Advances on Personal Sense of Power: How People Experience Power, how it Affects Self-Evaluations, and how it Pervades Close Relationships

Dissertation

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„Power is everywhere“

—Michel Foucault, 1976, p. 63

Abstract

Power is often considered as a fundamental force in driving human's mind and behavior. And indeed, several empirical reports demonstrate the versatile effects power can have. Yet, power is typically assessed with English-language scales and it remains unclear how to best measure power in non-English-speaking samples, which is why an instrument for the German language is introduced. Next, dyadic perspectives on power have not often been considered despite defining power as a social construct. Further, power can affect our thinking in positive and negative ways and we know less about mechanisms and outcomes on which these antithetical consequences can be observed. In this dissertation, the aforementioned research questions are addressed. Power is conceptualized as perceived capability to influence others. The self-perceived assessment, consequences of power in romantic relationships, and effects on self-perceptions as well as cognitive processes are studied.

After summarizing conceptual and theoretical perspectives on power in Chapter 1, I present in Chapter 2 the German Personal Sense of Power Scale. The scale showed convincing internal consistency, stability, construct validity using confirmatory factor analysis, nomological and criterion validity, measurement invariance, and extreme-group validity. In the following studies, the scale was used to further understand consequences of power.

In Chapter 3, associations of sense of power with relationship quality are studied in romantic relationships while also analyzing the effects of other power forms (e.g., positional power, power motive). Sense of power was a stronger predictor of relationship quality than positional power, and an actor's sense of power was also positively linked to partner's relationship quality. Subsequently, in Chapter 4, power was shown to be positively linked with forgiveness in romantic couples from Germany and Israel. Self-esteem mediated these associations. Again, actor's power related positively to partner's forgiveness. Thus, Chapter 3 and 4 demonstrate the importance

of considering the interdependence of relationship partners to fully understand effects of power in close relationships.

In Chapter 5, power measured as a trait and manipulated through a role scenario predicted positive body image. As in Chapter 4, self-esteem was a relevant variable in explaining the positive effect of power. Yet, power can also lead to cognitive illusions, which is addressed in Chapter 6. Power led to more overconfidence and had a small effect on the illusion of explanatory depth. Negative effects of power seem thus to be expected on some social cognitive phenomena whereas in all studies presented in this dissertation power had desirable effects on and desirable associations with self-perceptions that tap into feelings (i.e., self-worth, relationship quality, forgiveness, body appreciation and satisfaction).

Altogether, power proved to be an important variable that pervades close intimate relationships and impacts feelings and self-evaluations. This dissertation advances the measurement of power and is thus relevant in the field of psychological assessment. Further, power was studied from a social and personality psychological stance because social relationships, cognitive biases, and effects on the self-concept were examined. Implications are far-reaching because results could be useful in organizational settings to understand people in positions of power. Further, power is relevant in every relationship, be it with a romantic relationship partner, with a subordinate, work colleague or supervisor, or even with strangers, because power affects our thinking and feeling in versatile ways. Thus, the studies in this dissertation support the notion that power is everywhere.

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Abbreviations

AIC ..... **A**kaike **I**nformation **C**riterion

APIM ..... **A**ctor-**P**artner **I**nterdependence **M**odel

APIMeM ..... **A**ctor-**P**artner **I**nterdependence **Me**diation **M**odel

ANCOVA ..... **An**alysis of **Cova**riance

ANOVA ..... **An**alysis **o**f **Va**riance

BAS ..... **B**ehavioral **A**ctivation (**S**ystem)

BAS-2 ..... **B**ody **A**ppreciation **S**cale-**2**

BEN ..... **Ben**evolence

BHS ..... **B**ody **H**eight **S**cale

BIC ..... **B**ayes **I**nformation **C**riterion

BIS ..... **B**ehavioral **I**nhibition (**S**ystem)

BISS ..... **B**ody **I**mage **S**tate **S**cale

CFA ..... **C**onfirmatory **F**actor **A**nalysis

CFI ..... **C**omparative **F**it **I**ndex

FO ..... **Fo**rgiveness

GPSPS ..... **G**erman **P**ersonal **S**ense of **P**ower **S**cale

IOED ..... **I**llusion **O**f **E**xplanatory **D**epth

IRC ..... **I**ndividual **R**eliability **C**oefficient

MCAR ..... **M**issing **C**ompletely **A**t **R**andom

MI ..... **M**easurement **I**nvariance (testing)

ML ..... **M**aximum **L**ikelihood

MSCS/MSES ..... **M**ultidimensional **S**elf-**C**oncep**t** **S**cale

NARQ ..... **N**arcissistic **A**dmiration and **R**ivalry **Q**uestionnaire

NPI-15 ..... **N**arcissistic **P**ersonality **I**nventory**-15** (Short Form)

OSF ..... **O**pen **S**cience **F**ramework (osf.io)

PCIA ..... **P**ercentage of **C**onsecutive **I**dentical **A**nswers

PSPS ..... **P**ersonal **S**ense of **P**ower **S**cale

RES ..... **Res**entment-avoidance

RMSEA ..... **R**oot **M**ean **S**quare **E**rror of **A**pproximation

RQ ..... **R**elationship **Q**uality

RQQ ..... **R**elationship **Q**uality **Q**uestionnaire

SAS ..... **S**ocial-**A**utonomous **S**elf-Esteem (Interdependent Self-Esteem)

SE ..... **S**elf-**E**steem

SEM ..... **S**tructural **E**quation **M**odelling

SSES ..... **S**tate **S**elf-**E**steem **S**cale

t1 ..... First measurement **t**ime

t2 ..... Second measurement **t**ime

t3 ..... Third measurement **t**ime

TLI ..... **T**ucker-**L**ewis **I**ndex

WLSMV ..... **W**eighted **L**east **S**quares Estimator

German Summary

Macht wird oft als eine grundlegende Kraft angesehen, die das Denken und Verhalten der Menschen bestimmt. Tatsächlich zeigen zahlreiche empirische Studien vielfältige Auswirkungen von Macht (siehe Keltner et al., 2003; Guinote, 2017). Dennoch ist nach wie vor unklar, wie Macht in deutschsprachigen Stichproben am besten gemessen werden kann, da die meisten validierten Instrumente nur in Englisch vorliegen. Selten wurde Macht dyadisch analysiert, trotz dessen, dass Macht ein soziales Konstrukt ist. Darüber hinaus kann Macht unser Denken, Fühlen und Handeln in positiver und negativer Weise beeinflussen und wir wissen wenig über die Mechanismen und Variablen, an denen sich diese gegensätzlichen Folgen beobachten lassen. In dieser Dissertation wird den genannten Forschungsfragen nachgegangen. Macht wird als wahrgenommene Fähigkeit, andere zu beeinflussen, konzeptualisiert (Anderson et al., 2012), und es werden die Messung des individuellen Machterlebens, die Folgen von Macht in romantischen Beziehungen und die Auswirkungen auf Selbstwahrnehmung sowie kognitive Prozesse untersucht.

In **Kapitel 1** werden die unterschiedlichen Definitionen zum Machtkonzept vorgestellt. Darüber hinaus werden grundlegende Machttheorien (Approach / Inhibition Theory of Power, Keltner et al., 2003; Social Distance Theory of Power, Magee & Smith, 2013; Situated Focus Theory of Power, Guinote, 2007) erläutert, die eine Vielzahl der Konsequenzen von Macht erklären. Kurz wird darauf eingegangen, mit welchen Selbstberichtsfragebögen Macht gemessen werden kann und wie es typischerweise in vergangener Forschung experimentell induziert wurde. Abschließend wird in die empirischen Studien dieser Dissertation eingeleitet.

In **Kapitel 2** wird die deutschsprachige Personal Sense of Power Scale vorgestellt. Mittels sechs Items erfasst die Skala das individuelle Machterleben, also die wahrgenommene Fähigkeit, andere beeinflussen zu können (engl. Original von

Anderson et al., 2012). Fünf Studien wurden durchgeführt, um die psychometrischen Eigenschaften der Skala zu erfassen. In Studie 1 (N = 573) wurde die Skala mittels konfirmatorischer Faktorenanalysen auf Modellpassung hin geprüft. Zudem wurden Itemstatistiken (Schwierigkeit, Streuung, Trennschärfe) sowie die Reliabilität mittels interner Konsistenz (Cronbachs Alpha, McDonalds Omega) und Testwiederholung (über 6 und 12 Wochen) geprüft. Insgesamt zeigte der Skalenscore zufriedenstellende psychometrische Eigenschaften und war zeitlich stabil. Die nomologische Validität wurde mittels Korrelationen zu einer Vielzahl an Konstrukten getestet. So korrelierte die Skala am stärksten mit authentischem Stolz, Selbstwert, Narzissmus, Dominanz, Extraversion und emotionaler Stabilität. Kriteriumsvalidität konnte gezeigt werden, da die Skala positiv mit sozioökonomischen Status sowie Führungsverantwortung zusammenhing. Insgesamt zeigten sich bei der Validitätstestung zahlreiche postulierte, theoriekonforme Zusammenhänge. Zudem zeigte sich strikte Messinvarianz der Skalenwerte zwischen Männern und Frauen.

Die Unidimensionalität der Skala sowie zufriedenstellenden internen Konsistenzen wurden auch in Studie 2 (N = 435) und Studie 3 (N = 183) gezeigt. In Studie 2 wurden Versuchspersonen, die in einer romantischen Beziehung sind, akquiriert. Entsprechend wurde das Machterleben in der Beziehung abgefragt. Die Ergebnisse deuten darauf hin, dass die Skala nicht nur für das generelle Machterleben (über Beziehungstypen hinweg) geeignet ist, sondern auch, um das Machterleben in spezifischen Beziehungen zu erfassen. In Studie 3 wurden Versuchspersonen mit psychischen Erkrankungen akquiriert. Diese wiesen ein signifikant niedrigeres Machtempfinden auf als Versuchspersonen der Studie 1 (welche eher der Normalbevölkerung entsprachen). Die Befunde sprechen für das Vorliegen von Extremgruppenvalidität.

In den Studien 1 bis 3 wurde die Personal Sense of Power Scale mittels einer Trait-Instruktion getestet. Dagegen ist in den Studien 4 und 5 eine Zustandsversion der Skala analysiert worden. Sowohl durch autobiografisches Erinnern an eine machtvolle

(oder machtlose) Situation (N = 175) als auch durch ein fiktives Rollenszenario (N = 120), welches hohe oder niedrige Macht induzierte, konnte die Zustandssensitivität der Skala mit State-Instruktion gezeigt werden. Entsprechend ist die Skala geeignet, um in experimentellen Untersuchungen, Interventionen oder Coachings, die auf eine Veränderung des Machterlebens abzielen, eingesetzt zu werden.

Zusammenfassend sprechen die Befunde für zufriedenstellende psychometrische Eigenschaften der deutschsprachigen Personal Sense of Power Scale. Die Skalenscores sind je nach Instruktion stabil oder zustandssensitiv, weisen Konstrukt-, Kriteriums- und nomologische Validität auf sowie hohe interne Konsistenzen. Somit kann erstmals ein deutschsprachiges Instrument vorgestellt werden, dass individuelle Machtgefühle erfasst. Dies ermöglicht methodisch optimierte Machtforschung im deutschsprachigen Raum sowie Analysen zur interkulturellen Vergleichbarkeit des individuellen Machterlebens.

Die Rolle von Macht in romantischen Beziehungen wird in **Kapitel 3** präsentiert. Ist Macht antiquiert und von keiner Relevanz in intimen Beziehungen heutzutage oder ist es nach wie vor eine wichtige Variable, die über Beziehungsglück entscheidet? In diesem Kapitel wurde der Zusammenhang zwischen Macht und Beziehungsqualität in einer dyadischen Paarstudie untersucht. Viel Forschung zu diesem Zusammenhang spricht dafür, dass ein Machtgleichgewicht förderlich für die Beziehung ist (Aida & Falbo, 1991; Gray-Little & Burks, 1983), jedoch sind diese Befunde meist veraltet. Daher wurden vier verschiedene Machtindizes (subjektive Macht mit der Personal Sense of Power Scale; objektive Macht basierend auf Bildungsstand und relativem Einkommen; Zufriedenheit mit der erlebten Macht; Machtmotiv) mit einem multidimensionalen Fragebogen zur Beziehungsqualität (Siffert & Bodenmann, 2010) in Verbindung gesetzt. Darüber hinaus wurde das Machtgleichgewicht als absoluter Differenzwert der Werte von Männern und Frauen für jeden der vier Machtindizes berechnet. Insgesamt nahmen 181 heterosexuelle Dyaden teil. Die Auswertungen erfolgten über Actor-Partner Interdependence Modelle (Kenny et al., 2006). (Es wird

der Begriff Effekt genutzt, der bei dyadischen Auswertungen jedoch keine Kausalität impliziert.)

Es zeigte sich, dass sowohl für subjektive Macht als auch Zufriedenheit mit der erlebten Macht ein Gleichgewicht bestand, das heißt, Männer und Frauen unterschieden sich nicht signifikant in ihren Werten auf diesen Indizes. Weiterhin gaben Männer mehr objektive Macht sowie ein höheres Machtmotiv als Frauen an. Jedoch waren weder objektive Macht noch Machtmotiv relevante Prädiktoren zur Vorhersage von Beziehungsqualität. Subjektive Macht und Zufriedenheit mit der erlebten Macht in der Beziehung hingen signifikant positiv mit der Beziehungsqualität zusammen. Dabei gab es nicht nur intrapersonale, sondern auch interpersonelle Effekte. Umso mehr Macht jemand in der Beziehung erlebte, desto höher wurde die eigene Beziehungsqualität angegeben, aber auch umso höher gab der Partner oder die Partner die Beziehungsqualität an. Gleiches galt für Zufriedenheit mit erlebter Macht in der Beziehung als Prädiktor. Machtgleichgewicht bezüglich der verschiedenen Machtindizes war nicht signifikant mit Beziehungsqualität assoziiert. Bei allen Actor-Partner Interdependence Modellen ergaben sich kaum Geschlechterunterschiede (wenn bspw. erlebte Macht für Männer positiv mit Beziehungsqualität zusammenhing, war dies auch der Fall für Frauen).

Insgesamt sprechen die Befunde dafür, dass erlebte Macht relevanter für Beziehungsqualität als objektive Macht ist. Dies ergänzt Studien, die ebenfalls erlebte Macht als relevanteren Prädiktor für Outcomes identifizierten als objektive Macht (Bugental & Lewis, 1999; Fast & Chen, 2009). Zudem war Machtgleichgewicht kein signifikanter Prädiktor der Beziehungsqualität. Dies könnte daran liegen, dass frühere Studien oft nicht die Interdependenz der Personen in einer Beziehung berücksichtigt haben und daher solche Effekte überschätzt wurden. Andererseits könnte aber auch die vorliegende Stichprobe eher aus funktionalen, glücklichen Paaren bestanden haben, weshalb die Varianz beim Machtgleichgewicht zu gering war, um signifikante Actor- oder Partnereffekte zu finden. Dennoch, und zusammen mit den

interpersonellen Korrelationen, die für subjektive Macht und Zufriedenheit mit der erlebten Macht gefunden wurden, wird in der Studie deutlich, wie wichtig es ist, die Perspektive beider Personen in einer Beziehung zu erheben. Nur dies sichert statistisch unverzerrte Ergebnisse (Cook & Kenny, 2005), die auch Theorien gerecht werden, die die Interdependenz von Beziehungsprozessen oder Macht in Paarbeziehungen betonen (Simpson et al., 2015). Abschließend ist zu konstatieren, dass Personal Sense of Power eine relevante Variable in romantischen Beziehungen ist, um Beziehungsqualität beider Personen in einer Beziehung zu verstehen. Wer Einfluss und Kontrolle in der Beziehung erlebt, bewertet die Beziehung positiver.

In **Kapitel 4** wird ebenfalls der Rolle von Macht in romantischen Beziehungen nachgegangen. Dazu wurden intra- und interpersonelle Korrelationen zu Vergebungsbereitschaft untersucht. Durch Berücksichtigung von Actor- und Partnereffekten wird theoretischen Annahmen zur Interdependenz von Macht in Paaren entsprochen (Simpson et al., 2015). Zwar wurde Macht in Paarbeziehungen oft mit geringer Prosozialität verbunden (reduzierte Aufopferungsbereitschaft, weniger Anpassungswille; Righetti et al., 2015; Rusbult et al., 1991), dennoch wurde hier ein positiver Zusammenhang zu Vergebungsbereitschaft erwartet, da Macht zu Selbstwert führt (Wojciszke & Struzynska-Kujalowicz, 2007) und Selbstwert oft mit Vergebungsbereitschaft in Verbindung gebracht wurde (Eaton et al., 2006; Riek & Mania, 2012). Tatsächlich zeigte eine Arbeit positive Effekte von Macht auf Vergebungsbereitschaft (Karremans & Smith, 2010). Jedoch wurden in der Querschnittsstudie, die Versuchspersonen in Paarbeziehungen untersuchte, weder beide Personen einer Beziehung befragt noch wurde Selbstwert als Mediator analysiert. Zudem erfolgten keine interkulturellen Vergleiche.

In Kapitel 4 wurden daher zwei dyadische Paarstudien durchgeführt: Einmal mit deutschen Paaren (N = 149) und einmal mit israelischen Paaren (N = 174). Deutschland gilt als individualistisches Land, bei dem Personen ihren Selbstwert aus Erfolgen und Unabhängigkeit ziehen. Israel weist individualistische und kollektivistische Elemente

in seiner Kultur auf, weshalb hier interdependente Selbstkonzepte interessant sind. Bei diesen wird der Selbstwert aus dem Gemeinschaftssinn, Teil einer Gruppe sein und engen sozialen Verbindungen geschöpft (Markus & Kitayama, 1991).

Erlebte Macht in der Beziehung wurde über die Personal Sense of Power Scale erfasst, independenter Selbstwert über die Multidimensionale Selbstwertskala (Schütz et al., 2016), interdependenter Selbstwert über die Sozial-Autonome Selbstwertskala (Pöhlmann et al., 2002; nur in Israel) und für Vergebungsbereitschaft wurden sowohl Benevolence (wohlwollende Motivation nach Konflikten) und Resentment-Avoidance (Rache- und Vermeidungsmotivation) erfasst (Paleari et al., 2009). Es wurden mediierte Actor-Partner Interdependence Modelle (Ledermann et al., 2011) berechnet mit Selbstwert als Mediator zwischen Machterleben und Vergebungsbereitschaft.

In der deutschen Stichprobe zeigten sich hypothesenkonforme signifikante Actor- und Partnereffekte von Macht auf Vergebungsbereitschaft. Selbstwert mediierte die intrapersonalen Zusammenhänge zwischen Macht und Vergebungsbereitschaft teilweise. In der israelischen Stichprobe mediierte independenter Selbstwert teilweise die intrapersonalen Zusammenhänge zwischen Macht und Vergebungsbereitschaft. Ein positiver Actoreffekt bestand zwischen Machterleben und Benevolence der Partnerin bzw. des Partners. Interdependenter Selbstwert mediierte die Zusammenhänge zwischen Machterleben und Vergebungsbereitschaft vollständig, sodass kein direkter Effekt von Macht auf Vergebungsbereitschaft mehr vorlag. Zudem hing das individuelle Machterleben positiv mit dem interdependenten Selbstwert des Partners/der Partnerin zusammen (Partnereffekt), welcher wiederum positiv intrapersonal mit Vergebungsbereitschaft zusammenhing (Actoreffekt; daher Partner-Actor-Mediation). In beiden Stichproben waren die Effekte unabhängig vom Geschlecht.

Zusammengefasst betonen die Ergebnisse, dass Machterleben sich positiv auf die Beziehung auswirkt, indem es positiv mit Wohlwollen nach einem Konflikt zusammenhängt und negativ mit Rachemotivation sowie selbstberichtetem

Vermeidungsverhalten. Dabei bestätigte sich die Hypothese, dass Selbstwert ein relevanter Mediator ist. Erneut wurde festgestellt, dass es wichtig ist, interpersonelle Assoziationen (bzw. Partnereffekte) zu analysieren, um die Rolle von Macht in engen Beziehungen vollständig zu erfassen. Zudem konnte die positive Auswirkung von Macht auf Vergebungsbereitschaft in zwei verschiedenen Kulturen gezeigt werden, was impliziert, dass die positiven Auswirkungen von Macht auf Vergebungsbereitschaft (und möglicherweise andere Variablen) nicht nur auf deutsche Stichproben beschränkt sind.

Wie sich Macht auf die Wahrnehmung des eigenen Körpers auswirkt, wird in **Kapitel 5** adressiert. Bisher ist wenig darüber bekannt, wie Macht Körperwahrnehmungen beeinflusst, außer, dass es zu einer Überschätzung der eigenen Größe beziehungsweise Unterschätzung der Größe anderer führt (Duguid & Goncalo, 2012). Oft wird Macht mit vertikaler Expansivität in Verbindung gebracht. Auch führt Macht zu Zuversicht (Briñol et al., 2017), Selbstvertrauen und verändert Wahrnehmungsprozesse (z.B. Lee & Schnall, 2014). Entsprechend wird erwartet, dass Macht erneut mit Selbstwert positiv zusammenhängt und sowohl zu einer höheren Einschätzung der relativen Körpergröße als auch erhöhter Körperwertschätzung und Körperzufriedenheit führt. Die Hypothesen entsprechen Annahmen der Developmental Theory of Embodiment (Piran & Teall, 2012) und der Objektifizierungstheorie (Fredrickson & Roberts, 1997), die nahelegen, dass Machterleben ein protektiver Faktor für positive Körpereinstellungen sein kann.

Die Hypothesen wurden in einer Querschnittsstudie (N = 318) und einem Experiment (N = 114) geprüft. In der Querschnittsstudie wurde Macht mittels der Personal Sense of Power Scale operationalisiert. Im Experiment wurde Macht mittels eines WG-Szenarios induziert (2 Gruppen: hohe vs. niedrige Macht). Selbstwert wurde in Studie 1 mittels eines Trait-Maßes erfasst, in Studie 2 über ein State-Maß. Körperwahrnehmungen wurden über unterschiedlich große Silhouetten (relative Körperhöhe), die Body Appreciation-Scale 2 (Körperwertschätzung; Tylka & Wood-

Barcalow, 2015) und die Body Image States Scale (Körperzufriedenheit; Cash et al., 2002) erfasst. Zudem wurde Narzissmus erfasst und als Moderator der Beziehung zwischen Macht und Körperwahrnehmung konzeptualisiert. Denn Personen mit hohen narzisstischen Ausprägungen könnten so positive selbstbezogene Einstellungen aufweisen, dass eine Machtinduktion keine weiteren Effekte bei diesen Personen hätte.

Es zeigten sich die erwarteten Zusammenhänge zwischen Macht und Körperwertschätzung sowie Körperzufriedenheit in der Querschnittsstudie. Selbstwert mediierte die Zusammenhänge. Jedoch korrelierte Machterleben nicht positiv mit der relativen Körpergröße. Im Experiment gaben Versuchspersonen in der Gruppe mit hoher Macht mehr Körperwertschätzung, Körperzufriedenheit und eine höhere Körpergröße an, als Versuchspersonen in der Gruppe mit niedriger Macht. Selbstwert mediierte die Zusammenhänge. Narzissmus war kein relevanter Moderator.

Macht beeinflusst die Wahrnehmung des eigenen Körpers auf positive Art und Weise. Dabei stellte sich Selbstwert als vermittelnder Mechanismus heraus. Personen, die Macht erleben, erleben auch mehr Selbstwert, weshalb das eigene Körperbild positiver wahrgenommen wird. Denkbar sind jedoch auch andere Mediatoren (z.B. Authentizität) oder bidirektionale Einflüsse (Körperzufriedenheit ermöglicht mehr Machterleben). Die Befunde werden in der Diskussion von Kapitel 5 mit Theorien verbunden und es wird ausgeführt, welche Rahmenbedingungen die Effekte abschwächen könnten.

Nachdem die vorherigen Studien auf wünschenswerte Korrelate von Macht hindeuten, wird in **Kapitel 6** eine negative Auswirkung von Macht auf das Individuum untersucht. Oft wurde berichtet, dass Macht zu Selbstüberschätzung und illusionärem Denken führt (Fast et al., 2009). Hier wird nun der Effekt von Macht auf die Illusion der Erklärungstiefe (IOED) analyisert. Die IOED beschreibt die Tendenz,

dass Menschen glauben, sie verstehen Phänomene auf der Welt kohärenter, umfassender und tiefer als es wirklich der Fall ist (Rozenblit & Keil, 2002). Die IOED wird erfasst, indem Versuchspersonen auf einer Skala zuerst angeben sollen, wie sehr sie glauben, dass sie etwas verstehen (z.B. wie ein Erdbeben entsteht). Danach soll das Phänomen (in diesem Fall die Entstehung eines Erdbebens) erklärt werden, bevor erneut auf einer Skala angegeben wird, wie sehr sie glauben, dass sie das Phänomen verstehen. Typischerweise zeigt sich bei komplexem kausalem Wissen (z.B. über Technik, Naturphänomene, Politik, Gesundheitsvorsorge, Klimaschutz) ein Absinken in der Selbsteinschätzung zur Wissenstiefe von vor der Erklärung zu nach der Erklärung. Dieses Absinken ist nicht bei anderen Wissensstrukturen zu beobachten (z.B. Faktenwissen, prozedurales Wissen).

Es wurde angenommen, dass Macht eine höhere IOED bedingt, da Macht zu abstrakter Informationsverarbeitung führt (Smith & Trope, 2006), und abstrakte Informationsverarbeitung als Prädiktor der IOED berichtet wurde (Alter et al., 2010). Zudem wurde Narzissmus als Moderator analysiert, da Prädispositionen die Effekte von Macht beeinflussen können und Narzissmus aufgrund seines Zusammenhangs mit Selbstüberschätzung und Selbstaufwertungsmotiven vermutlich zu einer noch stärkeren IOED führen kann. Es wurden drei Studien durchgeführt.

In Studie 1 (N = 163) wurde der Effekt von Macht auf die IOED mit dem Effekt von Macht auf Selbstüberschätzung (nicht spezifisch auf komplexes kausales Wissen bezogen; Vergleich mit objektivem Kriterium) verglichen. Zudem bewerteten (in allen Studien) fünf Urteilende die Erklärungen der Versuchspersonen hinsichtlich ihrer Wissenstiefe. Die Differenz zwischen dem ersten Selbstrating der Versuchspersonen und der Fremdbeurteilung der Erklärung repräsentiert eine objektive IOED. Die Differenz zwischen dem ersten Selbstrating der Versuchspersonen und dem zweiten Selbstrating der Versuchspersonen repräsentiert eine subjektive IOED beziehungsweise die IOED, wie in bisheriger Forschung erfasst (Rozenblit & Keil, 2022).

Zuerst wurde Macht (hoch vs. niedrig) mit Hilfe eines Wohngemeinschaft-Szenarios manipuliert. Anschließend wurde die Wissenstiefe bei technischen Geräten (IOED) oder Prozeduren (generelle Selbstüberschätzung) erfasst, bevor Versuchspersonen die Geräte oder Prozeduren erklären sollten. Danach erfolgte eine erneute Einschätzung der Wissenstiefe der Geräte oder Prozeduren.

Es zeigte sich eine größere IOED in der Gruppe mit hoher Macht (verglichen mit der Gruppe niedrige Macht) sowohl anhand der Selbsteinschätzungen als auch anhand der Beurteilerratings (objektive IOED). Zudem zeigte sich in der Gruppe mit hoher Macht, aber nicht in der Gruppe mit niedriger Macht, eine generelle Selbstüberschätzung. Der Effekt von Macht auf Selbstüberschätzung unterschied sich vom Effekt von Macht auf IOED, da sich anhand der Selbsteinschätzungen zu prozeduralem Wissen kein Unterschied zwischen den Gruppen hohe Macht und niedrige Macht zeigte.

Ziel von Studie 2 (N = 202) war es, den Effekt von Macht auf die IOED in einem moderierten Mediationsmodell zu replizieren. Abstrakte Informationsverarbeitung wurde mittels der Behavior Identification Form (Vallacher & Wegner, 1989) operationalisiert und als Mediator in die Analysen einbezogen. Narzissmus wurde als Moderator erfasst. Macht (hoch vs. niedrig) wurde mittels eines Bewerbungsszenarios manipuliert. Jedoch zeigte sich kein signifikanter Effekt von Macht auf IOED und objektive IOED. Auch unterschied sich die abstrakte Informationsverarbeitung nicht in den Experimentalgruppen. Narzissmus verstärkte den (nicht signifikant positiven) Zusammenhang zwischen Macht und IOED.

Anschließend wurde in Studie 3 (N = 242) das moderierte Mediationsmodell aus Studie 2 erneut geprüft, jedoch mit der Personal Sense of Power Scale als unabhängige Variable. Zwar korrelierte Macht positiv mit abstrakter Informationsverarbeitung, allerdings hingen Macht und abstrakte Informationsverarbeitung nicht mit der IOED zusammen. Narzissmus war kein signifikanter Moderator.

Eine Mini-Metaanalyse wurde über die Ergebnisse der drei Studien berechnet. Es zeigte sich ein kleiner positiver Zusammenhang zwischen Macht und IOED. Darüber hinaus wurden zwei *P* Curve-Analysen über die Studien der beiden Artikel berechnet, in denen Macht mit abstrakter Informationsverarbeitung und abstrakte Informationsverarbeitung mit IOED in Zusammenhang gebracht wurden. Es zeigten sich keine Auffälligkeiten für die Arbeit zu Macht und abstraktem Denken. Jedoch deuteten die Analysen darauf, dass abstraktes Denken vermutlich kein plausibler Prädiktor der IOED ist.

Insgesamt konnte nur ein relativ kleiner Effekt von Macht auf die IOED festgestellt werden. Dieser wird nicht durch abstrakte Informationsverarbeitung mediiert. Narzissmus verstärkte den Zusammenhang nur, wenn Macht induziert, aber nicht, wenn das generelle Machterleben erfasst wurde. Scheinbar bewirkt nur ein situativer Boost im Machterleben verstärktes illusionäres Denken für Personen mit hohen Ausprägungen in Narzissmus. Jedoch zeigten Mächtige Selbstüberschätzung anhand eines objektiven Kriteriums in Studie 1.

Macht scheint also in gewissem Maße zu illusionärem Denken zu führen, aber die Effekte sind abhängig von der Art der Illusion. Es werden drei Gründe diskutiert: (a) die IOED ist eine stabile Variable; (b) Macht führt nicht zwangsläufig zu illusionärem Denken; (c) abstrakte Informationsverarbeitung ist kein zuverlässiger Grund der IOED, weshalb Macht die IOED auch nur schwach beeinflusst. Abschließend werden Implikationen für Management und Organisationsliteratur diskutiert.

Im abschließenden **Kapitel 7** werden die Ergebnisse aller Studien zusammengeführt. Implikationen für sozialpsychologische Grundlagenforschung zu Macht sowie Anwendungen im Bereich der Organisationspsychologie und bei zwischenmenschlichen Beziehungen werden diskutiert. Zudem werden Ausblicke auf die zukünftige Forschung sowie verschiedene Moderatoren, die Auswirkungen auf die Effekte haben könnten, angesprochen. Insgesamt zeigte sich, dass Personal Sense

of Power psychometrisch zufriedenstellend operationalisiert werden kann und Auswirkungen auf das Selbst (Körperwahrnehmung, Illusionen) und dyadische Beziehungen (Beziehungsqualität, Vergebungsbereitschaft) hat.

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Chapter 1

General Introduction

1.1 Introduction

Many prominent philosophers and other scientists—from Plato, Aristotle, and Niccolò Machiavelli, across Thomas Hobbes, Vilfredo Pareto, and Max Weber, to Alfred Adler, Hannah Arendt, and Michel Foucault—have provided influential work on power. Thus, in nearly all fields of social sciences and humanities across several epochs in human history and by several leading scientists the concept of power has been addressed. Power has become famous through these various works. The notion by Lord Acton (1887/1972), "power tends to corrupt, and absolute power corrupts absolutely" (pp. 335–336), is widespread. The omnipresence of this construct is not surprising because "power is a basic force in social relationships" (Keltner et al., 2003; p. 265). "Power is to the organization as oxygen is to breathing" (Clegg et al., 2006, p. 3). Power is THE fundamental concept in social sciences (Russell, 1938). Thus, "power is everywhere" (Faucault, 1976, p. 63). This dissertation focuses on how power is experienced, how it affects our feelings, self-evaluations, and thoughts—in individual and dyadic contexts.

The form of power studied here is *personal sense of power*, an individuals' perceived capability to influence others (Anderson et al., 2012; Smith & Galinsky, 2010), typically but not necessarily based on control over valued resources (Keltner et al., 2003). Actually, the subjective sense of being powerful seems what matters most for explaining the actions of power holders (Bugental & Lewis, 1999; Galinsky et al., 2003).

The first research question tackled in this dissertation is therefore how people experience power (resp. personal sense of power). For that reason, stability, underlying structure, and associations with a variety of psychological variables are studied of a self-report scale assessing an individual's sense of power. Is personal sense of power a unidimensional construct? Can a generalized sense of power reliably be reported by participants? And is power distinct from but still moderately related to personality variables and stable self-evaluations?

The second research question addresses how power pervades romantic relationships. For that reason, intra- and interpersonal associations with relationship

quality and forgiveness are studied. Power is a social construct (Keltner et al., 2003), which is why considering dyadic influences advances the field of power (Simpson et al., 2015). Do we find that a subjective sense of being powerful also correlates with relationship variables of both partners in a romantic relationship?

The final research question is whether power affects specific self-evaluations. On the one hand, power has been reported to make people more satisfied and confident with themselves (Briñol et al., 2017; Wojciszke & Struzynska–Kujalowicz, 2007). In line with that, it is studied whether power positively impacts body perceptions. Do people who feel powerful appreciate their body more than people who feel less powerful? And do situational boosts of power impact body perceptions? On the other hand, power does not only lead to confidence but also to overconfidence (Fast et al., 2012). Do we thus find effects of power on overconfidence and illusionary thinking? Moreover, underlying mechanisms (e.g., self-esteem) and boundary conditions (narcissism) of the effects are studied as well.

In addressing the aforementioned three broad research questions this dissertation aims at advancing research on sense of power. This research highlights the importance of paying attention to psychometric quality of measures when studying power, considering dyadic influences to understand consequences of power, and creating an awareness of the positive and negative consequences of power on self-evaluations.

1.2 Defining Concepts of Power

This work is about power. But what is meant with power? In several disciplines such as psychology, sociology, political sciences, history, philosophy, anthropology, and organizational sciences power has been and is still being studied. However, not only between these disciplines but also within a single discipline there are often various definitions of power. Overbeck (2010) stated, "every discipline has failed to agree upon a unified definition of power" (p. 19). Already in 1957, Dahl argued that there is no single, consistent, and coherent theory of power. There is a vast quantity of definitions and power theories. Further, power has been studied at several levels of analysis: Power in societies, power in institutions or organizations, power in groups, in dyads,

or in the individual (see Keltner et al., 2003). The perspectives on power presented in this work are applicable to the individual and thus are relevant for psychological research on power. For this reason, I first present and structure various definitions of power relevant for psychologists but also relevant for researchers in related fields (e.g., anthropology).

Why do we need conceptual clarity? Often, findings quoted in the press as well as in scientific journals sound like, 'touching others conveys power' (see Carney et al., 2005). The quoted researchers conducted two studies: In Study 1, dominance as personality trait was measured and in Study 2, rank within an organization was manipulated. Do rank and dominance, only rank, only dominance, or neither of the two constructs represent power? Both variables (dominance, rank) are related to power but they do not represent power as defined in the following sections. This example seems to apply to much research as power is treated differently in various studies (Overbeck, 2010). Everybody has some naïve understanding of what power is but laypeople typically struggle to provide a definition of power (cf. illusion of explanatory depth, Rozenblit & Keil, 2002; see Chapter 6 "Power and the IOED"). And as even among scientists no consensus exists on what power is, it is important to provide an attempt to define power and show similarities and differences to other hierarchy-related concepts.

1.2.1 Personal Power

Etymologically, power seems to be rooted in the Indo-Germanic word *magh* (= make, can, to be able). In the gothic language, power is *magan,* that is, capability. In Latin, *potentia* is the noun used for power and has several translations such as influence, capability, or potential. *Posse* is the corresponding verb and means can. In German, *Macht* (= power) is close to *machen* (= make), that is, doing something through volitional action. These etymological explanations provide the most inclusive sense of what power is: To have an impact on the environment, to be an agent of change, to be a subject instead of an object (Dépret & Fiske, 1993). This broad conceptualization of

power can be termed *personal power* (Overbeck, 2010; Overbeck & Park, 2001; see also Lammers et al., 2009; not to confound with personal *sense* of power, Anderson et al., 2012). Personal power as the ability to act is an intrapersonal characteristic (Heider, 1958). In the field theory, power is understood as producing potential changes in the world (Lewin, 1951). Also Russell's (1938) definition of power as production of intended effects can be subsumed as personal power. All these definitions of personal power emphasize the volition. There are parallels to concepts such as competence and autonomy (Ryan & Deci, 2000). Also, psychological variables such as locus of control (Rotter, 1966), illusion of control (Langer, 1975), learned helplessness (Seligman, 1972), self-efficacy (Bandura, 1977), and job decision latitude (Karasek, 1979) can be understood as forms of having or not having personal power. Yet, in the social hierarchy literature, they are typically referred to as simply control (without a social aspect, Overbeck, 2010). Personal power (or *power to*) is power without a relational aspect. In the following, I examine power with a relational aspect and always mean social power when simply writing on power.

1.2.2 Social Power: Influence, Dependence, and Control

Power in the social sciences is an inherently relational variable (Emerson, 1962; Fiske & Berdahl, 2007; Foucault, 1982). In contrast to personal power, social power is considered as an interpersonal construct, as a property of a social relationship. Therefore, social power is a comparative variable: A person has more, less, or equal power than another person (Dahl, 1957). Social power is also termed *power over* or *power through* because other people behave in accordance with the power holders' needs, beliefs, and attitudes (Overbeck, 2010; Turner, 2005). I suggest four forms of how social power can be understood and will show how these different conceptualizations relate to each other (for other differentiations see Fiske & Berdahl, 2007, or Overbeck, 2010). The forms presented in the following are (a) *actual influence,* (b) *potential for influence,* (c) *dependency,* and (d) *control* (typically based on resources).

Often researcher refer to various forms in a single definition but focus more on one aspect (e.g., influence) than on another (e.g., control).

Actual Influence

Prominent advocates of the power-as-actual-influence perspective are early researchers on that topic. Russell's (1938) definition of power as the production of intended effects can be understood as actual influence when used for social relationships. Also Goldhamer and Shils (1939) described power as the extent to which the behavior of others is influenced to meet one's own intentions. The political scientist Dahl (1957) wrote, "A has power over B to the extent that he can get B to do something that B would not otherwise do" (pp. 202–203). An addition in Dahl's definition is resistance: People with less power would not do what the powerful person wants if there is no influence. This paralleles Webers' (1972) writings on power, "Macht bedeutet jede Chance, innerhalb einer sozialen Beziehung den eigenen Willen auch gegen Widerstreben durchzusetzen, gleichviel worauf diese Chance beruht" (p. 28). Also organizational scientists have adopted the power-as-actual-influence definition, „power is […] to get things done the way one wants them to be done" (Salancik & Pfeffer, 1977, p. 4). Actually, it is assumed that an overwhelming part of the power literature understands power as influence (Fiske & Berdahl, 2007).

Potential for Influence

However, power does not need to be realized, it can just be potential (Overbeck, 2010). In their seminal work, French and Raven (1959) define power as potential ability to influence another person within a dyadic relationship. Also, the influential concept personal sense of power is relevant here, "power is […] a perception of one's capacity to influence others" (Anderson et al., 2012, p. 314). Within romantic relationships, Simpson et al. (2015) understand power as "the ability or capacity to change a partner's thoughts, feelings, and/or behavior so they align with one's own desired preferences, along with the ability or capacity to resist influence attempts imposed by the partner" (p. 409). These definitions have in common that power does not require actual

influence. Instead, the potential, ability, or capability to influence another person is what constitutes power. Therefore, power as potential for influence is a less broad understanding than power as actual influence. However, it is harder to assess the potential for influence: We can observer whether A actually influences B but knowing whether A is able to potentially influence B is vague. For that reason, advocates of the power-as-potential-influence perspective often assume that resources are the basis of influence.

For example, French and Raven (1959) provide a list of power bases that afford potential influence: Reward power is the ability to provide positive valences and reduce or remove negative valences. Coercive power is the use of punishment. Legitimate power is characterized by the right of A to influence B and B is obliged to accept the influence attempt. Thereby, legitimacy is defined by norms, internalized values, and socially prescribed behavior. Referent power as fourth base of power represents identification of the subordinate with the power holder. If the subordinate admires or wants to be associated with the power holder, the subordinate behaves as the power holder might wish or follows their command. Expert power exists when power is grounded in knowledge and expertise. Finally, a sixth power base was later added: Informational power, the possession of valuable information that helps with decision-making (Raven, 1965). (For a discussion whether the power bases by French and Raven, 1959, actually represent social power see Chapter "1.1.4 Status, Dominance, and Other Hierarchy-Related Variables").

Dependency

Another perspective on power is dependency: Who is more dependent on the other party has less power (see also principle of least interest, Sprecher et al., 2006). In their overview on power in close intimate relationships, Kim et al. (2019) provide an entire section on dependence power. The person in a romantic relationship who is less committed, less emotional invested, and has better alternatives is the more powerful person because this person is less dependent on his or her partner. Also, sociological

work by Emerson (1962) emphasizes dependence as central to power. The power to control or influence others is based on valued resources, which is why dependence is the driving force of power. The power of A over B is the dependence of B on A. This dependence becomes only apparent if A makes a demand, which is opposing to the interests of B. Emerson's power-dependence-relations theory shows several parallels to concepts of power as potential influence, for example, he wrote, "the power of actor A over actor B is the amount of resistance on the part of B which can be potentially overcome by A", (Emerson, 1962, p. 32). However, as he considers dependence as the basis of power (e.g., "power resides implicitly in the other's dependency, p. 32) his concept should be subsumed as dependence view.

Control

Concepts of power concerning control can be subdivided in outcome control and in control based on resources. The most famous advocate of the first power-as-outcome-control concept is Fiske. She understands power as relative control over another's valued outcomes. Thus, A has power over B if A controls the outcomes of B (Dépret & Fiske, 1993; Fiske, 1993; Fiske & Berdahl, 2007). Outcomes can be physical (e.g., food, pain), economic (e.g., money), or social (e.g., acceptancy, respect). She argues to separate influence from control. Power is according to her simply the control over valued resources whereas influence defines what power does (consequence), not what power is.

Yet, other researchers who define power as control do not necessarily proscribe influence. A strong focus on resources is already semantically present in the resources theory (Blood & Wolfe, 1960), which is relevant for power in relationship research. The authors define power as the number of resources, which help to fulfill the needs of the partner. Those who have more resources have more power. A detailed list of resources was provided by Safilios-Rothschildt (1979). Examples are socioeconomic resources (e.g., money, social mobility), expressive resources (e.g., emotional support, understanding), and companionship.

Finally, in the probably most prominent power theory in psychology power is defined as an "individual's relative capacity to modify others' states by providing or withholding resources or administering punishments" (Keltner et al., 2003, p. 265). Resources and punishments can be material or social. Further, as in other theories (e.g., Fiske & Berdahl, 2007) the value of the resources is central and reflects an individuals' dependency on that resources or the strength of social power (see Fiske & Berdahl, 2007; Galinsky et al., 2015). Moreover, according to Keltner et al. (2003) an individual's perceived freedom to provide or withhold resources or punishments determines the individual's level of power.

Common to all these theories is that power is considered a structural property of social relationships. Control rests on resources or outcome dependency.

The distinction of power as actual influence, potential influence, dependency, and control is an attempt to structure the various power concepts. Often the concepts emphasize one perspective more than another perspective (e.g., resources theory is about control), however, typically various perspectives are considered in a single theory (e.g., Keltner et al., 2003, emphasize resources but they also define power as potential influence). What perspective on power is most valid? Is it actually possible to use only a single concept of power?

Dahl (1957) uses the terms power and control interchangeably. However, Fiske and Berdahl (2007) consider power as outcome dependency respectively control and argue that influence is a consequence of power (or "power in action") and should be removed from the term power. An influence attempt does not need to be successful or even intended because control over valuable resources constitutes real power. However, Turner (2005) argues (in contrast to many power theorists) that influence causes control over valued resources. In this regard, influence cannot be considered a simple consequence. Likely, the relation between resource control and influence is bidirectional (Willer et al., 1997), and thus it seems promising to speak about both potential influence and control when defining power. As a consequences, in this

dissertation social power is understood as suggested by Keltner et al. (2003): The capacity to influence others that is based on control over resources and punishments. Typically, "with power comes others' dependence" (Tost, 2015, p. 45). Dependency is thus close to power but as most researchers understand power as potential influence and/or control the term dependency is here not used to replace power. The definition by Keltner et al. (2003) including potential influence and resources control seems most relevant to define social power in a broad way. However, if the subjectivity of power is central, another construct that focuses solely on potential influence is more appropriate.

