential moderating variables form a painful lack of knowledge. A few theoretical approaches shall be depicted in the following that may fuel the research on the functioning of the distal and proximal predictors within the mediator model.

Firstly, the basic structure of the process model is in accordance with interactional models of personality that view personality traits as behavioral tendencies. Depending on attributes of the actual situation, traits influence the observable behavior to a greater or lesser extent. This basic assumption is in agreement with the full mediation revealed in Study 3. Transformational leadership was found to completely mediate the effects of personality traits on leadership effectiveness. That is to say, only if the situation allows for behavior that corresponds to the traits, they can exhibit their impact on effectiveness. Beyond transformational leadership behavior, the traits did not show direct effects on outcome criteria. However, the way in which situational attributes influence the interplay of traits and behaviors has not been sufficiently investigated. For example, „the concept of situation strength has not been widely used in the study of leadership“ (Kaiser & Hogan, 2007, p. 175). Therefrom, it should be studied which kinds of situations allow leaders with certain traits to exhibit effective transformational leadership. The results of Study 1 indicated that several individual and organizational variables, i.e. supervisor’s gender, hierarchical level, and the type of organization, did not influence the rating scores of leadership behavior. However, these variables were found to influence leadership ratings in previous studies (Antonakis et al., 2003; Eagly et al., 2003; Lowe et al., 1996). Therefore, future research should investigate potential situational conditions that may influence the absolute level of transformational leadership and the impacts of such variables.

Moreover, research is needed on potential moderators of the relationships within the mediator model. Judge and colleagues (Judge & Long, 2012; Judge et al., 2009) have outlined paradoxes of traits in leadership that refer to the “dark side” of even desirable “bright traits” (Judge et al., 2009, p. 864). For example, a trait that is useful in one situation may become irrelevant or counterproductive in another situation. Thus, research should determine the distinct merits of different traits in different situations. Potential moderators of the relationship between traits and behaviors can be found within the leaders, e.g., their gender or intelligence (Hoffman et al., 2011), within the organization (Hoffman et al., 2011), and the work environment (De Hoogh et al., 2005). Another class of situational attributes which may moderate the model’s paths is formed by the followers (Klein & House, 1995). Their characteristics, including personality (Felfe & Schyns, 2006; Felfe & Schyns, 2009; Schyns & Felfe, 2006; Schyns & Sanders,

2007), perceived similarity (Felfe & Heinitz, 2009), their individual distance to the leader (Antonakis & Atwater, 2002; Shamir, 1995), and their implicit leadership theories (Keller, 1999; Schyns, Felfe, & Blank, 2007), may moderate the effect of leader traits on effectiveness. For example, “a trusting, gentle compassionate leader might earn the affection of her followers, but also might be vulnerable to being manipulated or duped by others” (Judge et al., 2009, p. 859). Moreover, traits may have curvilinear effects on desirable outcomes (Le et al., 2011). For example, excessively stable and extraverted leaders might overestimate their own capabilities and underestimate the relevance of feedback from followers and colleagues (Judge et al., 2009). In order to determine the diminishing marginal benefit of certain traits – and of certain leadership behaviors, their curvilinear effects with respect to different outcomes should be analyzed accurately.

Secondly, a look at the results through the glasses of the socioanalytic theory may be beneficial (Judge et al., 2009). With regard to personality, socioanalytic theory assumes that individuals have two primary motives, i.e. getting along and getting ahead (Hogan & Holland, 2003). Particularly the motive of getting ahead can link leader traits to leader emergence. For example, conscientious, extraverted, and emotionally stable individuals are motivated to get ahead (Barrick, Stewart, & Piotrowski, 2002), and thus, to seek leadership positions. In addition to these two basic motives, a third motive has been added to socioanalytic theory, namely finding meaning (Hogan & Shelton, 1998). Accordingly, “people want their lives to be predictable, orderly, and sensible” (p. 120). Transformational leaders inspire their followers “to strive toward a purpose that has meaning and the promise of fulfillment” (Judge et al., 2009, p. 861). Thus, transformational leadership might be more likely with conscientious leaders who are disciplined, well-organized, and planful themselves (Hogan & Shelton, 1998). Moreover, it might be effective as it might help followers to satisfy their motive of finding meaning. However, future research will have to clarify to what extent the three motives postulated by socioanalytic theory actually account for the relationship between traits and leader behaviors.