1.2.3 The Personal Sense of Power

The resources/control aspect of the power definition provides a somewhat objective assessment of power. However, "power is not simply the control over resources […] Power is also a psychological state" (Anderson et al., 2012, p. 314). This is reflected in the concept *personal sense of power*, which is studied in the present dissertation. Personal sense of power as the perceived ability to influence others highlights the subjectivity of power. Sense of power is typically related to sociostructural power but can also be independent from resources, status, etc. (Tost, 2015). Anderson et al. (2012) state, "those who perceive themselves as powerful behave in more effective ways that increase their actual power" (p. 314). Thus, the belief in one's sense of power strengthens actual influence—above and beyond sociostructural factors of power.

According to Anderson et al. (2012), sense of power is a *coherent* variable (i.e., shows high internal consistency) and comprises the ability to control joint decisions, to influence others' behavior, to shape others' internal states, and to satisfy one's own desires. Sense of power is moderately *consistent*, that is, power is somewhat relationship specific but correlates moderately across types of relationship. Sense of power exists on several levels of *abstraction*: People can assess their sense of power in momentary situations (i.e., power as state), in long-term dyadic relationships, in groups, and in a generalized form across relationships (i.e., power as trait).

The strongest correlates of sense of power are behavioral activation, dominance, narcissism, self-esteem, and extraversion. Yet, it is distinct from related concepts such as locus of control. Locus of control addresses whether people control their fate (Rotter, 1966). Anderson et al. (2012) report a correlation of .35 between internal locus of control and sense of power, that is, the two variables share only 12% variance. Thus, people may be able to control their fate but can nevertheless lack power in their relationships. The degree to which personal (e.g., talent) and non-personal (e.g., luck, chance) factors affect behavior defines locus of control. However, with sense of power the extent to which one is able to influence others varies and this is what constitutes social power. In this sense, personal sense of power is distinct from personal power (see Chapter "1.1.1 Personal Power").

To consider the subjectivity of power is important. "… the center around which modern social psychology actually turns is the *understanding of subjective experience*." (Wegner & Gilbert, 2000, p. 2). Subjective states and self-evaluations impact well-being and behavior (e.g., Anglim et al., 2020; Thielmann et al., 2020). This may also explain why several power researchers studied how feelings of power are related to various outcomes (see e.g., Galinsky et al., 2015; Tost, 2015). The perceived power of individuals can have several consequences, which may be even stronger than actual power (Bugental & Lewis, 1999; see also Chapter 3 "Power and Relationship Quality"). Altogether, how people's subjective sense of power impacts cognition, behavior, and other psychological variables seems a promising avenue.

1.2.4 Status, Dominance, and Other Hierarchy-Related Variables

In the previous sections, it was explicated what power is. Still, it should also be stated what is not power because there is a mixture around the terms power, status, dominance, prestige, leadership, and authority in the literature. Yet, there are important differences between all these hierarchy-related variables.

Hierarchies are systems of rank orders of individuals. Hierarchical differentiation is typically based on power or status (Magee & Galinksy, 2008). *Status* is the prestige,

respect, and esteem that someone has in the eyes of others (Blader & Chen, 2014). This can be based on perceived knowledge, sociodemographic variables, and other features that are relevant for a task at hand (see status characteristics theory, Berger et al., 1972). Thus, status is not a property of a person but it is a function of observers' evaluations. Both power and status are relational constructs but status is much stronger determined by the counterpart. Further, power is distinct from status because people can have power without status (e.g., security man) or status without power (e.g., an emeritus professor). Moreover, status is also used to describe one's hierarchical rank (Goldhamer & Shils, 1939; Henrich & Gil-White, 2001), that is, one's position in a social hierarchy with respect to a valued dimension (Magee & Galinsky, 2008). If an individual's social position is solely determined by income, education, and occupation, researchers speak about *socioeconomic status* (SES; Oakes & Rossi, 2003).

Whereas power and status are considered fundamental dimensions for hierarchical differentiation (Blader & Chen, 2014), there are distinct ways how to achieve rank and influence. In the dominance prestige account (Cheng et al., 2013; Henrich & Gil-White, 2001), two routes are suggested: *Prestige* is rank freely conferred on the basis of superior skills and knowledge (Cheng et al., 2014). It relates to advice-giving ability and has both agentic and communal aspects (Cheng et al., 2010). Prestige is the hierarchy variable closest to status but prestige designates typically a strategy to achieve rank whereas status is a broad term to describe the hierarchical position *or* the respect in the eyes of others. Contrary to prestige, *dominance* is the induction of fear, the use of coercion and aggression to grab power and status (respectively rank; Cheng et al., 2014; for a similar argument see Keltner et al., 2003). It is related to hubristic pride and narcissism (Cheng et al., 2010). Dominance is not analogous to power.

Further, dominance has a long research tradition as personality trait (Buss & Craik, 1980; Wiggins & Trapnell, 1996) characterized by assertiveness. Hence, dominance can be considered (a) as stable self-perception or trait and (b) as strategy to climb the hierarchical ladder (the same reasoning may apply to prestige, "Do I perceive myself as someone who is respected and skilled?", but this is not further addressed here).

Another hierarchy concept is *authority*. According to Emerson (1962), authority is legitimate power. This legitimacy is afforded through institutionalized roles (Weber, 1972; see also Milgram, 1969). Thus, power is broader as authority because power can also be illegitimate. Some researchers have suggested to study legitimacy as a moderator of the effects of power (e.g., Galinsky et al., 2015).

Power is also not *leadership*. As Weber (1972) wrote, "Herrschaft ist ein Sonderfall von Macht" (p. 541). Power is more general than leadership. Weber understood leadership on an institutionalized level and characterized by authority. Organizational scholars describe leadership as a process that involves influence. Further, leadership typically occurs in a group context in which individuals aim to achieve a common goal (Northouse, 2004). Thus, leadership is actual influence to achieve a shared goal (Bastardoz & Day, 2022).

Finally, power should be separated from the *need for power* (also power motive, Heckhausen & Heckhausen, 2008; McClelland, 1970; Winter, 1988). The need for power is characterized by the concern of humans to have an impact on others, the wish to influence and control other people. Wanting power does not necessarily match with having power because both concepts can have opposing correlates and downstream consequences (Kim et al., 2019; Murphy et al., 2022).

The previous paragraphs present an attempt to provide conceptual clarity on hierarchy-related variables. Nevertheless, there are various different perspectives on each variable and to account for all perspectives is impossible. Consider for example the power bases by French and Raven (1959; Raven, 1965). Blader and Chen (2014) do not consider these power bases as power per se but as bases of influence. They define power as outcome control only (see Fiske & Berdahl, 2007) and consider influence not as inherent to power but as ability to form the behavior and thoughts of others (i.e., as a downstream consequence of both power and status). In this perspective, reward and coercive power are actually power because they match with the definition of providing or withholding resources and punishments (see Keltner et al., 2003; note that I use a

broader definition in this work). Legitimate power matches with authority, referent power with status, and expert power with prestige. Yet, when power is equated with both influence and control, all these bases reflect power because they all afford influence (and in this work influence is equated with power as in much other literature on hierarchy). For example, it seems more plausible to understand referent power as a mixture of power and status: Someone is able to influence and control other people because these people respect and want to be like the power holder. That is, the reciprocal dynamic between hierarchy variables makes it difficult to separate them from each other: For example, power can cause status and status can cause power (see Blader & Chen, 2014).[1] Thus, it is important to try to operationalize power in ways that do not conflate power with other variables such as status and dominance.

1.3 Operationalization of Power

Typically, power is assessed with self-report scales or manipulated in experimental settings. There are some other ways to assess power, for example, through nonverbal judgments (Carney et al., 2005) or physiological markers such as high testosterone and low cortisol (Carney et al., 2010; Mehta & Josephs, 2010; see Galinsky et al., 2015). However, we do not consider the latter two operationalizations as relevant in the following because they are used in some research only and seem to be related not only to power but also other hierarchy-related concepts. Further, judgments of others' power do not refer to the actor but as this dissertation focuses on personal sense of power it is important to capture the actors' direct experience.

1.3.1 Self-Report Measures

The most common self-report measure of power is the Personal Sense of Power Scale (PSPS; Anderson et al., 2012). With eight items, an individual's perceived capability to

[1] The typical correlation between personal sense of power and status is between .33 and .37 (Anderson et al., 2012).

influence others is captured (e.g., "I can get him/her/them to do what I want" representing high power or "Even when I try, I am not able to get my way" representing low power). When the instruction is changed, the scale can capture an individual's perceived power in different relationships. For example, Anderson et al. (2012) assessed generalized power, power in the relationship with a friend, parent, supervisor, teaching assistant, or dating partner, and power in a negotiation context. The scale has been intensively validated, however, neither tests of unidimensionality (confirmatory factor analysis) nor measurement invariance have been conducted so far.

To the best of my knowledge, the PSPS is the only power scale that can assess generalized feelings of power (but see Murphy et al., 2022, for a recently published scale on generalized power feelings that partially contains PSPS items). Other scales focus on specific relationship types: Mostly romantic or work relationships. For example, the Relationship Power Inventory (Farrell et al., 2015) assesses an individual's power in a romantic relationship with 20 items (e.g., "I have more say than my partner does when we make decisions in this domain" [for domain-specific power] or "My partner has more power than me when deciding about issues in our relationship" [for overall power]). Overall relationship power can be assessed but also power in different domains of the relationship when the instruction is changed (e.g., think about finances, vacations, when/how much time together, etc.). An example for power in work settings are the Perceived Power and Status Scales (Yu et al., 2019). With six items, work-related power can be assessed (e.g., "I can provide rewards to others at my own discretion" or "I have a great deal of power at work").

One drawback in the power literature is that scales are used that do not assess an individual's power. Galinsky et al. (2015) provide a short list of individual difference measures on power. They list the PSPS but also scales on trait dominance (e.g., the dominance subscale of the Personality Research Form, Jackson, 1965) and the power motive. As elaborated in Chapter 1.2.4 ("Status, Dominance, and Other Hierarchy-Related Concepts") power should not be conflated with dominance, status, motives,

or other related constructs. For example, Anderson and Berdahl (2002) report increased approach tendencies among the powerful. Careful readers will note, however, that they used a trait dominance measure in a correlational study and therefore it remains unclear with that research whether trait power is also positively related to approach behavior.

1.3.2 Experimental Manipulations

Power has been manipulated in various ways. In the following, role tasks, conceptual and experiential priming, and nonverbal manipulation techniques are introduced because they are most often used in studies on power. However, this overview is not exhaustive and other manipulations to induce power feelings are also possible and have been employed in the literature.

Role Tasks

In role tasks, participants have to engage in predefined roles, typically managers and subordinates in an organization (Galinsky et al., 2015). Based on an ostensibly leadership questionnaire participants are assigned to one of two groups: Managers receive control over rewards and coercions. They can direct and evaluate outcomes of subordinates. Subordinates are dependent on manager's resources and cannot direct or influence their outcomes (Anderson & Berdahl, 2002). An adaptation of these real interactions between dyad members is that participants only imagine being in a manager or subordinate role. For example, vividly imaging to act and think like a manager (vs. subordinate) has been reported to increase participant's personal sense of power (Dubois et al., 2010). Other dyads such as senior versus freshman in high school or police versus accused are also possible (Cesario & McDonald, 2013).

Researchers have also used ultimatum (Güth et al., 1982) and dictator games (Kahnemann et al., 1986) to manipulate power (Sivanathan et al., 2008). The two members of a dyad have to decide how to divide money. The proposer has typically more power than the receiver because the proposer makes a first proposal that cannot

be influenced by the receiver. In the dictator game, the receiver cannot reject the outcome of the proposer and in the ultimatum game, the proposer receives on average more than 50% of the money (Galinsky et al., 2015).

Conceptual Priming

Power is linked to various experiences and behaviors in memory (Galinsky et al., 2015; Smith & Galinsky, 2010). Priming power is expected to have the same effects as experiencing power. Thus, if power is activated in one context through a priming task it is assumed to exert a non-aware influence in other subsequent contexts until the activation diminishes. Non-aware means participants do not realize the link between the priming task as activation and the influence on subsequent tasks (Bargh & Chartrand, 2000).

When participants engage in a conscious task, this type of priming is called supraliminal (or conscious priming). Participants are aware of the priming stimuli but not of the underlying primed construct, which affects subsequent reactions. An often used technique is the scrambled sentence task, where participants have to form a grammatical correct sentence from a random sequence of words (Srull & Wyer, 1979; for power-related examples see Smith & Trope, 2006). For example, the words "CEO, instructions, the, new, provides" should be sorted to "the CEO provides new instructions". Another technique is the word completion task. For example, "B _ S _" should be completed to "B O S S" (e.g., Anderson & Galinsky, 2006; Bargh et al., 1995).

In subliminal priming tasks, the priming stimuli are perceived nonconsciously. Presenting power-related words subliminal is supposed to activate power feelings (e.g., Bargh et al., 1995). Subliminal priming tasks can rule out alternative explanations for priming effects but usually have weaker effects than conscious priming tasks (Bargh & Chartrand, 2000).

Episodic Recall

Episodic recall tasks are also understood as (experiential) priming and follow the assumption that power is a mentally represented construct. Yet, episodic recall is not conceptual priming but mindset priming because procedural knowledge is primed (Bargh & Chartrand, 2000). Mindset priming is understood as the activation of a way of thinking, a way of approaching the world (Smith & Galinsky, 2010).

With episodic recall, participants write about a personally relevant experience with power. In a high power group, participants are usually requested to write about an incident in which they had power over others. Power is defined as controlling the ability of others to get something they want or being in a position to evaluate others. In the low power group, participants are requested to write about an incident in which someone else had power over them (Galinsky et al., 2003). An advantage of this technique is that power is primed without affecting cognitive capacity or role-prescribed norms (Galinsky et al., 2015; but see Tost, 2015, for a critical perspective). Episodic recall of power-related incidents was described as the most often used power manipulation in social psychology (Tost, 2015).

Embodiment

Body positions affect how we think, feel, and behave (Beilock, 2015). They can thus also be used to evoke a sense of power. The concept of *power posing* might be the most known intervention in the public domain and follows the idea "fake it till you make it". Participants engage for a short amount of time (e.g., 1-2 min) in expansive and open body positions, so-called high power poses, to activate the experience of power. Carney et al. (2010) observed higher feelings of power, higher risk tolerance, and desired endocrinological changes in participants who had engaged in high power poses compared to participants who had engaged in low power poses (contractive and closed body positions). However, in following research only psychological changes such as increased feelings of power were found to be robust whereas behavioral changes seem only to be expected with specific dependent variables and physiological

changes seem highly unlikely (Körner & Schütz, 2020; Körner et al., 2022). Moreover, in recent research the idea is put forward that power poses actually reflect dominance instead of power (Körner & Schütz, 2020; Witkower et al., 2020). Thus, despite the intense usage of power poses in previous research they seem only partially suitable for manipulating power per se.

Even more simple gestures were found to evoke a sense of power: Making a clenched fist (vs. keeping the hand in a relaxed position) was used in some studies (Schubert, 2004; Fischer et al., 2011). Other studies varied the seating or environmental position of the body: Kozak et al. (2014) instructed participants to sit in a large throne-like chair (high power condition) or in a child's chair (low power condition). Chen et al. (2001) used an elevated chair in a professor's office to induce power feelings whereas low power participants sat in a small and uncomfortable chair. In other research, participants sat in an expansive (vs. contractive) driver's seat, which was also found to successfully induce power feelings (Yap et al., 2013).

Altogether, both simple gestures as well as properties of the environment that imply a certain body position were used in past research to successfully activate power. Yet, researchers should be aware of the fact that specific gestures (e.g., high intensity and extreme expansiveness) may actually reflect dominance instead of power.

1.4 Theories on Power and Consequences of Power

The most influential theories on power contain various predictions how power changes our thoughts, emotional experience, and behavior. Thus, the power theories presented in the following also provide a broad overview of outcomes of power.

1.4.1 Approach / Inhibition Theory of Power

The approach / inhibition theory of power (Keltner et al., 2003) is the most influential, broad, and seminal account on psychological power. In that theory, power is defined

as capacity to influence others by providing or withholding resources or administering punishments.

The authors provide a short summary of variables that work as determinants of power (see Figure 1). For example, on an individual level extraversion, social skills, and body height are considered as determinants of high power. On a between-group level, factors such as high socioeconomic status and majority group affiliation bear the potential to experience high power. Yet, important for this dissertation are the consequences of power.

Two theories are used to derive predictions about consequences of power: the behavioral approach and inhibition systems (Gray, 1994) and the self-regulation theory of promotion and prevention focus (Higgins, 1999). Keltner et al. (2003) suggest that effects of power can be largely explained by activation of the behavioral approach system. Behavioral approach and promotion focus strengthen the desire to obtain rewards and approach self-related goals. By contrast, low power is associated with behavioral inhibition and a prevention focus, that is, with sensitivity to punishment, uncertainty, and avoidant behavior. The authors use the approach and avoidance aspects to derive propositions how power affects emotion, social attention, social cognition, and behavior.

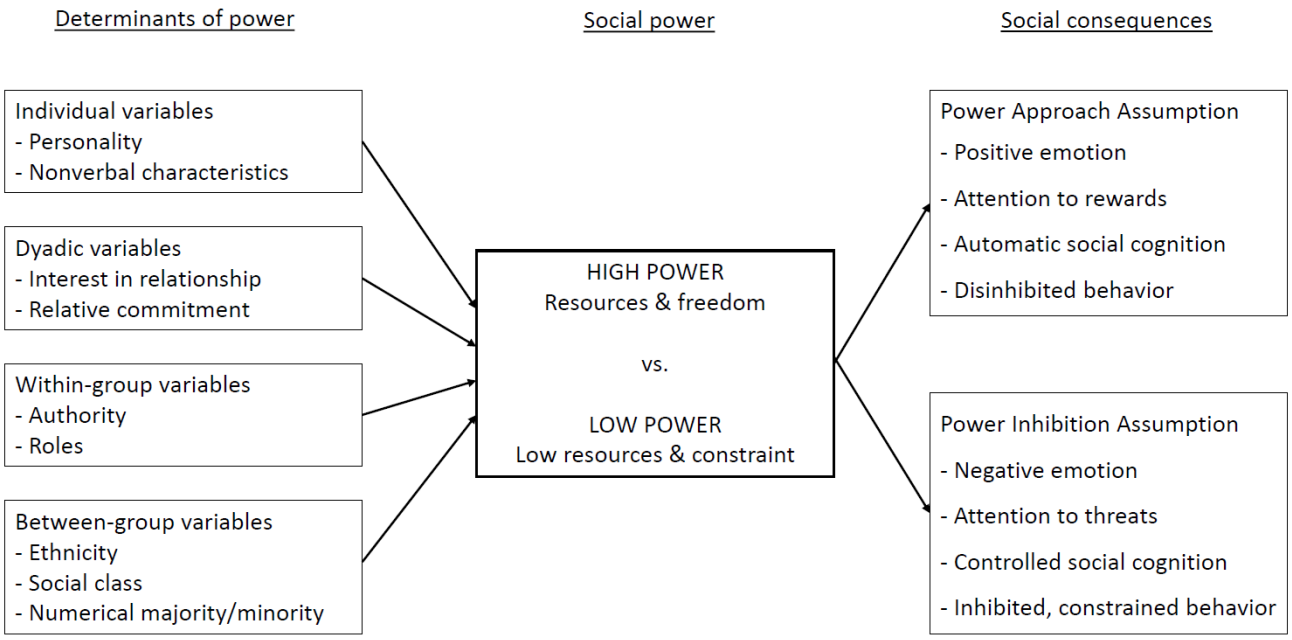
On the basis of theoretical considerations and empirical findings, high power is linked with the experience and expression of positive *emotions* such as enthusiasm and (authentic) pride. The positive emotions may ultimately help to achieve approach-related goals. By contrast, low power is associated with negative emotions such as embarrassment, fear, guilt, and shame.

With respect to *social attention*, high power is linked to increases in sensitivity to rewards whereas low power is linked to increases in sensitivity to punishment and threats. Thus, low power people see a dangerous and threatening world whereas high power people see a world with lots of opportunities to fulfill personal needs. Moreover, power holders are discussed to construe other people as a means to fulfill personal goals. Low power people tend to see themselves as a means to others' ends.

This dovetails with the propositions about *social cognition*: Power holders stereotype other people through their automatic information processing. They show out-group discrimination and in-group favoritism, and attribute achievements from group tasks to the self. Low power people exhibit the opposite pattern: They individuate others because they tend to a deliberated, controlled, and accurate social perception. They tend to in-group discrimination and out-group favoritism, and they focus on others, not the self, when doing group tasks.

Concerning *behavior*, power facilitates approach-related acts. Thus, power holders initiate physical contact, feel relatively free from social norms, and they show behavior that is in line with their internal states and traits. This may ultimately also lead to socially inappropriate behavior such as teasing, interrupting others, and norm-violating behavior. By contrast, low power is associated with behavioral inhibition such as less speaking and much hesitations. Context factors determine the behavior of low power people and norms restrict their behavioral variability as well as their trait-behavior-correspondence (see also Figure 1; Keltner et al., 2003).

Figure 1
Approach / Inhibition Theory of Power



Despite a clear definition of power, Keltner et al. (2003) refer to studies on power, status, socioeconomic status, dominance, and the power motive to derive their propositions. However, despite this criticism since 2003 research studying power as defined in this dissertation largely supported the propositions of approach / inhibition theory: For example, high power was linked to self-inspiration (emotional proposition; e.g., Van Kleef et al., 2015), optimism, risk-taking, and task-related attention (social attention to rewards proposition; e.g., Anderson & Galinsky, 2006), self-anchoring and planning fallacy (social cognition proposition; e.g., Overbeck & Droutman, 2013), and authenticity, self-concept consistency, and unethical behavior (trait-state correspondence in behavior proposition; e.g., Kraus et al., 2011; for an overview concerning all domains see Cho & Keltner, 2020). However, power does not necessarily lead to stereotyping. Overbeck and Park (2001) reported that goals of the power holder moderate social cognition: In person-centered tasks high power people can outperform low power people in individuating, that is, they showed an accurate and detailed interpersonal perception of subordinates. Keltner et al. (2003) note that specific factors such as accountability or stability of power relations can moderate effects of power on emotion, cognition, and behavior. Yet, a host of studies provide accumulating evidence for propositions of the approach / inhibition theory of power.

1.4.2 Social Distance Theory of Power

Predictions made by the authors of the approach / inhibition theory of power are mainly based on what would be expected with the neurobiological systems of behavioral approach and inhibition (e.g., activation of the behavioral approach system leads to the experience of joy and consequently power holders should experience joy because power goes together with behavioral approach). Yet, Magee and Smith (2013) argue that the behavioral approach and inhibition systems have neither been empirically nor theoretically linked with some outcomes (e.g., person perception) that are proposed in the approach / inhibition theory of power. For that reason, they suggest instead of a neurobiological mechanism, an interpersonal and a cognitive

mechanism to explain the effects of power: Power leads to social distance and social distance leads to an abstract construal style.

Magee and Smith (2013) understand power as asymmetric dependence between individuals. This asymmetry in dependence reflects asymmetry in *social distance*. Thus, high power individuals feel more distant to others than low power individuals. Power holders are less interested in affiliation and building close intimate relationships. In their theory, social distance is used in a broad fashion: High power persons compared with low power persons are assumed to show dissimilarity in social comparison (e.g., they show more stable self-concepts), are more resistant to social influence (e.g., they take less advice from others), and they are less interested in mental states of others (e.g., power reduces empathic concern). Furthermore, power is linked to empathic inaccuracy (e.g., less accuracy in recognizing emotion expressions) and the experience of socially disengaging emotions such as pride, disgust, and anger. Besides empirical evidence on which the authors build their argumentation, several studies since 2013 support the notion of the effect of power on social distance (see Magee, 2020, for an overview). For example, power holders tend to less goal contagion than less powerful individuals, that is, they do not adopt the goals of their partners. Low power individuals experience greater self-other overlap than high power people. When power holders approach other people, they do not want to be affiliated with these people but aim to control and dominate others. Finally, it is argued that it is not lonely at the top instead power decreases loneliness and power holders are more ready to form new social bonds after social exclusion.

Social distance is discussed to ultimately lead to an *abstract construal style*. This premise is based on construal level theory (Trope & Libermann, 2010) because abstract construal level and psychological distance are positively associated. Power has been repeatedly found to lead to abstract information processing (e.g., Smith & Trope, 2006) and thus power should change the construal of people, actions, and objects. More specifically, abstract information processing contains the focus on superordinate features, schematic representations, and extracting the gist, and this is what would be

expected of how power changes information processing. Magee and Smith (2006) propose that the abstract construal style of power holders explains the following effects: Focus on desirability concerns over feasibility concerns (i.e., correspondence between values and behaviors), increased subjective certainty and confidence due to neglecting attitude-incongruent information, more self-control and effective goal pursuit, and instrumental person perception. Finally, power is expected to lead to stereotyping if goal-relevant stereotypes are salient; otherwise, power leads to individuation if no stereotypes are salient because power is assumed to lead to accurate representations of others on a higher-order level. Finally, Magee and Smith (2013) suggest some moderating factors such as cultural background, legitimacy of power differentials, or context factors such as leadership.

1.4.3 Situated Focus Theory of Power

The Situated Focus Theory of Power (Guinote, 2007, 2010; Willis & Guinote, 2011) assumes that effects of power depend on situational circumstances and goals of the power holder. For that reason, Guinote is relying on cognitive models and self-regulation processes (in particular, attention).

Powerful people live in resource-rich environments, have less constraints, and experience rewards (see Keltner et al., 2003). By contrast, powerless individuals are constrained and experience threats (Keltner et al., 2003). This is why powerless individuals have to pay attention to various stimuli to attain some control about their environment whereas powerful individuals can pay attention to pursuing their goals and thus focus only on goal-relevant stimuli. Consequently, power holders have more cognitive resources available. Powerless people show controlled processing whereas powerful people can switch between controlled and automatic information processing depending on the task at hand (Guinote, 2007).

These differences in cognitive processes explain why powerful individuals process information selectively. Relevant information is processed more thoroughly and with less effort whereas powerless individuals process all information equally and with

more effort. Further, powerful individuals process information more flexible: If global processing is necessary, then the corresponding goal will be activated and they focus on higher-order information. If concrete processing is necessary, the goal changes and attention is redirected so that detailed information is processed thoroughly.

Because powerful people can easily attain desired outcomes, they trust default cognitive processes (e.g., feelings, stereotypes). Moreover, power holders direct their attention to relevant details of a situation and neglect peripheral information whereas powerless individuals also process unrelated information with the aim to understand the whole situation and receive control. However, this overrides other cognitive processes, which is detrimental to inhibiting distracting information and paying intense attention to goals. For example, in a study participants read information about targets. Half of the information was stereotype-consistent whereas the other half was not. Powerful individuals spend more time reading the stereotype-consistent information than the inconsistent information suggesting a shifted focus of attention. Powerless individuals did not show such as bias (Fiske & Dépret, 1996). However, when the goal changes and powerful participants have to focus on person-centered tasks, they show more individuation than powerless participants (Overbeck & Park, 2001, 2006), which can be explained by the altered goal.

Moreover, the situated focus theory proposes three behavioral consequences of the greater attentional resources of the power holders: Powerful individuals show increases in response speed (i.e., act faster), prioritizing (i.e., behavior is directed to attaining a goal), and greater behavioral variability (i.e., behavior changes across situations) than powerless individuals (Guinote, 2010). Altogether, power changes attentional processes, which can explain the differences in behaviors between powerful and powerless individuals. Moreover, powerful people show different behaviors in different situations, which can be explained by situated cognition.

1.5 Research Aims of the Present Projects

This dissertation is divided into five projects (see Table 1). In all projects, the personal sense of power (Anderson et al., 2012; Galinsky et al., 2003, Smith & Galinsky, 2010; see Chapter 1.2.3 "Personal Sense of Power") is the central variable. That is, power is understood as perceived capacity to influence others (Anderson, 2012).

In Project 1—relevant to the research question of how people experience power—the Personal Sense of Power Scale (PSPS) is adapted and validated for the German context. With five studies, psychometric properties, that is, reliability (internal consistency, retest-reliability, split-half reliability), construct validity (unidimensionality, nomological net for convergent and divergent associations, extreme group validity), and measurement invariance, are examined. Therefore, this project is relevant to psychological assessment. It allows the provision of a refined instrument to assess an individual's subjective power. Further, as the PSPS is heavily used in social psychological research, the findings are also relevant for basic research on social power because only the usage of valid and reliable methods allows for robust findings. Moreover, cross-cultural research will be allowed with the existence of a psychometrically sound power scale for the German language.

The Projects 2 and 3 were designed to investigate the importance of sense of power in close dyadic relationships (Research Question 2: How power pervades close relationships). In Project 2, sense of power is related to relationship quality on an intrapersonal as well as an interpersonal level. Further, associations of sense of power with relationship quality are compared with those from other power indices (i.e., positional power, power motive, satisfaction with experienced power, power balances). The findings illustrate not only whether a power balance or imbalance with respect to different power indices exists in German couples but also aim to show how and which form of power is relevant for being happy in a romantic relationship. Moreover, this study will also illustrate the importance to clearly separate various power constructs because they have different relations to outcomes (see Chapter 1.2.4 "Dominance, Status, and Other Hierarchy-Related Variables").

In Project 3, sense of power is related to forgiveness in romantic relationship partners from Germany and Israel. Moreover, self-esteem is analyzed as a mediator in the power-forgiveness-link. This research thus helps to explain the mechanism through which relationship power can benefit the individual (because forgiveness has several desirable correlates; Seybold et al., 2001). Furthermore, the findings will allow for a cross-cultural comparison: Is power in participants of an individualistic country (Germany) in the same way associated with forgiveness as in participants of a more collectivistic country (Israel). As in Project 2, Project 3 will also highlight the importance to analyze both relationship partners' psychological processes to understand how power affects the relationship. These studies on social relations are relevant for social and personality psychology because understanding interpersonal processes is central to these disciplines.

In Project 4, power is related to perceptions about one's body. With a cross-sectional study and an experiment it will be shown that power improves self-perceptions regarding one's body (i.e., increases body appreciation and body satisfaction). Again, self-esteem is identified as a mechanism through which power affects downstream consequences. This research is particularly relevant to social psychologists because the findings relate to objectification theory (Fredrickson & Roberts, 1997) in which power and self-views are considered central. Moreover, we know much about how power is embodied (Carney et al., 2010; Hall et al., 2005; see Chapter 1.3.2 "Experimental manipulations", section "Embodiment") but we know less about the fact whether power changes perceptions about the own body. Therefore, together with Project 5, Project 4 is relevant to understand how and which self-evaluations are affected by power (Research Question 3).

In the final Project 5, negative consequences of power are addressed: It is well-known that power can affect the individual in both positive and negative ways (Keltner et al., 2003; Magee & Smith, 2013). Further, power has been repeatedly linked to illusionary thinking (Fast et al., 2009, 2011). But does power also affect overconfidence with respect to complex causal knowledge? Does power increase the

illusion of explanatory depth (IOED; Rozenblit & Keil, 2002)? With two experiments and one cross-sectional study, the power-IOED link is studied, and abstract information processing is analyzed as a potential mechanism (see Chapter 1.4.2 "Social Distance Theory of Power"). The findings are relevant to social psychologists who aim to understand consequences of power on biases. Further, the findings are also relevant to organizational psychologists and management researchers to understand whether power holders are prone to specific kinds of thinking or cognitive illusions. Power holders have a huge impact on organizations and the individuals in these organizations, which is why potential illusionary thinking of power holders also affects others and should be prevented.

To sum up, the present studies start with providing a valid assessment tool for power that is related to both positive (e.g., relationship quality, self-esteem, body appreciation) and negative consequences (IOED) on an intrapersonal and interpersonal level. Thereby, the present research combines approaches from social and personality psychology and has implications for assessment and organizational psychology.

Moreover, several theories and different methodological approaches are used in the five projects. Of major importance are the approach / inhibition theory of power (Keltner et al., 2003) and the social distance theory of power (Magee & Smith, 2013; see Chapter 1.4 "Theories on Power and Consequences of Power"). The former theory postulates power leads to the experience of positive emotions and behavioral approach. This might explain why power enhances self-evaluations and boosts confidence, which means power could lead to higher self-esteem, body satisfaction, and benevolent motivation after conflicts. Thus, the studies provide correlational and empirical tests of propositions from that theory. The social distance theory, on the other hand, is particularly relevant to Project 5 because, according to this theory, power leads to abstract information processing (Smith & Trope, 2006). This could explain why power affects the IOED. Thus, also this theory is tested within this dissertation. Finally, the present research employs both correlational methods (e.g., in

using the PSPS) as well as experimental techniques because in Projects 1, 4, and 5 power feelings are instilled in participants through experiential priming (autobiographical recall) and role tasks (scenarios). In doing so, this dissertation aims to advance the understanding of the *personal sense of power*.

Table 1

Overview on Projects and Studies

Study	*N*	IV	DV	Data analysis	Results
Validation of German Personal Sense of Power Scale					
1	573	Trait power	23 Personality traits, emotions, and stable self-evaluations; 4 objective criteria	Item analysis, reliability, CFA, nomological associations, MI testing	GPSPS has satisfactory fit indices, is reliable, and shows good model fit. Nomological associations largely in line with hypotheses. Scale demonstrates measurement invariance between male and female participants.
2	435 (participants in romantic relationship)	Trait power	-	CFA	GPSPS with relationship-specific instruction (power in romantic relationship) shows satisfactory fit indices.
3	183 (clinical sample)	Trait power	-	CFA, ANCOVA	GPSPS shows satisfactory fit indices in a clinical sample. Clinical sample scores lower on power than a non-clinical sample (Study 1 participants).
4	175	Power manipulation	State power	*t* tests	GPSPS with a state instruction is sensitive to power manipulation: High power participants reported more power than low power participants.
5	120	Power manipulation	State power	*t* tests	GPSPS with a state instruction is sensitive to power manipulation: High power participants reported more power than low power participants.
Power & Relationship Quality					
1	181 couples	Trait power, Positional power, Satisfaction with power,	Relationship quality	APIM, similarity analyses	Trait power (relationship-specific) and satisfaction with experienced power are positively associated with relationship quality of actors and partners. Positional power and power motive show no significant actor and partner effects on relationship quality.

Study	*N*	IV	DV	Data analysis	Results
		Power motive, Power balance indices			Power balance (similarity) is not related to relationship quality.
Power & Forgiveness					
1	149 couples	Trait power	Self-esteem (mediator), forgiveness	APIMeM	Trait power (relationship-specific) has positive actor and partner effects on forgiveness. Self-esteem partially mediates the link between power and resentment-avoidance for actors.
2	174 couples	Trait power	Self-esteem (mediator), forgiveness	APIMeM	Trait power (relationship-specific) has positive actor effects on forgiveness. Self-esteem partially mediates the link between power and forgiveness. Interdependent self-esteem is a full mediator in the link between power and forgiveness.
Power & Body Image					
1	318	Trait power	Self-esteem (mediator), perceived body height, body satisfaction, body appreciation	Mediation & moderation	Power is positively related to body satisfaction and body appreciation. Self-esteem mediates these relationships. No significant association with perceived body height. No moderating effect of narcissism.
2	114	Power manipulation (high, low), Narcissism: moderator	Self-esteem (mediator), perceived body height, body satisfaction, body appreciation	ANCOVA, mediation & moderation in experimental design	High power participants report more body satisfaction, body appreciation, and higher perceived body height than low power participants. Self-esteem mediates these relationships. Narcissism moderates only the power-body appreciation link.

Study	*N*	IV	DV	Data analysis	Results
Power & IOED					
1	164	State Power (high, low) Knowledge (explanatory, procedural)	Assessment of knowledge depth (subjective & objective) for explanatory (IOED) and procedural (overconfidence) knowledge	ANOVAs	Larger IOED for high than low power participants. Larger overconfidence for high than low power participants.
2	202	State Power (high, low), Narcissism (moderator)	Assessment of knowledge depth (subjective & objective) for explanatory knowledge, Abstract thinking (mediator)	ANOVAs, mediation & moderation in experimental design	No effect of power on IOED (abstract thinking no mediator). Preliminary evidence for narcissism as moderator of the power-IOED link.
3	242	Trait power, Narcissism (moderator)	Assessment of knowledge depth (subjective & objective) for explanatory knowledge, Abstract thinking (mediator)	ANOVAs, mediation & moderation	No effect of power on IOED (power was related to abstract thinking but abstract thinking not to IOED). Narcissism was no moderator of the power-IOED link.

Notes. N = Sample Size. IV = Independent Variable. DV = Dependent Variable. ANCOVA = Analysis of Covariance. ANOVA = Analysis of Variance. APIM = Actor-Partner Interdependence Model. APIMeM = Mediated Actor-Partner Interdependence Model. CFA = Confirmatory Factor Analysis. GPSPS = German Personal Sense of Power Scale. IOED = Illusion of Explanatory Depth. MI = Measurement invariance.

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Chapter 2

It's All About Power: Validation of Trait and State Versions of the German Personal Sense of Power Scale

Reference

Körner, R., Heydasch, T., & Schütz, A. (2022). It's all about power: Validation of trait and state versions of the German Personal Sense of Power Scale. *European Journal of Psychological Assessment, 38*(1), 36–48.

Abstract

The present research was aimed at providing a German version of the Personal Sense of Power Scale (Anderson et al., 2012) and testing its psychometric properties. Personal sense of power describes the perception of one's ability to influence others. Probably every human relationship can be characterized by differences in power, which means that the measurement of experienced power is highly relevant. The availability of appropriate measures in different languages will help improve research and cross-cultural comparisons. Five studies were conducted. Internal consistency was high across all studies. Stability across 6 and 12 weeks was also high. Good fit was observed for a 6-item unidimensional version. Correlations with a variety of psychological and sociodemographic variables were in the expected directions, supporting nomological and criterion validity (Study 1). Measurement invariance across gender was demonstrated. In support of construct validity, a clinical sample scored significantly lower than others. Finally, two studies showed the sensitivity of a state version of the scale. We encourage researchers to use this scale as a reliable and valid instrument for assessing trait and state power.

Keywords: power, personal sense of power, trait power, state power, influence, status

2.1 Theoretical Background

2.1.1 Introduction

"The fundamental concept in social science is Power, in the same sense in which Energy is the fundamental concept in physics" (Russell, 1938, p. 10). Russell's statement can be found in various articles on power and status and illustrates the importance of power in psychological research and everyday life. In recent decades, several intriguing theories have emerged (e.g., Keltner et al., 2003; Magee & Smith, 2013), and various findings have been published. Power has overcome the stigma of being connected to only negative outcomes (e.g., corruption, self-serving behavior, and egocentric biases). Instead, power can be seen as an intensifier of goal-related approach motivation (Guinote, 2017). Accordingly, Guinote's (2017) review shows that power energizes thought, speech, and action, increases prioritization and authenticity, but also leads to stereotyping and objectification. Thus, on the basis of predispositions and situational circumstances, power apparently intensifies people's behavioral tendencies in either antisocial or prosocial ways.

In social psychology, power is often described as a type of resource control that can modify others' states (Keltner et al., 2003). Yet, power can be independent of sociostructural factors: Anderson et al. (2012) thus defined a subjective sense of power as a "psychological state—a perception of one's capacity to influence others" (p. 314). For example, an employee might make decisions in a negotiation despite lacking a formal position and responsibility. Thus, the employee might experience a high personal sense of power even without the formal position. But how can the experience of power be measured? We aimed to provide and validate a German version of the only established measure of generalized power: The Personal Sense of Power Scale (PSPS; Anderson et al., 2012).

The eight-item unidimensional PSPS captures individuals' beliefs about their influence over others and their decision-making ability within social relationships. Using nine different samples, Anderson et al. (2012) reported high internal consistency for the scale and showed a distinct but moderately related personal sense of power

between different relationship types (e.g., friend relationship, parent relationship). Further, they demonstrated the existence of a personal sense of power for different abstraction levels: short-term and long-term dyadic relationships, groups, and a generalized form.

The PSPS has become very popular in a very short amount of time. The scale has been in use since the early 2000s (e.g., Anderson & Galinsky, 2006), and its theory and development were presented in 2012 (Anderson et al., 2012). Anderson et al. (2012) presented instructions for the PSPS for different relationship types (e.g., date-, supervisor-, friend-relationships). As of October 2020, the original publication has been cited more than 600 times (Google Scholar). The scale has been translated into several languages such as Chinese (e.g., Wang, 2015), Dutch (e.g., Van Kleef et al., 2015), Hebrew (Uziel & Hefetz, 2014), and Polish (e.g., Kocur & Mandal, 2018), and acceptable internal consistencies have been reported for these translations. Researchers have also used the measure in Germany (e.g., Weineck et al., 2019).[2] Yet, to the best of our knowledge, the PSPS has not been validated in any language other than English. In the present study, we aimed to identify the psychometric properties of the German version of the Personal Sense of Power Scale (GPSPS), test the scale in distinct samples, extend predictions regarding its validity, and for the first time, test the unidimensionality of the scale by applying confirmatory factor analyses and examine the measurement invariance of the scale across sex.

Another important aspect of personal sense of power is that is has been used for manipulation checks and as a predictor and an outcome variable. As the PSPS is usually conceptualized as a trait measure, researchers have sometimes found no effect of an experimental power manipulation on this scale (e.g., Deuter et al., 2016). Therefore, in the current study, we also aimed to test and establish instructions for a state version of the GPSPS to measure situational fluctuations in sense of power.

[2] Weineck et al. (2019) used only six items (Items 1 to 6) from the original scale but these were different from the items that we had identified as being psychometrically adequate (Items 1, 2, 4, 5, 6, and 7). They reported a Cronbach's alpha of .82, which is slightly below the mean Cronbach's alpha reported in the present studies (M_{α} = .85).

2.1.2 Overview of Studies

We conducted five studies to provide an in-depth examination of the GPSPS's psychometric properties. Studies 1 to 3 were designed to test the unidimensionality of the trait version of the GPSPS with confirmatory factor analysis (CFA). In Study 1, we tested the scale's internal consistency and stability and assessed a variety of psychological and sociodemographic constructs for nomological and criterion validity. Further, we tested for measurement invariance across gender. In Study 2, we used a community sample and measured personal sense of power in the context of romantic relationships to further test for internal consistency and unidimensionality. A clinical sample was used in Study 3 to make a comparison between groups (i.e., clinical and nonclinical groups). Finally, in Studies 4 and 5, we tested a state version of the GPSPS.

2.2 Study 1

The first study was aimed at examining the reliability and unidimensionality of the GPSPS and at providing detailed information about nomological and criterion validity. The GPSPS was based on a translation/backtranslation procedure. The scale was used as a trait measure reflecting a generalized sense of power: "In my relationships with others…."

To test the nomological and criterion validity of the PSPS, we relied on the variables and measures used by Anderson et al. (2012) but also added several new measures (e.g., facets of narcissism, construal style). On the basis of the literature, we expected positive associations between personal sense of power and extraversion, conscientiousness, openness (Anderson & Cowan, 2014), internal locus of control (Anderson et al., 2012), dominance (Anderson & Cowan, 2014; Dunbar & Burgoon, 2005), narcissism (Brunell et al., 2008), self-esteem (Körner et al., 2019; Wojciszke & Struzynska–Kujalowicz, 2007), and behavioral activation (Keltner et al., 2003). Personal sense of power was not expected to be associated with agreeableness, and negative associations were expected with neuroticism (Anderson & Cowan, 2014) and behavioral inhibition (Keltner et al., 2003).

Further, to extend Anderson et al.'s (2012) nomological network of sense of power on the basis of two major theories in the field of power, we made the following predictions: Positive emotions will be positively correlated and negative emotions will be negatively correlated with personal sense of power (approach-inhibition theory of power; Keltner et al., 2003). With respect to the social distance theory of power (Magee & Smith, 2013), positive associations were expected for abstract construal style and social distance. Finally, as pride is the emotion most closely linked to social rank (Cheng et al., 2010), we also expected a positive association between power and pride. Yet, authentic pride should show a stronger association with personal sense of power than hubristic pride because associations between personality variables and authentic pride are similar to personal sense of power.

Moreover, we made some predictions regarding criterion validity. The original publication did not test for associations between objective criteria and personal sense of power. As the experience of power may be independent of sociostructural aspects but usually does show a moderate relation, we expected a positive but small correlation between subjective power and socioeconomic status (Anderson et al., 2012), managerial responsibility (Boeker, 1992), and number of employees. Given that status is associated with increased body height (Stulp et al., 2012), and powerful people overestimate their body height (Duguid & Goncalo, 2012), we also expected a positive association between body height and sense of power.

2.2.1 Method

2.2.1.1 Participants and Procedure

Participants were recruited online at a distance-learning university to collect data from a more heterogeneous sample with respect to age and professional background. Participants were offered course credit for completing the questionnaires. They lived all over Germany. We examined the stability of the GPSPS across three points of measurement. The questionnaire used at the first time point (t1) consisted of the GPSPS and several measures that were included to establish validity. Participants generated an individual code so that retest results could be matched. After data preparation (see

the section in the Results), the sample comprised 573 participants (80% women, 19% men, 1% diverse; M_{age} = 32.12, SD_{age} = 10.16, 18 to 75). After 6 weeks (t2), 266 individuals completed the GPSPS for a second time (80% women, 18% men, 1% diverse; M_{age} = 33.46, SD_{age} = 10.83, 18 to 75). Finally, 185 participants completed the scale for a third time after 12 weeks (t3; 79% women, 18% men, 1% diverse, M_{age} = 33.75, SD_{age} = 11.02, 18 to 75). We also tested for whether there was a pattern in the missing data across measurement points. Little's MCAR tests were not significant for the comparisons of the GPSPS scores, χ^2 (2) = 2.627, p = .269 (t1 with t2), χ^2 (2) = 1.676, p = .432 (t1 with t3), and χ^2 (1) = 0.376, p = .540 (t2 with t3). This supported the null hypothesis that the data were missing completely at random.