Thirdly and likewise, the well-known link between transformational leadership and effectiveness should be clarified with regard to the underlying processes. Here, approaches like the social identity theory (Hogg, 2001) might be fruitful in order to explain why followers of transformational leaders outperform others (Haslam & Platow,

2001; Haslam et al., 2001). For example, to what extent do transformational leaders change their followers' values, the group they identify with, and their self-concept (Shamir, House, & Arthur, 1993; Tajfel & Turner, 2004)?

### **Method Effects of Self and Other Ratings**

The current methodological findings also point to some open research questions. Applying CFA-MTMM procedures, it was found that self and follower ratings constitute dissimilar methods, weakly correlated, that exhibit strong method effects on leadership and personality ratings. However, it was beyond the scope of the present work to seek out the reasons for low self-other agreement. Future research should address this issue by building on the theoretical and empirical approaches that already exist. For example, the socioanalytical approach offers a theoretical explanation for the lack of agreement between self and observer ratings. According to Hogan and colleagues (e.g., Hogan & Holland, 2003), the lack of convergence resembles the difference between identity, i.e. how an individual sees him-/herself, and reputation, i.e. how an individual is perceived by others. Thus, self-report measures capture identity, while observer ratings capture a part of the leader's reputation. Given the different psychological functions and the distinct development of identity and reputation, the weak associations and the low convergence between self and other reports are of no surprise.

From an empirical point of view, the widely confirmed mean difference between self and other ratings was used to seek out some potential causes. Self-ratings are typically found to be significantly higher on desirable measures than other ratings (Atwater & Yammarino, 1997; Harris & Schaubroeck, 1988; and also Study 1). Based on this finding, the egocentric-bias theory was formulated as an explanation for the disagreement. Particularly in settings of evaluative ratings, it assumes that underlying processes of self-esteem and defensiveness cause a self-rater to inflate his/her ratings. Beyond this intentional bias of response distortion, the egocentric-bias may be due to unintentional attributional processes. While actors, i.e., self-raters, attribute positive results internally to their own behavior or traits and negative outcomes externally to environmental factors, observers tend to favor the converse pattern. Also building on attributional and evaluative effects, Helzer and Dunning (2012) recently argued that the overoptimism of self-prediction relies on a differential weighting scheme. While other raters particularly use past behavior when predicting others, self-raters gave greater weight to aspiration

level. This leads to less optimistic but more accurate peer predictions. Similarly, the results of Connelly and Hülshager (2012) support the clearer lens hypothesis of more accurate observer ratings, pointing to effects of self-deception (Paulhus, 1991). With regard to different observer ratings in multisource ratings for executives, ratings of subordinates, peers, and superiors were compared. Subordinates were found to exhibit the most rating bias due to leniency and halo effects (Ng et al., 2011). The exhibition of rating biases by subordinates is explained by their fear of potential negative consequences from their rated leaders. Even if ratings are assured to be confidential and anonymous, subordinates feel uncomfortable about rating their supervisor and they are inhibited in providing honest feedback (Mount & Scullen, 2001). In sum, diverse intentional and unintentional effects on self and on observer ratings have been described. Unfortunately, the relative significance of these potential biases is unclear, just as their differential effects on the mean difference and on the small correlation between self and follower ratings.

#### **5.4 Implications for HR Practitioners**

Within the empirical studies of this dissertation, self and follower ratings were analyzed. In practical HR settings, such data are typically collected within 360-degree feedback programs, also known as multisource performance ratings (MPR) – just as it was the case in Study 2 and Study 3. Thus, the present findings contain a series of implications for MPRs. However, the majority of these findings is likewise beneficial for feedback methods based on single-source ratings. Therefore, the practical recommendations that can be derived from the present findings are outlined in a general manner. Firstly, based on the affirmed dispositional basis of transformational leadership behavior, some remarks on potential consequences for personnel selection and developmental issues are provided. Next, some preliminary recommendations are depicted, based on the strong method effects that were revealed for self and follower ratings. Consequently, these arguments focus on MPR settings. Finally, some conclusions are formulated, based on the experiences with the applied rating instruments.