Study 1 was preregistered (http://aspredicted.org/blind.php?x=429eg5). Codes and data for all studies are available at https://osf.io/jf9dz. Correlational analyses and group comparisons were done with SPSS 25. Factor analyses were computed with Mplus 7 (Muthén & Muthén, 1998–2012). RStudio 1.2.5019 was used to calculate McDonald's ω. For all studies we report how we determined our sample size, all data exclusions, all data inclusion/exclusion criteria, whether inclusion/exclusion criteria were established prior to data analysis, all measures in the study, and all analyses including all tested models. If we use inferential tests, we report exact p values, effect sizes, and 95% confidence or credible intervals.

2.2.1.2 Measures

The *Personal Sense of Power Scale* (Anderson et al., 2012) comprises eight items (e.g., "My ideas and opinions are often ignored") rated on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). We used a translation/backtranslation procedure to create the German version according to the *Guidelines for Translating and Adapting Tests* by the International Test Commission (2017). First, two experts in psychological power research translated the items into German. A bilingual native English speaker backtranslated the items. There was high congruence in wording. Minor discrepancies occurred and were resolved in a discussion. The items and response format can be found in Table 2. Cronbach's alpha coefficients are presented in Table 2 for all scales.

Various trait measures were used to assess nomological validity. The habitual experience of positive and negative emotions was measured with the *Positive and Negative Affect Schedule* (German version: Krohne et al., 1996). Participants were asked to use a 5-point rating scale ranging from 1 (*not at all*) to 5 (*extremely*) to rate the extent to which they generally experienced 20 emotions. Half of the items addressed positive affect (e.g., excited) and the other half negative affect (e.g., ashamed).

The seven-item *Authentic and Hubristic Pride Scale* (Tracy & Robins, 2007) covers two facets of pride: Authentic pride refers to confidence and success (e.g., "I feel I am achieving"), whereas hubristic pride refers to arrogance and conceitedness (e.g., "I am smug"). The scale was administered with a 5-point rating scale ranging from 1 (*not at all*) to 5 (*extremely strong*).

The *Rosenberg Self-Esteem Scale* (German version: von Collani & Herzberg, 2003) measures trait self-esteem with 10 items (e.g., "I certainly feel useless at times"). Answers were given on a rating scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Narcissism was measured with the short form of the *Narcissistic Personality Inventory* (NPI-15; German version: Schütz et al., 2004). The 15-item scale addresses subclinical grandiose narcissism as a personality trait. The items have a dichotomous forced-choice format. One statement from each pair represents narcissism (e.g., "Everyone likes to listen to me"). Further, we used the short form of the *Narcissistic Admiration and Rivalry Questionnaire* (NARQ; Back et al., 2013). People who want to be admired by others for the purpose of self-exaltation score high on Admiration (e.g., "I deserve to be considered a great person"). Rivalry addresses asserting oneself against others to protect oneself (e.g., "I want my competitors to fail"). Each facet consists of three items. Answers were given on a 6-point scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*).

To measure dominance, we used adjectives from the *Revised Interpersonal Adjective Scales* (Wiggins et al., 1988). We relied on the findings by Lorr and Strack (1989), who identified seven adjectives (e.g., "assertive") that were the best markers for the

dominance-submission dimension. Answers were given on an 8-point rating scale ranging from 1 (*extremely inaccurate*) to 8 (*extremely accurate*) regarding how the person feels in general.

The *NEO-FFI-30* (Körner et al., 2008) is a German short form of the NEO Five-Factor Inventory and measures the Big Five with six items each. Answers were given on 5-point rating scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Locus of control was measured with the *Internal-External Control* scale (German version: Rost-Schaude et al., 2014). The 28 items (five filler items) have a dichotomous forced-choice format. One statement represents internal and the other external locus of control (e.g., "Unfortunately, a person's values often go unrecognized, no matter how hard he tries").

The *BIS/BAS Scale* (German version: Strobel et al., 2001) consists of 24 items with two superior factors: behavioral activation (BAS) and behavioral inhibition (BIS; e.g., "Criticism or scolding hurts me quite a bit"). The BAS factor can be divided into three components: Fun Seeking (e.g., "I am always willing to try something new if I think it will be fun"), Drive (e.g., "I go out of my way to get things I want"), and Reward Responsiveness (e.g., "It would excite me to win a contest"). Answers were given on a 5-point rating scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*).

The *Behavior Identification Form* (Vallacher & Wegner, 1989) measures construal style with 25 items. Participants were informed that behaviors can be identified in different ways. Then they had to choose one of two alternatives for a certain behavior (e.g., "making a list: (a) getting organized vs. (b) writing things down" representing (a) a high-level identity or (b) a low-level identity).

Table 2

Descriptive Statistics, Corrected Item-Total Correlations (r_{it}), and Loadings of the GPSPS Items in Study 1

Item		*M*	*SD*	r_{it}	Loading
1) Ich bekomme Menschen dazu, mir zuzuhören.*	I can get him/her/them to listen to what I say	5.55	1.09	.59	.68
2) Meine Wünsche haben nicht viel Gewicht. R*	My wishes do not carry much weight	5.06	1.39	.60	.69
3) Ich kann Menschen dazu bringen, zu tun, was ich will.	I can get him/her/them to do what I want	4.78	1.26	-	-
4) Auch wenn ich meine Ansichten ausspreche, haben diese wenig Einfluss. R*	Even if I voice them, my views have little sway	5.24	1.22	.73	.84
5) Ich habe viel Macht.*	I think I have a great deal of power	3.57	1.37	.53	.59
6) Meine Ideen und Meinungen werden oft ignoriert. R*	My ideas and opinions are often ignored	5.27	1.29	.71	.83
7) Selbst wenn ich es versuche, kann ich mich nicht durchsetzen. R*	Even when I try, I am not able to get my way	5.54	1.26	.69	.81
8) Wenn ich will, dann treffe ich die Entscheidungen.	If I want to, I get to make the decisions	5.25	1.27	-	-

Note. * Final items. R Inverse items. Response format: 1 = strongly disagree (stimme gar nicht zu), 2 = largely disagree (stimme kaum zu), 3 = somewhat disagree (stimme eher nicht zu), 4 = neither (weder noch), 5 = somewhat agree (stimme eher zu), 6 = largely agree (stimme weitgehend zu), 7 = strongly agree (stimme völlig zu).

Social distance was measured with the single-item measure *Inclusion of Other in the Self Scale* (Aron et al., 1992). Participants were instructed to circle the diagram that best described their interpersonal relationships. Each diagram consisted of two circles labeled "self" and "other." Answers were given on a pictorial 7-point rating scale ranging from 1 (*circles for self and other do not overlap*) to 7 (*circles for self and other almost completely overlap*).

Several sociodemographic characteristics were measured: age, gender, body height (in cm), managerial responsibility, and number of employees. Further, profession, net income, and educational and vocational qualifications were measured to assess sociodemographic status (for the procedure, see Lampert et al., 2013).

2.2.2 Results

2.2.2.1 Data Preparation

At t1, the questionnaire was completed by 607 participants. To ensure the quality of the data and the validity of the protocol (see Johnson, 2005), we conducted different data-cleaning steps in accordance with our preregistration. First, we excluded 11 participants with an average answer time below 2 s per item. Next, the individual reliability coefficient (IRC; Jackson, 1976) of the remaining 596 cases was computed using scales with more than one item, whereby the scales were adjusted according to the different rules for computing the scales (e.g., mean vs. sum; item coding zero to one vs. one to five). Five participants were excluded because they had an IRC below zero. The remaining 591 cases were examined to identify patterns of vertical answering, that is, they almost always provided the same score across items (e.g., agreeing strongly even when the items were inverted or referred to different matters). The percentage of consecutive identical answers (PCIA; Heydasch, 2014) was calculated (the number of consecutive identical answers on a rating scale divided by the number of items using that rating scale multiplied by 100). To obtain an overview, we averaged the PCIAs of all rating scales and excluded three participants who had nearly always chosen the same option (PCIA > 90%). Finally, as planned in the preregistration, 15 cases in which individuals participated repeatedly with an identical

code were deleted. In total, 573 valid cases remained in the sample and were used in the statistical analyses.

2.2.2.2 Factorial Validity and Item Characteristics

As assessed with the Kolmogorov-Smirnov test (*p*s < .001) and the Shapiro-Wilk test (*p*s < .001), the items and the sum score for the GPSPS were not normally distributed. Thus, we used the weighted least squares estimator (WLSMV) for the CFA (DiStefano & Hess, 2005). The expected unidimensional factor solution showed fit indices that were not satisfactory, $\chi^2(20) = 240.982$, $p < .001$; RMSEA = .139, 90% CI [.123, .155], $p < .001$; CFI = .955; TLI = .937. We then examined the modification indices and identified two items that were responsible for the poor fit (Items 3 and 8). The items were both about "wanting something" and thus differed from the rest of the items. The resulting six-item factor solution showed good fit, $\chi^2(9) = 22.454$, $p < .001$; RMSEA = .051, 90% CI [.025, .078], $p = .430$; CFI = .997; TLI = .995. All loadings were significant (*p*s < .001). In the following, we used the six-item version.[3] Table 2 presents the means, standard deviations, and corrected item-total correlations for the items.

2.2.2.3 Reliability

The split-half reliability was acceptable at .74 (Items 1, 2, and 4 correlated with Items 5, 6, and 7). Cronbach's alpha for the GPSPS was good at .85 (.86 at t2 and t3). McDonald's ω was computed by using the robust maximum-likelihood estimator (MBESS package in R; Kelley, 2018), and there was also good internal consistency at .85 (.87 at t2 and t3).

2.2.2.4 Stability

We found high test-retest correlations for the six-week, $r_{t1t2}(264) = .74$, $p < .001$, and 12-week intervals, $r_{t1t3}(183) = .72$, $p < .001$.

[3] In the CFAs for all studies, all error terms were uncorrelated.

Table 3

Nomological Validity of the GPSPS: Descriptive Statistics for the Dependent Measures and Zero-Order Correlations with Personal Sense of Power

Dependent measure	Cronbach's alpha	*N*	*M*	*SD*	Range	Expected correlation	Observed correlation
Positive emotions	.85	569	3.44	0.63	1-5	+	.44***
Negative emotions	.87	569	1.98	0.67	1-5	-	-.38***
Authentic pride	.89	569	3.47	0.75	1-5	+	.52***
Hubristic pride	.85	569	1.81	0.66	1-5	+	.12**
Self-esteem	.90	565	3.15	0.59	1-4	+	.52***
Narcissism (NPI)	.78 [a]	567	4.90	3.21	0-15	+	.49***
Narcissism (NARQ)	.79	569	2.62	0.93	1-6	+	.23***
Admiration	.80	569	2.93	1.17	1-6	no pre	.34***
Rivalry	.66	569	2.31	0.98	1-6	no pre	.04
Dominance	.67	568	5.11	1.06	1-8	+	.60***
Openness	.78	565	3.80	0.77	1-5	+	.07*
Conscientiousness	.75	565	3.97	0.61	1-5	+	.25***
Extraversion	.76	565	3.24	0.71	1-5	+	.39***
Agreeableness	.73	565	3.91	0.67	1-5	0	-.02
Neuroticism	.84	565	2.57	0.85	1-5	-	-.54***
Internal locus of control	.76 [a]	566	11.58	4.27	0-23	+	.25***
Behavioral activation	.75	586	3.08	0.36	1-4	+	.30***
BAS Drive	.69	586	3.07	0.49	1-4	+	.28***
BAS Fun Seeking	.59	569	2.91	0.50	1-4	+	.11**
BAS Reward Responsiveness	.60	569	3.23	0.44	1-4	+	.28***
Behavioral inhibition	.83	569	2.97	0.56	1-4	-	-.36***
Abstract construal style	.87 [a]	565	15.75	5.54	0-25	+	.17***
Social distance	-	565	3.93	1.55	1-7	+	.14**

[a] Values were calculated with the Kuder–Richardson Formula 20. no pre = no prediction was made for this variable in the preregistration.

* $p < .05$, one-tailed. ** $p < .01$, one-tailed. *** $p < .001$, one-tailed.

Table 4

Zero-Order Correlations between the GPSPS and Sociodemographic Characteristics

Dependent measure	Expected correlation	Observed correlation
Age	no pre	.10*
Gender [a]	no pre	-.07
Body height	+	.04
Socioeconomic status	+	.18***
Managerial responsibility	+	.20***
Number of employees	+	-.03

Note. No pre = no prediction was made for this variable in the preregistration.

[a] Male = 1, Female = 2.

2.2.2.5 Nomological Validity

All associations between the GPSPS and the psychological scales were in the expected directions (see Table 3). Interestingly, the correlation with authentic pride was much higher than with hubristic pride (Z = 8.00, p < .001). High positive correlations were found for the GPSPS with self-esteem, r(563) = .52, p < .001, and dominance, r(566) = .60, p < .001. With respect to narcissism, there was a positive association with admiration, r(567) = .34, p < .001, but no association with rivalry, r(567) = .04, *ns*. The strongest correlation with the Big Five was for neuroticism, r(563) = -.54, p < .001. The association with openness was positive as expected but almost zero, r(563) = .07, p < .05. For the facets of behavioral activation, the GPSPS showed higher correlations with drive (Z = 3.31, p < .001) and reward responsiveness (Z = 3.67, p < .001) than with fun seeking. There were also small but significant positive relations with abstract construal style, r(563) = .17, p < .001, and social distance, r(563) = .14, p < .01.

2.2.2.6 Criterion Validity

The GPSPS's associations with socioeconomic status and managerial responsibility were in the expected directions (see Table 4). The GPSPS's correlation with number of employees was unexpectedly close to zero, r(566) = -.03, p = .235. However, an inspection of the z-transformed data for the employee variable showed an outlier (z = 10.06 with 600 employees). This person was excluded, and the GPSPS's association with number of employees became slightly larger, r(565) = .08, p = .036. When

excluding participants who supervised more than 50 employees (cutoff for small companies) or more than 10 employees (cutoff for microenterprises), the association increased, $r(560) = .11$, $p = .004$, $r(533) = .16$, $p < .001$, respectively. Unexpectedly, there was no clear relation between the GPSPS and body height (see Table 4)[4].

2.2.2.7 Measurement Invariance

We tested for measurement invariance across gender (only male and female). Using multigroup CFA, we found strict invariance for the GPSPS (see Table 5) with respect to the invariance criterion by Cheung and Rensvold (2002; $\Delta CFI \leq .01$).

2.2.3 Discussion

The results largely supported the preregistered expectations. The GPSPS showed a unidimensional structure and good fit with six items. Two items were excluded. The modification indices suggested that adding covariances between Items 3, 8, and the other six items would improve the fit of the model. As correlated error terms violated the assumption of local model fit in a unidimensional model, the best approach was to remove these two items from the final scale. Further, Item 8 also showed the lowest corrected item-total correlation as well as the lowest loading in the CFA (see the Online Supplementary Material at https://osf.io/2tqwc/ or Appendix A). Cronbach's alpha barely changed when Items 3 and 8 were excluded. With respect to the content, the two items seemed to have something in common (they are about "wanting something")—an aspect that is not present in the other items. This suggests that these items may represent a different latent variable. The final GPSPS items showed high corrected item-total correlations. Internal consistency was satisfactory and similar to the values found for the original scale. The trait version showed high stability.

[4] The correlation between body height and sense of power was for men, $r(107) = .08$, and for women, $r(454) = .01$.

Table 5

Test of Measurement Invariance for Gender (Male/Female) in Study 1 (t1)

Fit indices	Configural	Metric	Scalar	Strict (factor variances)	Strict (residual error variances)
χ^2	35.448	43.902	55.813	56.729	74.733
RMSEA	.059	.057	.057	.056	.062
90% CI	[.029, .087]	[.030, .082]	[.034, .080]	[.033, .078]	[.042, .081]
CFI	.987	.984	.980	.980	.971
TLI	.978	.980	.979	.980	.976
AIC	9911.725	9910.178	9910.089	9909.005	9915.009
BIC	10067.850	10044.210	10018.510	10013.089	9993.072

Note. RMSEA = Root Mean Square Error of Approximation. CFI = Comparative Fit Index. TLI = Tucker-Lewis Index. AIC = Akaike Information Criterion. BIC = Bayes Information Criterion.

The construct was correlated with other variables in the expected directions. The strongest association was with dominance, which is a closely related construct with respect to social hierarchy. Also, its association with authentic pride, which is also closely related to power (Cheng et al., 2010), was expected. Self-esteem and narcissism also showed strong positive correlations with the personal sense of power, which suggests that this sense is linked to overall positive self-evaluations. Neuroticism showed the strongest negative association with personal sense of power, which suggests that emotional stability could lead to or might be a consequence of personal power. Of course, third variables such as depression or anxiety may be the basis for this association. This finding dovetails with the associations found with positive and negative emotions. Further, the expected correlations (emotions, behavioral activation, and inhibition) with respect to the approach/inhibition theory of power (Keltner et al., 2003) were high. Interestingly, however, the correlations with construal style and social distance were only small to medium in size. Overall, this may suggest that the GPSPS has a better match with the nomological net as proposed by the approach/inhibition theory than with the associations suggested by the social distance theory of power (Magee & Smith, 2013). Moreover, the present patterns and sizes of the correlation coefficients were largely comparable to the findings from the original scale (Anderson et al., 2012). Only the association with neuroticism was much stronger in the present study than it was in the original study, and the association with openness was much weaker. When potential cross-cultural differences are taken into account, this may suggest that emotional stability is more decisive for decision-making ability in Germany than in the US. But another way to explain these differences might be that the Big Five items have slightly different meanings in English and German (Hofstee et al., 1997).

Criterion validity was supported as the GPSPS showed small but positive associations with aspects of sociostructural power. However, the association between GPSPS and body height was not as expected. Apparently, physical features do not necessarily correspond to a personal sense of power. Despite the great deal of literature

suggesting that body height is positively associated with power and status (e.g., Stulp et al., 2012), there are studies that have shown no association (e.g., between body height and earnings in Germany; Heineck, 2005). Moreover, the overrepresentation of women in the sample may have prevented an association between sense of power and body height from being found. In fact, the association between sense of power and height is somewhat stronger for men than for women. Finally, because strict measurement invariance was established, personal sense of power was measured in the same way for both men and women.

2.3 Study 2

In Study 2, we cross-validated the unidimensional factor structure with six items in a second sample and assessed internal consistency. We used the GPSPS in the context of romantic relationships because sense of power is considered to pertain to various types of contexts and relationships (Anderson et al., 2012). We thus aimed to increase the applicability of the scale across contexts. The instruction read: "In the relationship with my partner…."

2.3.1 Method

Undergraduates of a university course recruited participants via snowball principle. Participants mostly were from southern Germany. Participants could participate online or offline. There was no incentive for participation. Overall, 435 participants took part (54% women, 46% men; M_{age} = 30.39, SD_{age} = 12.84, 14 to 73). All participants were in a romantic relationship (23.9% married, 3.4% engaged, 72.6% dating). The average relationship duration was 8 years (SD = 10.39, Range: 1 month to 52 years).

2.3.2 Results and Discussion

As in Study 1, the six-item GPSPS showed an acceptable fit, $\chi^2(9) = 55.988$, $p < .001$; RMSEA = .110, 90% CI [.083, .138], $p < .001$; CFI = .976; TLI = .961. Reliability was acceptable when computed as Cronbach's alpha (α = .78) or McDonald's ω (ω = .80). Further, the model fit the data much better than the eight-item version, $\chi^2(20) = 463.656$, $p < .001$; RMSEA = .226, 90% CI [.208, .244], $p < .001$; CFI = .806; TLI = .728. Overall, the

CFA supported the one-factor solution in a second independent community sample with better gender representation. Yet, the RMSEA was slightly above the traditional cut-off values for acceptable fit. This may have occurred because the violation of multivariate normality was largest in this sample (particularly with a kurtosis value > 3 for Item 1) and the degrees of freedom were low (Hammervold, 1998; Kenny et al., 2015). Because the CFI and TLI showed acceptable values and the RMSEA was acceptable in Studies 1 and 3, we concluded that the six-item solution was preferable.

2.4 Study 3

In this study, we examined the factorial validity of the GPSPS in a clinical sample. Moreover, we tested for construct validity: As individuals with mental disorders show impairments in their decision-making ability and their volitional control (Goschke, 2014), it seems plausible that they would experience a lower personal sense of power in their general relationships than others. Many patients experience stigma or discrimination due to their mental illness and consequently report lower power (Lysaker et al., 2008; Mashiach-Eizenberg et al., 2013). In addition, other proxies of personal sense of power, or the lack of it, such as behavioral inhibition, a prevention focus (Keltner et al., 2003), or neuroticism as found in Study 1, are associated with an increased likelihood of developing a mental disorder (Clauss & Blackford, 2012; Eddington et al., 2009; Lahey, 2009). To the best of our knowledge, such a test of extreme group validity has not been previously reported for the scale, but as elaborated above, it makes conceptual sense for impairment to be associated with a lack of experienced power. The GPSPS was used as a trait measure to measure a generalized sense of power: "In my relationships with others…."

2.4.1 Method

Participants were recruited online via 10 communities and fora concerning mental disorders, depression, and self-help. As an incentive, participants could be entered into a drawing for Amazon vouchers. The questionnaire contained items on demography and psychotherapeutic indications and the trait GPSPS. A total of 187

individuals participated; two were excluded due to vertical answer patterns; two responded too quickly (see Leiner, 2013). The final sample comprised 183 participants (77.6% women, 16.4% men, 1.6% diverse; M_{age} = 37.31, SD_{age} = 13.66, 16 to 83). Eighty-nine participants (48.6%) were currently in psychotherapeutic treatment; 157 (85.8%) reported at least one diagnosed mental disorder; 87 (47.5%) reported more than one diagnosed mental disorder. The following mental disorders were named: major depression (77.7%), anxiety disorders (33.8%), trauma- and stress-related disorders (24.2%), and borderline personality disorder (19.8%). This study was not preregistered as we were not able to estimate a priori how many participants would end up participating in this study.

2.4.2 Results and Discussion

First, missing values were replaced with the expectation-maximization method. Little's MCAR test was not significant, χ^2 (28) = 24.393, p = .661, which suggested that the data were missing completely at random. A total of six missing values were replaced. Internal consistency was high (α = .88, ω = .88). Then, a CFA was computed. The expected unidimensional factor solution fit the data well, $\chi^2(9)$ = 21.909, p < .01; RMSEA = .089, 90% CI [.042, .136], p = .081; CFI = .994; TLI = .990. Finally, we compared the mean of the GPSPS in this sample with the mean of the GPSPS in the sample from Study 1 (t1). An ANCOVA controlling for age and gender showed the expected main effect, $F(1, 736)$ = 155.207, p < .001, η_p^2 = .17. The participants in the Study 1 sample reported a significantly higher personal sense of power (M = 5.04, SD = 0.97) than the clinical sample participants (M = 3.91, SD = 1.28). When we excluded participants from Sample 3 who had not indicated a diagnosed mental disorder, the effect size increased, $F(1, 711)$ = 154.886, p < .001, η_p^2 = .18 (Sample 3: M = 3.86, SD = 1.26).

To sum up, high reliability was found in a third and clinical sample, and the unidimensional structure and fit of the GPSPS were supported. Moreover, participants who reported diagnosed mental disorders had a lower personal sense of power than others, which provides initial support for the measure's construct validity. Yet, we had not asked for mental disorders in Study 1, which allows for the possibility that some

of the Sample 1 participants might also suffer from a disorder. Furthermore, hospitalized patients with major mental health issues were not included in our clinical sample. Consequently, the differences between the clinical and nonclinical populations may in fact be even larger.

2.5 Study 4

The aim of Study 4 was to test a state version of the GPSPS. So far, the instructions for the PSPS have been trait-oriented. By contrast, in experimental designs concerning power, researchers have typically used individual items to measure experienced power. Yet, a validated scale to measure the state experience of power is helpful as it provides the opportunity of parallel measurement of state and trait power and increasing measurement accuracy. We used a simple method to transform the GPSPS into a state version: We used instructions that are often used for state measures. To test the validity of the instructions and the state GPSPS, we used an often-employed intervention in power research: autobiographical recall (e.g., Galinsky et al., 2003). Participants were assigned to a high- or a low-power group only because we were interested in the sensitivity of the scale. The instructions for state sense of power read: "Please tick the option that applies most to you at the moment."

2.5.1 Method

As stated in the preregistration (https://aspredicted.org/blind.php?x=8n4hp5), 200 participants were recruited from a distance-learning university. They were offered course credit for completing the experiment. Participants were instructed to remember an incident in which they had power over another person (high-power condition) or when someone else had power over them (low-power condition). The dependent variable was the GPSPS (α = .89, ω = .89). Twenty-five individuals did not complete the power scale and/or the memory task. The final sample comprised 175 participants (22% men, 78% women; M_{age} = 32.88, SD_{age} = 10.15, 19 to 60) with 89 people in the high-power and 86 in the low-power group. Participants' memories in the recall task were rated on three categories (strong memory, weak memory, missing the point): Two

independent raters assessed a subset (10%) of the memories. After establishing good interrater agreement using a quadratic weighted kappa (κ_w = .71), the remaining memories were assessed by one rater.

2.5.2 Results and Discussion

An independent-samples *t* test with all participants showed a significant difference between the high-power (*M* = 5.04, *SD* = 0.99) and low-power groups (*M* = 4.67, *SD* = 1.19), $t(173) = 2.23$, $p = .014$, $d = 0.34$. When we removed participants whose narratives had been rated as "missing the point," the effect became larger (high power: *M* = 5.09, *SD* = 0.95; low power: *M* = 4.63, *SD* = 1.18), $t(155) = 2.67$, $p = .004$, $d = 0.43$. Thus, the GPSPS can be used as a state measure to assess fluctuations in people's sense of power. Such an assessment may be relevant in experimental settings or in evaluations of training, coaching, or therapy. Further, interactions of trait power with state power may be investigated in future research.

2.6 Study 5

In a final study, we wanted to further establish the validity of the state version of the GPSPS by using a different sample, a different setting (lab instead of online), and a different power manipulation. We used the same instructions as in Study 4.

2.6.1 Method

The sample comprised 120 participants who were recruited at a university in southern Germany (81% women, 19% men; M_{age} = 22.56, SD_{age} = 5.86, 17 to 62). The students were offered course credit for completing the experiment. The power manipulation was developed in our laboratory and adapted for university students: Participants in the high-power condition were asked to imagine they lived in a large apartment and were receiving applications from potential flatmates. They had the option of choosing from among eight different applicants and were asked to figure out what they would say to applicants when interviewing them. In the low-power group, participants imagined that they had applied for a room in an apartment. They were told that they had only received a single invitation and had had a brief interview conducted in a cold manner

for an unattractive room. The dependent variable was the GPSPS (α = .86, ω = .87). There were three control items about identifying with one's role in the scenario, one's motivation to work on the task, and empathizing with one's role in the scenario. Answers were given on a 7-point scale. In accordance with the preregistration, participants with a mean below 4 on the control items were excluded (https://aspredicted.org/blind.php?x=88gj7j).

2.6.2 Results and Discussion

First, missing values were replaced. Little's MCAR test was not significant, $\chi^2(7)$ = 1.529, p = .981, which suggested that the data were missing completely at random. One missing value was replaced with the expectation-maximization method.

Then, one-tailed independent-samples t tests were calculated. Results showed a significant difference between the high-power (M = 5.35, SD = 0.78) and low-power groups (M = 5.00, SD = 1.02), $t(118)$ = 2.14, p = .017, d = 0.39. When we excluded participants who had a mean below 4 on the control items, the effect increased (high power: M = 5.37, SD = 0.70; low power: M = 4.97, SD = 1.04), $t(102)$ = 2.33, p = .011, d = 0.45. The results suggest that the state version of the GPSPS was sensitive to an experimental power manipulation.

2.7 General Discussion

In the present studies, we analyzed the psychometric properties of the trait and state versions of the German Personal Sense of Power Scale (Anderson et al., 2012) by using five independent samples and three different instructions for the scale. With respect to the factor structure, CFAs supported a unidimensional model with six items across three studies. The two excluded items may have had different connotations for Germans compared with English-speaking participants. Corrected item-total correlations and factor loadings were high. Reliability coefficients were satisfactory in all samples, and high stability was found for the trait version of the GPSPS across three measurement occasions. The GPSPS showed strict measurement invariance across gender. With respect to nomological validity, the GPSPS was correlated with a variety

of other psychological constructs in the expected direction and was thus comparable to the original scale. Personal sense of power had the strongest associations with dominance, neuroticism (negative), self-esteem, and authentic pride in the present research.

Criterion validity was established: Personal power was positively but not strongly associated with socioeconomic status. Supporting construct validity, as expected, a clinical sample scored lower on personal sense of power than the broad sample from Study 1. Furthermore, we tested a state version to assess fluctuations in personal sense of power. In two final studies, the state version of the GPSPS was sensitive to experimental power manipulations, but the effect sizes were rather small. Additional research will be needed to further establish the GPSPS as an adequate measure of state power. Future studies should also assess individuals' trait power and use that measure as a covariate in a subsequent experiment to better distinguish between trait and state variance.

There were no gender differences in generalized sense of power (see Study 1), which is surprising as power is still not distributed equally between men and women in Germany (Lang & Gross, 2020). However, the assimilation of gender roles as well as increased agentic traits in women have recently been observed (Athenstaedt & Alfermann, 2011; Schwartz & Gonalons-Pons, 2016). Moreover, the generalized sense of power is an overall assessment. There is still a need to check for whether domains in which people feel powerful differ between the sexes. For example, men may report higher personal sense of power in job-related contexts, but women might still feel more powerful in family matters (Beach & Tesser, 1993). Assessing sense of power in different domains and testing the moderating role of sex could be a topic of future studies.

What are the theoretical implications? As the correlations in the nomological network were in the hypothesized directions for positive and negative emotions, behavioral activation, behavioral inhibition, construal style, and social distance, this provided correlational evidence in support of the approach inhibition theory of power

(Keltner et al., 2003) as well as the social distance theory of power (Magee & Smith, 2013). Yet, the correlation coefficients were stronger for predictions that were based on the former theory. No associations were found between personal sense of power and agreeableness or rivalry. The latter finding corresponds to the small positive correlation with hubristic pride and supports the notion that the experience of power might not be associated with antisocial attitudes but rather with high self-regard—reasoning that is in line with the high positive correlations with self-esteem, authentic pride, and narcissism. Overall, these associations are in line with theoretical assumptions and empirical findings from past power literature (Anderson & Cowan, 2014, Anderson et al., 2012).

Is personal sense of power a cause or a consequence? Concerning the association between the GPSPS and socioeconomic status, both directions seem possible. Sociostructural power characteristics may have an impact on personal sense of power, but personal sense of power may also lead to high socioeconomic status. Future research should address this question in experimental and longitudinal studies. Other avenues for future research may include testing associations between personal sense of power and gender-role self-concepts or agency versus communion and addressing the question of how experienced power varies in certain situations.

The findings in the clinical sample support the notion that personal sense of power varies with individuals' personal background. Patients with mental disorders may also benefit from interventions to increase their personal sense of power because a higher self-perceived ability to influence others and decision-making ability in interpersonal relationships are associated with desirable traits (e.g., consider the strong association between personal sense of power and emotional stability).

The project provided evidence for the unidimensionality of the scale in three independent samples. Moreover, the statistical analyses (corrected item-total correlations, reliability with different internal consistency coefficients, multigroup CFA) go beyond the analyses by Anderson et al. (2012). We used clinical, student, and community samples. Moreover, we provided evidence for the suitability of the state

version of the scale. Researchers could use this scale as a manipulation check in experimental studies on power. This would be particularly promising for increasing objectivity over various power studies as researchers can directly compare their effect sizes with those of others. Such an approach would also increase the significance of statistical models with personal sense of power as a mediator or outcome as the scale has demonstrated high reliability, and analyses would have a stronger basis.

Limitations pertain to the data sources because we used only self-reported data across the studies. Indeed, personal sense of power is a subjective assessment, but nevertheless, it would be interesting to assess self-other agreement for experienced and perceived power by using peer-report data. Another limitation is the unequal gender distribution in Studies 1, 3, 4, and 5. Women were overrepresented, which may have influenced the results of certain analyses (e.g., measurement invariance). Future research should thus aim to test the scale in samples in which men and women are represented equally. Further, it would be promising to test the scale in other interpersonal relationships (e.g., supervisor-employee) with adapted instructions. Finally, cross-cultural comparisons would be exceedingly valuable for testing whether personal sense of power is lower or higher in certain cultures than in others and whether measurement invariance holds across cultures. Dovetailing with this issue, it is possible that a high personal sense of power in individuals from collectivistic cultures violates norms of modesty and humility and that a different pattern of correlations will thereby emerge (Morling et al., 2002). For example, there might not be a negative association between personal sense of power and negative emotions, and instead, there may be no clear correlation as the relation may be ambiguous.

All in all, the results of the present studies provide converging evidence for the good psychometric properties of the GPSPS. We encourage researchers to use this scale as a reliable and valid instrument for assessing trait power and state power.

2.8 References

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Chapter 3

Power in Romantic Relationships: How Positional and Experienced Power are Associated With Relationship Quality

Reference

Körner, R., & Schütz, A. (2021). Power in romantic relationships: How positional and experienced power are associated with relationship quality. *Journal of Social and Personal Relationships, 38*(9) 2653–2677.

Abstract

Power dynamics have been described as being constitutive of romantic relationships and can impact outcomes such as relationship quality. Yet, in relationships nowadays, power may be less important than in the past due to changes in gender roles and society's expectations. We analyzed four power characteristics and their effects on a multidimensional measure of relationship quality using an actor-partner interdependence model framework with 181 heterosexual couples. There was usually a balance of power in the couples with respect to a personal sense of power but an imbalance in positional power. We found actor and partner effects: Personal sense of power and satisfaction with power predicted actors' and partners' relationship quality. By contrast, positional power, the general power motive, and the balance of power were not associated with relationship quality. There were hardly any differences in actor or partner effects between men and women. Apparently, it is not objective, positional power but subjective, experienced power that is relevant to overall relationship quality. Furthermore, what matters most for satisfaction with the relationship is not the balance of power but rather the perceived personal level of power. Future research may extend these findings by using domain-specific power measures and behavioral power indicators.

Keywords: personal sense of power, positional power, relationship quality, balance of power, actor-partner interdependence model

3.1 Theoretical Background

3.1.1 Introduction

Power is a social construct that is pervasive in everyday interactions and relationships. There is a long tradition in social and personality science of analyzing differences in the level of power between romantic partners and the consequences of having or lacking power for variables such as relationship satisfaction (Blood & Wolfe, 1960; Rodman, 1967; Safilios-Rothschild, 1976). The question that is often asked is "Who's on top?" (Felmlee, 1994).

Only a few researchers have found a balance of power in couples (Neff & Suizzo, 2006). Instead, many researchers have found that in most couples, men have more power and more influence over decisions than women do (Bruhin, 2003; Felmlee, 1994; Gillespie, 1971; Sprecher, & Felmlee, 1997). This observation is in line with traditional gender roles and societal factors that foster the tradition of women supporting their partners and primarily being responsible for family work.

However, traditional roles have changed, particularly in western societies. Gender roles have adapted in such a way that there is now more equality in romantic relationships (Athenstaedt & Alfermann, 2011; Schwartz & Gonalons-Pons, 2016). In the present study, we used a heterogeneous sample to explore power and relationship quality in contemporary couples because actual and perceived power have been found to impact various aspects of relationships such as satisfaction and commitment (Kim et al., 2019). To extend previous research, we aim to provide information on the relations between men's and women's power and their own and their partners' perceived relationship quality (RQ) by analyzing the dyadic effects of four different power characteristics on a multitude of RQ dimensions by using reliable and validated scales. A better understanding of the relevance of power in relationships will support researchers' ability to make up-to-date inferences about the functioning of intimate relationships.

3.1.2 Positional and Experienced Power in Romantic Relationships

Power in social psychology is typically understood as control over resources (Keltner et al., 2003). This idea is in line with earlier accounts such as resources theory (Blood & Wolfe, 1960; Safilios-Rothschild, 1976), which assumes that the resources an individual has are central to the individual's ability to change the behavior of a relationship partner. In these accounts, the concept of resources is broadly formulated and encompasses socioeconomic (e.g., money, prestige), affective, societal, and other kinds of resources. An index of objective power can, for example, emanate from socioeconomic resources, such as income, occupational status, and educational attainment (Conger et al., 2010; Greaves et al., 1995; Harvey et al., 2002; Pahl, 1995; Strickhouser & Sutin, 2020). In the literature on marital power, the capacity to influence one's partner on the basis of socioeconomic resources is usually termed positional power (Fox & Blanton, 1994).

Even though positional power may be important in romantic relationships (Schwartz & Gonalons-Pons, 2016), experienced power may be at least as important in a relationship. Many researchers have used self-reports to measure the experience of power and conceptualized it as subjective decision-making ability within the intimate relationship (Beach & Tesser, 1993; Gray-Little & Burks, 1983). For example, Felmlee (1994) asked, "In your relationship, who makes more of the decisions about what the two of you do together?" However, one drawback of this early literature is the use of different and unvalidated measures (Gray-Little & Burks, 1983).

An influential concept was recently suggested, the *personal sense of power* (Anderson et al., 2012), along with a validated scale. Personal sense of power is defined as a "psychological state—a perception of one's capacity to influence others" (p. 314; Anderson et al., 2012). Other definitions concerning subjective power in romantic relationships also emphasize the ability to influence others as a characteristic of power. For example, Simpson et al. (2015) define power as "the ability or capacity to change a partner's thoughts, feelings, and/or behavior so they align with one's own desired

preferences, along with the ability or capacity to resist influence attempts imposed by the partner" (p. 409).

Given that the common ground of theories on power is the understanding that power is a form of control or influence (over the partner; Kim et al., 2019), the personal sense of power seems to be an appropriate and broad theoretical basis to assess experienced power in intimate relationships.[5] Moreover, personal sense of power can be based on but can also be independent of socioeconomic resources (Anderson et al., 2012; Körner et al., 2021). Actually, research shows that people with high positional power can have low perceived power, and vice versa. Moreover, perceived power has a stronger impact on behavior than positional power does (Bugental & Lewis, 1999; Fast & Chen, 2009). In line with this, in dyadic power theory (Dunbar et al., 2016), the perception that an individual has resources and authority is seen as more relevant than the actual levels of these characteristics. Thus, it is important to distinguish between resources that impact positional power in a relationship and the self-reported perception of influence that one partner has over the other partner.

Personal sense of power and other conceptualizations of power are typically referenced in a social context. This means that one's own level of power can have an impact on others' outcomes. In this vein, prominent theories and models, such as the interdependence theory (Kelley et al., 2003; Kelley & Thibaut, 1978), dyadic power theory (Dunbar et al., 2016; Rollins & Bahr, 1976), or the dyadic power social-influence model (Simpson et al., 2015), emphasize the social nature of power in intimate relationships and hold that an individual's power in a relationship affects the outcomes of both partners. Still, previous research has mostly studied the relevance of an individual's perceptions of power in the relationship for his or her own relationship satisfaction but has neglected the impact that a partner's perceptions may have on the individual. A more complete approach for understanding the impact of power in

[5] We considered a general and broad construct for assessing power to be adequate because, in past research, a power measure consisting of several domains was not a stronger predictor of actual behavior than an overall power measure (Farrell et al., 2015).

relationships can be provided by asking both partners about their perceptions and using statistical techniques that account for interdependence within the couples (Kenny et al., 2006).

3.1.3 The Impact of Power on Relationships

Previous research has observed the consequences of having or lacking power and a(n) (im)balance of power in romantic relationships with regard to relationship duration and quality, commitment, trust, sexual desire, and other variables (Bruhin, 2003; Felmlee, 1993; Kim et al., 2019; Lennon et al., 2013; Zverling, 2019). For example, a high income (as an indicator of positional power) was found to be associated with a lower commitment to marriage. Moreover, the partner with the higher income was typically found to attribute the partner's generous acts to instrumental motivation (Inesi et al., 2012) and to suspect that the partner had ulterior motives or was trying to make nice.

In self-report studies, women have typically reported higher investment and emotional involvement in the relationship than men (Felmlee, 1994; Sacher & Fine, 1996). Power over the partner is typically associated with less interest in the relationship and is more often found in men than in women (Sprecher et al., 2006). Low commitment, in turn, was found to have a negative impact on the relationship by lowering trust (Wieselquist et al., 1999). On the other hand, experiencing high power in a relationship led to increased authenticity (Neff & Suizzo, 2006) and subjective well-being (Kifer et al., 2013)—and experiencing low power led to a reduced tendency to address problems and to behavioral inhibition (Keltner et al., 2003; Rusbult et al., 1991). Finally, reports of a balance of power were associated with emotional well-being, relationship satisfaction, and higher sexual desire (Aida & Falbo, 1991; Brezsnyak & Whisman, 2004; Drigotas et al., 1999). Overall, the literature on power in intimate relationships has suggested that similar levels of power between partners but also high levels of experienced power may be beneficial.

The highest RQ has been reported by couples with a balance of power (Gray-Little & Burks, 1983; Conroy et al., 2016). RQ is a multidimensional construct consisting of facets such as fascination, engagement, sexuality, the long-term potential of the

relationship, trust, and constraints (Hassebrauck & Fehr, 2002; Siffert & Bodenmann, 2010). It is understood as the subjective evaluation of several dimensions of the relationship and has important implications for relationship commitment and health (Hassebrauck & Fehr, 2002; Robles et al., 2014).

Previous research has studied how the perception of power in relationships affects people's relationship quality (actor effects; e.g., Sprecher et al., 2006). However, it is less clear how people are affected by their partners' perceptions (partner effects). Analyzing only individual views does not account for the interdependence of partners in intimate relationships. In fact, test statistics become inaccurate when the assumption of nonindependence is violated (Cook & Kenny, 2005). Thus, in analyzing psychological processes in romantic couples, the interpersonal nature of these phenomena needs to be considered, and the fact that the data from the individuals are nested within the couple must be taken into account.

3.1.4 The Present Study

With the present research, we aimed to extend previous research by using appropriate statistical techniques to investigate the relations between a variety of power measures on multidimensional RQ within couples. By considering the dyadic nature of the data and analyzing partner effects in addition to actor effects on the link between power and RQ in western societies, we may be able to provide new insights into the functioning of contemporary romantic couples. To this end, we used actor-partner interdependence models (APIMs; Kenny et al., 2006).

We tested for differences in partners' power levels (Research Question 1) and for associations between power characteristics and RQ (Research Question 2). In doing so, we distinguished between subjective and objective power. As much research on power and RQ is either outdated (Gray-Little & Burks, 1983) or was investigated in developing and threshold countries (Conroy et al., 2016), whether experienced and positional power still have impacts on romantic relationships in western, industrialized countries are open questions. Further, the present study is the first to distinguish between different aspects of power (personal sense of power, positional

power, satisfaction with power, power motive) and between different aspects of relationship quality (six dimensions of RQ) and thus provides a fine-grained account of the associations between these variables. In doing so, we were able to test the moderating role of sex in an exploratory fashion.

With respect to *Research Question 1*, we expected to find relatively equal levels of both experienced and positional power due to increasing levels of equality between men and women in western societies (Athenstaedt & Alfermann, 2011; Schwartz & Gonalons-Pons, 2016).

For *Research Question 2*, specific predictions were made regarding the distinct power measures: First, we expected *personal sense of power* to most strongly influence RQ. As higher experienced power leads to positive emotions, optimism, and well-being in general as well as in romantic relationships (Anderson & Galinsky, 2006; Kifer et al., 2013; Keltner et al., 2003), a positive association between an actor's sense of power and his/her RQ was expected. Regarding the effect of the actor's sense of power on the partner's RQ, a negative association was expected as more decisions made by the actor could constrain the partner.

Second, as an objective measure of power, we measured *positional power* by comparing the participant's financial situation with the partner and including occupational/educational prestige. Previous research found that positional power was linked to lower satisfaction and commitment in relationships in the individual (Inesi et al., 2012; Vogler et al., 2008)—however, satisfaction and happiness with the relationship were found to be higher in couples with a high overall level of socioeconomic status (Conger et al., 2010). Thus, both positive and negative effects of positional power on the actor and the partner seem possible, and thus, no specific predictions were made.

Third, as people may have low personal or positional power but may be happy not making many decisions and having little responsibility, *satisfaction with power* was also assessed. It seems likely that partners who are satisfied with their level of power in the relationship would also be satisfied with their relationship overall (Ronfeldt et

al., 1998). Thus, we expected positive associations between satisfaction with power and RQ and its dimensions. This positive effect may also transfer to the partner, and thus, a positive association between the actor's satisfaction with power and the partner's RQ was also expected.

Finally, we measured the general (not relationship-specific) *power motive*. Pursuing power may have different effects than having power (Kim et al., 2019). In past research, men's need for power was linked with low relationship satisfaction (Stewart & Rubin, 1976) and aggressive sexual behavior (Zurbriggen, 2000). We expected both negative actor and partner effects of the power motive on RQ, especially in men. For example, a partner might report lower RQ due to a suppressive, coercive, and authoritarian actor, but the actor might also report lower RQ because the partner might not easily concede and might not behave according to the actor's desires.

Furthermore, to understand effects on the level of the couple, we tested for associations between the *balance of power* and RQ. Past research has provided evidence of positive relations between the balance of power and commitment, well-being, and relationship satisfaction (Aida & Falbo, 1991; Drigotas et al., 1999; Le & Agnew, 2001) but has not tested this link with different aspects of power measures. Actor and partner effects have also not been distinguished for RQ dimensions. We addressed these concerns within an APIM framework to contribute to the understanding of the complex nature of power in relationships.

3.2 Method

3.2.1 Participants

We aimed to collect data from at least 80 to 100 couples in accordance with the sample size recommendations for APIM analyses (Ledermann & Kenny, 2017). We were able to recruit 181 romantic heterosexual couples (men: M_{age} = 31.04, SD_{age} = 12.38, Range: 19 to 73; women: M_{age} = 29.19, SD_{age} = 12.55, Range: 18 to 72). A total of 41 couples were married (22.7%), 7 engaged (3.6%), and 133 not married (73.8%). The average relationship duration was 7.78 years (SD = 10.30, Range: 1 month to nearly 52 years). Most individuals were in their second or third romantic relationship (M = 2.63, SD =

2.00, Range: 1 to 15). A post hoc power analysis indicated that we were able to detect effects of $\beta_{Actor/Partner}$ = .20/.15 with a power of .98/.84 (α = .05, correlations of errors and of actor and partner variables = .30; Ackerman et al., 2020).

3.2.2 Procedure

Couples were recruited via a snowball procedure in Germany. They were addressed in person and then received a link to an online survey tool. Participation was voluntary without incentive. Participation was possible for individuals who were at least 18 years old and had been in a romantic heterosexual relationship for at least 1 month. An individual code was generated so that data could be matched between the respondent and the partner. First, participants provided demographic data on their age, biological sex, education, and profession. The relationship variables were collected with questionnaires about power and RQ. The survey took approximately 10 min to complete.

3.2.3 Measures

3.2.3.1 Power Measures

Subjective power in the relationship was measured with the German-language version of the *Personal Sense of Power Scale* (Anderson et al., 2012; Körner et al., 2021). The scale captures beliefs about the possibility of influencing others' with six items (e.g., "My ideas and opinions are often ignored"). Reponses were given on a scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The instructions read: "In my relationship with my partner…." Cronbach's alpha coefficients were between .76 and .90 in the original publication and similar in the present study (see all alphas in Table 6).

Satisfaction with power was measured with a single item: "How satisfied are you with the extent to which you influence decisions in your relationship?" Participants responded on a scale ranging from 1 (*very dissatisfied*) to 7 (*very satisfied*).[6]

[6] To test whether the measure of satisfaction with power in the relationship (satis power) differs enough from the items on the RQQ to be considered a distinct measure, we computed an exploratory factor analysis that included all the RQQ items plus the satis power item with Maximum Likelihood estimation and a Promax rotation. Six factors were extracted. The communality of the satis power item (h^2 = .29) was much lower than the communalities of the RQQ items (mean h^2 = .64, .44 ≤ h^2 ≤ .87). Thus,

Positional power was calculated as an index of a person's educational/occupational qualification and financial situation. Educational/occupational qualification was measured with nine response options pertaining to the German educational system. Reponses were given on a scale ranging from 1 (*no academic/vocational qualification*) to 9 (*university-entrance diploma and master's degree/diploma/PhD*). Financial situation was measured on a scale ranging from 1 (*I earn significantly less than my partner*) to 5 (*I earn significantly more than my partner*). We performed a linear transformation of the 5-point scale that measures financial situation to obtain a 9-point response scale. Then, we computed the mean of the two items (educational/occupational qualification and financial situation) to create our index of positional power.

The short version of the *Unified Motive Scales* (Schönbrodt & Gerstenberg, 2012) was used to measure the power motive on a 6-point scale. We only presented the subscale (six items) on the desire to have an impact on others and the drive for status and prestige (e.g., "I like to have the final say"). A Cronbach's alpha coefficient of .80 for the power subscale was reported and was comparable to the coefficients in the present study.

3.2.3.2 Relationship Quality

The *Relationship Quality Questionnaire* (RQQ; Siffert & Bodenmann, 2010) consists of six subscales with a total of 26 items. *Fascination* measures admiration for and attraction to the partner (e.g., "I admire many things about my partner"). Commitment and investment in the relationship is captured by *Engagement* (e.g., "I invest in our relationship"). The *Sexuality* subscale addresses sexual fulfillment in the relationship (e.g., "I enjoy sex with my partner"). The duration and potential of the relationship is captured by the *Future* subscale (e.g., "I think that our relationship has a future"). *Mistrust* (e.g., "Sometimes I distrust my partner") measures a lack of trust toward the partner. The experience of restrictions is captured by *Constraint* (e.g., "I feel restricted

variance in the satis power item was not explained very well by the various factors that were composed of the RQQ items. Further, the satis power item did not have high loadings (standardized factor coefficients < .30) nor did it load on one specific RQQ factor, thus suggesting that the item is distinct from RQ (see Table 1 for the communalities and Table 2 for the pattern matrix at https://osf.io/txyb9/).

and confined by our partnership"). Answers were given on a scale ranging from 1 (*disagree*) to 5 (*strongly agree*). The authors reported Cronbach's alpha values that ranged from .75 to .94 for the subscales and a value of .78 for the global score. In the present study, the Cronbach's alpha values were similar (see Table 6).

3.2.4 Analytic Strategy

First, paired-samples *t* tests and Pearson correlations were calculated to test for mean differences and partner similarities in the measured variables. Then, APIMs (Kenny et al., 2006) were computed to detect associations between the power measures and RQ.[7] The APIM accounts for the interdependence of predictor and outcome variables for the respondents and their partners. Actor effects are intrapersonal and describe associations between the predictor and outcome for the respondent. Partner effects are interpersonal and describe associations between the respondent's predictor and the partners' outcome (Kenny et al., 2006). Because of the dyadic nature of the data, the couple was the unit of analysis. Analyses were implemented in Mplus 7 (Muthén & Muthén, 1998–2012) using Maximum Likelihood estimation for the SEM framework. Bootstrapped 99% Confidence Intervals (k = 5,000 samples) were reported. The total score of the RQQ was modeled as a latent trait with the six subscales as indicators. Within the APIM analyses, we tested a saturated model (all effects freely estimated) against a nested equal-actor-equal-partner-effects model. The equal-effects model indicated the absence of sex effects and was favored when the Likelihood Ratio Test was nonsignificant ($p < .20$; Kenny & Ledermann, 2010; see OSF). When the saturated model was favored but the *b* coefficients were still very similar for men and women (difference < .10), we tested an equal-actor-different-partner-effects model and/or a different-actor-equal-partner-effects models against the saturated model. For the *b* coefficients, we chose a conservative criterion for statistical significance due to the

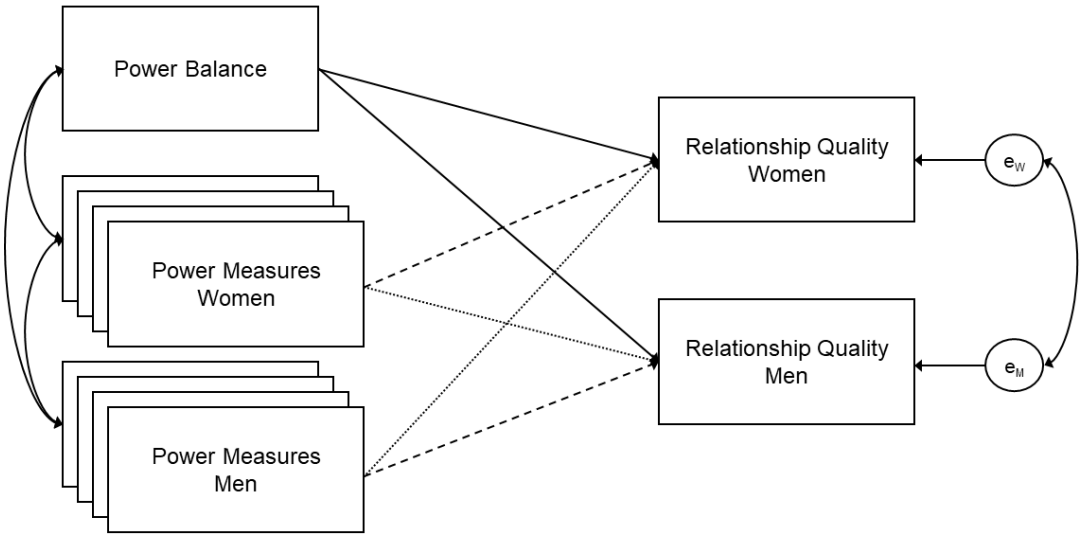
[7] We checked whether relationship status (dating vs. married/engaged) moderated the association between power and total RQ. Using Model 1 in PROCESS Version 3.3, no interaction terms were significant (personal sense of power: $p = .72$; satisfaction with power: $p = .83$; positional power: $p = .48$; power motive: $p = .60$). Thus, in our study, relationship status did not affect how power was associated with RQ.

multiple tests ($p < .005$, two-tailed). For the effect size, we calculated coefficient Δ following the procedure by Brauer and Proyer (2018; see also Proyer et al., 2019). Δ describes the change in the outcome (RQ) in standard deviations when the predictor (power measure) changes by 1 point. The coefficient was calculated separately for men and women ($\Delta_{F/M} = b/SD_{F/M}$) because they had different variances on the outcomes.

Moreover, we tested for the influence of power balance (called similarity in the following) on RQ with the previously described APIM procedure for the total RQ score as the outcome (see Figure 2). We controlled for actor and partner effects on the respective power measure to obtain the unique contribution of similarity. Four new variables were computed in two steps. They represent power balances with respect to sense of power, satisfaction with power, positional power, and the power motive. First, we computed the absolute difference score for each power measure within the couple as is common practice in dissimilarity research (e.g., Brauer & Proyer, 2018; Chopik & Lucas, 2019; Dyrenforth et al., 2010). Then, in line with previous similarity research (e.g., Furler et al., 2013), we multiplied the absolute difference variables by –1. Thus, the new variables represent similarity instead of dissimilarity. Thus, higher *b* coefficients indicate that a balance of power (higher similarity) is related to higher RQ. For example, if people reported that they experienced higher power (e.g., a "7" on a response scale) than their partners (e.g., "3"), a large absolute difference score would result ("4"). Partners in other couples may report experiencing equal levels of power, and in such a case, the absolute difference would be zero. When the signs of these scores are reversed ("4" → "–4"; "0" → "0"), higher *b* coefficients in the APIM indicate higher RQ through the balance of power. As the cutoff for statistical significance, we chose $p < .05$ (two-tailed). All data and codes are on the OSF (https://osf.io/txyb9/).

Figure 2

Model Specification for the APIM Estimating the Effect of a Balance of Power on RQ, Controlling for the Respective Power Measure of Both Partners



Note. Continuous arrows = effects of a balance of power. Dashed arrows = actor effects. Dotted arrows = partner effects.

3.3 Results

Research Question 1: Are Contemporary Romantic Relationships Characterized by a Balance of Power?

Descriptive statistics for all study variables are displayed in Table 6. Correlations between variables within and between partners can be found at https://osf.io/txyb9/. Men's and women's personal sense of power, $r(180) = .32$, as well as their satisfaction with power in the relationship, $r(175) = .25$, were positively correlated. Also, the power motive was slightly positively correlated within couples, $r(180) = .16$. Positional power was strongly negatively associated within couples, $r(180) = -.54$. Regarding partner differences, men reported a higher power motive ($d = 0.53$) and more positional power ($d = 0.85$) than women. No sex differences were found for experienced power ($d = -0.07$) and satisfaction with power ($d = -0.08$). Thus, the present sample was characterized by an imbalance of power regarding positional power with men having higher values but a balance of power regarding personal sense of power.

Table 6

Descriptive Statistics (Means, Standard Deviations), Cronbach's Alphas, Partner Similarity (Pearson Correlations), and Partner Differences (Paired-Samples t Tests with Cohen's d) for the Power Measures and Relationship Quality

		Women			Men						
Variable	Range	*M*	*SD*	α	*M*	*SD*	α	*r*	*t*	*df*	*d*
PSPS	1-7	5.65	0.87	.79	5.59	0.76	.72	.32***	-0.88	180	-0.07
Pos power	1-9	4.94	1.74	-	6.48	1.90	-	-.54***	6.45***	180	0.85
Satis power	1-7	6.10	1.24	-	5.99	1.37	-	.25**	-1.04	175	-0.08
Power motive	1-6	3.21	0.88	.82	3.70	0.98	.86	.16*	5.42***	180	0.53
RQQ	1-5	3.51	0.38	.79	3.54	0.29	.67	.30***	1.09	179	0.09
Fascination	1-5	4.25	0.77	.88	4.46	0.62	.80	.21**	3.19**	179	0.30
Engagement	1-5	4.40	0.76	.91	4.41	0.56	.80	.16*	0.26	179	0.02
Sexuality	1-5	4.09	0.95	.90	4.04	0.94	.88	.31***	-0.56	179	-0.05
Future	1-5	4.56	0.82	.93	4.64	0.57	.85	.40***	1.45	179	0.11
Mistrust	1-5	1.60	0.91	.81	1.51	0.77	.75	.12	-1.11	179	-0.11
Constraint	1-5	1.71	0.76	.88	1.75	0.69	.87	.06	0.61	179	0.06

Note. PSPS = Personal Sense of Power Scale. Pos Power = Positional Power. Satis Power = Satisfaction with one's Power in the Relationship. RQQ = Relationship Quality Questionnaire. $N \leq 181$ couples.

* $p < .05$. ** $p < .01$. *** $p < .001$ (two-tailed).

Table 7

Results (Unstandardized Regression Coefficients, Bootstrapped 99% Confidence Intervals, Standard Errors, p*-Values for Two-Tailed Wald Tests, Effect Sizes) of APIM Analyses Predicting Relationship Satisfaction from Personal Sense of Power*

	Actor					Partner				
Variable	$b_{F/M}$	99% CI	*SE*	*p*	$\lvert\Delta_{F/M}\rvert$	$b_{F/M}$	99% CI	*SE*	*p*	$\lvert\Delta_{F/M}\rvert$
Fascination	**0.27**	[0.15, 0.40]	0.05	<.001	0.56/0.35	0.10/ **0.26**	[-0.03, 0.24]/ [0.12, 0.41]	0.05/ 0.06	.055/ <.001	0.13/0.42
Engagement	**0.18**	[0.06, 0.30]	0.05	<.001	0.24/0.32	**0.18**	[0.07, 0.30]	0.04	<.001	0.24/0.32
Sexuality	**0.35**	[0.16, 0.53]	0.07	<.001	0.37/0.37	0.10	[-0.07, 0.26]	0.06	.126	0.11/0.11
Future	**0.24**	[0.13, 0.36]	0.05	<.001	0.29/0.42	**0.12**	[0.02, 0.23]	0.04	.002	0.16/0.21
Mistrust	**-0.33**	[-0.49, -0.18]	0.06	<.001	0.36/0.43	-0.07	[-0.20, 0.06]	0.05	.140	0.08/0.09
Constraint	-0.20/ **-0.37**	[-0.42, 0.00]/ [-0.52, -0.21]	0.08/ 0.06	.013/ <.001	0.26/0.54	0.02/ -0.11	[-0.15, 0.16]/ [-0.31, 0.09]	0.06/ 0.08	.689/ .135	0.03/0.16
Total RQQ	**0.27**	[0.16, 0.39]	0.04	<.001	0.71/0.93	0.09/ **0.21**	[0.00, 0.19]/ [0.08/0.35]	0.04/ 0.05	.012/ <.001	0.24/0.72

Note. F = female, M = male.

Table 8

Results (Unstandardized Regression Coefficients, Bootstrapped 99% Confidence Intervals, Standard Errors, p*-Values for Two-Tailed Wald Tests, Effect Sizes) of APIM Analyses Predicting Relationship Satisfaction from Positional Power*

	Actor					Partner				
Variable	$b_{F/M}$	99% CI	*SE*	*p*	$\lvert\Delta_{F/M}\rvert$	$b_{F/M}$	99% CI	*SE*	*p*	$\lvert\Delta_{F/M}\rvert$
Fascination	0.09/ 0.00	[-0.01, 0.20]/ [-0.08, 0.09]	0.04/ 0.03	.026/ .974	0.12/0.00	-0.01/ 0.07	[-0.10, 0.08]/ [-0.02, 0.16]	0.04/ 0.04	.844/ .053	-0.01/0.11
Engagement	0.01	[-0.05, 0.07]	0.02	.669	0.01/0.02	0.00	[-0.06, 0.06]	0.02	.924	0.00/0.00
Sexuality	0.01	[-0.08, 0.12]	0.04	.715	0.01/0.01	0.00	[-0.10, 0.11]	0.04	.956	0.00/0.00
Future	0.03	[-0.03, 0.09]	0.02	.233	0.04/0.05	0.02	[-0.04, 0.08]	0.02	.392	0.02/0.04
Mistrust	-0.01	[-0.08, 0.07]	0.03	.872	0.01/0.01	-0.05	[-0.13, 0.03]	0.03	.115	0.05/0.06
Constraint	-0.06	[-0.12, 0.01]	0.03	.025	0.08/0.09	-0.01	[-0.07, 0.05]	0.02	.656	0.01/0.01
Total RQQ	0.02	[-0.03, 0.08]	0.02	.284	0.05/0.07	0.01	[-0.04, 0.07]	0.02	.682	0.03/0.03

Note. F = female, M = male.

Table 9

Results (Unstandardized Regression Coefficients, Bootstrapped 99% Confidence Intervals, Standard Errors, p*-Values for Two-Tailed Wald Tests, Effect Sizes) of APIM Analyses Predicting Relationship Satisfaction from Satisfaction with Power in the Relationship*

	Actor					Partner				
Variable	$b_{F/M}$	99% CI	*SE*	*p*	$\lvert\Delta_{F/M}\rvert$	$b_{F/M}$	99% CI	*SE*	*p*	$\lvert\Delta_{F/M}\rvert$
Fascination	**0.15**	[0.06, 0.25]	0.04	<.001	0.19/0.24	0.06	[-0.01, 0.14]	0.03	.035	0.08/0.10
Engagement	0.09	[0.01, 0.17]	0.03	.008	0.12/0.16	**0.10**	[0.02, 0.17]	0.03	.001	0.13/0.18
Sexuality	**0.27**	[0.16, 0.39]	0.05	<.001	0.28/0.29	0.03	[-0.08, 0.12]	0.04	.419	0.03/0.03
Future	**0.12**	[0.05, 0.20]	0.03	<.001	0.15/0.21	0.04	[-0.03, 0.12]	0.03	.118	0.05/0.07
Mistrust	**-0.22**	[-0.32, -0.12]	0.04	<.001	0.24/0.29	-0.04	[-0.13, 0.05]	0.04	.272	0.04/0.05
Constraint	**-0.20**	[-0.29, -0.12]	0.03	<.001	0.26/0.29	-0.04	[-0.12, 0.03]	0.03	.130	0.05/0.06
Total RQQ	**0.16**	[0.08, 0.24]	0.03	<.001	0.42/0.55	**0.06**	[0.01, 0.12]	0.02	.005	0.16/0.21

Note. F = female, M = male.

Table 10

Results (Unstandardized Regression Coefficients, Bootstrapped 99% Confidence Intervals, Standard Errors, p*-Values for Two-Tailed Wald Tests, Effect Sizes) of APIM Analyses Predicting Relationship Satisfaction from the Power Motive*

	Actor					Partner				
Variable	$b_{F/M}$	99% CI	*SE*	*p*	$\lvert\Delta_{F/M}\rvert$	$b_{F/M}$	99% CI	*SE*	*p*	$\lvert\Delta_{F/M}\rvert$
Fascination	0.03	[-0.07, 0.12]	0.04	.496	0.04/0.05	0.05	[-0.05, 0.14]	0.04	.191	0.06/0.08
Engagement	-0.02	[-0.11, 0.07]	0.04	.552	0.03/0.04	-0.01	[-0.10, 0.08]	0.04	.856	0.01/0.02
Sexuality	0.10	[-0.04, 0.24]	0.05	.063	0.11/0.11	**0.23**/ 0.02	[0.03, 0.42]/ [-0.16, 0.18]	0.08/ 0.07	.002/ .821	0.24/0.02
Future	-0.01	[-0.11, 0.08]	0.04	.719	0.01/0.02	-0.02	[-0.11, 0.07]	0.03	.613	0.02/0.04
Mistrust	0.13/ -0.06	[-0.10, 0.33]/ [-0.21, 0.09]	0.08/ 0.06	.120/ .326	0.14/0.08	0.01	[-0.11, 0.12]	0.05	.801	0.01/0.01
Constraint	-0.02	[-0.13, 0.10]	0.04	.674	0.03/0.03	0.04	[-0.07, 0.14]	0.04	.357	0.05/0.06
Total RQQ	0.01	[-0.07, 0.10]	0.03	.682	0.03/.03	0.01	[-0.07, 0.09]	0.03	.732	0.03/0.03

Note. F = female, M = male.

There were positive associations within the couple with respect to total RQ, $r(179) = .30$, and its dimensions, $.06_{Constraint} \leq rs(179) \leq .40_{Future}$. A significant difference was only found for Fascination: Men reported more Fascination with their partner than women did ($d = 0.30$).

Research Question 2: How are Power Characteristics Associated with RQ?

Personal Sense of Power

In line with the hypothesis, for actors, experienced power was significantly and positively associated with all facets of RQ ($0.18 \leq |bs| \leq 0.37$, $0.24 \leq |\Delta_F| \leq 0.56$, $0.32 \leq |\Delta_M| \leq 0.54$) and the total RQ score ($b = 0.27$, $\Delta_F = 0.71$, $\Delta_M = 0.93$). Only the association of women's experienced power and the RQ dimension of Constraint ($b = -0.20$, $p = .013$) was not significant when we applied our conservative criterion of significance. Contrary to our hypothesis, partners' RQ was also positively associated with actors' experienced power for several dimensions (see Table 7). Partner effects that were independent of sex were found for Engagement ($b = 0.18$, $\Delta_F = 0.24$, $\Delta_M = 0.32$) and Future ($b = 0.12$, $\Delta_F = 0.16$, $\Delta_M = 0.21$). Men's experienced power was positively associated with women's Fascination ($b = 0.26$, $\Delta_M = 0.42$). The effect of women's experienced power on men's total RQ was not significant ($b = 0.09$, $p = .012$), but men's experienced power had a positive significant effect on women's total RQ ($b = 0.21$, $\Delta_M = 0.72$).

Positional Power

There were neither significant actor ($|bs| \leq 0.09$, $ps \geq .025$) nor significant partner effects ($|bs| \leq 0.07$, $ps \geq .053$) between positional power and RQ (see Table 8). Only the associations between power and women's Fascination ($b = 0.09$, $\Delta_F = 0.12$) and women's and men's Constraint ($b = -0.06$, $\Delta_F = 0.08$, $\Delta_M = 0.09$) for actors showed small effects but missed the cutoff for significance.

Satisfaction With Power

Consistent with our hypothesis, for actors, associations between satisfaction with power in the relationship and RQ were significant (see Table 9) and in the expected direction for five out of six RQ facets ($0.12 \leq |bs| \leq 0.27$, $0.15 \leq |\Delta_F| \leq 0.28$, $0.21 \leq |\Delta_M| \leq 0.29$) and the total RQ score ($b = 0.16$, $\Delta_F = 0.42$, $\Delta_M = 0.55$). Only for Engagement was

the cutoff for statistical significance not met (b = 0.09, p = .008). As expected, total RQ was positively associated with partners' satisfaction with power (b = 0.06, Δ_F = 0.16, Δ_M = 0.21). There was also a significant positive partner effect for Engagement (b = 0.10, Δ_F = 0.13, Δ_M = 0.18). All other partner effects were not statistically significant ($|bs| \leq 0.06$, $ps \geq .035$).

Power Motive

There was only one unexpectedly positive association between women's power motive and men's scores on Sexuality (b = 0.23, Δ_F = 0.24). Contrary to our hypothesis, no significant actor ($|bs| \leq 0.13$, $ps \geq .063$) or partner effects ($|bs| \leq 0.05$, $ps \geq .191$) were found (see Table 10).

Balance of Power

We tested the influence of a balance of power on the total RQ score (see Table 11). Surprisingly, we found no significant effects of a balance of power on total RQ for either power measure ($0.01 \leq |bs| \leq 0.10$, $0.03 \leq |\Delta_F| \leq 0.26$, $0.03 \leq |\Delta_M| \leq 0.14$).

Table 11

Results (Unstandardized Regression Coefficients, Bootstrapped 99% Confidence Intervals, Standard Errors, p*-Values for Two-Tailed Wald Tests, Effect Sizes) of APIM Analyses Predicting Relationship Satisfaction from Balance of Power*

	Balance of power				
Variable	$b_{F/M}$	99% CI	*SE*	*p*	$\lvert\Delta_{F/M}\rvert$
Personal sense of power					
Total RQQ	0.09/ -0.04	[-0.18, 0.41]/ [-0.19, 0.11]	0.11/ 0.06	.444/ .463	0.24/0.14
Positional power					
Total RQQ	0.01	[-0.04, 0.07]	0.02	.532	0.03/0.03
Satisfaction with power					
Total RQQ	0.07/ -0.02	[-0.08, 0.22]/ [-0.12, 0.09]	0.06/ 0.04	.265/ .571	0.18/0.07
Power motive					
Total RQQ	-0.10/ 0.02	[-0.30, 0.08]/ [-0.13, 0.17]	0.07/ 0.06	.194/ .689	0.26/0.07

Note. F = female, M = male.

3.4 Discussion

In this study, we investigated how partners in romantic heterosexual relationships perceive their power in the relationship and how satisfied they are with their power. Further, we asked for power motives and computed positional power on the basis of socioeconomic factors. Our first research question concerned the balance or imbalance of power in contemporary couples. The second research question dealt with the importance of power for relationship-related outcomes, which is why we analyzed the associations of various aspects of power with facets of RQ. Using APIM models, we tested for both actor and partner effects.

3.4.1 Balance of Power

With respect to the first research question, as expected, a balance of power was found for personal sense of power. In most couples, the partners reported that they had a similar influence on and a similar say in decision-making. Further, both partners reported rather high experienced power, which means, on average, both individuals feel that they are able to get their way. How might this work? First, decisions are not necessarily a zero-sum game (Nalis et al., 2018). Second, individuals may seek influence in different aspects of the relationship, and each may have different realms that are especially important to them (Beach & Tesser, 1993). For example, she might want to decide where to go on vacation, whereas he may decide where to eat dinner. Thus, both partners can have their way in their respective domain, and this is why they can experience equal and high levels of power (McCormick et al., 1984; Sprecher, 1985). This idea also fits with positive associations between personal sense of power and satisfaction with power in the relationship and equal levels of satisfaction with power within couples.

Yet, with respect to positional power, an imbalance was observed. Men reported having significantly more positional power, operationalized as educational and occupational qualification as well as higher income, than women, a finding that is in line with national statistics and other studies: Despite the societal emphasis of more gender equality, women still have less positional power than men, there is still a

gender pay gap, and men work in better paid jobs (Bergmann et al. 2019; Schwartz & Gonalons-Pons, 2016). Moreover, in our sample, the men were 2 years older than their partners on average. This enhanced men's positional power as they had more years to complete a higher education and earn money. Finally, sex differences were also found for power motives. Overall, men pursued power more than women did, which is also in line with traditional gender roles (Diekman & Eagly, 2008).

3.4.2 Associations Between Power Measures and RQ

Beyond merely testing whether there is a balance or imbalance of power in relationships, we were interested in understanding how both partners' perceptions of power affect their own and their partners' relationship-related outcomes. Regarding personal sense of power, there were the expected positive associations between actors' power and the RQ dimensions Fascination, Engagement, Sexuality, Future, and Trust, as well as the total RQ score. Thus, experiencing power was associated with an overall positive evaluation of the romantic relationship. This is in line with research showing a link between sense of power and positive evaluations in general (Anderson et al., 2012; Keltner et al., 2003; Kifer et al., 2013; Körner et al., 2019; Körner & Schütz, 2021). Only women's sense of power was not associated with the RQ dimension Constraint, which suggests that their feeling of being in power is not related to feeling constrained. Maybe it is other objective factors that are more relevant to the perception of feeling constrained. Contrary to the hypotheses, partner effects of personal sense of power on Engagement and Future were positive. Even though in past research, high power was found to be associated with a lack of emotional involvement and commitment to a relationship for both men and women (Sprecher et al., 2006), high power may have negative or positive consequences. For example, high power can also increase social responsibility (Overbeck & Park, 2001; Scholl, 2020), and thus, in the context of intimate relationships, it can lead to increased feelings of responsibility for the relationship. Therefore, the partner possessing less power may also perceive a long-term positive potential of the relationship and invest in the relationship. The effects of men's personal sense of power on women's Fascination and on women's total RQ were

also positive. As sense of power has also been shown to increase authenticity (Kraus et al., 2011; Neff & Suizzo, 2006), men reporting more sense of power and consequently expressing authenticity may be perceived as particularly fascinating by their partners.

Independent of their personal sense of power, many women in our sample were admired by their partners, and the partner effect of personal sense of power on total RQ was much stronger for men than it was for women. This means that the higher a man's experienced power, the higher a woman's RQ. Apparently, many women were more satisfied with the relationship when the partner felt that he is in charge, which is in line with traditional gender roles. Future research could explore changes over time or differences in different parts of the population.

For positional power, there were neither significant actor nor significant partner effects. The strongest sex-independent effect (although it still did not reach the cutoff for significance) was the actor effect for Constraint. This means that the higher someone's socio-structural power was, the less restricted the individual felt in the relationship. Yet, objective power characteristics were not associated with RQ. An explanation for this finding may be found in the following reasoning: When women out-earned their partners, decision-making still often remained unchanged (Tichenor, 2005), suggesting that financial resources will be less likely to influence relationship variables than the actual sense of power in that very relationship. Further, income has a weaker effect on relationship outcomes today than it did in the past (Schwartz & Gonalons-Pons, 2016). Moreover, regarding the impact of positional power on satisfaction in relationships, past research has found positive and negative effects (Conger et al., 2010; Inesi et al., 2012; Vogler et al., 2008), and these effects may balance each other out.

With respect to satisfaction with power in the relationship, all actor effects were significant except for the effect on Engagement. The general positive effect makes sense as satisfaction with power was related to a personal sense of power and RQ. People who were satisfied with their decision-making ability in their romantic relationship were also satisfied with their overall RQ. Partner effects were found for

Engagement and total RQ. Thus, when people were satisfied with their own level of power, their partners were also happier with the relationship and tended to invest more.

Regarding the power motive, there were no significant actor effects and only one significant association between women's power motive and men's Sexuality. Men reported more sexual fulfillment when women reported a strong power motive. This sex-dependent effect is in line with research showing that men's power motive is associated with relationship dissatisfaction, whereas women's power motive shows no such relation (Stewart & Rubin, 1976). Instead, women's power motive was positively associated with frequency of sexual intercourse (Schultheiss et al., 2003) and with estradiol (Stanton & Edelstein, 2009)—a hormone increasing women's sexual desire and behavior (Cappelletti & Wallen, 2016), which in turn may be related to men's satisfaction with the couple's sex life.

In addition to APIM analyses of absolute power characteristics on RQ, the similarity of the two partners on the power measures was analyzed and related to RQ. Surprisingly, no associations between the balance of power and total RQ were significant. This is contrary to past research that has suggested a positive link between balance of power and relationship-related outcomes (Aida & Falbo, 1991; Drigotas et al., 1999). Yet, past research did not control for individuals' level of power, which is why the association between balance of power and relationship-related variables might have been overestimated (cf. Furler et al., 2013; Schröder-Abé & Schütz, 2011). This issue is also known as a "confounding of difference scores with their constituents," and this is why researchers have recommended that main (actor, partner) effects (i.e., the absolute levels of the partners' scores) be controlled for when testing for similarity (Dyrenforth et al., 2010; Griffin et al., 1999). Furthermore, our sample of romantic heterosexual couples was primarily characterized by a balance of power (for experienced power and satisfaction with power), which means that the sample was too homogeneous to find an effect. Overall, this result suggests that what matters for RQ is not the balance of power but rather the absolute power level. This

may make sense because the feeling that one can act freely may be more important than the relative feeling of having a say.

Other techniques are also available for assessing similarity (power balance) effects. Researchers have used dyadic response surface analyses (Schönbrodt et al., 2018) or have computed profile similarity coefficients (Furr, 2008). However, response surface analyses would have produced many more coefficients than our APIM models, and thus, the results regarding our focal questions would not have been as clear, and multidimensional power measures (e.g., assessing different domains of experienced power) would have been useful if we had computed a test of profile similarity. We did not find similarity effects with our approach, but future research may address the issue with more heterogeneous samples, multidimensional measures, and some of the aforementioned techniques.

3.4.3 Limitations and Future Directions

In the present study, we used the general power motive because, to the best of our knowledge, there is no power motive measure that is specifically designed for romantic relationships (e.g., How important is the following statement for you, "Setting the tone in my romantic relationship"). Yet, the use of a valid and reliable measure of power motives regarding intimate relationships may uncover associations with RQ that were not found for the general power motive. In line with past research (Fox & Blanton, 1994; Greaves et al., 1995) the measure we used to assess positional power was based on objective power characteristics. However, the component regarding the financial situation was not completely objective. We had asked for relative earnings (i.e., who earns more within the couple) to avoid having too many missing values due to lack of responses.[8] Moreover, our index of objective power that was based on resources theory (Blood & Wolfe, 1960) and approach/inhibition theory (Keltner et al., 2003) does not contain subjective aspects (e.g., relational resources such as trust or attention; Safilios-Rothschild, 1976) because we aimed to employ a relatively

[8] In Germany, questions about income are typically considered a taboo.

objective indicator (i.e., positional power) that was related to the subjective experience of power (personal sense of power). Further, as different resources that impact the level of positional power may have different personal value for each partner, the value of (or the need for) these resources should also be measured in upcoming studies.

Several distinct power measures were used in this study. An additional differentiation could be made with respect to the domains in which power is exercised (Dunbar et al., 2016; Sagrestano et al., 1998). Steil and Weltman (1991) differentiated between four areas (e.g., household, childcare), and Beach and Tesser (1993) differentiated between 24 areas (e.g., how to spend free time, when to have sex, where to go on vacation) in which decision-making between men and women can differ. An appropriate measure may be the Relationship Power Inventory (Farrell et al., 2015), which includes 10 areas. Future research may test whether these areas moderate the effect of power on dimensions of RQ (i.e., Is less or more power in a specific field relevant to relationship quality in men or in women?). Our overall approach may also explain why, on average, both partners reported high experienced power—they may have power in aspects that are relevant to them. Another fruitful avenue would be to use behavioral power indicators (see Simpson et al., 2015, or Farrell et al., 2015, for discussions of this issue) when observing couples' interactions and to contrast the effect of experienced power on RQ with the effect of observed levels of behavioral power on RQ. Furthermore, in future studies, outcomes other than RQ can be tested, and the effect of power in homosexual couples using APIM analyses can be investigated.

Even though the participants in our sample covered a broad age range, young couples were overrepresented. This point should be taken into consideration with respect to the generalizability of the results. Thus, a potential task for future research would be to test whether power has different effects on relationship functioning in younger and older couples. Further, as power has different connotations in different cultures (Hofstede, 2001; Schwartz, 1994), the findings might not be generalizable

across cultures. They may apply to individualistic countries but could be different in collectivistic countries.

Moreover, we used self-report measures to assess power and RQ, and thus, social desirability may be an issue. Yet, we did not directly ask whether a relationship was unbalanced or whether someone had less power than their partner. Rather, we used the personal sense of power scale to assess an actor's subjective decision-making ability and perceived influence without making comparisons. Thus, because our analyses were based on absolute scores, they may be less biased by social desirability. Further, Farrell et al. (2015) reported that their measure of subjective power in romantic relationships was unrelated to social desirability. A final limitation refers to the cross-sectional design of our study. To establish causality between power and RQ as well as other outcomes, longitudinal as well as experimental evidence will be essential.

3.4.4 Conclusion

Does power still matter in romantic relationships? To some extent. We found there was a balance of power with respect to personal sense of power and satisfaction with power. Both forms were strongly associated with several dimensions of and total RQ—but the balance of power seemed less important. Positional power and the power motive were higher in men than in women but were not associated with RQ. Apparently, in contemporary romantic relationships, formal aspects of power are less important to the partners than the perceived ability to make decisions and have an impact. The latter seems to be a crucial factor in people's own RQ as well as their partners'—for both men and women.

3.5 References

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Chapter 4

Revisiting the Power to Forgive: A Dyadic Approach for Determining the Relations Between Power, Self-Esteem, and Forgiveness in Romantic Relationships

Reference

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Abstract

Power pervades interpersonal relationships and can impact relationship-related outcomes (e.g., forgiveness). Here, we expected a positive association between power and forgiveness in two studies involving German and Israeli couples (N = 149/174 couples). Actor-partner interdependence mediator models showed the expected positive associations of actor's power with both actor's forgiveness and partner's forgiveness. Independent self-esteem partially mediated and interdependent self-esteem completely mediated the power-forgiveness link for actors. Also, high experienced power was associated with high self-esteem, which in turn was positively related to benevolence motivation and negatively related to revenge and avoidance motivation. The implications of these findings are relevant for couple's therapy and advance our understanding of associations between power and relationship variables. Future research may distinguish between authentic and instrumental forgiveness and use experimental settings.

Keywords: power, forgiveness, APIMeM, self-esteem

4.1 Theoretical Background

4.1.1 Introduction

> "The weak can never forgive. Forgiveness is the attribute of the strong."
>
> —Mahatma Gandhi, *Young India*, 1931

Does Gandhi's statement hold when tested in close relationships? We conceptualized the strong as the powerful and investigated whether power was associated with forgiving in romantic relationships. Romantic relationships are very personally important (Clarks & Mills, 2011) and are characterized by interdependence and support (Griskevicius et al., 2015) but also conflict. Thus, forgiveness plays a vital role in ensuring a couple's functioning. Does experienced power correlate with the willingness to forgive? Is power also related to a partner's tendency to forgive? Finally, what is a possible link between power and forgiveness in couples?

4.1.2 Power and Forgiveness

Power is understood as social influence (Anderson et al., 2012; Dahl, 1957) and is grounded in control over resources (Keltner et al., 2003). Whereas the actual possession of power as based on resources can be understood as structural or positional power, the experience of power is a subjective assessment. We refer to subjective power in the following because this type of power is most important in romantic relationships (Körner & Schütz, 2021). In the relationship literature, power is typically defined as the capacity to change a partner's thoughts, feelings, and behavior and to resist counterinfluence attempts (Simpson et al., 2015). Thus, influence is central to the possession of power. In measuring power, some researchers focus on absolute levels (e.g., personal sense of power), whereas others measure power in dyadic terms where relative power is understood as the extent to which one person has more power than the other (Righetti et al., 2015). We are concerned with the personal sense of power (Anderson et al., 2012) in the relationship (i.e., the perceived ability to influence one's romantic partner). For example, a high personal sense of power in intimate relationships can be experienced when someone feels they have an influence in joint

decisions that matter to them. In romantic relationships, an actor's experienced power is associated with relationship quality, authenticity, and subjective well-being (Kifer et al., 2013; Neff & Suizzo, 2006) but also with lower commitment (Sprecher et al., 2006), and the links to aggression and other forms of destructive behavior are not yet clear (Alonso-Ferres et al., 2021; Pietromonaco et al., 2021; Ronfeldt et al., 1998). Forgiveness is a way to de-escalate conflicts and is thus important to a couple's functioning.

Forgiveness can be defined as a prosocial response "whereby one becomes decreasingly motivated to retaliate against an offending relationship partner, decreasingly motivated to maintain estrangement from the offender, and increasingly motivated by conciliation and goodwill for the offender" (pp. 321–322, McCullough et al., 1997). In most definitions, the motivational component of forgiveness is central, but emotion and behavior are relevant, too (Worthington, 2019). Moreover, forgiving others can occur at three levels: offense-specific, relationship-specific (across offenses), and trait forgiveness as a general tendency (tending to forgive multiple others across several situations; Worthington, 2019). We focused on offense-specific forgiveness (i.e., forgiving a specific transgression) because this type of forgiveness is fundamentally dyadic. It should be affected by both relationship partners' power characteristics and should thus be especially important in couples. Offense-specific forgiveness is characterized by both an increase in benevolence (i.e., a conciliatory motivation) and decreases in both resentment (i.e., vengeance motivation) and avoidance of the partner (Haversath et al., 2017; Paleari et al., 2009). Forgiveness has several positive consequences for relationship quality (Wallace et al., 2008; Webb & Toussaint, 2019). Thus, it is important to understand who forgives in a relationship and why.

Power is fundamental in everyday life and has a prosocial but also an antisocial nature (Kipnis et al., 1972; Guinote et al., 2017). In intimate relationships, power is related to relationship satisfaction but also to less emotional involvement (Kim et al., 2019). Past research has found that power has both positive and negative relationships with constructs that may be related to forgiveness. First, power in romantic couples

has shown negative correlations with sacrificing and accommodating behavior (Righetti et al., 2015; Rusbult et al., 1991). Both sacrificing and accommodating tendencies may be related to forgiveness, which is why a negative power-forgiveness relation may be expected—and this would be in line with the antisocial consequences of power found in the early literature (Kipnis, 1972).

However, on the basis of theories and findings that have shown that power increases positive emotions, action orientation, and goal-related approach motivation (Galinsky et al., 2003; Keltner et al., 2003), researchers have reported that power can increase prosocial behavior when the goal is having an intact and good relationship (Chen et al., 2001; Gordon & Chen, 2013). Further, from a philosophical stance, forgiveness can be understood as taking control and abandoning the role of a victim (Derrida, 2001). Thus, partners who feel powerful may forgive more easily. This reasoning is in line with observations regarding revenge: Situational power increased revenge among chronically powerless students but decreased revenge among chronically powerful ones (Strelan et al., 2014). Moreover, personal sense of power was positively related to forgiveness among close acquaintances, and in a sample of students in romantic relationships, power was again positively associated with offense-specific forgiveness (Karremans & Smith, 2010).

We built upon these findings and investigated whether power was associated with forgiveness in couples. As the study by Karremans and Smith (2010) was the first to measure forgiveness directly, we based our hypotheses on their results and expected a positive association between power and forgiveness. Yet, we obtained much larger sample sizes, used data from two countries, and employed a dyadic approach. Further, we analyzed the underlying process more closely and tested self-esteem as a mediator.

4.1.3 Self-Esteem as a Mediating Process

Power has been found to be positively associated with trait self-esteem (Anderson et al., 2012) and increased state self-esteem (Körner, Petersen et al., 2021; Wojciszke, & Struzynska–Kujalowicz, 2007). Recently, we suggested a power-self-esteem hypothesis (Körner & Schütz, 2022): The relation between the two constructs may be

so close (Guinote, 2017) that many downstream consequences of power may be explained by a mediating effect of self-esteem. In this proposition, self-esteem is considered a consequence of power because self-esteem is malleable (Anusic & Schimmack, 2016) and can be affected by interpersonal experiences (Leary & Baumeister, 2000). Similarly, the approach/inhibition theory of power (Keltner et al., 2003) suggests that power increases positive emotions and approach behavior, which in turn are linked to high self-esteem. Finally, because self-esteem converges over time in romantic couples (Schafer & Keith, 1992), it seems plausible to assume that self-esteem is the consequence rather than the cause (see also Baumeister et al., 2003) of power experienced in romantic relationships. Thus, we expected that experienced power would affect self-esteem.

Self-esteem has been found to be positively related to forgiveness (Eaton et al., 2006; Riek & Mania, 2012; but see Neto & Mullet, 2004). It can protect people from taking transgressions personally and can help them avoid or leave the victim role (Semmer et al., 2020). By contrast, people low in self-esteem assume that their partners also perceive them negatively (Murray et al., 2000; Schütz & Tice, 1997), which can in turn erode trust between partners and increase destructive relationship behavior (e.g., Murray et al., 2015), such as not forgiving transgressions. Moreover, positive experiences are shared less with low self-esteem partners (MacGregor & Holmes, 2011) than with others, thereby potentially inhibiting pro-relationship behavior among people with low self-esteem. We thus expected that self-esteem would mediate the power-forgiveness link.

4.1.4 A Dyadic Perspective

Concepts such as power and interpersonal forgiveness can only be understood in a social context. Dyadic power theories (e.g., interdependence theory, Kelley et al., 2003; dyadic power-social-influence model, Simpson et al., 2015) imply that the interdependence of the two relationship partners must be taken into account to fully understand the consequences of power. This perspective seems essential as an individual's power can affect the outcomes of both partners.

Personal sense of power is moderately positively associated between relationship partners (Körner & Schütz, 2021). Besides social acceptance and approval (see sociometer theory; Leary & Baumeister, 2000), power has been identified as another important source of self-esteem (Wilson & Wilson, 1976). As couples in well-functioning relationships are closely intertwined (Johnson et al., 2020), the experience of power should affect not only one's own but also one's partner's self-esteem. For example, a high-power actor may be more approving of their partner, thus bolstering their partner's self-esteem.

With respect to forgiveness, we also expected the actor's power to be positively related to the partner's forgiveness: Power affords goal-related motivation and behavior (Guinote, 2010) and can thus strengthen responsibility and pro-relationship behavior in happy romantic couples. Such behavior is in turn likely to facilitate pro-relationship behavior in the partner (Kelley et al., 2003). Thus, if a transgression has been committed but people see that their partners are interested in maintaining a good relationship, they may also be more willing to forgive in order to support the quality of the relationship.