##### **Identification and Development of Effective Leaders**

“Indeed, a dispositional approach implies that leaders should be selected according to their level on certain traits” (Dinh & Lord, 2012, p. 653). The current findings show that the probability of effective transformational leadership behavior is higher for

leaders with a higher level on certain traits. Thus, in search for effective leaders, HR practitioners would be well advised to look for people with higher levels of achievement and extraversion. However, the limitations outlined above have pointed to a plenty of questions that are still open regarding the functioning and situational variability of these relationships. Therefore, the following practical implications include some remarks that go beyond basic personnel selection advices.

Within this dissertation, the effectiveness of transformational leadership was again confirmed. Actually, the current findings exceed previous research as the class of transformational leader behaviors was proved to be empirically distinguishable from transactional behaviors. Moreover, it was shown that transformational leadership promotes followers' job satisfaction and the subsequent sales profit of the team. Remarkably and beyond previous research, these two relationships were verified based on latent scores, i.e. independently of method effects of ratings perspectives. Thus, the well-known relationship between the followers' evaluation of their leader's transformational behavior and their own job satisfaction is not just a matter of common method variance (cf. Podsakoff et al., 2003) or individual sympathy (cf. Brown & Keeping, 2005). Therefore, HR practitioners can be assured and should continue to enhance transformational leadership in organizations.

Generally, the appearance of a particular behavior can be influenced (1) by the selection of people who are likely to perform this behavior, (2) by behavioral intervention programs that foster the individual exhibition of this behavior, and (3) by the selection or manipulation of situations that promote the desired behavior. The first of these strategies refers to the dispositional basis of transformational leadership, which found support in Study 2 and Study 3. Some researchers have argued against the dispositional basis of transformational leadership by referring to findings on the effectiveness of training interventions (Abrell et al., 2011; Barling et al., 1996), i.e. the effectiveness of the second strategy. If developmental programs can significantly enhance, i.e. *change*, transformational leadership behavior, a significant part of its variance cannot be due to *stable* individual differences. However, I argue that, as is often the case, these two strategies may benefit from an integrative view. Indeed, the amount of variance that – drawing on available findings – can be accounted for by either traits *or* training is far from one hundred percent in both cases. Thus, stable traits *and* behavioral experiences, which

may be encountered during training interventions or during daily leadership situations, may both, individually and interactionally, influence leadership behavior.

What kind of interactional influence might this be? For example, personality traits can influence the effectiveness of training interventions (Colquitt et al., 2000; Rowold, 2007). This holds true for standardized group trainings and all the more for individualistic interventions like coaching. McCormick and Burch (2008) have vividly described the potential advantages of personality-based coaching. Namely, a trait-orientated assessment of the strengths and developmental needs can provide a fertile starting point to understand individual habits and to define coaching goals. Moreover, it can function as a framework for identifying and practicing new behaviors. As McCormick and Burch emphasize, personality-focused coaching “does not seek to ‘change’ personality but rather uses an understanding of a coachee’s personality traits to facilitate behavioral change in certain (leadership) situations and contexts” (2008, p. 273).

Furthermore, the full mediation that was found in Study 3 for transformational leadership, which completely mediated the effects of personality traits on leadership outcomes, points to the potential benefits of additionally integrating the third strategy. If it is not personality that directly affects performance but the leadership behavior that is displayed in diverse situations, than these situations do have an influence on this process. On the other hand, Study 1 has revealed that the hierarchical level and the type of organization do not directly increase or decrease the probability of transformational leadership. Thus, research is still needed on the impact of organizational and individual situations and of their attributes like situational strength and trait-relevant cues. This three-fold integration would find famous precedents in psychological research. As outlined in the beginning of this dissertation, by now, an interactional view on the explanation of human behavior is favored. Accordingly, the displayed behavior is influenced by individual differences *and* situational attributes *and* their interaction in a number of ways. Consequently, HR practitioners should attentively look out for situations that promote transformational leadership behavior. For this purpose, HR developers could actively cooperate with the leaders themselves in training and coaching settings. The three strategies outlined before might, for example, be integrated by explorative questions to the leaders: In which situations is it easy for you to lead transformationally? Given your personality, which transformational behaviors are easy for you to express?

Given your typical leadership situations and given your personality, which developmental support, do you think, would help you to lead transformationally?

### **Self and Follower Ratings in Multisource Performance Ratings**

Throughout Study 1 and Study 2, self and follower ratings did not only show quantitative differences in the absolute scoring level but also substantial qualitative differences. Their latent method factors correlated only marginally and, moreover, they strongly affected the ratings of personality traits and leadership behavior. What practical implications can be derived from these method effects?

First of all, these strong method effects refer to the well-known disagreement of self and observer ratings. If, in MPR settings, leaders' self-ratings and observer ratings from their supervisor, peers, and subordinates are collected, usually large discrepancies are found between self-ratings and observer ratings from different levels (Conway & Huffcutt, 1997; Harris & Schaubroeck, 1988; Mount, Judge, Scullen, Sytsma, & Hezlett, 1998). This discrepancy can be viewed in two ways. On the one hand, a correlational view focuses on the low convergence and thus refers to the unique information self and observer ratings provide. Self and other ratings were found to represent unique sources of variance that show differential and incremental validities on a multitude of outcome variables (Connelly & Ones, 2010; Oh & Berry, 2009; Oh et al., 2011; Vazire & Mehl, 2008). Therefore, these different perspectives should both be incorporated in the assessment of individual attributes like personality traits and leadership behaviors. In contrast to many current research studies, which often still rely on single-source ratings, HR practitioners already account for this insight by the use of 360-degree feedback programs and MPRs. Here, the advantages of multiperspectivity have already made their voice heard. Different perspectives are viewed to complement each other and to enhance the "ecological validity of an individual's overall picture" (Sarges, 2006, p. 742, author's translation). Likewise, a multimethodological approach has been established in personnel selection processes. Here, typically, different methods like tests, simulations, and interviews are combined in order to increase the ecological and predictive validity. In both cases, i.e. feedback programs and selection issues, practitioners should continue with the multimethodological proceedings and, at the same time, keep in mind that the differences between the methods do not constitute mere measurement errors but meaningful and valid perspectives on the target attributes (Lance et al., 2008).

On the other hand, a congruence-focus on the absolute difference of rating scores ascribes the discrepancy to a leaders' lack of self-awareness or to distorted follower ratings. As leadership is commonly viewed as what is perceived, the former interpretation is generally favored (cf. Atwater & Yammarino, 1992; Fleenor et al., 2010). Actually, the difference between self and other ratings was found to be a valid predictor of organizational effectiveness (Atwater & Yammarino, 1992; Atwater, Ostroff, Yammarino, & Fleenor, 1998; Bass & Yammarino, 2008; Bratton, Dodd, & Brown, 2011; Connelly & Hülshager, 2012), and thus, a criterion for the leaders' performance. Consequently, for organizations and particularly for HR practitioner, the question becomes crucial: How can we enhance leaders' self-awareness? Firstly, the feedback on the discrepancy itself was found to be beneficial (Atwater, Roush, & Fischthal, 1995). Leaders who receive ratings that are lower than their self-ratings were motivated to reduce the discrepancy by improving their performance (Antonioni, 1996; Johnson & Ferstl, 1999). Further techniques can be derived from research on the reasons for low self-other agreement. In general, intentional reasons, like faking and leniency, and unintentional reasons, like self-deception and halo, are distinguished from each other (Colbert et al., 2012). In order to avoid intentional biases in other ratings, the raters' anonymity is usually ensured (London, Wohlers, & Gallagher, 1990). If raters were not anonymous but accountable, their ratings would be found to be inflated (Antonioni, 1994). Thus, the anonymity of raters can increase the likelihood of accurate ratings. Moreover, it can increase the likelihood of a discrepancy between higher self-ratings and lower other ratings (Morgeson, Mumford, & Campion, 2005), which, in turn, as depicted before, enhances individual development (Johnson & Ferstl, 1999).