4.1.5 Overview

We conducted two studies with other-sex couples in different cultures. We considered power to be a stable trait in the relationship (Anderson et al., 2012). Further, we focused on experienced power in terms of social influence in the relationship because experienced power has been shown to have a stronger impact on relationship variables than positional power (i.e., possession of resources; Körner & Schütz, 2021; Tichenor, 2005). As argued previously (Karremans & Smith, 2013; Riek & Mania, 2012), we hypothesized that experienced power would be positively associated with offense-specific forgiveness and that self-esteem would mediate this link. Further, we assessed two different types of self-esteem that mapped onto the different levels of individualism and collectivism in the countries we studied: independent self-esteem in Germany and both independent and interdependent self-esteem in Israel.

We took into account the interdependence of partners' relationship characteristics (Kim et al., 2019; Zverling, 2019). Previous research on power or self-esteem and forgiveness has neglected to consider interdependence when examining the associations of these constructs in interpersonal contexts. However, when both partners provide assessments of their own power and forgiveness, a more complete picture can be drawn (Kenny & Ledermann, 2010). In line with dyadic power theories, we aimed to test dyadic effects and expected that one partner's power would also affect the other partner's experience. We hypothesized that power would be positively associated with the self-esteem and forgiveness of both partners. Because of the interdependence of the relationship partners, the actor affects may also generalize to the partner. We also tested for indirect effects for both actors and partners.

4.2 Study 1 – German Sample

Study 1 was conducted with German couples. Germany is an individualistic country with gender roles largely adapted to equality (Athenstaedt & Alfermann, 2011; Siffert & Bodenmann, 2010). Personal sense of power was expected to be positively correlated with both actor's and partner's forgiveness. We also expected that this process would be mediated by the experience of high self-esteem and tested for indirect effects for both actors and partners. Hypotheses and analyses were preregistered (https://aspredicted.org/blind.php?x=em3xx8).

4.2.1 Method

4.2.1.1 Participants

We collected data from 436 individuals. For 74 individuals, partner data were missing or could not be matched, leaving 181 couples. On the basis of responses to a control item and in line with our preregistration, we excluded 32 couples in which at least one partner could not remember a conflict. The final sample comprised 149 other-sex couples (men: M_{age} = 31.65, SD_{age} = 12.95, 19 to 73; women: M_{age} = 29.77, SD_{age} = 13.17, 18 to 72). The average relationship duration was 8.32 years (*Mdn* = 3.33, *SD* = 10.94, 2 months to nearly 52 years). Our sample size allowed us to detect effects of $\beta_{Actor/Partner}$ =

0.20/0.15 with a power of 0.95/0.77 (α = .05, error correlations = .03, correlation between actor and partner variables = .25; Ackerman et al., 2020). Please see the Online Supplement or Appendix C for the procedure.

4.2.1.2 Measures

Power was measured with the German *Personal Sense of Power Scale* (PSPS; Anderson et al., 2012; Körner, Heydasch et al., 2021). The scale addresses social influence and perceived decision-making ability (six items; e.g., "I can get him/her to listen to what I say"). The item stem reads: "In my relationship with my partner…."

To assess self-esteem, we used the self-regard subscale from the German *Multidimensional Self-Concept Scale* (MSCS; Fleming & Courtney 1984; Schütz et al., 2016).[9] Self-regard represents a person's global perception of self-worth (seven items; e.g., "Do you doubt yourself?").

Two forgiveness dimensions were assessed with the German *Marital Offence-Specific Forgiveness Scale* (Haversath et al., 2017; Paleari et al., 2009): Benevolence is characterized by a conciliatory motivation after transgressions (four items). Resentment-avoidance is defined by retaliation and avoidant and vengeful motivation (six items). In the following, we use forgiveness as an umbrella term for both dimensions (i.e., high benevolence, low resentment-avoidance). Items were adapted for unmarried couples. Participants were instructed to remember a situation involving a conflict with their partner as accurately as possible. Reponses were given on a scale ranging from 1 to 6. A control item followed ("How intensively could you remember a situation involving conflict with your partner?"). Participants who ticked "*not at all*" were removed from the analyses because they would not be able to answer the offense-specific items.

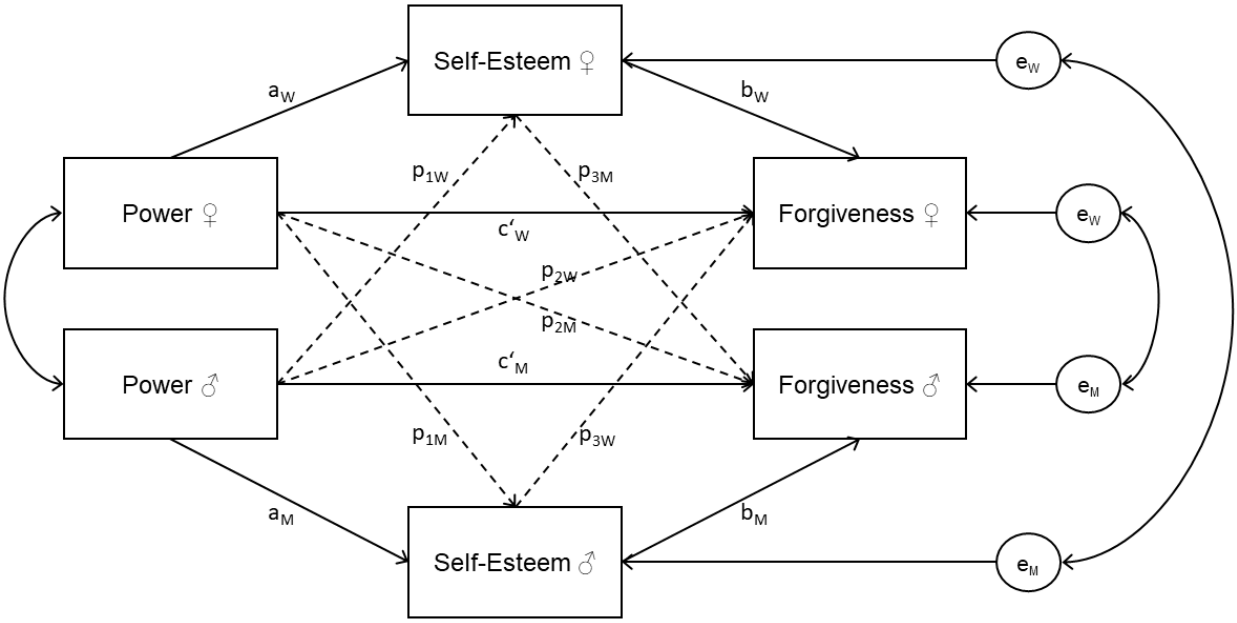
[9] We chose the self-regard subscale from the German *MSCS* (i.e., the German Fleming and Courtney scale; Fleming & Courtney, 1984; Rentzsch et al., 2021) because it is strongly correlated with the Rosenberg self-esteem scale (r = .78) but has lower stability (r_{tt} = .70 across 10 weeks; Schütz et al., 2016). Thus, without being a state scale (which would not be in line with the present hypotheses), the scale was more sensitive to capturing possible effects of experienced power.

4.2.1.3 Analytic Strategy

After excluding couples who were not able to remember a conflict with their partner, we calculated paired-samples *t* tests and Pearson correlations to test for differences and similarity. The main analyses involved Actor-Partner Interdependence Mediator Models (APIMeM; Ledermann et al., 2011). Actor effects are associations between the predictor, mediator, and outcome for only the respondent (see Figure 3). Partner effects are associations between the respondent's predictor and the partner's mediator or outcome. Partner effects are typically smaller than actor effects (Dyrenforth et al., 2010). Note that we used APIM terminology (i.e., effect), which does not refer to causality but instead indicates the direction of an association. Analyses were based on structural equation modeling (ML estimation) in Mplus 7. We report bootstrapped 95%-Confidence Intervals (k = 5,000 samples). For direct effects, we computed effect sizes (see Brauer et al., 2021) separately for men and women ($\Delta_{F/M} = b/SD_{F/M}$). Δ is the change in the outcome in *SD*s when the predictor changes by 1 point. For each APIMeM, a saturated model (all effects freely estimated; distinguishable dyads) was tested against an equal-actor-equal-partner effects model (absence of gender effects; i.e., indistinguishable dyads). When the Likelihood-Ratio Test was nonsignificant (p < .20; Kenny & Ledermann, 2010), we chose the equal effects model. Data, material, and analysis code are available online (https://osf.io/zndau/).

Figure 3

Model Specification for the APIMeMs Estimating the Effect of Power on Forgiveness With Self-Esteem as a Mediator



Note. Continuous arrows = actor effects. Dashed arrows = partner effects.

4.2.2 Results

4.2.2.1 Preliminary Analyses

Cronbach's alpha was acceptable for all scales (see Table 12). Men and women did not differ in experienced power. Men reported higher self-esteem and forgiveness, but the differences did not have large effect sizes (ds ≤ 0.40). Partners were similar in power and forgiveness, rs(147) ≥ .26, indicating interdependence between men and women. Only self-esteem was somewhat unrelated between partners, r(147) = .06.

4.2.2.2 Main Analyses

Likelihood-Ratio Tests indicated that associations were independent of gender, $\chi^2(6) < 2.468$, $p \geq .872$. Regarding the APIMeM with benevolence as the outcome, we found two significant actor effects (see Table 13): Power was positively associated with self-esteem (b = 0.39, 95% CI [0.24, 0.54]) and benevolence (b = 0.36, 95% CI [0.23, 0.50]), but self-esteem was unrelated to benevolence (b = 0.02, 95% CI [-0.06, 0.11]). There was one significant partner effect: Actor's power was positively associated with partner's benevolence (b = 0.19, 95% CI [0.07, 0.31]).

Table 12

German Sample: Descriptive Statistics, Cronbach's Alphas, Partner Differences (Paired-Samples t Tests With Cohen's d), and Bivariate Zero-Order Correlations Within and Between Partners for Power, Self-Esteem, and Forgiveness

	Women			Men					Within-Partner				Between-Partner			
Variable	*M*	*SD*	α	*M*	*SD*	α	*t*	|*d*|	1	2	3	4	1	2	3	4
1 PSPS	5.59	0.91	.80	5.52	0.77	.70	-0.78	0.08	-	.24**	.37***	-.34***	.29***	.02	.36***	-.30***
2 SE	4.84	1.17	.89	5.28	1.03	.87	3.55**	0.40	.25**	-	.08	-.29***	-.05	.06	.09	-.12
3 BEN	4.68	0.97	.79	4.94	0.83	.76	2.91**	0.29	.40***	.16	-	-.62***	.27**	.07	.26**	-.24**
4 RES	2.51	1.02	.82	2.25	0.83	.75	-3.04**	0.28	-.35***	-.23**	-.68***	-	-.20*	-.10	-.30***	.38***

Note. 1 (PSPS) = Personal Sense of Power. 2 (SE) = Independent Self-Esteem. 3 (BEN) = Benevolence. 4 (RES) = Resentment-Avoidance. Within-partner correlations are presented separately for men (below the diagonal) and women (above the diagonal). Between-partner correlations were computed across partners (rows = women, columns = men). $N = 149$ couples.

*$p < .05$. **$p < .01$. ***$p < .001$ (two-tailed).

Table 13

German Sample: APIMeMs With Personal Sense of Power (PSPS) as the Independent Variable, Independent Self-Esteem (SE) as the Mediator, and Benevolence and Resentment-Avoidance (FO) as Outcomes

	Benevolence					Resentment-Avoidance				
	b	95% CI	*SE*	*p*	$\lvert\Delta_{F/M}\rvert$	*b*	95% CI	*SE*	*p*	$\lvert\Delta_{F/M}\rvert$
Direct effects										
PSPS → SE										
Actor (a)	**0.39**	[0.24, 0.54]	0.08	<.001	0.33/0.38	**0.39**	[0.24, 0.54]	0.08	<.001	0.33/0.38
Partner (p_1)	-0.09	[-0.25, 0.06]	0.08	.266	0.08/0.09	-0.09	[-0.25, 0.06]	0.08	.266	0.08/0.09
SE → FO										
Actor (b)	0.02	[-0.06, 0.11]	0.04	.681	0.02/0.02	**-0.13**	[-0.22, -0.05]	0.04	.002	0.13/0.16
Partner (p_3)	0.02	[-0.05, 0.10]	0.04	.596	0.02/0.02	-0.05	[-0.12, 0.04]	0.04	.252	0.05/0.06
PSPS → FO										
Actor (c')	**0.36**	[0.23, 0.50]	0.07	<.001	0.37/0.43	**-0.37**	[-0.52, -0.23]	0.07	<.001	0.36/0.45
Partner (p_2)	**0.19**	[0.07, 0.31]	0.06	.001	0.20/0.23	**-0.15**	[-0.28, -0.01]	0.07	.029	0.15/0.18
Indirect effects										
Actor										
Total	**0.37**	[0.24, 0.51]	0.07	<.001		**-0.42**	[-0.56, -0.28]	0.07	<.001	
Total indirect	0.01	[-0.03, 0.04]	0.02	.775		**-0.05**	[-0.09, -0.02]	0.02	.011	
Actor-Actor	0.01	[-0.02, 0.04]	0.02	.690		**-0.05**	[-0.10, -0.02]	0.02	.006	
Partner-Partner	0.00	[-0.02, 0.00]	0.01	.714		0.00	[0.00, 0.03]	0.01	.514	
Partner										
Total	**0.20**	[0.09, 0.31]	0.06	<.001		**-0.16**	[-0.29, -0.02]	0.07	.021	
Total indirect	0.01	[-0.02, 0.04]	0.02	.687		-0.01	[-0.04, 0.03]	0.02	.722	
Actor-Partner	0.01	[-0.02, 0.04]	0.02	.604		-0.02	[-0.05, 0.01]	0.02	.274	
Partner-Actor	0.00	[-0.02, 0.00]	0.01	.766		0.01	[-0.01, 0.04]	0.01	.311	

For the APIMeM with resentment-avoidance as the outcome, for actor's, we found positive associations between power and self-esteem and negative associations between self-esteem and resentment-avoidance (b = -0.13, 95% CI [-0.22, -0.05]) and power and resentment-avoidance (b = -0.37, 95% CI [-0.52, -0.23]; see Table 14). Self-esteem partially mediated the power-forgiveness relation for actors because the total indirect effect was negative and significant (b = -0.05, 95% CI [-0.09, -0.02]) as the direct effect was too. Regarding partner effects, there was a negative association between actor's power and partner's resentment-avoidance (b = -0.15, 95% CI [-0.28, -0.01]).

4.2.3 Discussion

In line with theoretical reasoning (Chen et al., 2001) and empirical research (Karremans & Smith, 2010), the hypothesis regarding a positive association between power and forgiveness was supported. The associations were independent of gender. Further, for the first time, we found that actor's power was also positively related to partner's forgiveness. Partners seemed to be more willing to behave in a conciliatory fashion and to avoid revenge when a powerful partner made a transgression. Thus, high subjective power in a relationship offers a double benefit for relationship functioning: One can more easily forgive and continue after conflicts, and the partner is likewise more willing to forgive. In line with the reasoning that experienced power in a relationship should affect both partners (Simpson et al., 2015), we found that power was associated with both partners' forgiveness, which underscores the relevance of considering interdependence in relationships and a focus on both partners' traits. Further, the positive association between power and forgiveness was partially mediated by self-esteem. Thus, power seems to bolster self-esteem, which in turn promotes forgiveness. We found no indirect partner effects: Actor's power did not affect partner's self-esteem, and actor's self-esteem was not correlated with partner's forgiveness. The effects were found in Germany and might only generalize to individualistic cultures because concepts of power differ between cultures (Torelli et al., 2020) and may thereby have different consequences. Thus, we aimed to replicate these findings in a more collectivistic context.

4.3 Study 2 – Israeli Sample

Israel is an industrial nation characterized by the presence of both individualistic and collectivistic elements (Hofstede, 2001). As self-esteem with traditional measures (Rosenberg, 1965) taps into the self-worth of people with an independent self-concept, people from collectivistic countries may have low explicit self-esteem on these measures but may still be happy with themselves. Especially in collectivistic contexts, self-esteem might not be construed as individual achievement and standing out from others but as relatedness (Sedikides et al., 2003). Interdependent self-esteem can thus be defined as self-worth derived from experiencing connectedness with others, identifying with social groups, and building strong social ties (Singelis, 1994). In addition to the measures employed in Study 1, we added a self-esteem scale that assesses self-esteem in an interdependent fashion so we could compare the relevance of the two conceptualizations of self-esteem in a more collectivistic context. Further and in contrast to the *MSCS*, interdependent self-esteem is by definition more relationship-specific and may thus be an even more important mediator of the power-forgiveness link in highly committed relationships (e.g., romantic couples). The study was preregistered (https://aspredicted.org/blind.php?x=uw7xc5).

4.3.1 Method

4.3.1.1 Participants and Procedure

Data were collected from 520 participants. We excluded individuals when partner data were missing or could not be matched (n = 86) or when participants reported only extreme values (i.e., always ticking "1"; n = 38). Of the remaining 198 couples, we excluded 24 couples because they were unable to remember a conflict with their partner. Thus, the final sample comprised 174 other-sex couples (men: M_{age} = 35.73, SD_{age} = 10.15, 19 to 77; women: M_{age} = 33.03, SD_{age} = 9.55, 18 to 73). The average relationship duration was 9.53 years (Mdn = 7.00 SD = 8.98, 1 month to 55 years). With this sample size, we were able to detect effects of $\beta_{Actor/Partner}$ = 0.20/0.15 with a power of 0.97/0.83 (α = .05, error correlations = .03; Ackerman et al., 2020). Procedure was the same as in Study 1. We also used the same measures and the same control item as in

Study 1. Additionally, we used the interdependent self-esteem subscale from the *Social-Autonomous Self-Esteem Scale* (SAS; Pöhlmann et al., 2002). The SAS referred to interdependent self-esteem experienced in the relationship.

4.3.1.2 Analytic Strategy

As preregistered, we first examined the psychometric properties of the *PSPS* and the *SAS*. Please see the Online Supplement or Appendix C for the rationale and results of these analyses. Altogether, both scales showed acceptable item characteristics and good fit in a CFA and were thus used in the following analyses.

Paired-samples *t* tests and Pearson correlations were computed to test for differences and similarity. Analyses of Actor-Partner Interdependence Mediator Models (APIMeM; Ledermann et al., 2011) were conducted as in Study 1. Data, materials, and code are available online (https://osf.io/zndau).

4.3.2 Results

4.3.2.1 Preliminary Analyses

Cronbach's alphas of all scales separated for men and women were acceptable (see Table 14). There was no difference between partners in experienced power but small to medium differences for self-esteem and forgiveness (ds ≤ 0.48). Partners were similar on all measures, rs(172) ≥ .13, with the highest similarity for interdependent self-esteem, r(172) = .56 (see Table 15). Thus, there was robust interdependence between partners.

4.3.2.2 Main Analyses

Likelihood-Ratio Tests indicated that associations were independent of gender, $\chi^2(6) < 6.501$, $p \geq .370$. For actors, the model with independent self-esteem (*MSCS*) as the mediator showed positive associations between power and self-esteem (b = 0.49, 95% CI [0.36, 0.61]), self-esteem and benevolence (b = 0.29, 95% CI [0.14, 0.44]), and power and benevolence (b = 0.24, 95% CI [0.05, 0.44]). Like the direct effect, the total indirect effect was significant (b = 0.13, 95% CI [0.05, 0.23]), and the 95% CI did not include zero, thus indicating partial mediation (see Table 16). Actor's power was also positively

associated with partner's benevolence (b = 0.19, 95% CI [0.01, 0.38]), but the effect was rather small in size.

In actors, in the model with independent self-esteem as the mediator and resentment-avoidance as the outcome, we found a positive association between power and self-esteem and negative associations between self-esteem and resentment-avoidance (b = -0.41, 95% CI [-0.56, -0.24]) and power and resentment-avoidance (b = -0.21, 95% CI [-0.40, -0.01]). The direct and the total indirect (b = -0.20, 95% CI [-0.31, -0.10]) effects were significant, indicating partial mediation. There was no significant partner effect (see Table 16).

Table 14

Israeli Sample: Descriptive Statistics, Cronbach's Alphas, and Partner Differences (Paired-Samples t Tests with Cohen's d)

	Women			Men				
Variable	*M*	*SD*	α	*M*	*SD*	α	*t*	|*d*|
1 PSPS	5.60	0.97	.82	5.51	0.91	.76	-1.11	0.10
2 SE	5.21	1.08	.85	5.71	0.99	.84	4.97***	0.48
3 SAS	6.13	0.83	.83	6.00	0.90	.84	-2.05*	0.15
4 BEN	5.06	1.27	.67	5.35	1.35	.80	2.27*	0.23
5 RES	3.39	1.46	.85	2.96	1.24	.78	-3.39***	0.32

Note. 1 (PSPS) = Personal Sense of Power. 2 (SE) = Independent Self-Esteem. 3 (SAS) = Social-Autonomous Self-Esteem (Interdependent Self-Esteem). 4 (BEN) = Benevolence. 5 (RES) = Resentment-Avoidance. N = 174 couples.

*p < .05. **p < .01. ***p < .001 (two-tailed).

Table 15

Israeli Sample: Bivariate Zero-Order Correlations Within and Between Partners for Power, Self-Esteem, and Forgiveness

	Within-Partner					Between-Partner				
Variable	1	2	3	4	5	1	2	3	4	5
1 PSPS	-	.43***	.69***	.30***	-.37***	.34***	.25***	.42***	.18*	.20**
2 SE	.50***	-	.39***	.36***	-.37***	.17*	.18*	.18*	-.01	.06
3 SAS	.62***	.50***	-	.42***	-.46***	.39***	.25***	.56***	.23**	-.17*
4 BEN	.30***	.26***	.47***	-	-.50***	.21**	.09	.21**	.13	-.10
5 RES	-.28***	-.43***	-.34***	-.51***	-	-.23**	-.19*	-.28***	-.14	.25***

Note. 1 (PSPS) = Personal Sense of Power. 2 (SE) = Independent Self-Esteem. 3 (SAS) = Social-Autonomous Self-Esteem (Interdependent Self-Esteem). 4 (BEN) = Benevolence. 5 (RES) = Resentment-Avoidance. Within-partner correlations are presented separately for men (below the diagonal) and women (above the diagonal). Between-partner correlations were computed across partners (rows = women, columns = men). $N = 174$ couples.
*$p < .05$. **$p < .01$. ***$p < .001$ (two-tailed).

Table 16

Israeli Sample: APIMeMs With Personal Sense of Power (PSPS) as the Independent Variable, Independent Self-Esteem (SE) as the Mediator, and Benevolence and Resentment-Avoidance (FO) as Outcomes

	Benevolence					Resentment-Avoidance				
	b	95% CI	*SE*	*p*	$\lvert\Delta_{F/M}\rvert$	*b*	95% CI	*SE*	*p*	$\lvert\Delta_{F/M}\rvert$
Direct effects										
PSPS → SE										
Actor (a)	**0.49**	[0.36, 0.61]	0.07	< .001	0.45/0.49	**0.49**	[0.36, 0.61]	0.07	< .001	0.45/0.49
Partner (p_1)	0.07	[-0.05, 0.20]	0.06	.269	0.06/0.07	0.07	[-0.05, 0.20]	0.06	.269	0.06/0.07
SE → FO										
Actor (b)	**0.29**	[0.14, 0.44]	0.08	< .001	0.23/0.21	**-0.41**	[-0.56, -0.24]	0.08	< .001	0.28/0.33
Partner (p_3)	-0.13	[-0.27, 0.03]	0.08	.098	0.10/0.10	0.02	[-0.14, 0.17]	0.08	.762	0.01/0.02
PSPS → FO										
Actor (c′)	**0.24**	[0.05, 0.44]	0.10	.015	0.19/0.18	**-0.21**	[-0.40, -0.01]	0.10	.035	0.14/0.17
Partner (p_2)	**0.19**	[0.01, 0.38]	0.10	.049	0.15/0.14	-0.15	[-0.34, 0.04]	0.10	.134	0.10/0.12
Indirect effects										
Actor										
Total	**0.37**	[0.20, 0.55]	0.09	< .001		**-0.41**	[-0.58, -0.25]	0.09	< .001	
Total indirect	**0.13**	[0.05, 0.23]	0.05	.004		**-0.20**	[-0.31, -0.10]	0.05	< .001	
Actor-Actor	**0.14**	[0.06, 0.24]	0.05	.002		**-0.20**	[-0.31, -.0.11]	0.05	< .001	
Partner-Partner	-0.01	[-0.04, 0.00]	0.01	.399		0.00	[-0.01, 0.03]	0.01	.827	
Partner										
Total	0.15	[-0.02, 0.31]	0.09	.085		-0.16	[-0.33, 0.01]	0.09	.064	
Total indirect	-0.04	[-0.14, 0.04]	0.05	.352		-0.02	[-0.12, 0.09]	0.05	.745	
Actor-Partner	-0.06	[-0.14, 0.01]	0.04	.101		0.01	[-0.07, 0.08]	0.04	.764	
Partner-Actor	0.02	[-0.01, 0.08]	0.02	.339		-0.03	[-0.09, 0.02]	0.03	.300	

Table 17

Israeli Sample: APIMeMs With Personal Sense of Power (PSPS) as the Independent Variable, Interdependent Self-Esteem (SAS) as the Mediator, and Benevolence and Resentment-Avoidance (FO) as Outcomes

	Benevolence					Resentment-Avoidance				
	b	95% CI	*SE*	*p*	$\lvert\Delta_{F/M}\rvert$	*b*	95% CI	*SE*	*p*	$\lvert\Delta_{F/M}\rvert$
Direct effects										
PSPS → SAS										
Actor (a)	**0.54**	[0.45, 0.64]	0.05	< .001	0.65/0.60	**0.54**	[0.45, 0.64]	0.05	< .001	0.65/0.60
Partner (p_1)	**0.19**	[0.11, 0.27]	0.04	< .001	0.23/0.21	**0.19**	[0.11, 0.27]	0.04	< .001	0.23/0.21
SAS → FO										
Actor (b)	**0.70**	[0.45, 0.92]	0.12	< .001	0.55/0.52	**-0.47**	[-0.77, -0.19]	0.15	.002	0.32/0.38
Partner (p_3)	-0.12	[-0.37, 0.13]	0.13	.360	0.09/0.09	0.08	[-0.14, 0.31]	0.12	.506	0.05/0.06
PSPS → FO										
Actor (c′)	0.02	[-0.19, 0.21]	0.10	.869	0.02/0.01	-0.17	[-0.38, 0.04]	0.11	.112	0.12/0.14
Partner (p_2)	0.07	[-0.13, 0.28]	0.10	.491	0.06/0.05	-0.11	[-0.32, 0.10]	0.11	.284	0.08/0.09
Indirect effects										
Actor										
Total	**0.37**	[0.20, 0.55]	0.09	< .001		**-0.41**	[-0.59, -0.25]	0.09	< .001	
Total indirect	**0.35**	[0.21, 0.50]	0.08	< .001		**-0.24**	[-0.39, -0.09]	0.08	.002	
Actor-Actor	**0.38**	[0.23, 0.53]	0.08	< .001		**-0.25**	[-0.41, -0.11]	0.08	.001	
Partner-Partner	-0.02	[-0.08, 0.02]	0.03	.390		0.01	[-0.03, 0.07]	0.03	.532	
Partner										
Total	0.14	[-0.02, 0.31]	0.09	.100		-0.16	[-0.33, 0.01]	0.09	.066	
Total indirect	0.07	[-0.07, 0.20]	0.07	.316		-0.05	[-0.17, 0.08]	0.07	.471	
Actor-Partner	-0.06	[-0.21, 0.07]	0.07	.370		0.04	[-0.08, 0.17]	0.06	.508	
Partner-Actor	**0.13**	[0.07, 0.21]	0.03	< .001		**-0.09**	[-0.17, -0.03]	0.03	.010	

The APIMeM with interdependent self-esteem (*SAS*) as the mediator and benevolence as the outcome showed positive associations between actor's power and actor's self-esteem (b = 0.54, 95% CI [0.45, 0.64]) and actor's self-esteem and actor's benevolence (b = -0.70, 95% C I[0.45, 0.92]; see Table 17). The direct effect of power on benevolence was nonsignificant for actors, but the total indirect effect was positive and significant (b = 0.35, 95% CI [0.21, 0.50]). Thus, interdependent self-esteem completely mediated the power-benevolence link. Regarding partner effects, there was a positive association between actor's power and partner's self-esteem (b = 0.19, 95% CI [0.11, 0.27]). There was also a significant indirect effect from actors' power to partner's benevolence through partner's self-esteem (b = 0.13, 95% CI [0.07, 0.21]).

The same pattern of associations emerged in the model with interdependent self-esteem as the mediator and resentment-avoidance as the outcome (see Table 17). Actor's power was positively associated with actor's self-esteem, and actor's self-esteem was negatively associated with actor's resentment-avoidance (b = -0.47, 95% CI [-0.77, -0.19]). Full mediation was found because the direct actor effect was nonsignificant, but the total indirect effect was significant (b = -0.24, 95% CI [-0.39, -0.09]). Actor's power was positively associated with partner's self-esteem (b = 0.19, 95% CI [0.11, 0.27]), and a significant indirect effect from actor's power to partner's resentment-avoidance through partner's self-esteem was found (b = -0.09, 95% CI [-0.17, -0.03]).

4.3.3 Discussion

The second study was conducted in a more collectivistic context and tested independent and interdependent self-esteem as potential mediators. When we measured independent self-esteem, we found a positive association between power and forgiveness as in Study 1. For benevolence, there was a significant partner effect. Further, for actors, power was positively related to independent self-esteem, which in turn was positively related to forgiveness. The partial mediation by self-esteem is in line with the results found in Study 1. Gender did not moderate any association. Interdependent self-esteem completely mediated the power-forgiveness relation,

underscoring the relevance of this form of self-esteem for forgiveness. Furthermore, we found an indirect partner-actor effect, suggesting that interdependent self-esteem is higher in a relationship when one partner experiences high power. Interdependent self-esteem is in turn positively related to one's own tendency to forgive one's partner's transgressions.

How might the difference in the magnitudes of the indirect effects of the two self-esteem measures be explained? In a recent meta-analysis, which supported a small positive association of self-esteem with forgiveness (Riek & Mania, 2012), most studies used independent self-esteem measures. However, a study distinguishing between construals of self-esteem in Portuguese students found that interdependent self-construals were positively associated with forgiveness, whereas independent self-construals were negatively related (Neto & Mullet, 2004). The latter finding is contrary to our results because independent self-esteem predicted forgiveness in our samples. Yet, we found that interdependent self-esteem was a stronger mediator than independent self-esteem, which is in line with Neto and Mullet (2004) because they suggested that interdependent self-construals are likely more predictive of forgiveness.

4.4 General Discussion

This research aimed to investigate associations of personal sense of power with self-esteem and offense-specific forgiveness in romantic relationships. A dyadic approach was used to also consider partner effects. The findings from couples from Germany and Israel were largely in line with our hypotheses. Power was positively related to one's own forgiveness and largely also to one's partner's forgiveness. Independent self-esteem mediated this relation in both samples for both forgiveness dimensions: benevolence and resentment-avoidance. Interdependent self-esteem, which we tested in the Israeli sample, was actually such an important mediator that the direct effect of power on forgiveness became nonsignificant.

The results contribute to the literature as our analytic approach was dyadic (Ledermann & Kenny, 2017), our sample sizes were much larger than that of a previous

study (Karremans & Smith, 2010), and we found the effect in two cultures (Germany and Israel). Moreover, we identified self-esteem as an important mediator. Especially self-esteem that is derived from close relationships (interdependent self-esteem) proved to be essential in the relation. We were able to replicate positive associations between power and self-esteem (Anderson et al., 2012), and for the first time tested this link in the context of romantic relationships. As in research that did not involve couples (Riek & Mania, 2012), self-esteem and forgiveness also showed a positive link. Finally, we replicated the positive effect of power on forgiveness (Karremans & Smith, 2010) but found this link for the first time in a dyadic setting. This research is therefore the second study to find a positive power-forgiveness relation and thus provides further evidence of the positive effect of power on forgiveness-related variables on which past theories (Kipnis et al., 1972; Keltner et al., 2003) and research did not yield a clear picture (e.g., Rusbult et al., 1991). Further, in using couple's data, we showed the relevance of considering interdependence in close intimate relationships because several partner effects were found.

The findings may benefit practitioners (e.g., in couples therapy). Empowering clients may have positive effects in highly committed relationships because power may lead to higher self-esteem, and self-esteem in turn may positively influence forgiveness, which is important for healthy and happy relationships (Webb & Toussaint, 2019).

Although our design has strong external validity, we cannot make claims about causality. Thus, future research may benefit from experimental methods and manipulate power in relationship partners to test effects on state forgiveness. It may be important to control for trait power in such an experiment (cf. Strelan et al., 2014). Further, this points to the equivalence of different structural equation models: The direction of the association of power with forgiveness may actually be the reverse. However, as several experiments have demonstrated that power increases self-esteem (e.g., Wojciszke & Struzynska–Kujalowicz, 2007), and as we measured power as a stable property of the relationship and self-esteem as a personality variable, it seemed

reasonable to use offense-specific forgiveness as the outcome. Nevertheless, using experimental or longitudinal designs would be helpful for establishing true mediation effects. Further, we did not measure commitment in our samples because we considered it high in romantic couples. Nevertheless, a commitment measure could be used in future research as a potential moderator. A final limitation pertains to the use of the interdependent self-esteem measure in only the Israeli sample. Upcoming research could test it in another clearly individualistic culture like Germany and in another even more clearly collectivistic culture.

Future research may also benefit from using additional relationship measures. The forgiveness scale we used was specifically designed for close intimate relationships and measured offense-specific forgiveness. Whether effects will be similar with more global forgiveness measures still needs to be addressed. Further, the philosopher Derrida (2001) distinguished between instrumental and authentic forgiveness. Are individuals being conciliatory by forgiving, or are they aiming to achieve some instrumental goals by forgiving? Different power variants could also be studied. We aimed to use a broad, psychometrically sound, well-established power scale, but distinguishing between power domains (e.g., Farrell et al., 2015) or measuring the need for power and dominance in the couple may provide additional insights. Partner's perceptions of power (i.e., how the partner perceives the influence of the other in the relationship) might also be studied as a predictor of forgiveness.

Altogether, experienced power was found to be an important variable for experiencing forgiveness—for both actors and partners. This relation was explained by the higher self-esteem of partners with social influence in their romantic relationship. Thus, as already noted by Gandhi 90 years ago, the strong and the powerful possess the attribute to forgive. Experiencing power may thus be important for a healthy relationship.

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Chapter 5

Power, Self-Esteem, and Body Image

Reference

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Abstract

We expected power, the perceived capacity to influence others, to be an antecedent of positive body image because power is closely linked to self-esteem, which in turn is linked to body image. In a cross-sectional study (N = 318), sense of power was positively related to body appreciation and satisfaction with one's appearance. Self-esteem partially mediated this effect. In an experimental study (N = 114), participants assigned to a high power group indicated more body appreciation, reported more body satisfaction, and estimated themselves to be taller than participants assigned to a low power group. Self-esteem mediated all the effects. Altogether, power affected body image directly but also indirectly through elevated self-esteem. Implications refer to clinical prevention and intervention programs.

Keywords: power, self-esteem, body height, personal sense of power, narcissism

5.1 Theoretical Background

5.1.1 Introduction

Power—the perceived capacity to influence others—changes how people think and feel (Guinote, 2017). It is a fundamental force that can account for social and intrapsychic processes (Keltner et al., 2003). As power dynamics are of major importance in everyday life and affect human functioning (Pratto, 2016), it is likely that they also affect how individuals perceive their physical appearance.

In general, people strive for positive self-perception and want to feel good about themselves (Taylor & Brown, 1988). Regarding one's body, moreover, respecting and appreciating various qualities and functions of the body are associated with several desirable correlates, such as life satisfaction, physical health, and less stress (Davis et al., 2020; Lobera, 2011). Yet, the factors that positively impact body image have only partially been identified (Piran, 2015; Tylka & Wood-Barcalow, 2015a). Whereas factors such as sexual orientation (Frederick & Essayli, 2016), attachment styles (Cash et al., 2004) or nature exposure (Swami et al., 2019) have been considered as antecedents, to the best of our knowledge, one important factor that has not yet been investigated is power. The present study is aimed at closing this gap by testing whether the experience of power is associated with body appreciation and body height. Self-esteem, which has been linked to both power and body perception, can be expected to mediate this relationship.

5.1.2 Conceptualizing Power

Power is most often defined as control over valued resources (Emerson, 1962; Keltner et al., 2003) or influence over other people (Dahl, 1957). Power can be differentiated into whether people actually possess power or whether they feel they have power. The first can be understood as *structural power* and can be manipulated through role assignment. The latter is called *personal sense of power* (Anderson et al., 2012) and describes an individual's perceived ability to influence others. Sense of power can be based on but can also be independent of sociostructural characteristics and may

actually be more predictive of various outcomes than the actual possession of power (Bugental et al., 1997).

Sense of power can be assessed as a stable trait (e.g., Schmid, 2018) or as a situation-specific state measure (Anderson et al., 2012). When manipulating power, researchers typically aim to instill a sense of power in participants (Tost, 2015) and test its downstream consequences. Clearly, the experience of power has effects on various spheres of life. It activates the behavioral approach system (Anderson & Berdahl, 2002), increases confidence (see Briñol et al., 2017), increases authenticity and well-being (Kraus et al., 2011), and impacts perception (Lee & Schnall, 2014). Overall, power energizes the thoughts and behaviors that are in line with the aims and values of the actor (Guinote, 2017; Keltner et al., 2003), an effect that also suggests that underlying dispositions may have stronger effects when a person has power. Thus, the effects of power and dispositions may interact to bring about certain outcomes.

5.1.3 Power and Body Image

To date, researchers who have studied power in relation to body-related measures have focused only on body height. Apparently, observers associate power with vertical expansion (Schubert, 2005). In this vein, terms in our daily language that refer to height (e.g., up, top) are associated with power (Giessner & Schubert, 2007). Thus, power differences have also been referred to as the vertical dimension of relationships. Tall people are more likely than short people to be seen as potential leaders (Blaker et al., 2013), and individuals in managerial positions on average are taller than other employees (Egolf & Corder, 1991). Further, body height has been reported to be positively correlated with sociostructural power characteristics, such as income or workplace success (Judge & Cable, 2004), and researchers have found that independent of participants' gender, experimentally induced power feelings lead participants to underestimate the size of others (Yap et al., 2013) and to overestimate their own body height in comparison with an inanimate object, their actual body height, and the height of an avatar in a video game (Duguid & Goncalo, 2012). Thus, there is evidence that power is linked to perceptions of body height.

Yet, body height is only one of various components of overall body image. A positive body image (which is considered distinct from a negative body image or components of overall body image such as body height) encompasses body appreciation, body acceptance and love, perceived beauty, appearance-related self-care, inner positivity, and filtering information in a body-protective manner (Tylka & Wood-Barcalow, 2015a). Body appreciation is considered the most central component of a positive body image (Tylka & Wood-Barcalow, 2015b), and this centrality is why we chose to focus on this component in the present study.

Body appreciation is characterized by seeing value in the features, functionality, and the health of one's body (Tylka & Wood-Barcalow, 2015a). Like personal sense of power, body appreciation can be measured as a state or as a trait. There is evidence that body appreciation is malleable: For example, a dissonance-based body image intervention and self-compassion meditation training were found to increase body appreciation (Halliwell et al., 2015).

Can experiencing power also increase body appreciation? We think so because power changes one's perception (Guinote, 2017; Lee & Schnall, 2014; Wang et al., 2018). For example, high power participants judged boxes to be less heavy than low power participants did (Lee & Schnall, 2014). Such effects do not seem to be restricted to the physical environment but are relevant to the evaluation of one's own physical properties (see Duguid & Goncalo, 2013). Moreover, influential individuals are perceived to be competent and confident (e.g., Anderson & Kilduff, 2009), and participants in expansive body positions, which signal power, are perceived to be more attractive (Vacharkulksemsuk et al., 2016). Thus, it seems plausible that not only powerful others are rated as more attractive than others, but also, an actor's power might activate such self-perceptions and boost body satisfaction and appreciation. Yet, most importantly, we believe that power affects body image because the experience of power increases self-esteem (e.g., Körner et al., 2021; Wojciszke & Struzynska–Kujalowicz 2007).

5.1.4 Self-Esteem as a Mediating Mechanism

On a broad level, power leads to confidence (see Briñol et al., 2017). Correlates and consequences of power (e.g., touching others, action orientation, breaking social norms) are often rooted in confidence (e.g., Carney et al., 2005; Galinsky et al., 2003; Guinote, 2017). Increases in confidence through power may be explained by learning experiences. When observing powerful others, people may observe disinhibited behaviors and confidence and associate these behaviors with power. In this vein, studies have shown that participants who experience high power report higher confidence and self-worth than those who experience low power (Briñol et al., 2007, 2009). Similarly, Wojciszke and Struzynska–Kujalowicz (2007) previously stated that "power and self-esteem go together" (p. 472). Experimental (Körner et al., 2021; Wojciszke & Struzynska–Kujalowicz, 2007) as well as correlational findings (Anderson et al., 2012; Körner, Heydasch, et al., 2022; Körner, Schütz et al., 2022; Wang, 2015) have shown that power is positively related to self-esteem. Therefore, we postulate a power-self-esteem hypothesis: Due to their ability to influence others and get their way as well as due to learning experiences, powerful people experience high overall self-esteem. In fact, self-esteem can be seen as a proximal mechanism of power, contributing to consequences such as agency (see Guinote, 2017). Yet, past research has tested whether power increases self-esteem without testing for the downstream consequences of such an increase in self-esteem.

Self-esteem is the positive global evaluation of the self (Baumeister, 1998). Having self-acceptance, self-respect, and self-worth protects against stress, anxiety, and social comparisons (e.g., Greenberg et al., 1992) and is an indicator of well-being (Orth & Robins, 2022; Ryff, 1989). Thus, it seems plausible that self-esteem is also related to body perceptions in a positive way, and a great deal of research has actually shown relevant associations: In adolescents as well as in adults, self-esteem has been found to be positively associated with body appreciation (Lobera, 2011; Tylka & Wood-Barcalow, 2015b). Self-esteem was also negatively associated with body dissatisfaction (van den Berg et al., 2011). Finally, patients with body dysmorphic disorder were

reported to have lower explicit as well as implicit self-esteem than nonclinical individuals (Buhlmann et al., 2009).

In clinical research, low self-esteem is seen as a risk factor for many body-related disorders (Polivy & Herman, 2002), and meta-analytical findings have supported the notion that low self-esteem is a precursor to eating disorders (Colmsee et al., 2021). In nonclinical intervention studies, self-related variables, such as self-compassion and self-esteem, have been reported to predict body satisfaction (e.g., Seekis et al., 2017, 2020). Low self-esteem is considered a risk factor for body image concerns, whereas high self-esteem is seen as a protective factor in developing a positive body image. Therefore, self-esteem interventions are often used to target body dissatisfaction and internalizations of a thin ideal (see O'Dea, 2004). In a longitudinal study with schoolgirls, low self-esteem predicted the development of eating problems 4 years later (Button et al., 1996). In another study with adolescents, self-esteem mediated the effect of an intervention that targeted body satisfaction (Armitage, 2012). Altogether, past cross-sectional, experimental, and longitudinal research indicates that self-esteem can predict body image. Thus, we expected self-esteem to be a mediator of the relationship between power and body image.

Yet, the effects of power may vary with stable dispositions (Chen et al., 2001; ten Brinke & Keltner, 2022). We assumed that inflated self-esteem, that is, narcissism (Foster et al., 2003), may be relevant to the power-body-image relationship because people with exceedingly positive self-views may report an overall positive body image independent of the experience of power. In other words, their body image would be high overall, regardless of further conditions.

5.1.5 Theoretical Relevance

This research is relevant to objectification theory (Fredrickson & Roberts, 1997). Objectification means that someone views less powerful people as a means to meet their own goals or needs. People lacking self-determination and agency are considered more likely to become targets of objectification (Nussbaum, 1999). As power is positively associated with self-determination, agency (Anderson et al., 2012), and self-

esteem, it is possible that power may also buffer people against becoming the target of objectification.

Valuing others only for their physical appearance and treating them as sexual objects is considered sexual objectification (Fredrickson & Roberts, 1997). When people have been the target of sexual objectification, they also tend to accept these views (Loughnan et al., 2017). Such self-objectification is negatively associated with self-esteem and body appreciation (Veldhuis et al., 2020). By contrast, when people experience power and in turn heightened self-esteem, their self-perception regarding their body may also change. Consequently, self-objectification, which has negative implications for health (e.g., Woodward et al., 2017), may be less frequent.

Studying power in relation to body image also provides a way to tentatively test aspects of the Developmental Theory of Embodiment (Piran & Teall, 2012). This theory proposes three domains that are relevant to a positive body image: physical freedom, mental freedom, and social power. Social power, which resembles the idea of personal sense of power (i.e., having influence, experiencing freedom, and being able to implement decisions) is most relevant to the present research and includes experiences of freedom due to not being confronted with prejudice, being treated fairly regardless of one's appearance, and being able to resist oppressive forces (Piran, 2015). Still, the other domains are related to power too: Safety and the connection to desire and pleasure (physical domain) are linked to power because power is linked to being able to satisfy pleasure motives (Keltner et al., 2003). Freedom of voice and action regardless of appearance (mental domain) pertain to power because power is associated with action tendencies and with behaving freely (Galinsky et al., 2003). As Piran (2015) wrote, "girls who are raised in social environments that nurture their assertive voice, power, passionate involvement in meaningful activities, and freedom to act in the world assertively have a more positive body image" (p. 152). Thus, the experience of social power should be particularly relevant to a positive body image. As power can be linked to consequences such as an action tendency (Galinsky et al., 2003), promotion focus (Keltner et al., 2003), and self-esteem (Wojciszke & Struzynska–

Kujalowicz, 2007), the experience of power should also be relevant for the other two domains described in the Developmental Theory of Embodiment.