Interestingly, self-ratings tended to be overly optimistic even if the setting did not foster motivational biases but an accurate assessment would be advantageous for the leader himself (Connelly & Hülshager, 2012). Thus, unintentional biases do, at least in part, affect the ratings as well. Connelly and Hülshager (2012) concluded that self-reports suffer from "cloudy lenses" (p. 624). But how can HR developers reduce unintentional self-misperception? How can they support leaders in an accurate self-perception? Actually, the discrepancy between self and other ratings illustrated in 360-degree feedback reports can be used to stimulate leaders for a shift in perspective. What behaviors might have caused others to this assessment? This invitation to "mimic ob-

servers” (Connelly & Hülshager, 2012, p. 624) and “to see themselves as others see them” (Bratton et al., 2011, p. 13) can shift the focus from own intentions to displayed behavior (Helzer & Dunning, 2012) and reduce overattribution (Ross, 1977).

### **Measurement of Leadership Behavior and Personality Traits**

Several results of Study 1 provide important insights into the capability and attributes of the Transformational Leadership Inventory (Heinitz & Rowold, 2007; Podsakoff et al., 1990), which should guide its utilization in practical HR issues. First, as the factorial structure and its invariance across rating perspectives have been impressively confirmed, the TLI can be used to reliably assess self and follower ratings of seven subscales of transformational and transactional leadership behavior.

Second, several individual and organizational variables did not significantly influence the TLI scores. Therefore, the norms that are provided in Appendix A can be applied to a wide range of supervisors and organizations, namely female and male supervisors, leaders from different hierarchical levels (lower, middle, higher), and different types of organizations (public and private). However, as previous studies have occasionally found differences between those groups (Antonakis et al., 2003; Eagly et al., 2003; Lowe et al., 1996), users should keep possible group differences in mind. The norms that were derived in Study 1 can substantively support the adequate application of the TLI, and by this, the reliable measurement of leadership behavior. In Study 1 as well as in Study 2, the TLI scales showed an acceptable to good level of internal consistency. Moreover, the individual scores were normally distributed, which, in turn, emphasizes the applicability of the norms.

Third, self-ratings proved to be typically more favorable than follower ratings, paralleling previous findings of self-report inflation (Atwater & Yammarino, 1992; Podsakoff & Organ, 1986). Therefore, a large number of absolute over-estimators will be expected if the TLI is applied in 360-degree feedback settings. However, due to the group mean difference, not all of them are overraters in the usual sense. Studies on self-other agreement categorize raters as over-estimators, in-agreement, and under-estimators on the basis of deviation from the *mean difference* (Atwater & Yammarino, 1992, Atwater & Yammarino, 1997; Fleenor, McCauley, & Brutus, 1996). That is to say, leaders with a positive difference between their self-rating and their followers’ ratings that corresponds to the mean difference of rating perspectives are categorized as in-

agreement. They do not belong to the group of over-estimators, for whom lower levels of organizational and individual effectiveness were revealed (Atwater, Waldman, Ostroff, Robie, & Johnson, 2005; Fleenor et al., 2010). The relative categorization should, hence, be taken into account when these research findings on the relationship between self-other agreement and leadership performance are applied to individual leaders. The relative categorization can be ensured by the use of the norms that are provided separately for self and follower ratings of the TLI in Appendix A.

Finally, in Study 2 and Study 3, contextualized, work-related items (Hossiep & Krüger, 2012) have done a good job in the measurement of personality traits. Therefore, the use of frame-of-reference scales is recommended in research and in HR practice. As Hoffman et al. (2012) have pointed out, a common frame of reference is particularly important in multisource performance ratings, because these ratings are characterized by raters with limited rating experience and different perspectives on the ideal performance. Contextualized questionnaires have been found to show a higher level of accuracy and less construct overlap (Hoffman et al., 2012). The accurate measurement of discrete behavioral tendencies is crucial if specific interventions to develop discrete individual attributes are derived from the appraisal results.

## **5.5 Conclusion**

Leadership constitutes a fundamental human phenomenon, and the identification of good leaders has been a major subject matter of social and organizational scholars and practitioners for centuries. For more than two decades, transformational leadership has intensively been investigated and, by this, has established its place in the focus of leadership research. This dissertation yields appreciable insights into the antecedents, relatives, and consequences of transformational leadership. CFA-based MTMM analyses of supervisors' self-ratings and followers' observer ratings were used to control for the method effects of measurement when investigating the relationships of transformational leadership with precedent individual dispositions, with distinct leadership styles, and with succeeding outcomes. By this means, the discriminant validity of transformational leadership was, for the first time, empirically established. Drawing on the true-score correlations of latent factors, six classes of transformational behavior could be distinguished from each other and from transactional leadership. With respect to potential antecedents, three personality traits, i.e. achievement, extraversion, and emotional

stability, were found to show substantial true-score correlations with transformational leadership behavior. Due to their intercorrelations, only achievement and extraversion showed incremental validities as antecedents of transformational leadership in a comprehensive mediator model. Their indirect effects on leadership effectiveness were fully mediated by transformational leadership, which significantly predicted the concurrent job satisfaction of followers and the team's subsequent sales profit.

As the method effects of rating perspectives were found to strongly affect the ratings of personality traits and leadership behavior, the identified true-score correlations differed substantially from the zero-order correlations that had been reported previously. Thus, researchers are well advised to attentively account for method effects when investigating the relationship of constructs. Likewise, HR practitioners are well advised to account for rating effects when using self and other ratings in settings of personnel selection, development, and feedback.

A complex phenomenon like leadership demands a farseeing handling from the leaders as well as from researchers and practitioners who engage in this topic. Thorough research on effective leadership as well as thorough practice, which both account for malleable and immutable parameters, are continuously needed. This dissertation has uncovered stable individual characteristics that affect the conduct of effective leadership behavior. Moreover, it has pointed to a promising path to integrate the different but equally valid angles of those who lead and those who are led. In respecting these personal qualities, effective leadership behavior can be promoted, for daily and extreme situations, for the sake of employees, leaders, organizations, and societies. Indeed, if effective leadership can prevent sinking, much will be gained.

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## Appendix

### Appendix A: Norms for the German TLI

For the application of the TLI in practical contexts, norms are provided based on the aggregated samples described above. To calculate the norms, raw scores of the seven scales (i.e., means of the items or recoded items where necessary, see Heinitz & Rowold, 2007) were transformed via their cumulative distribution function to *T*-scores with a mean of 50 and a standard deviation of 10. For the TLI raw scores, maxima of .5-intervalls are assigned to *T*-scores in Table 15.

To transform an individual raw score into a *T*-score, one should look for this raw score or for the next highest score in the first column of Table 15. Thereafter, one should follow this row to the right and read off the *T*-scores for the scales and rating perspectives needed. For example, a raw score of 2.4 in a follower rating for Individualized Support becomes a *T*-score of 37 (following the row of 2.5 as the next highest raw score to the IS-column in the left part of the table), indicating a rather low rating. According to widely-used guidelines, the range from one standard deviation below average ( $T = 40$ ) and one standard deviation above average ( $T = 60$ ) is called “average”, including per definition 68 % of the participants. By transforming individual raw scores to *T*-scores, they can be compared to the results of the norm sample. In this way, the results of supervisors’ self-ratings and follower ratings can be interpreted as low, average, or high.