5.1.6 Overview

We conducted two studies (one cross-sectional, one experimental) to investigate the effects of power on body height perception, body satisfaction, and body appreciation. First, we aimed to test whether powerful people describe themselves as taller than others. Second, we aimed to identify power as a potential antecedent of body satisfaction and body appreciation. Third, we tested whether self-esteem is a mediator of the power-body-image link.

Power is a sociorelational construct, and the question of how body image is shaped by social aspects is important (Tylka & Wood-Barcalow, 2015a). Moreover, if power is an antecedent of positive body image, power could function as a protective factor in developing positive body perceptions. Finally, the current research provides a test of the role of power in objectification theory (Fredrickson & Roberts, 1997) because this theory suggests that self-objectification marked by a lack of power is related to negative appearance evaluations. Altogether, our studies should contribute to the power literature by expanding the variables that power can predict. Our studies should also contribute to the body image literature by helping to provide a more complete understanding of the predictors (in this case, power) of body image.

5.2 Study 1

In this cross-sectional study, we assessed personal sense of power as a trait (see Anderson et al., 2012) to study whether generalized feelings of power are related to body image. Sense of power has been shown to be predictive of various outcomes and to be more relevant than objective power (Bugental et al., 1997; Körner & Schütz, 2021). Moreover, experienced power is the variable that is relevant for interventions, as it is easier to increase someone's sense of power in coaching or therapy (Huang et al., 2011) than to change a person's objective circumstances. We expected that sense of power would be positively associated with perceived body height (Hypothesis 1), body

appreciation (Hypothesis 2), and satisfaction with one's body (Hypothesis 3). We expected self-esteem to mediate the associations between power and body satisfaction (Hypothesis 4a), body appreciation (Hypothesis 4b), and body height (Hypothesis 4c). In an exploratory fashion, we tested whether narcissism would moderate the power-body-image relationship. The study was preregistered (https://aspredicted.org/blind.php?x=ez3gg5), and the hypotheses, sample size, scales, and data analytic strategy were specified before the data were collected. All data are available at https://osf.io/vfnyh/.

5.2.1 Method

5.2.1.1 Participants and Procedure

Participants were recruited from two German universities and via social media. Overall, 320 individuals completed the study. Two participants were excluded because they had implausibly fast processing times (Leiner, 2013).[10] The final sample comprised 318 participants. As the results did not differ between the full sample and the preregistered sample size (300), we used the larger sample. Due to a programming error, demographic data were available for only two thirds of the sample (data were compiled from two projects). Of these participants, 22% were male and 78% were female, with a mean age of 22.98 years (SD_{age} = 7.22, Range: 18 to 68).

The online survey began with questions about demographic data; followed by the scales for narcissism, power, and self-esteem; and finally, the body-image-related measures. The survey took around 20 min to complete.

5.2.1.2 Measures

Power was measured with the trait version of the German Personal Sense of Power Scale (*GPSPS*; Anderson et al., 2012; Körner, Heydasch, et al., 2022). The six items (e.g., "My ideas and opinions are often ignored") are rated on a scale ranging from 1 to 7 (*strongly agree*). Strict measurement invariance across sex has been demonstrated for the scale as well as satisfactory construct validity and high temporal stability (Körner,

[10] Results hardly differed when the excluded participants were retained in the analyses (see the Online Supplement: https://osf.io/vfnyh/ or Appendix D).

Heydasch, et al., 2022). In that study, the Cronbach's alpha coefficients were between .85 and .88. The coefficients for the present study are presented in Table 18. In addition, we report McDonald's ω total by using the robust maximum-likelihood estimator (MBESS package in R; Kelley, 2018).

The short form of the Multidimensional Self-Esteem Scale (*MSES*; Rentzsch et al., 2021) consists of 24 items (e.g., "Do you have a positive attitude toward yourself?") and was used to measure trait self-esteem. Some items are assessed with respect to intensity (1 = *not at all* to 7 = *very much*), some with respect to frequency (1 = *never* to 7 = *very often*). The items capture the following six topics: self-regard, social contact, social criticism, performance self-esteem, physical appearance,[11] and physical ability.

Two scales were used to measure aspects of body image: The Body Image State Scale (*BISS*; Cash et al., 2002) is a six-item measure of momentary evaluative and affective experiences involving one's own body. Responses were given on a 9-point scale (e.g., "Right now I feel… *extremely/mostly/moderately/slightly dissatisfied; neither dissatisfied nor satisfied; slightly/moderately/mostly/extremely satisfied* with my physical appearance"). For the present study, we used trait instructions ("In general, I feel…"). Cash et al. (2002) reported Cronbach's alpha values of .72 to .77. Further, the Body Appreciation Scale-2 was used (*BAS-2*; Tylka & Wood-Barcalow, 2015b). The scale assesses the acceptance of favorable attitudes toward one's body with 10 items (e.g., "I respect my body"). A 5-point scale was used. The authors reported Cronbach's alpha values of .93 to .97.

To assess perceived relational body height, we developed a 10-point pictorial measure and refer to this as the Body Height Scale (*BHS*). The conception of the scale was based on a pictorial body image scale by Petersen (2005) and addresses perceptions of oneself in relation to others. However, we did not vary body fat or muscularity but only body height. The *BHS* showed 10 silhouettes of a gender-neutral avatar (created in MakeHuman Version 1.1.0, 2016) in ascending order with respect to

[11] Note that the results hardly changed when the analyses were conducted without the physical appearance self-esteem subscale to minimize construct overlap between self-esteem and body satisfaction (see the Online Supplement or Appendix D).

body height. Participants were instructed to tick the avatar that best described their body height in relation to the other silhouettes.

Narcissism was measured with the Narcissistic Admiration and Rivalry Questionnaire (*NARQ*; Back et al., 2013). The total score for the NARQ was computed. High scores reflect the strong motivation of maintaining a grandiose self. A sample item is, "I deserve to be considered a great person." Answers were given on a scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). For Cronbach's alpha, Back et al. (2013) reported α = .74.

5.2.1.3 Data Analysis Strategy

We used SPSS Version 25 and PROCESS Version 3.3 (Hayes, 2012) for the data analyses.[12] Hypotheses were tested with mediation analyses using model 4 in PROCESS. Unstandardized regression coefficients (*b*) and one-tailed bootstrapped 95% Confidence Intervals (*k* = 10,000 samples) for the indirect effects were based on Davidson-MacKinnon heteroscedasticity-consistent standard errors (*SE*). For the direct, indirect, and total effects, partially standardized effect sizes (*ps*) were computed. They indicate the change in standard deviations on the criterion for a one-unit increase in the predictor. In an exploratory fashion, we tested the moderating role of narcissism using model 1 in PROCESS. One-tailed *p*-values are reported due to the directional nature of the hypotheses.

5.2.2 Results

Descriptive statistics for and correlations between all variables can be found in Table 18. In line with Hypothesis 1, power was positively associated with the *BISS* (*b* = 0.17, *p* = .041). In line with Hypothesis 2, power was positively associated with the *BAS-2* (*b* = 0.08, *p* = .021). Contrary to Hypothesis 3, there was no significant association between power and the *BHS* (*b* = 0.06, *p* = .329).

[12] We replicated (for both studies) all results in Mplus Version 7 with a model in which we tested the associations between power, self-esteem, and the three body-related dependent variables simultaneously.

Table 18

Study 1: Descriptive Statistics, Cronbach's Alpha Coefficients, McDonald's Omega Coefficients, and Zero-Order Correlations for Power, Self-Esteem, Narcissism, and Body-Related Measures

Variable	*M*	*SD*	1	2	3	4	5	6
1-Power	4.72	0.92	.82/.83					
2-Self-esteem	4.24	1.05	.54***	.94/.94				
3-Body satisfaction	6.22	1.73	.40***	.63***	.82/.82			
4-Body appreciation	3.61	0.80	.46***	.71***	.76***	.93/.93		
5-Perceived body height	4.92	2.00	.02	.01	.01	-.02	-	
6-Narcissism	2.48	0.83	.21***	.18**	.14*	.20***	.05	.73/.74

Note. Cronbach's alpha/McDonald's omega coefficients are presented on the diagonal.
*p < .05, two-tailed. **p < .01, two-tailed. ***p < .001, two-tailed.

Next, we tested whether self-esteem mediated the relationship between power and body image. Regarding the *BISS*, sense of power affected both the mediator and the outcome (see Table 19). The bootstrapped 95% CI of the indirect effect did not include zero [0.46, 0.73], which suggests that power had an increasing effect on the *BISS* through self-esteem. As both the direct and total effects were significant and the 95% CI did not include zero, self-esteem was found to be a partial mediator of the power-*BISS* relationship. This finding provides support for Hypothesis 4a.

In line with Hypothesis 4b, personal sense of power indirectly affected the *BAS-2* through self-esteem (see the 95% CI in Table 2, [0.25, 0.38]). Both the total effect and the direct effect were significant, which suggests that self-esteem partially mediated the relationship between power and the *BAS-2*.

Last, for perceived body height, the indirect effect did include zero in the bootstrapped 95% CI [-0.14, 0.13], which shows that self-esteem did not mediate the relationship between power and the *BHS* (see Table 19). This finding was contrary to Hypothesis 4c.

Narcissism was not a moderator. The effect of the interaction between power and narcissism did not have a significant effect on the *BISS* (p = .229), *BAS-2* (p = .405), or *BHS* (p = .087).

Table 19

Study 1: Results of Mediation Analyses Predicting Body-Related Variables (Y) From Power (X) Mediated by Self-Esteem (M)

	b	*SE*	*p*	95% CI	Effect size *ps*
Body satisfaction					
X → M (a)	0.62	0.06	< .001	[0.52, 0.72]	
M → Y (b)	0.96	0.10	< .001	[0.80, 1.11]	
X → Y (c′)	0.17	0.10	.041	[0.00, 0.33]	0.10
Indirect (a*b)	0.59	0.08	-	[0.46, 0.73]	0.34
Total (c)	0.76	0.10	< .001	[0.58, 0.93]	0.44
Body appreciation					
X → M (a)	0.62	0.06	< .001	[0.52, 0.72]	
M → Y (b)	0.50	0.04	< .001	[0.44, 0.57]	
X → Y (c′)	0.08	0.04	.021	[0.02, 0.15]	0.10
Indirect (a*b)	0.31	0.04	-	[0.25, 0.38]	0.39
Total (c)	0.39	0.05	< .001	[0.32, 0.47]	0.49
Perceived body height					
X → M (a)	0.62	0.06	< .001	[0.52, 0.72]	
M → Y (b)	-0.01	0.13	.466	[-0.23, 0.21]	
X → Y (c′)	0.06	0.14	.329	[-0.17, 0.30]	0.03
Indirect (a*b)	-0.01	0.08	-	[-0.14, 0.13]	0.00
Total (c)	0.06	0.12	.320	[-0.14, 0.25]	0.03

Note. p-values are one-tailed.

5.2.3 Discussion

This study is the first to directly study power in relation to body image. The hypotheses that power is positively associated with body appreciation and satisfaction with one's appearance were supported. Both relationships were partially explained by self-esteem. Yet, with respect to the other research question, there was no association between personal sense of power and body height. Despite experimental evidence of a strong relationship between size and power (Duguid & Goncalo, 2012), we did not find a relationship. Notably, other reports found trait sense of power as well as sociostructural power characteristics to be unrelated to body height (Heineck, 2005; Körner, Heydasch, et al., 2022). Perhaps only strong manipulations that instill strong feelings of power have the capacity to change self-perception so that individuals perceive themselves to be taller. We tested this assumption in the next study. Further, as the causal relationships and directions of effects between the constructs have yet to be clarified, we tested our hypotheses in an experimental design.

5.3 Study 2

Study 2 was designed as an experiment to assess whether differences in people's perceived positive body image depend on induced power. A scenario task was used as a power manipulation because such tasks have been found to reliably induce a sense of power (Galinsky et al., 2003). We expected that participants in the high power group would indicate higher body height (Hypothesis 1), higher body appreciation (Hypothesis 2), and higher body satisfaction (Hypothesis 3) than participants in the low power group. Self-esteem was hypothesized to mediate the effect of power on measures of body image (Hypotheses 4a-c). The study was preregistered (https://aspredicted.org/blind.php?x=zt5gz8). Again, in an exploratory fashion, narcissism was tested as a moderator of the relationship between power and body image.

5.3.1 Method

5.3.1.1 Participants

Participants were recruited online via university mailing lists, social media, and fora. A total of 122 participants completed the study. Eight participants were excluded because they gave implausible answers on the power manipulation task or had implausibly fast processing times (Leiner, 2013).[13] The final sample comprised 114 individuals (66% female, 33% male, 1% diverse). They were 30 years old on average (*SD* = 13.85, Range: 18 to 66). Participants lived all over Germany. The majority of the sample comprised university students (59%), and 36% were employed.

5.3.1.2 Procedure

We used a cover story to avoid demand effects. Participants were told that they were participating in a study on the relationship between specific life events and self-perception. They did not know that there were two experimental groups. Further, we did not employ a manipulation check for the power induction to avoid priming the topic of power. Moreover, in previous research, the manipulation had reliably produced differences in participants' sense of power (d = 1.613 for the difference between high and low power with 52 participants; d = 2.254 with 202 participants; see Chapter 6).

After providing demographic data and completing a questionnaire on narcissism, participants were randomly assigned to a high or low power group. In the high power group, participants were asked to imagine that they were in a leadership position of a student-led consultancy and had received applications from potential student employees. They were able to decide which applicants would be invited and to generate questions for the job interview. Participants in the low power group were asked to imagine that they had applied for a job at the student-led consultancy and that they very much needed a job to pay their expenses. They were instructed to write a letter of application. Then, they had to wait for a response and were finally rejected.

[13] The results hardly differed when the excluded participants were also part of the analyses (see the Online Supplement or Appendix D).

The manipulations contained the same situation (a job at the consultancy) for participants in both groups, but specific features were varied. The features that were varied were aligned with the typical tasks and environments that would go with a high power person (listing the requirements, being in an employed position) or a low power person (making a request/writing a letter of application, being unemployed; Keltner et al., 2003).

Afterwards, participants completed questionnaires on self-esteem and body image. After the data were collected, participants were debriefed via email.

5.3.1.3 Measures

The same questionnaires that were used in Study 1 were used to measure body image and narcissism (α = .77, ω = .78). The reliabilities are presented in Table 20.

To measure self-esteem, we used the State Self-Esteem Scale (*SSES*; Rudolph et al., 2020), which has been shown to be sensitive to experimental manipulations and does not measure trait self-esteem like the *MSES* from Study 1 does. With 15 items (e.g., "I am worried about looking foolish"), the scale captures performance-, social-, and appearance-based dimensions of self-esteem. Answers were given on a scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Rudolph et al. (2020) reported a Cronbach's alpha of .90 for the total scale.

5.3.1.4 Data Analysis Strategy

As preregistered, the effect of power on body image was tested using ANCOVAs that controlled for age and gender. Results are reported along with difference values (*D*) indicating the absolute difference between the high and low power groups. The mediation hypotheses were tested as in Study 1. The low power group was coded 1, and the high power group was coded 2. We computed partially standardized effect sizes (*ps*), which indicate the change in the standard deviations of the indirect, total, or direct effect when the predictor increases by one unit (i.e., when it changes from low power to high power). As in Study 1, we tested narcissism as a potential moderator. If an interaction term was significant ($p < .05$, one-tailed), conditional effects were

reported for the 16th (low), 50th (medium), and 84th (high) percentiles. Again, one-tailed *p*-values were reported for the hypothesis tests.

Table 20

Study 2: Descriptive Statistics (Means, Standard Deviations), Cronbach's Alpha Coefficients, McDonald's Omega Coefficients, and Zero-Order-Correlations for Self-Esteem and Body-Related Measures

Variable	Low Power		High Power		Group	1	2	3
	M	*SD*	*M*	*SD*				
1-Self-esteem	3.17	0.81	3.59	0.59	.29**	.92/.91		
2-Body satisfaction	5.33	1.64	6.45	1.39	.35***	.67***	.87/.89	
3-Body appreciation	3.48	0.74	3.86	0.67	.25**	.69***	.76***	.93/.93
4-Perceived body height	4.86	1.87	6.19	2.44	.28**	.49***	.56***	.44***

Note. Cronbach's alpha/McDonald's omega coefficients are presented on the diagonal.
*p < .05, two-tailed. **p < .01, two-tailed. ***p < .001, two-tailed.

5.3.2 Results

Descriptive statistics for and correlations between the dependent variables and self-esteem are presented in Table 20. In line with Hypothesis 1, we found a medium-sized effect of power on the *BISS*, $F(1, 110) = 14.22$, $p < .001$, $\eta_p^2 = .11$, with higher values for participants in the high power condition than for those in the low power condition ($D = 1.04$, $SE = 0.28$). Also, Hypothesis 2 was supported, as participants in the high power group scored higher on the *BAS-2* than those in the low power group, $F(1, 110) = 6.96$, $p = .010$, $\eta_p^2 = .06$ ($D = 0.34$, $SE = 0.13$). Regarding the *BHS*, $F(1, 110) = 7.63$, $p = .007$, $\eta_p^2 = .07$, as expected, values for participants in the high power condition were higher than values for participants in the low power condition ($D = 1.10$, $SE = 0.40$). Effect sizes for the *BAS-2* and *BHS* were also medium in size.

Next, we tested for whether self-esteem mediated the relationship between power and body image. Regarding the *BISS*, the independent variable (power manipulation) affected both the mediator and the outcome (see Table 21). The bootstrapped 95% CI of the indirect effect did not include zero [0.25, 0.94], which suggests that power

increased body satisfaction through self-esteem. As both the direct and total effects were significant, and zero was not included in the 95% CIs, self-esteem was a partial mediator of the power-*BISS* relationship.

Table 21

Study 2: Results of Mediation Analyses Predicting Body-Related Variables (Y) From Power (X) Mediated by Self-Esteem (M)

	b	*SE*	*p*	95% CI	Effect size *ps*
Body satisfaction					
X → M (a)	0.42	0.14	.002	[0.18, 0.66]	
M → Y (b)	1.38	0.19	< .001	[1.07, 1.69]	
X → Y (c′)	0.55	0.24	.012	[0.15, 0.95]	0.35
Indirect (a*b)	0.58	0.21	-	[0.25, 0.94]	0.37
Total (c)	1.13	0.30	< .001	[0.62, 1.63]	0.72
Body appreciation					
X → M (a)	0.42	0.14	.002	[0.18, 0.66]	
M → Y (b)	0.69	0.10	< .001	[0.52, 0.86]	
X → Y (c′)	0.09	0.12	.232	[-0.11, 0.28]	0.12
Indirect (a*b)	0.29	0.10	-	[0.12, 0.46]	0.40
Total (c)	0.37	0.14	.005	[0.14, 0.60]	0.52
Perceived body height					
X → M (a)	0.42	0.14	.002	[0.18, 0.66]	
M → Y (b)	1.48	0.25	< .001	[1.07, 1.89]	
X → Y (c′)	0.72	0.42	.044	[0.03, 1.41]	0.31
Indirect (a*b)	0.62	0.25	-	[0.25, 1.08]	0.27
Total (c)	1.34	0.41	.001	[0.66, 2.02]	0.57

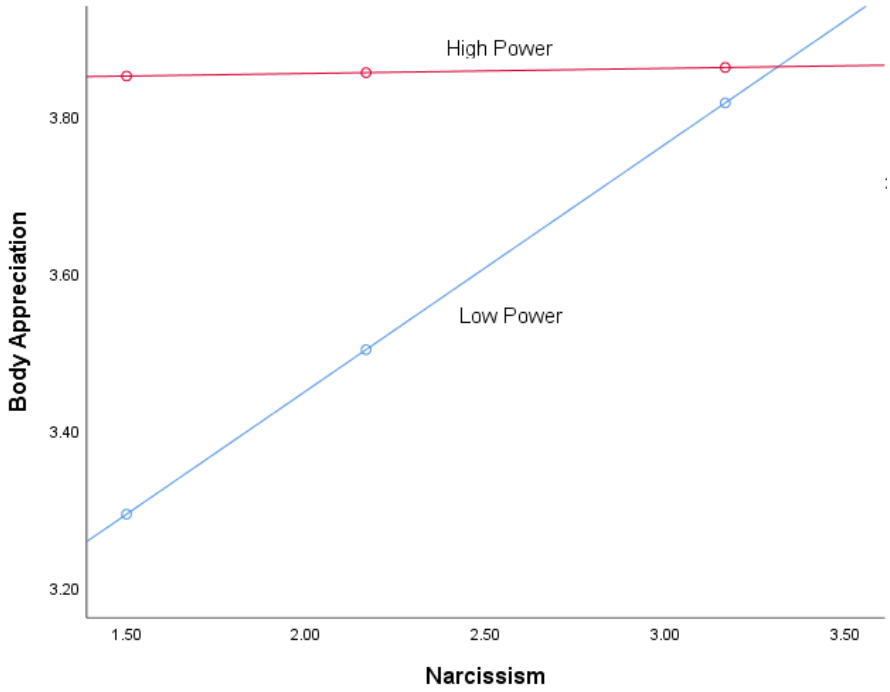
Note. p-values are one-tailed.

Power indirectly affected the *BAS-2* through self-esteem (see the 95% CI in Table 21, [0.12, 0.46]). Whereas the total effect was significant, the direct effect of power on the *BAS-2* was not significant. Thus, self-esteem fully mediated the relationship between power and the *BAS-2*.

Finally, the high power manipulation led to higher values on the *BHS* than the low power condition did—by augmenting self-esteem in participants. The total and direct effects were significant, and the indirect effect did not include zero in the bootstrapped 95% CI [0.25, 1.08], which shows that self-esteem partially mediated the relationship between power and the *BHS* (see Table 21). Altogether, the results of mediation analyses supported Hypotheses 4 a-c.

Figure 4

Study 2: Body Appreciation as a Function of Power and Narcissism



Exploratory analyses that tested whether narcissism moderated the effect of power on body image revealed no significant interaction for the *BISS* (p = .057) or the *BHS* (p = .195). Yet, the interaction between narcissism and the *BAS-2* was significant and negative, $F(1, 110) = 3.17$, p = .039, one-tailed, and explained 2.58% of the variance in

the criterion. The overall model explained 10.37% of the variance in the *BAS-2* scores. Simple slope analyses showed significant effects of power on the *BAS-2* when narcissism was low, $b = 0.56$, 95% CI [0.26, 0.86], $t = 3.08$, $p = .003$, or medium, $b = 0.35$, 95% CI [0.13, 0.58], $t = 2.60$, $p = .011$, but not when narcissism was high, $b = 0.05$, 95% CI [-0.31, 0.40], $t = 0.21$, $p = .835$. These results mean that participants in the high power group with low or medium levels of narcissism showed higher scores on the *BAS-2* than participants in the low power group did. Yet, for participants with high levels of narcissism, there was no significant difference in *BAS-2* scores between the two experimental groups.

5.3.3 Discussion

This experiment showed that participants in the high power group reported higher body satisfaction, body appreciation, and body height than participants in the low power group did. The effects were due in part to the higher self-esteem of the participants in the high power group in comparison with the participants in the low power group. For body appreciation, the difference between people in the high and low power groups was fully mediated by self-esteem, which underscores the importance of positive self-evaluations in the power-body-image link. Further, for people high on narcissism, there was no effect of power on body appreciation. It is likely that their self-views were already highly positive, so that it was not possible to increase the impact through the manipulation.

5.4 General Discussion

This research aimed to investigate the sometimes assumed but previously untested issue of whether power is an antecedent of positive body image. Power has been shown to change perceptual processes (Lee & Schnall, 2014) and make people confident (Briñol et al., 2017). For these reasons, we had expected that power might also make people more appreciative of their bodies. We measured relational body height as an aspect of overall body image, and we measured body appreciation and

satisfaction with one's appearance as aspects of positive body image. Self-esteem was assumed to be a mediating factor in these links.

The findings on body height differed between the studies. Whereas personal sense of power was not significantly associated with height in the cross-sectional study, in the experiment, we found that participants in the high power group pointed to a taller silhouette to describe themselves than participants in the low power group did. These findings dovetail with past research. Personal sense of power assessed as a trait was reported to be unrelated to body height (Körner, Heydasch, et al., 2022), whereas research that demonstrated an overestimation of one's body height was experimental (Duguid & Goncalo, 2012). On the basis of these findings, we assume that only a strong experience of high (or low) power has the potential to affect perceptual processes to such an extent that people perceive their physical properties or the size of others in a different way. Furthermore, these effects may be temporary. In everyday life, there are multiple occasions to validate one's relative height, so misperceptions might not persist.

With respect to body appreciation as a broad component of positive body image (Tylka & Wood-Barcalow, 2015a) and satisfaction with one's appearance as another important body-image-related variable, the results supported the hypotheses. In both studies, power was positively linked to body appreciation and body satisfaction. Apparently, power is an important antecedent of body image. Even in highly narcissistic people, power was related to positive body image in all but one test. Therefore, we do not consider narcissism to be an important moderator.

Self-esteem mediated the association between power and body image for both measures we employed. In Study 2, the direct effect of power on body appreciation became nonsignificant when self-esteem was added as a mediator. Thus, the impact of power on body image is due to the strong positive association between power and self-esteem (Körner et al., 2021; Wojciszke & Struzynska–Kujalowicz, 2007)—a finding that is in line with the fact that self-esteem has repeatedly been reported to be positively correlated with body image (e.g., Lobera, 2011). Thus, the power-self-esteem

proposition suggested in the theory section was supported as were the hypotheses describing self-esteem as a mediator of a positive body image.

Altogether, this is the first study to show power as an antecedent of positive body image. The results can be viewed as dovetailing with the Developmental Theory of Embodiment (Piran & Teall, 2012) in that social power and power-related proxies were shown to be highly relevant for positive body image. Power may in fact work as a protective factor against body-related threats. Both a generalized high sense of power and momentary feelings of high power apparently affect body appreciation. In a practical sense, it may be possible to use empowering interventions to promote a positive body image and possibly also help people develop the ability to make decisions and be assertive (Pratto, 2016). People who tend to engage in self-objectification and body surveillance (Fredrickson & Roberts, 1997) may also benefit from the experience of power. Future research could follow up on the findings presented here and design and test programs with empowering components—particularly in individuals with strong tendencies to engage in self-objectification. Further, clinical implications may be relevant for practitioners who treat patients with a low positive body image. If therapists aim to increase perceived power, such an increase in perceived power may also impact self-esteem and body satisfaction. An intervention could contain different training scenarios in which participants learn to make decisions and assert their own wishes and opinions to experience this kind of influence.

Yet, there are also boundary conditions that are relevant to the results presented here. On the one hand, when people in general think positively about their body and then experience power, this experience can increase their confidence in their body because power typically strengthens a person's reliance on their inner thoughts (Guinote et al., 2012; Weick & Guinote, 2008). A power intervention might thus further strengthen the person's positive body image. On the other hand, people who tend to think negatively about their body and then experience increased self-confidence through the experience of power may be in an incongruent state (Swann et al, 1987).

This power-induced self-confidence would not be in line with their preexisting thoughts (see the self-validation hypothesis; Briñol & Petty, 2003). Consequently, no or a negative effect of power on positive body image may emerge. Future studies could test these assumptions by considering a self-validation approach (Briñol et al., 2009) and assessing trait body image before an experimental manipulation of power. This reasoning also has implications for clinicians who work with patients with a very negative body image. Providing positive thoughts and emotions might be a prerequisite for obtaining the positive effects of empowerment on body-related perceptions.

Beyond their relevance in therapy, the findings may also extend the understanding of people in positions of power. Indeed, we investigated personal sense of power, but sense of power and actual power are typically correlated (e.g., Anderson et al., 2012), and in Study 2, participants experienced power from a high (or low) position of power. People who attain power in organizations may, due to stereotypes and implicit leadership theories, often be perceived as attractive (Cherulnik et al., 1990) and have a positive body image. In fact, leading positions typically require positive self-views regarding one's performance, social competencies, and even physical abilities and appearance. Imagine leaders who feel uncomfortable with their appearance and worry about how they are perceived—they may be distracted during important interactions or presentations and might thus not be effective. In turn, when people attain a position of power, a positive body image may develop. Future research may test whether people who have a successful career tend to have a positive body image. Of course, and as elaborated in the examples above, such an association could be bidirectional: Power may affect body image, and body image may affect power through self-perception and the perceptions of others and their feedback.

Body image researchers have called for a better understanding of mediators in intervention programs (Piran, 2015). We tested and found that self-esteem was a general and important mediator, but there may be other possible pathways from power to a positive body image. The Approach/Inhibition Theory of Power (Keltner et

al., 2003) posits that positive emotions are a consequence of power. However, evidence regarding this proposition has been mixed. Some researchers have found positive associations between power and mood (Berdahl & Martorana, 2006), whereas others have not (Galinsky et al., 2003; Smith & Bargh, 2008). Therefore, we do not think that mood would be a relevant alternative mechanism. However, authenticity was reported to be elevated by power (Kraus et al., 2011), and there is initial evidence that links authenticity to body satisfaction in adolescents (Impett et al., 2008). Future research could test authenticity as a possible mediator. Rumination or change in the focus of one's attention could also be relevant. As power is associated with action orientation and implemental thinking (Galinsky et al., 2003), powerful people may be less affected when confronted with threats regarding their appearance. Examining intermediate processes can help to further extend the understanding of how power affects positive body image. This idea is particularly emphasized by the Study 2 findings, which showed that self-esteem fully mediated the power-body-appreciation link, but with respect to body satisfaction, there was only a partial mediation—which suggests that additional processes may be relevant.

Yet, with respect to theory building, we were able to demonstrate that the positive effect of power on self-esteem also affects downstream consequences (i.e., body image measures). Upcoming studies should test other consequences of power (e.g., disinhibition) with self-esteem as a mediator. Doing so would strengthen the proposed power-self-esteem hypothesis and provide evidence regarding the question of whether self-esteem is an important aspect of power that needs to be integrated into existing power theories.

Limitations of this study pertain to the samples we used. In both studies, most participants were university students with only some employees. Testing associations between power and positive body image in community samples, with children, adolescents, or the elderly will help broaden the generalizability of the results. In addition, more gender-balanced samples would allow for tests of gender effects. Although effects of power are typically independent of gender (e.g., Smith & Trope,

2006), it may be useful to test the gender effect for a variable such as body height because height seems to be more important for men than for women (Stulp et al., 2013). As our research showed that power can impact perceived body height and image—future research and theorizing could address the possible relevance of gender in that relationship. Moreover, we used different study designs (i.e., cross-sectional and experimental), but to validate power as a protective factor, it would be exceedingly important to also employ longitudinal designs. For example, assessing sense of power and body appreciation at two points of measurement would be informative for developmental psychologists and may help clinical interventions. In addition, such a design would provide insights into whether body image might also affect social power. Indeed, we found that sense of power causes a more positive body image, but bidirectional effects are certainly possible. Further, the power manipulation used in Study 2 has been shown to reliably induce power feelings (i.e., social power), but personal power (i.e., self-efficacy, agency, perceived control; Overbeck, 2010) might also have been influenced. Personal power is strongly positively linked to social power as studied in the present research, but future research might benefit from disentangling the effects of social and personal power (see, e.g., Lammers et al., 2009) on body image. A final limitation refers to the cross-cultural comparability of the results. The effects of power and self-esteem on body image may depend on cultural factors (Torelli & Shavitt, 2010) because, in individualistic countries, autonomy and free will are emphasized to a greater degree than in collectivistic cultures. A cross-cultural test of the associations between power, self-esteem, and body image would be helpful for gaining insight into such possible differences.

There are several additional avenues for future research: We tested body appreciation as a broad component of positive body image, but there are other important facets. For instance, it might be interesting to test for how power is associated with body acceptance and love, authentic body pride (Castonguay et al., 2015), or filtering information in a body-protective manner. Power is related to changes in cognitive processes (Smith & Trope, 2006), and thus, power may also affect the

processing of (appearance-related) media information. Also, personal sense of power is positively correlated with authentic pride, and this association is significantly stronger than the association with hubristic pride (Körner, Heydasch, et al., 2022). Therefore, power may also have a positive impact on authentic body pride. These processes seem likely to be mediated by self-esteem too, as self-esteem is the affective core of authentic pride (Tracy et al., 2009) and is related to the perception of ideal beauty standards (Williams et al., 2014). Finally, we used cross-sectional and experimental designs to investigate effects of power on body image. Yet, the use of clinical methods, which is typical of prevention or intervention research, will be very helpful to further validate the effect of perceived power on positive body image. For example, researchers could study whether power measured at a first measurement point is a precursor of a positive body image at a second measurement point several years later. To analyze effects of power on self-esteem and body appreciation, a control group could be compared with an experimental group that receives a specific treatment that includes components that increase social power.

Overall, correlational as well as experimental evidence demonstrated a strong positive relationship between power and body appreciation as well as between power and body satisfaction, mediated by self-esteem. The findings are relevant for social and personality psychologists who aim to further their understanding of the consequences of power, but also for clinicians who aim to understand the antecedents of a positive body image. Therefore, we recommend that practitioners as well as researchers consider power as a relevant factor for self-esteem and for theories and interventions that address a positive body image.

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Chapter 6

"It Doesn't Matter if You Are in Charge of the Trees, You Always Miss the Trees for the Forest": Power and the Illusion of Explanatory Depth

Reference

Körner, R., Petersen, L.-E., & Schütz, A. (2022). *"It Doesn't Matter if You Are in Charge of the Trees, You Always Miss the Trees for the Forest": Power and the Illusion of Explanatory Depth* [Manuscript submitted to Current Psychology].

Abstract

Power increases overconfidence and illusory thinking. We investigated whether power is related to the illusion of explanatory depth (IOED), people's tendency to think they understand the world in more depth than they actually do. Abstract thinking was reported as a reason for the IOED, and according to the social distance theory, power increases abstract thinking. We linked these literatures and tested construal style as a mediator. Further, we considered narcissism as a moderator. In three studies, we manipulated or measured power. We found evidence for the IOED. Power led to overconfidence but had only a small impact on the IOED. Power and narcissism had a small interactive effect on the IOED. Implications refer to research on management, power, and overconfidence.

Keywords: power, IOED, construal style, narcissism, overconfidence

6.1 Theoretical Background

6.1.1 Introduction

Power holders' thinking and decision-making typically have a large impact on organizations and society. Thus, it is important to understand whether power holders are susceptible to cognitive biases and under which conditions their assessments may be flawed. For example, as president of Brazil, Jair Bolsonaro is at the top of a social hierarchy and has extensive power. When the COVID-19 pandemic was increasingly spreading around the world in 2020 and top physicians and epidemiologists urged caution about the risk of contagion, Bolsonaro called the coronavirus a flu and did not do much to bolster Brazil's health system or protect its citizens. Consequently, Brazil was among the countries worst affected by COVID-19 in 2020 (Walsh et al., 2020). If Bolsonaro had been asked how good his understanding of the virus and its consequences was, he may have been very confident about the depth of his knowledge—a reaction that could be considered typical of narcissists (Campbell et al., 2004) but may also be observed in others: When people who are confident about their knowledge are asked to explain specifically how something works, they often have to admit that their knowledge is lower than they thought before they had to provide such a detailed explanation. This phenomenon is called the illusion of explanatory depth (IOED; Rozenblit & Keil, 2002). Here, we investigated the impact of power on the IOED.

6.1.2 Power and Illusions

Power is understood as social influence (Anderson et al., 2012) and is grounded in asymmetric control over valued resources (Keltner et al., 2003). Whereas power can have several positive consequences (e.g., optimism, positive emotion, approach-related behavior; e.g., Anderson & Galinsky, 2006), it has also been reported to lead to illusory thinking. For example, research has shown that power increases confidence and leads to overconfident decision-making (Baron, 2000; Briñol et al., 2007; Fast et al., 2012; See et al., 2011; Tost et al., 2012). For example, high-power participants were more

likely to bet on extremely difficult questions than low-power participants despite low chances of winning (Fast et al., 2012). In another line of research, power was linked to an illusion of control (i.e., power holders believed they could influence outcomes that were beyond their reach; Fast et al., 2009). Further, power can lead to transparency illusions: Powerless people overestimated the extent to which their internal states were salient to observers (Garcia, 2002), whereas powerful people overestimated how accurately subordinates perceived feedback (Schaerer, Kern, et al., 2018). The aforementioned findings suggest that power is related to biases in thinking and decision-making that could be beneficial or harmful for oneself but also for others (Taylor & Brown, 1988). However, to more fully understand whether power is related to cognitive biases one prominent illusion that has not yet been related to power should be studied: The IOED.

The IOED describes people's tendency to think they understand the world in more detail, coherence, and depth than they actually do. People only become aware that they are subject to this illusion when they attempt to explain the details of a phenomenon. Rozenblit and Keil (2002) found this type of illusion only with respect to causal explanatory knowledge. In their original study, participants learned how to use a 7-point scale to assess their level of understanding of certain phenomena (Rozenblit & Keil, 2002). First, participants rated their level of understanding for various items. Then, they had to provide step-by-step explanations for selected items and afterwards rate their level of understanding for these items again. There was a reduction in self-assessed understanding between preexplanation and postexplanation ratings. When they had to provide explanations, people understood that they had overestimated the depth of their understanding. This illusion was domain-specific and pertained only to causal knowledge (Keil, 2006), such as complex devices or natural phenomena (e.g., "How a sewing machine works"). The IOED does not pertain to facts or simple procedures (e.g., "How to bake a cake"). With these latter types of knowledge, people typically have exact assessments of how deep their understanding is because they have more experience with assessing their knowledge depth in these domains and these

domains are more transparent, i.e., participants know the steps leading to a satisfying response. In later research, the IOED was demonstrated with causal knowledge regarding mental disorders (Zeveney & Marsh, 2016), health improvement, climate protection (Bromme et al., 2016), and policy (Alter et al., 2010; Fernbach et al., 2013; Vitriol & Marsh, 2018). Moreover, the IOED was reported to also occur in children (Mills & Keil, 2004).

Importantly, the IOED is different from overconfidence as the IOED pertains only to a specific type of knowledge (complex causal explanations; Keil, 2006) and requires awareness (i.e., a conscious change in self-assessments occurs). Further, overconfidence is more generalized (i.e., related to the self but not to specific knowledge domains) and is typically studied by comparing participants' confidence in answering questions with their performance (Moore & Healy, 2008).

6.1.3 Postulating a Moderated Mediation Model

Different reasons have been proposed for why the IOED occurs (e.g., people seldom provide explanations and are consequently bad at assessing the depth of their knowledge, explanations have indeterminate end states, Rozenblit & Keil, 2002; people confuse knowledge that others provide with their own, Sloman & Rabb, 2016; Rabb et al., 2019). Alter et al. (2010) conducted five experiments and reported that an abstract construal style led to the IOED. Abstract information processing comprises a focus on core aspects of information and the necessity to extract the gist (i.e., the deeper meaning) of an object or issue. Abstract construals are broad, general, and superordinate, whereas concrete construals focus on specific features (Trope & Liberman, 2010).

Another line of research demonstrated that power is associated with abstract information processing (Huang et al., 2011; Nissan et al., 2015; Smith & Trope, 2006) and abstract language (Magee et al., 2010), which makes sense because leaders need to see the big picture and take long-term goals into perspective (Guinote, 2017). A central element of the social distance theory of power is that power leads to abstract information processing (Magee & Smith, 2013). An abstract construal style, a focus on

higher order goals, and long-term desires are regarded as necessary and positive consequences of power: "After all, it seems most logical and profitable to make decisions that are driven by goals and values rather than by the small details" (Smith & Trope, 2006, p. 593).

We linked the literature on power and construal style (Smith & Trope, 2006) with the literature on construal style and the IOED (Alter et al., 2010) and expected that there may be a dark side of abstract thinking: Power may increase the IOED. In other words, we expected a larger IOED (i.e., a larger difference between preexplanation and postexplanation ratings) for high-power participants as compared with low-power participants. (We did not make specific predictions whether a larger IOED would be driven by increased preexplanation or decreased postexplanation ratings but based on the literature the former can be considered the relevant component.) According to the theorizing above, we expected abstract information processing to be a mediator: Power should increase abstract thinking and abstract thinking should go along with a stronger IOED (greater difference between preexplanation and postexplanation rating).

So far, construal style has not been considered as a mediator in the effects of power and thus the present research may provide evidence for distal predictions derived from the social distance theory of power, i.e., construal style as consequence of power explains how power holders ultimately think and behave. Moreover, this research will contribute to the ongoing debate whether power has positive or negative effects in actors (Galinsky et al., 2015; Guinote, 2017). This would dovetail with previous research which has often identified other predisposition and values to determine whether power has prosocial or antisocial consequences (Overbeck & Park, 2001, 2006; Tost, 2015).

The same argument applies to cognitive illusions, which is why we considered it relevant to test whether narcissism would be a potential moderating factor in the power-IOED link. Interindividual differences can moderate effects of power on outcomes. It thus seems likely that people who tend towards overconfidence would

become even more overconfident when they have power. We considered narcissism as a relevant moderator because narcissism is associated with self-enhancement (Campbell et al., 2000; John & Robins, 1994) and overconfidence (Campbell et al., 2004). Narcissists think they are more intelligent than they actually are (Gabriel et al., 1994) and are thus subject to illusory thinking just like power holders'. Power typically leads to trait-behavior-correspondence and thus increases in the expression of the authentic self (e.g., Chen et al., 2001). Thus, it can be assumed that a boost of power in narcissists increases their tendency to overestimate their own knowledge. In line with that reasoning, researchers suggested to study effects of power and narcissism together (Fast et al., 2012) and it was shown that power and narcissism can increase overconfidence (Macenczak et al., 2016). Whereas the IOED is distinct from general overconfidence, we expect that the Power x Narcissism interaction may generalize across illusions and biases and thus expect higher degrees of narcissism to augment the power-IOED link.

6.1.4 Overview

We conducted three studies in which participants completed the IOED paradigm. Additionally, participants' explanations were rated by judges to provide an objective indicator of the IOED. Consequently, we were able to contrast the IOED as subjective change in knowledge assessment as previously done with this objective indicator. Note that we use the term IOED also with the analysis of the observer ratings but actually this new measure may be considered a variant of the IOED as it reflects how well participants estimates are calibrated in relation to an objective criterion. We consider it useful to add this measure to know whether the rating actually diverges from objective standards. To ensure a potent induction of power, we pretested the power manipulations (see Online Supplement or Appendix E).

In Study 1, we compared the effect of power on the IOED with the effect of power on overconfidence. In Studies 2 and 3, we tested a model with construal style as a mediator and narcissism as a moderator of the power-IOED link. Power was manipulated (Studies 1 and 2) or assessed with an established scale aimed at

measuring general power feelings (Study 3). Finally, we conducted a mini meta-analysis on our experiments and checked the evidential value of previous studies on the mediating process. We report all manipulations, measures, and exclusions in all the studies we conducted (https://osf.io/p5kw3/).

6.2 Study 1

In the first experiment, we aimed to analyze the direct effect of power on the IOED and additionally compared this effect with the effect of power on general overconfidence. To address the latter question, knowledge type (how devices work as examples of causal explanations vs. procedures) was designed as a between-subjects factor. Rozenblit and Keil (2002) emphasized that the IOED is a cognitive illusion that occurs only with complex causal patterns, whereas overconfidence is a phenomenon that occurs across knowledge domains. Further, empirical findings (Mills & Keil, 2004; Rozenblit & Keil, 2002) and theoretical considerations (Keil, 2006) have provided evidence that the IOED and general overconfidence are different constructs. For example, the IOED is defined as a change in self-assessments, whereas overconfidence is typically apparent when comparing participants' performance with an objective criterion. Thus, an overestimation of knowledge of procedures (compared with a criterion, here judges' ratings) reflects overconfidence, whereas an overestimation of causal knowledge (e.g., with devices) reflects the IOED. We aimed to provide evidence about the question of whether power specifically promotes the IOED or general overconfidence or both. On the basis of prior findings (e.g., Fast et al., 2012), we expected to find positive effects of power on both the IOED and general overconfidence. To provide a valid measure of overconfidence and additionally to add an objective measure of the IOED, judges rated participants' explanations. This enabled us to contrast results from self-report and observer ratings.

6.2.1 Method

6.2.1.1 Participants and Design

We determined our sample size a priori using G*Power on information from studies on the IOED (Alter et al., 2010) and power and overconfidence (Fast et al., 2012) to obtain a valid effect size estimate (see https://aspredicted.org/blind.php?x=qj2cr5). The required sample size was 62 for between-subjects effects (ANOVA, α = .05, 1-β = .80, f = .36). We targeted a more conservative sample size because we wanted to be able to detect even small to medium effects and to have enough participants for analyses after exclusions. Thus, we intended to recruit at least 120 participants. Participants were recruited via email lists and through university courses. In total, 164 participants participated. One person was excluded due to language problems. The final sample comprised 163 individuals, mostly (97%) university students (85% women; M_{age} = 23.19, *SD* = 7.45, 17 to 64). As an incentive, participants were offered course credit or financial compensation (5€).

We used a 2 (between-subjects factor power: high vs. low) x 2 (between-subjects factor knowledge domain: devices vs. procedures) x 2 (within-subjects factor measurement time: t1 vs. t2 [self-report] or explanation [observer rating]) design. The measurement time factor refers to (a) the comparison of participants' self-ratings only and (b) the comparison of participants' self-ratings at t1 with judges' ratings. For the latter, five judges read the explanations provided by the participants and rated participants' level of understanding on the same scale as the participants did (see IOED Task). The judges were undergraduate students who had been trained to score explanations on the 7-point scale. Judges did not know the participants. (Detailed results of how power affects the various components of the IOED, that is, preexplanation ratings, judges' ratings, and postexplanation ratings, can be found in the Online Supplement or Appendix E.)

6.2.1.2 Procedure

Participants were told that they would take part in a study concerning social and cognitive abilities. After providing informed consent, participants completed

questions about demographics and read the instructions for the IOED task. Then, power was manipulated, and the manipulation check items followed. Then, participants assessed their understanding of 19 items, provided explanations for three items, and reassessed their level of understanding of these items. Finally, control items were answered. The experiment took approximately 1 hr to complete.

Power Manipulation. We used the flat-sharing scenario that was validated in the pilot study. Participants were randomly assigned to the high- (select a flatmate) or low-power (apply for a room in an unattractive apartment) group. The manipulation check consisted of the pretest items ("dominant," "inferior," "in charge," "powerless"; α = .83) that were presented along with eight filler items (emotion words) to distract participants from the experimental hypotheses. Agreement with the items was rated on a scale ranging from 1 (*not at all*) to 7 (*extremely*).

IOED Task. First, participants learned how to use a 7-point scale to indicate their level of understanding. Participants were instructed to choose the 1 on the scale if they knew nothing or nearly nothing about how a device/procedure works, the 4 if they assessed their knowledge as moderate, and the 7 if they thought they knew (nearly) everything about the procedure/device. After two sample items, two control items were implemented to assess whether participants correctly understood the instructions. The standard IOED task followed later (see Rozenblit & Keil, 2002). Participants rated how well they thought they understood 19 phenomena (t1). Then, they were asked to explain three of these phenomena in written form and with supporting drawings if desired. After each item, they assessed how well they thought they understood the item (t2). The test items for devices were zipper, sewing machine, and tachometer. The items for procedures were how to tie a tie, how to drive from one German city (Bamberg) to another (Nürnberg), and how to cook pasta.

Control Items. For the power manipulation, we used the same control items as in the pilot study (identification with the role in the scenario, motivation for the task, empathizing with the role). For the IOED task, we asked how motivated participants were to provide good explanations, how much effort they put into the task, and how

seriously they had worked on the task. Responses were given on a scale ranging from 1 (*not at all*) to 7 (*extremely*).

6.2.2 Results

6.2.2.1 Manipulation Check

A one-way ANOVA with group as the between-subjects factor and feelings of power as the dependent variable was significant, $F(3, 157) = 45.287$, $p < .001$, $\eta_p^2 = .464$. Post hoc Scheffé tests showed that participants in the high-power groups did not differ significantly from each other (devices: $M = 5.32$, $SD = 0.86$; procedures: $M = 5.34$, $SD = 0.85$; $p = 1.00$), and neither did participants in the low-power groups ($M = 3.65$, $SD = 1.17$; $M = 3.23$, $SD = 1.22$; $p = .365$). However, and most importantly, participants in the high-power groups reported higher feelings of power than participants in the low-power groups did (all ps $< .001$, ds ≥ 1.613).

Table 22

Descriptive Statistics for the Four Groups in Experiment 1

	Before exclusion ($N = 163$)			After exclusion ($N = 135$)		
Condition	Pretest	Posttest	Observer rating	Pretest	Posttest	Observer rating
HD	2.61 (1.05)	2.10 (0.96)	2.14 (0.60)	2.85 (1.07)	2.30 (0.98)	2.28 (0.62)
LD	2.53 (0.94)	2.33 (0.91)	2.53 (0.73)	2.59 (0.93)	2.34 (0.89)	2.58 (0.75)
HP	4.43 (0.89)	4.22 (0.98)	3.88 (1.10)	4.40 (0.94)	4.24 (1.03)	3.96 (1.01)
LP	4.24 (1.05)	4.28 (0.93)	4.20 (0.95)	4.32 (0.99)	4.32 (0.90)	4.26 (0.96)

Note. HD = High-power devices, LD = Low-power devices, HP = High-power procedures, LP = Low-power procedures.

6.2.2.2 Main Analyses – Self-Ratings

Descriptive statistics across all condition are displayed in Table 22. A three-way repeated-measures ANOVA showed a main effect of knowledge, $F(1, 159) = 179.609$, $p < .001$, $\eta_p^2 = .530$, meaning that the overall level of understanding was higher for procedures than for devices. There was also a main effect of time, $F(1, 159) = 17.804$, p

< .001, η_p^2 = .101, indicating that knowledge assessment at t1 were higher than at t2. The main effects were qualified by a Power x Time interaction, $F(1, 159) = 6.962$, p = .009, η_p^2 = .042, suggesting that ratings in the high-power groups decreased to a larger extent from t1 to t2 than ratings in the low-power groups. Finally, there was also a Knowledge x Time interaction, $F(1, 159) = 6.559$, p = .011, η_p^2 = .040. Participants' self-rated understanding about devices decreased more than their self-rated understanding about procedures. The three-way interaction was nonsignificant. Thus, power did not lead to a higher overestimation for devices than for procedures.

Remember we expected to find a larger IOED for high-power than for low-power participants. When analyzing types of knowledge separately, we found that the IOED (devices) was present for participants in both power groups (main effect of time), $F(1, 80) = 22.717$, $p < .001$, η_p^2 = .221, and was indeed stronger for high- than low-power participants: The first showed a greater decrease in self-ratings than the latter, $F(1, 80) = 4.398$, p = .039, η_p^2 = .052 (Power x Time interaction). There was no support for a change in self-assessments for procedures as neither the main effect nor the interaction were significant (ps ≥ .107), which provides support for the domain-specificity of the IOED.

When excluding participants who scored 4 or lower on the control items (N = 27, see the preregistration), the results of the three-way ANOVA remained similar (see the Online Supplement or Appendix E for detailed results). The two-way ANOVA for devices showed evidence of the IOED, $F(1, 63) = 23.369$, $p < .001$, η_p^2 = .271, but the Power x Time interaction missed the conventional level of significance, $F(1, 63) = 3.414$, p = .069, η_p^2 = .051. The two-way ANOVA for procedures again showed no significant main effect of time and no significant interaction (ps = .305).

6.2.2.3 Main Analyses – Observer Ratings

We first assessed interrater agreement using the intraclass correlation. The raters showed high consensus in their assessments of procedures, M(ICC[2, 1/5]) = .87/.97, and devices, M(ICC[2, 1/5]) = .57/.86. Please note that the analyses concerning the observer ratings were exploratory and not preregistered.

As with the self-ratings, a three-way repeated-measures ANOVA showed a main effect of knowledge, $F(1, 159) = 188.608$, $p < .001$, $\eta_p^2 = .543$, and a main effect of time, $F(1, 159) = 13.462$, $p < .001$, $\eta_p^2 = .078$. In other words, level of understanding was higher for procedures compared with devices and higher for the self-rating at t1 compared with the judges' ratings. Only the Power x Time interaction was significant, $F(1, 159) = 11.275$, $p < .001$, $\eta_p^2 = .066$; the scores in the low-power group did not differ between t1 and the judges' ratings, but for the high-power group, the judges' ratings were lower than the self-ratings (see Table 22).

Next, we analyzed the types of knowledge separately. For devices, there was a main effect of time, $F(1, 80) = 5.855$, $p = .018$, $\eta_p^2 = .068$, indicating the presence of the IOED. This main effect was qualified by a Power x Time interaction, $F(1, 80) = 5.855$, $p = .018$, $\eta_p^2 = .068$. The IOED was stronger for participants in the high-power group and absent for participants in the low-power group.

The focal test of whether power leads to overconfidence is the Power x Time interaction with procedures as knowledge type. There was a significant main effect of time, $F(1, 79) = 7.591$, $p = .007$, $\eta_p^2 = .088$, qualified by the Power x Time interaction, $F(1, 79) = 5.467$, $p = .022$, $\eta_p^2 = .065$. Participants in the high-power group showed a larger discrepancy between their self-ratings at t1 and the judges' ratings than participants in the low-power group. Thus, high-power participants experienced overconfidence compared with low-power participants who hardly ever showed overconfidence.

Again, the results of the two- and three-way ANOVAs after removing participants who scored 4 or lower on the control items remained similar (see the Online Supplement or Appendix E).

6.2.3 Discussion

First, the findings demonstrated that the IOED was present for all participants and was distinct from overconfidence—an overestimation for procedures was only found when considering observer ratings but not when comparing self-ratings across measurement times. The IOED occurred for both self-ratings and observer ratings: when comparing

self-ratings at t1 with self-ratings at t2 and when comparing self-ratings at t1 with observer ratings.

Second and more importantly, we found initial evidence that power affected both the IOED and overconfidence. With respect to the comparison of self-reports across the two measurement times, results suggested that power slightly increased the IOED. With respect to the comparison of self-reports with observer ratings, we again found that the IOED was more pronounced in the high-power group than in the low-power group. Self-assessments of knowledge depth of procedures were not affected by power. In addition, we found that high-power participants showed overconfidence, whereas low-power participants did not. This result dovetails with the nonsignificant effect of power on knowledge depth for self-rated procedures because overconfidence can only be assessed on the basis of an objective criterion (e.g., Kwan et al., 2008). As the effect of power on the IOED was small, we aimed to replicate this finding.

6.3 Study 2

In this study, we examined the effect of power on the IOED and tested construal style as a mediator of this relation (Alter et al., 2010; Smith & Trope, 2006). As much research has shown a positive effect of power on abstract information processing (see Magee & Smith, 2013), we expected that high power would lead to a more abstract construal style than low power and in turn to a higher IOED (Alter et al., 2010). Additionally, we tested whether narcissism would magnify the link between power and the IOED. As in Study 2, judges rated participants' explanations to provide evidence of whether power affects the IOED if additionally measured with an objective criterion.

6.3.1 Method

6.3.1.1 Participants and Design

We aimed to gather a sample of 200 participants to have sufficient power to test for mediation via bootstrapping and recruited slightly more individuals to have enough power after exclusions (https://aspredicted.org/blind.php?x=qz782i). Participants were recruited via email lists, social media, and on campus. In total, 208 individuals

took part. We excluded four participants because they did not complete the IOED or scenario task and two participants because they had implausible values on the control items for the IOED instructions, which suggested that they did not understand the instructions (i.e., ticking a 1 when an explanation was very exhaustive). The final sample consisted of 202 individuals (98% university students; 75% women; M_{age} = 22.50, *SD* = 4.30, 18 to 54). We offered course credit and 10 x 10€ Amazon vouchers for those who performed best on the tasks to ensure careful responding.

There was one between-subjects factor (power: high vs. low) and one within-subjects factor (measurement time: t1 vs. t2 [self-report]/explanation [observer rating]). Again, five trained judges rated participants' level of understanding from participants' written explanations.

6.3.1.2 Procedure

The procedure was identical to Study 1 except that two scales were added (narcissism, construal style), a different power manipulation was used, and two instead of three devices were used in the IOED task to keep the experimental time identical to that of Study 1. Participants were told that the study was on social and cognitive abilities. Participants completed questions on demographics and a narcissism questionnaire. Next, they read the instructions for the IOED task. The power manipulation followed (see Pilot Study 2 in the Online Supplement or Appendix E) for which participants were randomly assigned to the high (being in a leading position and choosing between applicants) or the low-power (applying for a job) group (Cronbach's α for the manipulation check = .83). Then, they completed a measure of construal style. Following that, they completed the IOED task (see Study 1). Test items were how a zipper works and how a toilet flushes. Finally, control items were given. The experiment took approximately 1 hr.

6.3.1.3 Measures

To measure construal style, we used the *Behavior Identification Form* (Vallacher & Wegner, 1989). Participants were informed that behaviors can be identified in different ways. Then they chose one of two alternatives for certain behavior (25 items; e.g.,

"making a list: (a) getting organized vs. (b) writing things down" representing (a) a high-level construal or (b) a low-level construal). State instructions were given prior to the items. Cronbach's alpha was good (α = .80).

The short form of the *Narcissistic Admiration and Rivalry Questionnaire* (NARQ; Back et al., 2013) was used to assess narcissism. The scale captures the facets Admiration (three items; e.g., "Being a very special person gives me a lot of strength") and Rivalry (three items). Responses were given on a scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Cronbach's α was .72.

6.3.2 Results

6.3.2.1 Manipulation Check

Participants in the high-power group (M = 4.65, SD = 1.13) reported significantly higher power feelings than those in the low-power group (M = 2.32, SD = 0.89), $t(200) = 15.890$, $p < .001$, d = 2.254. Thus, the manipulation was effective.

6.3.1.2 Main Analyses - Self-Ratings

We conducted some preliminary analyses: Narcissism did not differ between groups (p = .597), suggesting that the variable could be used as a moderator. However, construal style did not differ between the groups either (high power: M = 14.46, SD = 4.61; low power: M = 14.25, SD = 4.70), $t(200) = 0.315$, p = .753, indicating that it might not be an appropriate mediator. Further, construal style was not significantly correlated with the difference score for the IOED (t1-t2), $r(200) = -.07$, p = .320, which is why a mediation through construal style would be implausible.

Table 23 presents descriptive statistics for the IOED scores. When computing a repeated-measures ANOVA with self-ratings as the within-subjects factor and power as the between-subjects factor, we found evidence of the IOED because the main effect of time was significant, $F(1, 200) = 13.217$, $p < .001$, $\eta_p^2 = .062$. Self-ratings at t2 (M = 3.13, SD = 1.32) were significantly lower than self-ratings at t1 (M = 3.38, SD = 1.32). However, neither the main effect of power (p = .696) nor the interaction (p = .436) were significant.

Table 23

Descriptive Statistics for Experiment 2

	Before exclusion (N = 202)			After exclusion (N = 136)		
Condition	Pretest	Posttest	Observer rating	Pretest	Posttest	Observer rating
High power	3.33 (1.33)	3.13 (1.39)	3.41 (1.19)	3.49 (1.45)	3.30 (1.50)	3.45 (1.15)
Low power	3.45 (1.30)	3.14 (1.22)	3.54 (0.91)	3.38 (1.11)	3.14 (1.23)	3.57 (0.96)

Using Model 5 in PROCESS, we conducted a moderated mediation analysis with power (1 = high power, 2 = low power) as the predictor, construal style as the mediator, narcissism as the moderator, and the IOED (t1-t2) as the outcome. One-tailed *p*-values are reported in the following because the model allowed us to test all of our one-tailed hypotheses. The results mirrored those from the preliminary analyses: There were no significant effects of power on construal style or the IOED, nor was there a mediation by construal style. The Power x Narcissism interaction was also not significant (see the Online Supplement or Appendix E).

When we excluded participants who scored below the theoretical midpoint of the control scale, the results did not change much (see the Online Supplement or Appendix E). Again, there was no difference in construal style between the power groups (high power: M = 14.82, SD = 4.63; low power: M = 14.03, SD = 4.65), $t(132) = 0.978$, $p = .330$. Evidence of the IOED was found (main effect of time), $F(1, 134) = 6.466$, $p = .012$, $\eta_p^2 = .046$, but neither the main effect of power ($p = .541$) nor the interaction ($p = .803$) were significant. Construal style was not related to the IOED, $r(134) = -.02$, $p = .816$, and the moderated mediation model showed no significant direct or indirect effects. Yet, narcissism moderated the power-IOED link ($p = .047$, one-tailed), indicating that for high-power participants, the IOED was more pronounced the higher the participant's narcissism score was. Note that the lower limit of the 95% CI was negative [-0.07], and the result should thus be interpreted with caution.

6.3.1.3 Main Analyses – Observer Ratings

The raters showed high consensus in their assessments, *M*(ICC[2, 1/5]) = .85/.97. Construal style was only weakly correlated with the IOED (t1-observer rating), $r(200) = .109$, $p = .124$. When computing a repeated-measures ANOVA with power as the between-subjects factor and measurement time as the within-subjects factor, no significant main effects nor a significant interaction were found (*p*s > .314; see Table 23 for descriptive statistics).

Results of a moderated mediation analysis showed no significant effects. When excluding participants who scored below 4 on the control items, we found weak evidence of an effect of construal style on the IOED, $b = 0.05$, $p = .042$, one-tailed, 95% CI [-0.01, 0.11]. The Power x Narcissism interaction was close to the conventional level of significance ($p = .063$, one-tailed), suggesting that with higher narcissism, the effect of power on the IOED became larger. No other effect was significant.

6.3.2 Discussion

As in Study 1, we found support for the IOED.[14] However, with both types of assessment (comparing self-ratings across measurement times as the classical approach for assessing the IOED or when comparing self-ratings at t1 with observer ratings to assess participants' degree of calibration of their own knowledge), there was no evidence of an effect of power on the IOED despite a very strong power manipulation. Further, there was no effect of power on construal style, and construal style was not reliably related to the IOED, which is why the mediation model was rejected. There was some evidence that narcissism moderated the power-IOED link so that high power coupled with high narcissism led to the strongest IOED.

Why did we not find evidence of an effect of power on the outcomes in this study? One possibility is that power actually has no effect on the IOED because the IOED is too stable to be affected by specific states. Alternatively, our incentive might have

[14] The effect pertained only to the self-rated IOED. We did not test for the observer-rated IOED because the observer ratings were descriptively higher than the self-ratings. In other words, there was no drop from t1 (self-rating) to the observer ratings of the explanations.

weakened a potential effect: Participants were informed that they could win 10€ Amazon vouchers if they did very well on the experimental tasks. This was done to increase participants' motivation. Yet, in the approach/inhibition theory of power, high power is related to attention to rewards (Keltner et al., 2003), and according to the situated focus theory of power, powerful people are especially good at paying attention to goal-related information and performing on tasks that are goal-relevant (Guinote, 2007). Thus, high-power participants might have turned their attention toward details to do well on the tasks in order to win the vouchers and may thus have performed similarly to the low-power participants, who, in either case, should have shown more concrete information processing (Smith & Trope, 2006). To test these two options, we conducted a third experiment.

6.4 Study 3

In Study 1, weak evidence of an effect of power on the IOED was found, and in Study 2, no evidence was found. To tackle the question of whether power affects the IOED and to rule out the possibility that the incentive in Study 2 might have led to a change in performance and in the self-assessments of the high-power participants, we conducted a third study. In this study, we measured stable individual differences in experienced power because this strategy allowed us to increase the study's ecological validity and generalize the findings. The methodology was very similar to Study 2; however, we assessed sense of power as a trait and changed the incentive. This allowed us to test the two alternative explanations proposed in the Discussion of Study 2. Again, we measured the IOED in a traditional way (comparing self-ratings) and in the objective fashion that we had suggested (judge-rated explanations).

6.4.1 Method

6.4.1.1 Participants and Procedure

We aimed to collect data from at least 200 participants to have enough power to test the mediation and were able to recruit 250 participants via a mailing list (https://aspredicted.org/blind.php?x=hi9h8s). We excluded eight participants because

they did not seriously complete the IOED task (e.g., they wrote they were not interested in explaining how something works) or showed implausible responses on the control items for the IOED. The total sample consisted of 242 participants (71% women; M_{age} = 45.32, *SD* = 16.40, 18 to 78). Participants could win one of two 50€ Amazon vouchers for completing the study — independent of their task performance.

The cover story and procedure were identical to Study 2 except that we used a power scale instead of a power manipulation. The experiment took approximately 45 min. Again, five judges rated participants' level of understanding of participants' explanations.

6.4.1.2 Measures

As in Study 2, we used the *Behavior Identification Form* (Vallacher & Wegner, 1989, α = .88) and the *Narcissistic Admiration and Rivalry Questionnaire* (NARQ; Back et al., 2013, α = .72). Additionally, we employed the *Personal Sense of Power Scale* (Anderson et al., 2012; Körner et al., 2021) to measure trait feelings of power. The scale assesses social influence and decision-making ability with six items (e.g., "My ideas and opinions are often ignored"). Responses are given on a scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Cronbach's α in the present study was .85.

6.4.2 Results

6.4.2.1 Self-Ratings

There was strong evidence of the IOED, $F(1, 240) = 45.681$, $p < .001$, $\eta_p^2 = .159$, as knowledge assessments decreased from pretest (M = 4.22, SD = 1.41) to posttest (M = 3.82, SD = 1.48). Power was correlated with construal style, $r(240) = .16$, $p = .012$; however, neither power nor construal style were related to the IOED, $rs(240) \leq |.04|$. The Power x Narcissism interaction was nonsignificant. A moderated mediation model with power as the predictor, construal style as the mediator, narcissism as the moderator, and the IOED as the outcome revealed no significant effects except for a positive link between power and construal style. When participants who scored below 4 on the control items were excluded (N = 41), there was again an IOED effect (η_p^2 =

.128), and the correlations and the results of the moderated mediation model remained similar (see the Online Supplement or Appendix E).

6.4.2.2 Observer Ratings

The raters showed high consensus in their assessments, *M*(ICC[2, 1/5]) = .88/.97. Again, strong evidence for the IOED based on observer ratings was found as the pretest ratings (*M* = 4.22, *SD* = 1.41) were much higher than the observer ratings (*M* = 2.92, *SD* = 1.23), $F(1, 241) = 188.694$, $p < .001$, $\eta_p^2 = .439$. Yet, the IOED showed only weak and non-significant correlations with power, $r(240) = .09$, $p = .190$, and construal style, $r(240) = .06$, $p = .324$. There were no significant direct, indirect, or interactive effects except for the positive link between power and construal style. When excluding participants who scored below 4 on the control items, the results remained similar: There was evidence of the IOED ($\eta_p^2 = .426$), but the results of the moderated mediation model did not support the hypotheses concerning construal style as a mediating factor and narcissism as a moderating factor.

6.4.3 Discussion

In this final study, we examined the link between power assessed as an individual difference variable and the IOED. Whether the IOED was measured as a comparison between self-ratings or in a rather objective fashion (contrasting self-ratings with observer ratings) did not make a difference for the results. Strong support for the IOED was found. However, in line with the results of Study 2, there was no evidence of an association between experienced power and the IOED. Power was weakly correlated with abstract information processing, but neither power nor abstract information processing were significantly related to the IOED.

We also aimed to shed light on the questions of whether the IOED is too stable to be affected by power or whether power leads to a higher goal focus (Guinote, 2007), and thus, there would not be a difference in the IOED between high- and low-power participants. Indeed, we could not rule out either of these explanations, but, as we found no effect of power on the IOED in this study, the first explanation seems plausible. Thus, it does not seem that it was solely the incentive in Study 2 that led to

a nonsignificant effect of power on the IOED, but the link seems less substantial than expected.

6.5 Meta-Analytical Considerations

Because we found a weak and significant effect in one study and nonsignificant effects of power on the IOED in the other studies, we conducted a mini meta-analysis to estimate the overall effect in this project and have enough statistical power to detect even small effects (Goh et al., 2016). Further, we examined the evidential value of our mediation hypotheses using *p*-curve analyses.

The meta-analyses were carried out using a fixed effects approach (i.e., effect sizes were weighted by sample size). This approach is more appropriate when analyzing fewer than five studies (see the OSF for additional results using a fully random effects meta-analysis). First, all effect sizes were converted into Pearson correlations. Then, all correlations were Fisher's *z*-transformed for analyses and back-transformed into Pearson correlations for presentation. With respect to the IOED based on self-reports, the overall effect of power on the IOED was significant but very small in size, $M(r)$ = .07, 95% CI [-.01, .16], Z = 1.69, p = .046, and was also not significantly different from zero when we excluded participants who showed low motivation and effort (< 4 on the control items; 7-point scale), $M(r)$ = .05, 95% CI [-.05, .14], Z = 1.02, p = .186. When computing the observer-rated IOED scores, the overall effect of power on the IOED was significantly different from zero but again weak in size, $M(r)$ = .08, 95% CI [.00, .17], Z = 1.86, p = .032 (after exclusions: $M(r)$ = .11, 95% CI [.01, .21], Z = 2.24, p = .013). Altogether, the meta-analytic evidence suggests that power can affect the IOED but the effect is small. By contrast, the IOED (t1-t2) was observed with an overall medium-sized effect, $M(r)$ = .36, 95% CI [.28, .43], Z = 8.46, p < .001 (after exclusions: $M(r)$ = .34, 95% CI [.25, .42], Z = 7.02, p < .001).

Next, we examined the evidential value underlying previous studies regarding the mediation model. This was done using *p*-curve analyses (Simonsohn et al., 2014), which test the distribution of statistically significant *p*-values. Right-skewed *p*-curves

indicate the presence of a true effect, whereas left-skewed *p*-curves indicate selective reporting and *p*-hacking.

Smith and Trope (2007) reported the results of seven studies demonstrating a positive effect of power on abstract construal style. We extracted the seven relevant *p*-values and subjected them to the *p*-curve app (http://www.p-curve.com; see the OSF for our *p*-curve disclosure table and a figure of the *p*-curve). The *p*-curve was not significantly right-skewed (full *p*-curve: Z = -0.02, p = .494; half *p*-curve: Z = 0.09, p = .538), but the evidential value seemed adequate (Z = -1.47, p = .071). Taking into consideration the large literature showing a positive link between power and construal style (e.g., Huang et al., 2011; Magee et al., 2010; Nissan et al., 2015), we believe the effect might be real even if the effect seemed smaller than expected. In this vein, in Study 3, we found a weak but significantly positive correlation between power and construal style.

Alter et al. (2010) reported six studies showing that the IOED is stronger when participants adopt an abstract instead of a concrete construal style. We extracted six *p*-values of the critical tests (correlation of construal style with the IOED or interaction of abstract/concrete construals with the IOED). Neither the full (Z = 1.76, p = .961) nor the half *p*-curve (Z = -0.38, p = .353) indicated evidential value, and the *p*-curves were not significantly right-skewed. Next, we tested whether the evidential power was inadequate. The observed *p*-curve was compared with the expected *p*-curves of studies with an average power of only 33%: If the *p*-curve was flatter than that of such a low-powered set of studies, evidential value would be lacking (see Simonsohn et al., 2014). The full *p*-curve was significant (Z = -2.88, p = .002), which means that evidential value was absent. Along with the conceptual replications in our Studies 2 and 3, we concluded that construal style was not a valid reason for why the IOED occurs.

6.6 General Discussion

In three studies, we examined the link between power and the IOED. As power holders determine the functioning of organizations, it is important to understand whether (or not) these people are exceedingly illusory with respect to causal explanatory

knowledge. If this is the case, there might be serious consequences of their own decision-making and their behavior toward subordinates. Further, we tested construal style as a potential mediator and narcissism as a potential moderator of the expected power-IOED link. Overall, power (experimentally manipulated or measured as a stable trait) showed only a very small and not reliable effect on the IOED, and construal style did not mediate the link. Narcissism interacted with experimentally induced but not with trait power in predicting the IOED. How can these findings be related to past research and theory?

First, across studies, we found strong evidence for the IOED. People indicated that their explanatory knowledge was much lower after they were asked to actually provide explanations about how certain devices worked (i.e., they became aware that their knowledge was shallower than they previously believed). This finding adds to accumulating research demonstrating that the IOED exists in various fields of explanatory knowledge (e.g., Fernbach et al., 2013; Rozenblit & Keil, 2002; Vitriol & Marsh, 2018). Further, we presented a new operationalization of the IOED based on observer ratings and consistently found that the IOED is also present with this objective criterion. We also refer to this phenomenon as IOED because we observed an overestimation of people's knowledge depth in relation to the objective criterion but we stress that this operationalization extends the original definition which focused on a change in self-assessments.

Second, we found only a small effect of power on the IOED even though we validated the power manipulations with pretests, and manipulation checks ensured strong inductions of power feelings. In Study 3, we additionally used a well-established and reliable power scale to assess habitual feelings of power as a predictor (Anderson et al., 2012; Körner et al., 2021).

We conclude that power makes people only slightly illusory with respect to complex explanatory knowledge. This can have different reasons: (a) The IOED could be a relatively stable and general variable (cf. Parker & Fischhoff, 2005). Research on the IOED so far has focused on the question of which domains this illusion occurs in

and has shown that devices but not procedures are affected. Still, to date, there is hardly any evidence that inductions of certain states may evoke a stronger (or weaker) IOED. The present research is the first to consider psychological power, or more broadly speaking, a situational antecedent of the IOED, and found only a very small effect. (b) Power does not necessarily lead to misperceptions in decision-making: Power can strengthen the ability to selectively focus on information that is most relevant for specific situations and tasks at hand (Guinote, 2007; Overbeck & Park, 2006). Thus, power might lead to greater sensitivity to goal-relevant situational cues (Overbeck & Park, 2001). In the case of the IOED, power holders might be motivated to provide accurate assessments of their knowledge depth at t1. Remember the results of Study 2, in which powerful participants might have been more inclined to thoroughly complete the IOED task to have higher chances to win vouchers. This argument runs against the notion that power makes people illusory and shows that general overconfidence (which increases with power, e.g., See et al. 2011) differs from the IOED. By combining these competing assumptions, it is also possible that the different effects of power may cancel each other out, and thus, there would not be an observable effect. (c) A third explanation is that abstract information processing as a consequence of power is not an antecedent of the IOED, which we consider most likely and discuss below.

Third, we found that the effect of power on abstract construal style was small and that construal style was not related to the IOED. Past research has investigated the effects of power on various variables (see Guinote, 2017; Keltner et al, 2003) such as construal styles—but these variables have not yet been systematically studied as possible mediators in research on the downstream effects of power. We tested construal style as a mediator because there was compelling evidence regarding effects of power on this variable (Magee & Smith, 2013). Nevertheless, we could not validate construal style as a mediator. Apparently, construal style is affected by power, but the assumed link between construal style and the IOED was not found. Thus, the latter seems to be the missing link in the expected indirect effect of power on the IOED. *P*-

curve analyses suggested that there was no evidential value of an effect of construal style on the IOED. It is possible that other reasons for the IOED are more relevant (e.g., confusing one's mental representation of how something works with environmental support; Rozenblit & Keil, 2002; Sloman & Rabb, 2016).

Fourth, we tested narcissism as a potential moderator of the power-IOED link and found only weak support for this hypothesis. Again, the IOED may be too general a tendency that does not vary much interpersonally. Yet, in line with the results of Study 2, we think that a situational boost of power in people high in narcissism might lead to a stronger IOED. Future research concerning the link between narcissism, power, and the IOED might be most promising when people who score very high in narcissism are tested—because power plus extreme narcissism could in fact be a toxic composite for the IOED (for a similar argument see Macenczak et al., 2016).

Finally, we found that power led to overconfidence as in previous research (e.g., Fast et al., 2009, 2012; See et al., 2011). This finding provides support for the notion that power can lead to general overconfidence but that the IOED is a distinct phenomenon that does not seem to be affected by power. Typically, people are not aware of the fact that they are overly confident; however, they can become aware of their lack of explanatory knowledge when they are asked how a device works. Consequently, power seems to only slightly affect an illusion (e.g., the IOED) of which people can become aware but may affect decisions or ratings when people are unaware of their general overconfidence. In line with that, in past research power did not lead to overconfidence when participants received negative feedback (Fast et al., 2012): The IOED task points participants to the fact that their knowledge may be shallow. By contrast, typical tasks that measure overconfidence do not include such feedback. Further, knowledge domains are important to consider because, as shown in self-ratings and in observer ratings, the IOED is a phenomenon that pertains to explanatory depth regarding devices that seem familiar at first glance even though the mechanisms are not really understood.

The present studies have broad implications for practice and theory. People in positions of power (e.g., managers, professors, politicians) who provide high experienced power (Tost, 2015) can be overconfident, but they do not seem to strongly overestimate the depth of their causal explanatory knowledge more than others do. In fact, to achieve a good calibration of one's knowledge, it may help people to provide an explanation of complex issue before asking them how good their knowledge is. Yet, as powerful people do not differ from powerless people in this domain, it is not necessary to develop specific interventions targeting power holders. Simply starting to explain complex issues helps people better calibrate their self-perceptions of their knowledge depth—independent of their standing in the social hierarchy. However, power in combination with toxic traits could increase the IOED. Thus narcissism and other dispositions should be more closely studied in future studies on the topic. Moreover, Study 1 and other research suggests that power leads to overconfidence, which is why interventions should aim to make people aware of their illusions which often are not conscious.

Further, in our research, we did not find evidence that power holders' abstract construal style (Smith & Trope, 2006) has a dark side with respect to decision-making because construal style is not related to the IOED. The findings support the social distance theory of power (Magee & Smith, 2013) insofar as power was related to construal style but they do not support construal style as reason for the IOED.

Altogether, this research adds to the literature in social, personality, and cognitive psychology as well as organizational behavior in showing the presence of the IOED overall, but the effects of power pertain largely to overconfidence and not much to the IOED. More research is needed to address the consequences of power and whether these consequences (e.g., construal style, approach behavior, positive emotion) can directly affect other downstream consequences (e.g., decision processes, cognitive biases).

6.6.1 Limitations and Future Research

In the present studies, we did not use a control group to contrast the effects of the two experimental groups with that group. However, as the high-power group did not largely differ from the low-power group regarding the IOED, it seems implausible that a relevant effect would have been detected with a control group. Moreover, a previous study suggested that effects of power might not necessarily be linear (Schaerer, du Plessis, et al., 2018); however, an inspection of the data from Study 3 did not show a curvilinear relation.

Another limitation pertains to the overrepresentation of women in the samples. Although previous research suggests that the IOED as well as effects of power on overconfidence do not differ between sexes (e.g., Alter et al., 2010; Fast et al., 2012), in future studies, more diverse and gender-balanced samples should be used to increase generalizability. Further, to keep the experimental time reasonable, we did not assess construal style in Study 1. Yet, future research may benefit from testing whether construal style can mediate the power-overconfidence relation. For this purpose, different measures of abstract information processing should be employed (e.g., categorization tasks or gestalt completion tasks; Smith & Trope, 2006). Upcoming studies may also benefit from conducting comparisons of extreme groups (i.e., assessing the IOED or other illusions in managers or subordinates or using samples with extreme narcissism scores).

We were concerned with the effect of power on the IOED. We found no reliable support that power leads to the IOED, but we cannot rule out the possibility that power in combination with other personality or situational variables may increase the IOED. Thus, other situational factors beyond power (e.g., impression management concerns) can be investigated in relation to the IOED to examine the plausibility of the reasons we suspected for why power did not affect the IOED. Furthermore, the stability of the IOED over time and across situations could be tested in future research. Another interesting question is whether effects of power (overconfidence and illusory

thinking vs. heightened sensitivity to tasks at hand) may even each other out and obfuscate effects on the IOED.

6.6.2 Conclusion

The experience of power has been related to several positive consequences (Keltner et al., 2003) but also to negative aspects, such as illusory thinking (e.g., Fast et al., 2012). The present research supports the notion that power is associated with overconfidence. However, in three studies in which power was manipulated or measured, we found only a very small effect of power on the IOED. Possibly, power has stronger effects on general overconfidence than on the IOED because the processes in these two forms of illusions are different: General overconfidence probably occurs at a less conscious level than the IOED and the IOED focuses on a specific kind of knowledge which is exploratory whereas overconfidence is more general. What we have shown in any case: Power does not necessarily increase all forms of illusions. Apparently, people are subject to an IOED relatively independent of their experienced power.

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Chapter 7

Concluding Discussion

7.1 Summary of Findings Across Projects

This dissertation aimed to advance the understanding of the personal sense of power. For that reason, five projects containing 13 studies were conducted based on data of 3,534 participants. The five projects were designed to address three broad research questions: How do people experience power? How does power pervade close relationships? And does power affect specific self-evaluations? Six main findings are relevant to the three research questions:

(1) Project 1 directly addresses the question of how people experience power. The German Personal Sense of Power Scale (GPSPS) showed to be a psychometrically sound assessment tool to measure an individual's subjective sense of power. Participants were able to indicate their generalized sense of power (across relationship types and instances). There was also considerable variance. Thus, people differ in how much power they experience. This dovetails with the finding that specific groups can show a lower (or higher) sense of power: Patients with a diagnosed mental disorder reported less subjective power than participants from the average population. Moreover, sense of power was well embedded in its nomological net. It was not redundant with other psychological constructs but showed expected and theory-conform (see Chapter 1.4 "Theories on Power and Consequences of Power") associations with a broad range of personality variables, emotions, self-evaluations, and sociodemographic and objective criteria. Participants' sense of power was relatively stable across three months. Moreover, participants were also able to indicate their power in romantic relationships as well as their momentary sense of power when a state instruction in an experimental setting was used. Thus, sense of power can not only be captured on a generalized level but also on situation-specific or relationship-specific levels. Overall, sense of power can be reliably and validly assessed with the GPSPS.

This project adds to the overwhelming literature on personal sense of power (Anderson et al., 2012) in providing a psychometrically satisfying assessment tool

for the German language and showing some new findings such as associations with so far unexplored constructs, measurement invariance across men and women, and a test of extreme group validity. Moreover, the findings suggest that when people experience power they also perceive themselves as happy, proud, outgoing, active, confident, emotional stable, and dominant.

(2) Power pervades close relationships. In Project 1, it was shown that people can report their perceived power in romantic relationships. The scale score of the GPSPS was unidimensional and showed high reliability. In Projects 2 and 3, not only intrapersonal but also interpersonal associations of power with relationship-relevant variables were shown. This pertained not only to German but also to Israeli couples. Moreover, sense of power seems to pervade close relationships stronger than objective power (resp. positional power) because only sense of power was associated with relationship quality but not objective power. The presence of several significant partner effects is in line with theories who call to consider the interdependence of both relationship partners to understand power (Simpson et al., 2015). Power pervades close relationships in a positive way: Power was positively related to one's own relationship quality, self-esteem, and forgiveness but also positively related to the partner's relationship quality and forgiveness. Altogether, these studies highlight the social aspect of power and that research should consider power as an important variable when studying close intimate relationships.

The following three main findings are relevant to the research question of how power affects self-evaluations:

(3) Power is related to several socially desirable outcomes. Power experienced in the relationship was positively associated with relationship quality as well as with benevolence motivation and decreased resentment-avoidance after conflicts (Projects 2 and 3). The generalized sense of power as well as experimentally induced power were predictors of positive body image (Project 4): Powerful

people were more satisfied with their bodies and showed higher body appreciation than powerless people. These findings are in line with the approach / inhibition theory of power (Keltner et al., 2003), which postulates positive self-perceptions and approach behavior as consequences of power. Thus, power seems to have several positive correlates and consequences that may benefit the individual.

(4) Power was also positively associated with and led to self-esteem (Projects 3 and 4). Much theorizing as well as statistical analyses in the aforementioned projects suggest that self-esteem mediates the effects of power on forgiveness and body image measures. Thus, in four studies conducted with participants from two different countries initial evidence is found for a mechanism through which power affects specific consequences: Through elevated self-esteem. Power holders do not only experience positive emotions and less constraints (see Keltner et al., 2003), they are also confident and show high self-regard (see also Briñol et al., 2017; Wojciszke & Struzynska-Kujalowicz, 2007). This positive global evaluation of the self offers a plausible explanation for why power holders also see other aspects of their life (i.e., romantic relationship, body image) positively. However, with the data analysis techniques used direction of effects cannot be fully supported (also because only one of the four studies was an experiment). It is also possible that power impacts self-esteem through relationship quality and body image. Yet, much theorizing in Projects 3 and 4 considers this alternative explanation as less valid but nevertheless future research is necessary to further tackle that question.

(5) Whereas Projects 2, 3, and 4 suggest power is associated with positive perceptions about oneself, Project 5 suggests that power can have negative consequences as well. First, power led to overconfidence; a finding in line with much literature on power and illusions (Fast et al., 2009, 2012; Schaerer et al., 2018; See et al., 2011). Second, there was weak evidence that power leads to changes in self-perceptions about one's knowledge depth. In high power participants a slightly stronger IOED was found than in low power participants. Whether this effect is relevant in real-

world settings needs to be further examined. In either case, Project 5 highlights that power does not only boosts perceptions about oneself but also can be somewhat detrimental with respect to cognitive illusions.

The next point is less relevant to the three research questions but still important when considering methodological aspects of research on social power:

(6) The experience of trait and state power as well as the effects of both forms of power were largely similar. First, both forms of power could be reliably assessed by individuals. Both forms of power formed a unidimensional psychological construct (see CFA and reliability analyses in Project 1). Second, both forms of power did only slightly differ in their consequences. In Project 3, state power increased self-esteem, body satisfaction, body appreciation, and relative body height. With the exception of relative body height, the aforementioned variables were also positively related to trait power. In Project 5, the effects or associations of power with the IOED did hardly differ across the two experiments and the cross-sectional study.[15] Thus, researchers who study state personal sense of power with experiments (or at least with the power manipulations used in this dissertation) could be somewhat confident that these findings also relate to generalized power feelings—and vice versa.

7.2 Future Research Directions

Several limitations as well as avenues for future research are stated in each project. Here, three broad and global future research directions that pertain to all five projects will be addressed.

First, in this dissertation power was conceived as personal sense of power, that is, an individual's self-perceived capability to influence others (Anderson et al., 2012). This potential for influence can be used for good as well as for bad (Keltner, 2016). This suggests that moderators (e.g., relationship orientation, Chen et al., 2001; ego threat,

[15] If there was a difference in the effect of power, this difference was more pronounced between the two experiments.

Fast & Chen, 2009; legitimacy, Lammers et al., 2008; task orientation, Overbeck & Park, 2006) can influence the consequences of power. Situated focus theory of power (see Chapter 1.4 "Theories on Power and Consequences of Power") can provide a theoretical account for some of the aforementioned moderators. In Projects 4 and 5, narcissism was tested as moderator (see also Macenczak et al., 2014). However, there was barely any evidence that narcissism moderated the effects of power on body image or the IOED.

Yet, here I suggest a much more proximal moderator of power: People's *construal of power*. Recent research suggests two different lay theories people hold about power (ten Brinke & Keltner, 2022; see also Belmi & Laurin, 2016). Some people construe power as fundamentally coercive, involving manipulation, force, and aggression. This is called coercive lay theory of power. Other people construe power as virtue to support others, to enable coordination and collaboration. This is called collaborative lay theory of power. These two power construals fit nicely with dual power theories (e.g., naked vs. traditional power, Russell, 1938; personalized vs. socialized power, McClelland, 1970). In this dissertation the personal sense of power was studied to capture an individual's self-perceived potential to influence others. Possibly, people who hold a fundamentally coercive lay theory of power use their potential for influence to grab status and subjugate others, which is why negative consequences on variables such as forgiveness or relationship quality might be expected. On the other hand, people with collaborative lay theories of power probably might use their sense of power to help others—resulting in positive interpersonal outcomes and perhaps also more positive self-evaluations. Thus, it would be interesting to test whether the correlates and consequences of power studied in this dissertation differ depending on people's lay theory of power.

Second, another important moderator would be people's *responsibility* (de Wit et al., 2017; Scholl, 2020; Scholl et al., 2022). This aligns somewhat with the aforementioned considerations. However, here the distinction is whether power is construed as being responsible for others ("noblesse oblige") or whether power is

construed as opportunity and freedom (Tost, 2015). Thus, this approach is less about the question of whether power is fundamentally prosocial or antisocial but addresses the question of whether power relieves the individual from constraints or not. For example, it might be expected that sense of power, which is construed as responsibility, leads to less illusionary thinking and overconfidence than power, which is construed as opportunity. Feeling responsible for other people could lead to more deliberative thinking because the power holder is aware of the social consequences of his or her behavior and is restrained by moral obligations and role-prescribed norms.

Third, not only testing moderating effects of power construals would benefit the field but also clearly separating direct effects of *various social hierarchy variables* on outcomes (see Chapter "1.2.4 Status, Dominance, and Other Hierarchy-Related Variables"). In a recent paper, the authors illustrated opposite correlates of felt power (synonymous to sense of power) and power motive with various self-evaluations (Murphy et al., 2022). For that reason, they partialled out shared variance between both constructs (for the same approach see also Cheng et al., 2010; Körner & Schütz, 2022; Tracy & Robins, 2007). It would also be interesting to test whether motive-free sense of power has the same correlates as unadjusted sense of power. The same procedure could be done with personal power: For example, is sense of power still a strong predictor of self-esteem after removing shared variance with variables such as self-efficacy or internal locus of control? Moreover, contrasting effects of power with those of status and dominance would also be interesting to illuminate how much social hierarchy variables overlap or diverge with respect to their consequences. This dissertation focused on the personal sense of power but it would be helpful to statistically separate sense of power from other hierarchy-related concepts to understand its correlates and consequences in more completeness.

7.3 Conclusion

In this dissertation, the German Personal Sense of Power Scale was introduced as a valid and reliable instrument to assess an individuals' experienced power. Power was

found to be correlated with relationship quality and forgiveness on an intrapersonal and an interpersonal level in romantic couples. Power increased via self-esteem body appreciation and body satisfaction and power had a small effect on the IOED. Thus, sense of power is related to several self-evaluations. Combining methods from psychological assessment, social psychology, and personality, the current findings are relevant for basic research on social power and have implications for organizational psychology. In this vein, I strongly hope the five projects of this dissertation help to further advance our understanding of personal sense of power.