As significant differences of the scores could not be observed for the corresponding subgroups (Table 8), these norms can be applied to female and male supervisors, leaders from different hierarchical levels (lower, middle, higher) and different types of organizations (profit and nonprofit). Given that these differences had been found in other samples, users of the norms should pay attention to possible group differences. In the same way, specific occupations or organizations might show results systematically differing from these norm values. However, the present data do not point in this direction. Although quite heterogeneous samples were analyzed in this study, no significant differences could be found between them for almost all of the six TLI scales in the two rating perspectives. Only in the self-ratings of Individualized Support, post hoc tests revealed significant differences, indicating lower means for the profit sample #1 (rail-

way company) and the nonprofit sample #6 (orchestras) compared to the other seven samples. Therefore, based on the present results, the use of these norms can be recommended for a large variety of occupations and organizations. However, due to the sampling procedure, the norms should be used with caution in contexts where leaders and followers do not participate on a voluntary basis.

Table 15. Norms (*T*-values with a mean of 50 and a standard deviation of 10) for the German TLI, specifically for rating perspective (follower rating and self-rating)

Raw score	Follower rating							Self-rating						
	AV	PAM	FAG	HPE	IS	ISN	CR	AV	PAM	FAG	HPE	IS	ISN	CR
1.0	24	26	25	20	21	27	25							
1.5	28	29	30	24	26	30	30							
2.0	35	36	35	32	31	38	35	26	20		31		23	21
2.5	40	40	40	36	37	41	40	32	26	25	35	25	29	29
3.0	47	47	45	44	42	48	45	42	38	33	44	33	40	36
3.5	52	51	50	50	47	53	49	48	44	42	48	40	46	44
4.0	58	57	55	56	53	59	54	57	55	50	57	48	57	52
4.5	62	62	60	60	58	63	59	63	61	58	64	56	62	59
5.0	69	68	65	68	63	70	64	72	73	67	70	63	73	67

*Note.* AV = Articulating a Vision; PAM = Providing an Appropriate Model; FAG = Fostering the Acceptance of Group Goals; HPE = High Performance Expectations; IS = Individualized Support; ISN = Intellectual Stimulation; CR = Contingent Reward.

## Appendix B: Instruments applied in Study 1 to Study 3

### Study 1

Table 16. Instruments applied in Study 1

Construct	Instrument	Scales/operationalization used in the studies	No. of items per scale	Original publication (German version if necessary)
Subscales of transformational leadership	TLI (self and other rating version)	Articulating a Vision Providing an Appropriate Model Fostering the Acceptance of Group Goals High Performance Expectations Individualized Support Intellectual Stimulation	5 3 4 3 4 3	Podsakoff et al., 1990 (Heinitz & Rowold, 2007)
Transactional leadership	TLI (self and other rating version)	Contingent Reward	4	Podsakoff et al., 1990 (Heinitz & Rowold, 2007)

## Study 2

Table 17. Instruments applied in Study 2

Construct	Instrument	Scales/operationalization used in the studies	No. of items per scale	Original publication (German version if necessary)
<i>Personality traits</i>				
Achievement	BIP-6F	Engagement	8	Hossiep & Krüger, 2012
Extraversion	(self and other rating version)	Social Competence	8	
Emotional stability		Stability	8	
<i>Leadership behavior</i>				
Transformational leadership	TLI (self and other rating version)	Transformational Leadership	22	Podsakoff et al., 1990 (Heinitz & Rowold, 2007)

### Study 3

Table 18. Instruments applied in Study 3

Construct	Instrument	Scales/operationalization used in the studies	No. of items per scale	Original publication (German version if necessary)
<i>True score of</i>				
Achievement	(BIP-6F)	Engagement	(8)	Hossiep & Krüger, 2012
Extraversion		Social Competence	(8)	
Emotional stability		Stability	(8)	
<i>True score of</i>				
Transformational leadership	(TLI)	Transformational Leadership	(22)	Podsakoff et al., 1990 (Heinitz & Rowold, 2007)
<i>Leadership effectiveness</i>				
Subjective leadership effectiveness	Job description scale	Job satisfaction	8	Neuberger & Allerbeck, 1978
Objective leadership effectiveness	-	Percentage of unit's target sales profit	-	-