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Appendix

Appendix A – Validation of German Personal Sense of Power Scale

Corrected Item-Total Correlations and Loadings of Eight-Item Version

Table S1
Corrected Item-Total Correlations (r_{it}), and Loadings of the GPSPS with Eight Items

Item	r_{it}	Loading
1	.63	.70
2	.56	.67
3	.63	.68
4	.72	.83
5	.59	.66
6	.68	.80
7	.71	.82
8	.51	.57

Confirmatory Factor Analyses for Studies 4 and 5

CFA results for Study 4 (GPSPS based on six items; WLSMV estimation, $N = 175$)

$\chi^2(9) = 37.242$, $p < .001$; RMSEA = .134, 90% CI [.091, .180], $p = .001$; CFI = .988; TLI = .980

CFA results for Study 5 (GPSPS based on six items, WLSMV estimation, $N = 120$)

$\chi^2(9) = 17.489$, $p = .042$; RMSEA = .089, 90% CI [.017, .150], $p = .139$; CFI = .990; TLI = .983

Please note: In both studies, the sample sizes were below the traditional cut-off values for conducting CFAs (> 250 individuals; Bühner, 2011).

Item Characteristics and Loadings of GPSPS Items in Studies 2 to 5

Table S2

Descriptive Statistics, Corrected Item-Total Correlations (r_{it}), and Loadings (L) of the GPSPS Items for Studies 2 to 5

	Study 2				Study 3				Study 4				Study 5			
Item	*M*	*SD*	r_{it}	L	*M*	*SD*	r_{it}	L	*M*	*SD*	r_{it}	L	*M*	*SD*	r_{it}	L
1	6.25	0.96	.45	.57	4.79	1.57	.61	.68	5.23	1.32	.63	.71	5.52	1.01	.54	.59
2	5.64	1.59	.52	.69	3.81	1.63	.65	.72	4.85	1.44	.68	.77	5.22	1.29	.72	.81
3	5.58	1.38	.68	.82	3.93	1.53	.81	.90	4.90	1.38	.80	.88	5.32	1.18	.75	.86
4	4.22	1.25	.27	.31	2.80	1.59	.48	.55	3.82	1.34	.58	.63	3.88	1.29	.57	.62
5	5.75	1.32	.67	.82	4.08	1.57	.78	.89	5.10	1.42	.76	.86	5.51	1.20	.70	.90
6	5.87	1.21	.64	.77	4.07	1.71	.76	.85	5.26	1.36	.81	.90	5.62	1.19	.68	.79

Note. Study 2: $N = 435$. Study 3: $N = 183$. Study 4: $N = 175$. Study 5: $N = 120$. All loadings were significant ($p < .001$).

Appendix B – Power & Relationship Quality

Distinctiveness of Satisfaction With Power and Relationship Quality

To show the distinctiveness between the satisfaction with power-item (satis power) and relationship quality (RQQ), communalities and factor loadings of an exploratory factor analysis (Maximum Likelihood estimation and Promax rotation) are reported.

Table S3

Communalities of the Satis Power Item and the RQQ Items

	h^2
Satisfaction with power	.29
1: Engagement1	.53
2: Fascination1	.58
3: Constraint1	.51
4: Fascination2	.71
5: Future1	.76
6: Fascination3	.67
7: Sexuality1	.80
8: Future2	.87
9: Engagement2	.74
10: Constraint2	.61
11: Engagement3	.81
12: Constraint3	.71
13: Sexuality2	.76
14: Engagement4	.49
15: Sexuality3	.44
16: Constraint4	.51
17: Engagement5	.59
18: Future3	.61
19: Future4	.70
20: Sexuality4	.65
21: Mistrust1	.45
22: Future5	.62
23: Mistrust2	.62
24: Mistrust3	.65
25: Constraint5	.64
26: Sexuality5	.64

Table S4

Factor Pattern Matrix of Exploratory Factor Analysis With Maximum Likelihood Estimation and Promax Rotation

Items	Extracted factors					
	1	2	3	4	5	6
Satis power	.30	.25				-.25
1: Engagement1			.71			
2: Fascination1					.86	
3: Constraint1		-.66				
4: Fascination2	.23				.63	
5: Future1				.38	.55	
6: Fascination3					.83	
7: Sexuality1	.86					
8: Future2				.71	.31	
9: Engagement2			.42	.23	.34	
10: Constraint2		-.77				
11: Engagement3			.89			
12: Constraint3		-.77				
13: Sexuality2	.86					
14: Engagement4			.66			
15: Sexuality3	.66				-.23	
16: Constraint4		-.70				
17: Engagement5			.64			
18: Future3				.85	-.24	
19: Future4				.92		
20: Sexuality4	.83					
21: Mistrust1						.66
22: Future5				.67		
23: Mistrust2						.84
24: Mistrust3						.81
25: Constraint5		-.76				
26: Sexuality5	.80					

Note. For clarity, we only present coefficients > .20.

Correlational Analyses Between All Variables

Table S5

Bivariate Zero-Order Correlations between Power Measures and RQ Within Persons and Couples

	1	2	3	4	5	6	7	8	9	10	11
Within person											
1	-	.21**	.67***	.25**	.27***	.37***	.25**	.35***	.31***	-.37***	-.27***
2	.14	-	.12	.13	.07	.12	.05	.07	.06	.07	-.14
3	.56***	.13	-	.04	.22**	.32***	.25**	.34***	.29***	-.39***	-.33***
4	.11	.23**	.16*	-	.03	-.02	-.07	.06	-.04	.12	.04
5	.29***	-.03	.24**	.06	-	.79***	.81***	.80***	.67***	-.11	-.29***
6	.41***	.01	.34***	.09	.62***	-	.72***	.62***	.70***	-.35***	-.53***
7	.34***	.01	.22**	-.01	.66***	.55***	-	.57***	.73***	-.30***	-.59***
8	.30***	-.01	.43***	.17*	.78***	.48***	.41***	-	.42***	-.29***	-.34***
9	.39***	.04	.27***	-.03	.53***	.51***	.53***	.33***	-	-.48***	-.65***
10	-.32***	.02	-.35***	-.06	-.03	-.29***	-.25**	-.25**	-.51***	-	.38***
11	-.40***	-.12	-.42***	-.06	-.18*	-.51***	-.53***	-.39***	-.50***	.38***	-
Within couple											
1	-	.04	.23**	.03	.30***	.25**	.33***	.17**	.24**	-.12	-.10
2	.01	-	.02	.01	.02	-.02	.04	-.05	.01	-.03	.10
3	.29***	.10	-	-.05	.18*	.17*	.30***	.14	.15*	-.11	-.19*

	1	2	3	4	5	6	7	8	9	10	11
4	.08	-.12	.04	-	.21**	.11	.04	.22**	.01	-.05	.07
5	.27***	-.05	.14	-.02	-	.16*	.23**	.24**	.32***	-.28**	-.07
6	.36***	.05	22**	.01	.26**	-	.30***	.20**	.34***	-.28***	-.18*
7	.30***	-.10	.17*	-.09	.17*	.14	-	.13	.30***	-.29***	-.08
8	.19*	.02	.14	.04	.25**	.15	.16*	-	.10	-.14	-.06
9	.29***	.03	.16*	-.08	.13	.06	.18*	.07	.40***	-.29***	-.12
10	-.25**	-.18*	-.18*	.08	-.02	-.08	-.18*	-.05	-.11	-	.22**
11	-.19*	.00	-.14	.02	.02	-.03	-.02	-.04	-.15	.26***	-

Note. 1 = Personal Sense of Power Scale. 2 = Positional Power. 3 = Satisfaction with one's Power in the Relationship. 4 = Power Motive. 5 = Relationship Quality Questionnaire. 6 = Fascination. 7 = Engagement. 8 = Sexuality. 9 = Future. 10 = Mistrust. 11 = Constraint. $N \leq 181$ couples. The within-person correlations are correlations that are presented separately for men (below the diagonal) and women (above the diagonal). The within-couple correlations are correlations between partners (rows = women, columns = men).

* $p < .05$. ** $p < .01$. *** $p < .001$ (two-tailed).

Results of Likelihood Ratio Tests

Table S6

Results of Likelihood Ratio Tests for APIMs Predicting RQ from Distinct Power Measures (Saturated Model vs. Equal-Actor-Equal-Partner Effects Model) and for APIMs Predicting RQ by Balance of Power (Saturated Model vs. Equal Effects Model)

	Sense of power		Positional power		Satisfaction with power		Power motive	
	$\chi^2(2)$	*p*	$\chi^2(2)$	*p*	$\chi^2(2)$	*p*	$\chi^2(2)$	*p*
Absolute power scores								
Fascination	4.267	.118	4.968	.083	1.292	.524	1.858	.395
Engagement	0.998	.607	2.133	.344	2.047	.359	2.236	.327
Sexuality	0.079	.961	3.107	.212	0.404	.817	5.059	.080
Future	2.531	.282	0.641	.726	2.800	.247	1.095	.579
Mistrust	2.692	.260	2.438	.296	2.578	.276	4.660	.097
Constraint	4.042	.133	1.616	.446	0.161	.923	1.334	.513
Total RQQ	3.594	.166	1.183	.553	0.793	.673	2.547	.280
Balance of power								
Total RQQ	1.989	0.158	1.039	.308	2.651	.103	2.049	.152

Note. Analyses of Likelihood Ratio Tests (also comparing Saturated Models vs. Equal-Actor-Different-Partner-Effects Models vs. Different-Actor-Equal-Actor-Effects Models) are also on the OSF (https://osf.io/txyb9/).

Appendix C – Power & Forgiveness

Procedure of Studies 1 and 2

German Sample: Participants were recruited via the snowball principle. Exclusion criteria were: younger than 18 years and less than 1 month in their relationship. Participants completed an online survey beginning with demographic data and followed by questionnaires on relationship variables, power, self-esteem, forgiveness, and relationship quality. Results for the last variable are presented in another project. Each person's answers were independent of their partner's. A couple code was generated to match partners. Survey completion took approximately 20 min.

Israeli Sample: The procedure was similar to Study 1: Participants were recruited via the snowball principle to complete an online survey (20 min). The survey consisted of questions about demographics, relationship variables, power, self-esteem, and forgiveness.

Examination of the Psychometric Properties of the Hebrew PSPS and SAS

We examined the psychometric properties of the *PSPS* and the *SAS*. This was done because the German *PSPS* has six items, but the English *PSPS* has eight items. Moreover, we had adapted the *SAS* to measure interdependent self-esteem in the relationship, and we wanted to ensure good model fit. In the following, we considered corrected item-total correlations > .30 and Cronbach's alpha coefficients > .70 as desirable (Bühner, 2016). Homogeneity was examined using confirmatory factor analysis (WLSMV estimation). Residuals of indicators were uncorrelated. CFI and TLI ≥ .90 indicate adequate model fit (Marsh et al., 2004).

Interitem correlations of the *PSPS* were all positive, $.16 \leq r(394) \leq .63$, and showed no strong overlap. Corrected item-total correlations were satisfactory ($.34 \leq r_{it} \leq .63$). Model fit was acceptable, $\chi^2(20) = 219.290$, $p < .001$; CFI = .928; TLI = .900. All loadings were significant. Cronbach's alpha was good with .80.

The *SAS* items also showed only positive interitem correlations, $.18 \leq r(394) \leq .73$. Corrected item-total correlations were good ($.36 \leq r_{it} \leq .74$). Model fit was satisfactory, $\chi^2(20) = 86.405$, $p < .001$; CFI = .986; TLI = .981. All loadings were significant. Cronbach's alpha was good at .84. Thus, both scales did not need further revision and were acceptable to be used in the APIMeM analyses.

Distinctiveness of Power and Self-Esteem

To test whether the personal sense of power scale is distinct from the self-esteem scale, we computed an exploratory factor analysis that included all power and self-esteem items with Maximum Likelihood estimation and a Promax rotation. Two factors were extracted.

For the German sample, the standardized factor coefficients for the power scale on the first factor were all > .27 (M = 60), whereas they were < |.09| on the second factor (M = |.04|; see Table S7). The standardized factor coefficients for the self-esteem scale were < |.10| (M = |.06|) on the first factor and > .60 on the second factor (M = .73). Each item had a high loading on the respective factor and close to zero loadings on the other factor, which suggests simple structure. There were also no double loadings. Thus, the distinctiveness of the two scales was supported.

The results of the Israeli sample were pretty similar to the German findings: The power items had standardized factor coefficients that were > .23 (M = .55) on the first factor and < |.12| (M = .08) on the second factor. The self-esteem items had standardized factor loadings that were > .52 (M = .67) on the second factor and < |.15| (M = .06) on the first factor. Thus, the two scales captured different constructs in the Israeli sample, too.

Table S7

Factor Pattern Matrix of Exploratory Factor Analysis With Maximum Likelihood Estimation and Promax Rotation for the German Sample (N = 298) and Israeli Sample (N = 348). Power Items are From the Personal Sense of Power Scale; Self-Esteem Items are From the Multidimensional Self-Esteem Scale

Items		Extracted factors			
		German sample		Israeli sample	
		1	2	1	2
Power 1	I can get him/her to listen to what I say.	.55	.09	.51	.11
Power 2	My wished do not carry much weight.	.53	.01	.75	-.12
Power 3	I can get him/her to do what I want.	.75	-.05	.76	-.02
Power 4	Even if I voice them, my views have little sway.	.27	.05	.23	.08
Power 5	I think I have a great deal of power.	.82	-.02	.76	.03
Power 6	My ideas and opinions are often ignored.	.67	-.02	.73	.06
Power 7	Even when I try, I am not able to get my way.	-	-	.33	-.10
Power 8	If I want to, I get to make the decisions.	-	-	.36	.10
Self-Esteem 1	Do you doubt yourself?	-.10	.72	.08	.65
Self-Esteem 2	How often do you have the feeling that there is nothing you can do well?	.06	.63	.15	.63
Self-Esteem 3	Do you have a positive attitude toward yourself?	.00	.77	-.03	.69
Self-Esteem 4	Do you ever think that you are a worthless individual?	.00	.81	-.03	.76
Self-Esteem 5	How often are you so unhappy with yourself that you wonder if you are a valuable person?	.08	.77	-.02	.69
Self-Esteem 6	How often do you not like yourself?	-.06	.79	-.11	.78
Self-Esteem 7	How often do you feel satisfied with yourself?	.09	.60	..01	.52

Note. For clarity, we present coefficients > .20 in light grey. The German Personal Sense of Power scale has 6 items, the Israeli version has as the original English scale 8 items.

Self-Esteem as a Moderator in the Power-Forgiveness-Link

We tested an alternative model in which self-esteem acts as a moderator of the relation between power and forgiveness. We computed moderation analyses with power as the predictor, self-esteem as the moderator, and forgiveness as the outcome using Model 1 in PROCESS Version 3.3 (Hayes, 2012). We report unstandardized regression coefficients and two-tailed bootstrapped 95% Confidence Intervals (CI; k = 5,000 samples). Six models were tested (for the German sample: one predictor x one moderator x two outcomes; for the Israeli sample: one predictor x two moderators x two outcomes).

There was only one significant interaction for Power x Independent Self-Esteem when predicting benevolence in the German sample (see Table S8). Because one out of six tests may be considered significant by chance, we refrained from interpreting this effect (we did not have a hypothesis about such an effect). When analyzing gender separately, the results mirrored that of the full sample: For men, zero out of six interaction tests were significant (see Table S9); for women, one out of six interaction tests was significant (see Table S10). We did not test an Actor-Partner-Interdependence Moderation Model because partner effects are typically smaller in size than actor effects (Dyrenforth et al., 2010). To sum up, a competing model with self-esteem as the moderator of the relation between power and forgiveness was not supported.

Table S8

Results of Moderation Analysis With All Participants

Sample	Outcome	Effect	Estimate	*SE*	95% CI		*p*
					LL	*UL*	
German (*N* = 298)	Benevolence	Power	0.89	0.23	0.43	1.35	< .001
		Self-esteem	0.59	0.26	0.07	1.11	.025
		Power x self-esteem	-0.10	0.05	-0.20	-0.01	.032
German (*N* = 298)	Resentment-Avoidance	Power	-0.53	0.24	-1.00	-0.07	.026
		Self-esteem	-0.32	0.27	-0.84	0.21	.235
		Power x self-esteem	0.03	0.05	-0.07	0.12	.554
Israeli (*N* = 348)	Benevolence	Power	-0.12	0.34	-0.80	0.56	.728
		Self-esteem	-0.09	0.35	-0.78	0.61	.808
		Power x self-esteem	0.07	0.06	-0.05	0.20	.258
Israeli (*N* = 348)	Resentment-Avoidance	Power	-0.05	0.34	-1.18	0.17	.144
		Self-esteem	-0.70	0.35	-1.40	-0.01	.047
		Power x self-esteem	0.05	0.06	-0.08	0.17	.447
Israeli (*N* = 348)	Benevolence	Power	-0.04	0.43	-0.89	0.81	.929
		SAS	0.60	0.36	-0.11	1.31	.096
		Power x self-esteem	0.01	0.07	-0.13	0.15	.894
Israeli (*N* = 348)	Resentment-Avoidance	Power	0.33	0.46	-0.57	1.23	.476
		SAS	-0.05	0.38	-0.80	0.69	.888
		Power x self-esteem	-0.08	0.07	-0.23	0.056	.258

Note. CI = confidence interval; *LL* = lower limit; *UL* = upper limit. Self-esteem = independent self-esteem measured with the Multidimensional Self-Concept Scale. SAS = interdependent self-esteem measured with the Social-Autonomous Self-Esteem Scale.

Table S9

Results of Moderation Analysis for Male Participants

Sample	Outcome	Effect	Estimate	*SE*	95% CI		*p*
					LL	*UL*	
German (*N* = 149)	Benevolence	Power	0.70	0.37	-0.03	1.43	.062
		Self-esteem	0.29	0.39	-0.48	1.06	.453
		Power x self-esteem	-0.05	0.07	-0.19	0.09	.490
German (*N* = 149)	Resentment-Avoidance	Power	-0.50	0.37	-1.22	0.22	.176
		Self-esteem	-0.12	0.38	-0.88	0.64	.749
		Power x self-esteem	0.01	0.07	-0.13	0.15	.913
Israeli (*N* = 174)	Benevolence	Power	0.47	0.64	-0.80	1.73	.469
		Self-esteem	0.32	0.58	-0.82	1.46	.583
		Power x self-esteem	-0.02	0.11	-0.24	0.20	.841
Israeli (*N* = 174)	Resentment-Avoidance	Power	-0.28	0.56	-1.38	0.83	.622
		Self-esteem	-0.60	0.50	-1.60	0.39	.231
		Power x self-esteem	0.03	0.10	-0.16	0.22	.793
Israeli (*N* = 174)	Benevolence	Power	0.12	0.66	-0.18	1.41	.858
		SAS	0.78	0.55	-0.31	1.88	.158
		Power x self-esteem	-0.02	0.11	-0.23	0.20	.875
Israeli (*N* = 174)	Resentment-Avoidance	Power	0.21	0.64	-1.05	1.47	.745
		SAS	-0.39	0.54	-1.10	1.02	.942
		Power x self-esteem	-0.06	0.11	-0.27	0.14	.547

Note. CI = confidence interval; *LL* = lower limit; *UL* = upper limit. Self-esteem = independent self-esteem measured with the Multidimensional Self-Concept Scale. SAS = interdependent self-esteem measured with the Social-Autonomous Self-Esteem Scale.

Table S10

Results of Moderation Analysis for Female Participants

Sample	Outcome	Effect	Estimate	*SE*	95% CI		*p*
					LL	*UL*	
German (*N* = 149)	Benevolence	Power	1.09	0.31	0.48	1.70	< .001
		Self-esteem	0.82	0.37	0.09	1.56	.029
		Power x self-esteem	-0.15	0.07	-0.28	-0.02	.024
German (*N* = 149)	Resentment-Avoidance	Power	-0.62	0.32	-1.26	0.02	.058
		Self-esteem	-0.48	0.39	-1.25	0.28	.215
		Power x self-esteem	0.05	0.07	-0.08	0.19	.432
Israeli (*N* = 174)	Benevolence	Power	-0.36	0.43	-1.21	0.48	.397
		Self-esteem	-0.35	0.49	-1.31	0.61	.474
		Power x self-esteem	0.12	0.09	-0.05	0.29	.152
Israeli (*N* = 174)	Resentment-Avoidance	Power	-0.45	0.48	-1.41	0.50	.349
		Self-esteem	-0.43	0.55	-1.52	0.65	.434
		Power x self-esteem	0.01	0.10	-0.18	0.20	.887
Israeli (*N* = 174)	Benevolence	Power	-0.31	0.57	-1.44	0.82	.591
		SAS	0.34	0.47	-0.58	1.27	.463
		Power x self-esteem	0.06	0.09	-0.13	0.24	.545
Israeli (*N* = 174)	Resentment-Avoidance	Power	0.76	0.64	-0.49	2.02	.233
		SAS	0.04	0.52	-0.99	1.06	.940
		Power x self-esteem	-0.15	0.10	-0.35	0.05	.144

Note. CI = confidence interval; *LL* = lower limit; *UL* = upper limit. Self-esteem = independent self-esteem measured with the Multidimensional Self-Concept Scale. SAS = interdependent self-esteem measured with the Social-Autonomous Self-Esteem Scale.

Results of Likelihood Ratio Tests

Table S11

Results of Likelihood Ratio Tests for APIMeMs Predicting Forgiveness From Power With Self-Esteem as a Mediator (Saturated Model vs. Equal-Actor-Equal-Partner Effects Model)

	German sample		Israeli sample	
	$\chi^2(6)$	*p*	$\chi^2(6)$	*p*
Criterion (mediator in parantheses)				
Benevolence (MSCS)	2.468	.872	2.276	.893
Resentment-avoidance (MSCS)	1.173	.978	4.979	.547
Benevolence (SAS)	-	-	1.248	.974
Resentment-avoidance (SAS)	-	-	6.501	.370

Note. MSCS = Multidimensional Self-Concept Scale, i.e., independent self-esteem. SAS = Social Autonomous Self-Esteem Scale, i.e., interdependent self-esteem.

Baseline Actor-Partner-Interdependence Model With Power as Predictor and Forgiveness as Outcome

Table S12

Results (Unstandardized Regression Coefficients, Bootstrapped 99% Confidence Intervals, Standard Errors, p*-Values for Two-Tailed Wald Tests, Effect Sizes) of APIM Analyses Predicting Forgiveness Dimensions from Power*

	Actor					Partner				
Variable	$b_{F/M}$	99% CI	*SE*	*p*	$\lvert\Delta_{F/M}\rvert$	$b_{F/M}$	99% CI	*SE*	*p*	$\lvert\Delta_{F/M}\rvert$
German Sample										
Benevolence	**0.37**	[0.20, 0.55]	0.07	<.001	0.38/0.45	**0.20**	[0.05, 0.34]	0.06	.001	0.21/0.24
Resentment-Avoidance	**-0.42**	[-0.60, -0.23]	0.07	<.001	0.41/0.51	**-0.16**	[-0.33, 0.03]	0.07	.021	0.16/0.19
Israeli Sample										
Benevolence	**0.37**	[0.15, 0.60]	0.09	<.001	0.29/0.27	0.14	[-0.08, 0.36]	0.08	.089	0.11/0.10
Resentment-Avoidance	**-0.41**	[-0.64, -0.20]	0.09	<.001	0.28/0.33	-0.16	[-0.38, 0.06]	0.09	.059	0.11/0.13

Appendix D – Power, Self-Esteem, Body Image

Mediation of the Effect of Power via Self-Esteem (Without the Physical Appearance Subscale) on Body Satisfaction (BISS)

Table S13

Study 1: Results of Mediation Analyses Predicting Body-Related Variables (Y) From Power (X) Mediated by Self-Esteem Without the Physical Appearance Subscale (M)

	b	*SE*	*p*	95% CI	Effect size *ps*
Body satisfaction					
X → M (a)	0.62	0.06	< .001	[0.51, 0.73]	
M → Y (b)	0.79	0.10	< .001	[0.59, 0.97]	
X → Y (c′)	0.27	0.10	.007	[0.07, 0.47]	0.15
Indirect (a*b)	0.49	0.08	-	[0.35, 0.65]	0.28
Total (c)	0.76	0.10	< .001	[0.55, 0.96]	0.44

Note. 95% CIs and *p*-values are one-tailed.

Table S14

Study 2: Results of Mediation Analyses Predicting Body-Related Variables (Y) From Power (X) Mediated by Self-Esteem Without the Physical Appearance Subscale (M)

	b	*SE*	*p*	95% CI	Effect size *ps*
Body satisfaction					
X → M (a)	0.20	0.10	.026	[0.01, 0.39]	
M → Y (b)	1.64	0.28	< .001	[1.10, 2.19]	
X → Y (c′)	0.80	0.25	.001	[0.30, 1.29]	0.51
Indirect (a*b)	0.32	0.17	-	[0.01, 0.69]	0.21
Total (c)	1.13	0.30	< .001	[0.53, 1.73]	0.72

Note. 95% CIs and *p*-values are one-tailed.

When overlapping scales were not included, and thus, the self-esteem scales (SSES, MSES) did not refer to physical appearance subscales, the results hardly differed (see

Tables S13, S14) from those reported in the manuscript with all the subscales, and the implications remained the same. This lack of change suggests that self-esteem also mediates the power-body-satisfaction link when conceptually similar aspects of self-esteem and body satisfaction are removed. Thus, the relationship that was found was not due to overlap in the measures. In other words, being confident about one's appearance is not (solely) responsible for the mediation of power through self-esteem on body satisfaction (BISS).

Admiration and Rivalry as Moderators

Study 1: The interaction between power and admiration did not have significant effects on the *BISS* (p = .449), *BAS-2* (p = .287), or *BHS* (p = .108). Thus, admiration was not a moderator. The interaction between power and rivalry also did not have significant effects on the *BISS* (p = .079), *BAS-2* (p = .223), or *BHS* (p = .276). Thus, rivalry was also not a moderator.

Study 2: The interaction between power and admiration did not have significant effects on the *BISS* (p = .112), *BAS-2* (p = .105), or *BHS* (p = .241). Thus, again, admiration was not a moderator. The interaction between power and rivalry also did not have significant effects on the *BISS* (p = .070) or *BHS* (p = .330). But the effect of the interaction between power and rivalry did have a significant effect on the *BAS-2* (p = .047). Thus, participants in the high power group with low or medium levels of rivalry showed higher body appreciation than participants in the low power group. Yet, in participants with high levels of rivalry, there was no significant difference.

Results With All Three Dependent Variables in One Mediation Model

Table S15

Study 1: Results of Mediation Analyses Predicting Body-Related Variables (Y) From Power (X) Mediated by Self-Esteem (M)

	b	*SE*	*p*	95% CI	Effect size *ps*
Body satisfaction					
X → M (a)	0.62	0.06	< .001	[0.50, 0.73]	
M → Y (b)	0.95	0.09	< .001	[0.77, 1.13]	
X → Y (c′)	0.17	0.10	.043	[-0.02, 0.36]	0.10
Indirect (a*b)	0.59	0.08	-	[0.43, 0.76]	0.34
Total (c)	0.76	0.10	< .001	[0.55, 0.96]	0.44
Body appreciation					
X → M (a)	0.62	0.06	< .001	[0.50, 0.73]	
M → Y (b)	0.49	0.04	< .001	[0.40, 0.57]	
X → Y (c′)	0.09	0.04	.013	[0.01, 0.17]	0.11
Indirect (a*b)	0.30	0.04	-	[0.23, 0.38]	0.37
Total (c)	0.39	0.05	< .001	[0.30, 0.48]	0.48
Perceived body height					
X → M (a)	0.62	0.06	< .001	[0.50, 0.73]	
M → Y (b)	0.00	0.13	.488	[-0.26, 0.25]	
X → Y (c′)	0.06	0.14	.341	[-0.22, 0.33]	0.03
Indirect (a*b)	0.00	0.08	-	[-0.17, 0.16]	0.00
Total (c)	0.06	0.12	.320	[-0.18, 0.29]	0.03

Note. 95% CIs and *p*-values are one-tailed. Cases that were excluded from the results presented in manuscript were included in the results presented in this table.

Table S16

Study 2: Results of Mediation Analyses Predicting Body-Related Variables (Y) From Power (X) Mediated by Self-Esteem (M)

	b	*SE*	*p*	95% CI	Effect size *ps*
Body satisfaction					
X → M (a)	0.41	0.13	.002	[0.14, 0.67]	
M → Y (b)	1.50	0.23	< .001	[1.15, 1.84]	
X → Y (c′)	0.52	0.23	.015	[0.04 0.97]	0.32
Indirect (a*b)	0.80	0.21	-	[0.21, 1.05]	0.37
Total (c)	1.13	0.30	< .001	[0.54, 1.72]	0.69
Body appreciation					
X → M (a)	0.41	0.13	.002	[0.15, 0.67]	
M → Y (b)	0.57	0.10	< .001	[0.36, 0.77]	
X → Y (c′)	0.07	0.14	.311	[-0.21, 0.33]	0.09
Indirect (a*b)	0.23	0.09	-	[0.08, 0.42]	0.30
Total (c)	0.30	0.15	.022	[0.01, 0.59]	0.39
Perceived body height					
X → M (a)	0.42	0.14	.002	[0.14, 0.70]	
M → Y (b)	1.48	0.25	< .001	[1.03, 1.98]	
X → Y (c′)	0.72	0.41	.044	[-0.12, 1.50]	0.31
Indirect (a*b)	0.62	0.25	-	[0.19, 1.18]	0.27
Total (c)	1.34	0.41	.001	[0.52, 2.15]	0.57

Note. 95% CIs and *p*-values are one-tailed. Cases that were excluded from the results presented in manuscript were included in the results presented in this table.

In the presented tables, we simultaneously tested the mediation of power via self-esteem on all three dependent variables. We used Mplus Version 7 to conduct the analyses. The results hardly differed from those obtained with PROCESS.

Justification of the New Power Manipulation

Typical power manipulations are role-plays, scenario tasks (imagining being in a powerful or powerless role), priming, or postural changes (see Galinsky et al., 2015). We did not use postural interventions because these might actually manipulate dominance or prestige instead of power (Körner et al., 2022). Priming manipulations have not been successful in our lab, and priming is seen as somewhat controversial (e.g., Doyen et al., 2014). A scenario task was more feasible during the pandemic than an actual role-play. Moreover, scenario tasks have often been employed in power research. Yet, we developed a new task to fit this task to our population of potential participants (i.e., students).

Typically, power researchers who employ scenario tasks instruct participants to imagine being in the position of a boss who is in charge of employees (high power) or being an employee who has to follow orders (low power; Dubois et al., 2010). The same task has also been used with additional elements in the literature in which high power participants evaluated low power participants and decided who received a monetary bonus. By contrast, low power participants were told to follow orders and that they would be evaluated by managers (Galinsky et al., 2003). Often, managers have to direct, evaluate, and reward subordinates, whereas subordinates must follow the managers' directions (Huang et al., 2011). In other low-power scenarios, participants are asked to imagine sitting in front of a boss who is dissatisfied with the participant's job performance, sitting in a dentist's chair, being detained by the police, or being a freshman who is laughed at by older students. In other high-power scenarios, participants are asked to imagine watching and evaluating the performance of a subordinate in a meeting, being a senior in high school looking at freshman, or standing at one's own executive desk and overseeing the progress of the work team (see Cesario & McDonald, 2013).

We used an application scenario because most students are familiar with such situations. We adopted the manager-subordinate scheme and thus had a boss and an applicant. To strengthen the power induction, participants were asked to engage in

different tasks. The boss was in charge, evaluated the applicants, and decided who would be rewarded (i.e., invited to a job interview). The applicant had to write a letter of application, which is a new element compared with other power manipulations, but the applicant was also fully dependent on the boss as in other manipulations. The scenario reflects common power definitions, which emphasize social influence as the most important aspect (Anderson et al, 2012; Dahl, 1957): The boss had power over the applicant in being able to influence the applicant's outcomes. The applicant was fully subjected to the decision-making power of the boss and could not influence the outcome (because the application was rejected in the end). The specific tasks differed from other power manipulations, but the core elements remained the same (a boss directed, evaluated, and rewarded the applicant; an applicant was supposed to follow orders or try to fit the job posting).

Appendix E – Power and the Illusion of Explanatory Depth

Pilot Study 1

To ensure a strong induction of power and to circumvent criticism regarding some previously used power manipulations (Tost, 2015), we created new manipulations that were aimed to closely fit our target population. We used scenarios to manipulate power (https://aspredicted.org/blind.php?x=sr6vd8) because they have been used successfully in power research (Galinsky et al., 2015; Inesi et al., 2014).[16] In the high-power condition, participants were asked to imagine that they lived in a large apartment and had received applications from potential flatmates. They were able to choose between applicants and formulated requirements for these people. Thus, high-power participants had resource and outcome control (Keltner et al., 2003)—factors that have been shown to evoke a sense of power (Tost, 2015). Participants in the low-power condition imagined that they had applied for a room in an unattractive apartment and urgently needed a room. Thus, they lacked resources. Then, participants completed 20 state feelings of which 16 were filler items to avoid potential demand effects. As a manipulation check, we administered the adjectives "dominant," "inferior," "in charge," and "powerless" to create a score for power feelings (α = .66). Afterwards, participants completed control items regarding their immersion into and identification with their role in the scenario, motivation to do the task, and empathy with their role on a 7-point scale. In total, 57 participants completed the pretest (46 women; M_{age} = 24.63, SD = 2.26, 21 to 29).

Participants in the high-power condition (M = 4.80, SD = 0.90) reported significantly higher feelings of power than participants in the low-power condition (M = 3.54, SD = 1.11), $t(55) = 4.679$, $p < .001$, $d = 1.245$. After excluding participants who had

[16] We also pretested a scrambled sentence task but found no difference in power feelings between high- (M = 4.46, SD = 1.19) and low-power participants (M = 4.57, SD = 0.98), $t(68) = -.533$, p = .666, d = -0.102. Thus, this manipulation was not used in the studies.

a mean that was below 4 on the aggregated control variables (i.e., the participants indicated low motivation or effort when completing the scenarios) as preregistered, the manipulation check showed high consistency ($\alpha = .71$), and the difference increased (high power: $M = 5.03$, $SD = 0.85$; low power: $M = 3.39$, $SD = 1.04$, $t(45) = 5.862$, $p < .001$, $d = 1.715$. Apparently, the task induced a large effect on experienced power and was thus used in the following main experiment.

Pilot Study 2

We pretested the effectiveness of the power manipulation for Experiment 2. Again, we used scenarios to which participants were randomly assigned but changed the content to allow for higher generalizability of the results. Participants in the high-power condition were asked to imagine that they were in a leading position of a student consultancy. They received applications from potential employees and had to decide which applicants they wanted to invite for a job interview. Then, they generated questions for the interview. Participants in the low-power condition imagined that they had applied for a job at the consultancy. They were told that they very much needed this job to pay for their expenses and were instructed to write a letter of application. The same manipulation check ($\alpha = .78$) and filler items as in Pilot Study 1 followed. 52 participants finished the pretest. Seven participants had to be excluded because they did not complete the power manipulation (22 women; $M_{age} = 30.13$, $SD = 12.22$, 19 to 68).

Participants in the high-power condition ($M = 4.78$, $SD = 1.38$) reported significantly higher feelings of power than those in the low-power condition ($M = 2.73$, $SD = 1.15$), $t(43) = 5.399$, $p < .001$, $d = 1.613$. Thus, this scenario task also produced a large effect on experienced power and was thus used in the following main experiment.

Detailed ANOVA Results

Study 1

Table S17

Results of 2 (High vs. Low Power) x 2 (Devices vs. Procedures) x 2 (t1 vs. t2) ANOVA for Experiment 1

Effect	*F*	*df*	*p*	η_p^2
Power	0.001	1, 159	.971	.000
Knowledge	179.609	1, 159	**< .001**	.530
Time	17.804	1, 159	**< .001**	.101
Power x Knowledge	0.244	1, 159	.622	.002
Power x Time	6.962	1, 159	**.009**	.042
Knowledge x Time	6.559	1, 159	**.011**	.040
Power x Knowledge x Time	0.119	1, 159	.731	.001

Table S18

Results of 2 (High vs. Low Power) x 2 (Devices vs. Procedures) x 2 (t1 vs. t2) ANOVA for Experiment 1 After Excluding Participants Based on Control Items

Effect	*F*	*df*	*p*	η_p^2
Power	0.118	1, 132	.732	.001
Knowledge	134.065	1, 132	**< .001**	.504
Time	17.371	1, 132	**< .001**	.116
Power x Knowledge	0.130	1, 132	.791	.001
Power x Time	4.162	1, 132	**.043**	.031
Knowledge x Time	7.403	1, 132	**.007**	.053
Power x Knowledge x Time	0.352	1, 132	.554	.003

Table S19

Results of 2 (High vs. Low Power) x 2 (Devices vs. Procedures) x 2 (t1 vs. Rating of Judges) ANOVA for Experiment 1

Effect	*F*	*df*	*p*	η_p^2
Power	0.754	1, 159	.387	.005
Knowledge	188.608	1, 159	**< .001**	.543
Time	13.462	1, 159	**< .001**	.078
Power x Knowledge	0.113	1, 159	.737	.001
Power x Time	11.275	1, 159	**.001**	.066
Knowledge x Time	0.196	1, 159	.659	.001
Power x Knowledge x Time	0.017	1, 159	.896	.000

Table S20

Results of 2 (High vs. Low Power) x 2 (Devices vs. Procedures) x 2 (t1 vs. Rating of Judges) ANOVA for Experiment 1 After Excluding Participants Based on Control Items

Effect	*F*	*df*	*p*	η_p^2
Power	0.311	1, 132	.578	.002
Knowledge	140.160	1, 132	**< .001**	.515
Time	13.122	1, 132	**< .001**	.090
Power x Knowledge	0.205	1, 132	.651	.002
Power x Time	9.791	1, 132	**.002**	.069
Knowledge x Time	0.001	1, 132	.980	.000
Power x Knowledge x Time	0.119	1, 132	.731	.001

Study 2

Table S21

Results of Moderated Mediation Analysis (Experiment 2) With IOED as Outcome

Effect	*b*	*SE*	*p*	95% CI	
				LL	UL
Power on IOED (X →Y)	0.11	0.14	.214 [a]	-0.17	0.40
Construal style on IOED (M → Y)	-0.01	0.02	.195 [a]	-0.04	0.02
Power on construal style (X → M)	-0.21	0.66	.376 [a]	-1.52	1.11
Narcissism (moderator)	-0.10	0.10	.324	-0.30	0.10
Power x narcissism	0.12	0.20	.275 [a]	-0.27	0.51
Indirect effect	0.00	0.01	-	-0.03	0.03

Note. One-tailed bootstrapped 95% Confidence Intervals (CI, LL = lower limit; *k* = 10,000 samples) for the indirect effect were reported based on Davidson-MacKinnon heteroscedasticity-consistent standard errors.

[a] one-tailed *p*-values

Table S22

Results of Moderated Mediation Analysis (Experiment 2) With IOED as Outcome After Exclusions

Effect	*b*	*SE*	*p*	95% CI	
				LL	UL
Power on IOED (X →Y)	0.04	0.17	.413 [a]	-0.30	0.38
Construal style on IOED (M → Y)	0.00	0.02	.450 [a]	-0.04	0.03
Power on construal style (X → M)	-0.78	0.80	.165 [a]	-2.37	0.80
Narcissism (moderator)	-0.01	0.12	.926	-0.25	0.22
Power x narcissism	0.40	0.24	**.047** [a]	-0.07	0.88
Indirect effect	0.00	0.02	-	-0.04	0.05

Note. One-tailed bootstrapped 95% Confidence Intervals (CI, LL = lower limit; *k* = 10,000 samples) for the indirect effect were reported based on Davidson-MacKinnon heteroscedasticity-consistent standard errors.

[a] one-tailed *p*-values

Table S23

Results of Moderated Mediation Analysis (Experiment 2) With IOED (Observer Ratings) as Outcome

Effect	*b*	*SE*	*p*	95% CI	
				LL	UL
Power on IOED (X →Y)	-0.01	0.22	.487 [a]	-1.34	0.10
Construal style on IOED (M → Y)	0.04	0.02	.062 [a]	-0.45	0.43
Power on construal style (X → M)	-0.21	0.66	.376 [a]	-1.52	1.11
Narcissism (moderator)	-0.02	0.15	.898	-0.33	0.29
Power x narcissism	0.22	0.16	.236 [a]	-0.39	0.29
Indirect effect	-0.01	0.03	-	-0.08	0.04

Note. One-tailed bootstrapped 95% Confidence Intervals (CI, LL = lower limit; *k* = 10,000 samples) for the indirect effect were reported based on Davidson-MacKinnon heteroscedasticity-consistent standard errors.

[a] one-tailed *p*-values

Table S24

Results of Moderated Mediation Analysis (Experiment 2) With IOED (Observer Ratings) as Outcome After Exclusions

Effect	*b*	*SE*	*p*	95% CI	
				LL	UL
Power on IOED (X →Y)	-0.19	0.27	.239 [a]	-0.72	0.07
Construal style on IOED (M → Y)	0.05	0.03	**.042** [a]	-0.01	0.11
Power on construal style (X → M)	-0.78	0.80	.165 [a]	-2.37	0.80
Narcissism (moderator)	0.02	0.19	.906	-0.35	0.39
Power x narcissism	0.58	0.19	.063 [a]	-0.35	0.39
Indirect effect	-0.04	0.05	-	-0.16	0.04

Note. One-tailed bootstrapped 95% Confidence Intervals (CI, LL = lower limit; *k* = 10,000 samples) for the indirect effect were reported based on Davidson-MacKinnon heteroscedasticity-consistent standard errors.

[a] one-tailed *p*-values

Study 3

Table S25

Results of Moderated Mediation Analysis (Experiment 3) With IOED as Outcome

Effect	*b*	*SE*	*p*	95% CI	
				LL	UL
Power on IOED (X →Y)	0.04	0.07	.256 [a]	-0.09	0.18
Construal style on IOED (M → Y)	0.00	0.01	.451 [a]	-0.02	0.02
Power on construal style (X → M)	0.93	0.38	**.008** [a]	0.18	1.67
Narcissism (moderator)	-0.08	0.09	.380	-0.25	0.10
Power x narcissism	0.00	0.09	.481 [a]	-0.19	0.18
Indirect effect	0.00	0.01	-	-0.03	0.03

Note. One-tailed bootstrapped 95% Confidence Intervals (CI, LL = lower limit; *k* = 10,000 samples) for the indirect effect were reported based on Davidson-MacKinnon heteroscedasticity-consistent standard errors.

[a] one-tailed *p*-values

Table S26

Results of Moderated Mediation Analysis (Experiment 3) With IOED as Outcome After Exclusion

Effect	*b*	*SE*	*p*	95% CI	
				LL	UL
Power on IOED (X →Y)	0.02	0.08	.404 [a]	-0.13	0.17
Construal style on IOED (M → Y)	0.00	0.01	.492 [a]	-0.02	0.02
Power on construal style (X → M)	0.75	0.42	**.039** [a]	-0.08	1.57
Narcissism (moderator)	-0.13	0.09	.169	-0.31	0.05
Power x narcissism	0.06	0.09	.242 [a]	-0.31	0.05
Indirect effect	0.00	0.01	-	-0.02	0.02

Note. One-tailed bootstrapped 95% Confidence Intervals (CI, LL = lower limit; *k* = 10,000 samples) for the indirect effect were reported based on Davidson-MacKinnon heteroscedasticity-consistent standard errors.

[a] one-tailed *p*-values

Table S27

Results of Moderated Mediation Analysis (Experiment 3) With IOED (Observer Ratings) as Outcome

Effect				95% CI	
	b	*SE*	*p*	LL	UL
Power on IOED (X →Y)	0.09	0.10	.191 [a]	-0.11	0.28
Construal style on IOED (M → Y)	0.01	0.02	.234 [a]	-0.02	0.05
Power on construal style (X → M)	0.93	0.38	**.008** [a]	0.18	1.67
Narcissism (moderator)	0.18	0.14	.184	-0.09	0.45
Power x narcissism	0.08	0.14	.286 [a]	-0.19	0.34
Indirect effect	0.01	0.02	-	-0.02	0.05

Note. One-tailed bootstrapped 95% Confidence Intervals (CI, LL = lower limit; *k* = 10,000 samples) for the indirect effect were reported based on Davidson-MacKinnon heteroscedasticity-consistent standard errors.

[a] one-tailed *p*-values

Table S28

Results of Moderated Mediation Analysis (Experiment 3) With IOED (Observer Ratings) as Outcome After Exclusion

Effect				95% CI	
	b	*SE*	*p*	LL	UL
Power on IOED (X →Y)	0.09	0.11	.219 [a]	-0.14	0.32
Construal style on IOED (M → Y)	0.01	0.02	.280 [a]	-0.03	0.05
Power on construal style (X → M)	0.75	0.42	**.039** [a]	-0.08	1.57
Narcissism (moderator)	0.19	0.15	.212	-0.11	0.48
Power x narcissism	0.09	0.15	.265 [a]	-0.20	0.38
Indirect effect	0.01	0.02	-	-0.02	0.05

Note. One-tailed bootstrapped 95% Confidence Intervals (CI, LL = lower limit; *k* = 10,000 samples) for the indirect effect were reported based on Davidson-MacKinnon heteroscedasticity-consistent standard errors.

[a] one-tailed *p*-values

Analyses With Different Components of the IOED

Study 1 - ANALYSES WITH PREEXPLANATION RATINGS

Table S29

Results of 2 (High vs. Low Power) x 2 (Devices vs. Procedures) ANOVA for Experiment 1 with Preexplanation Ratings as Dependent Variable

Effect	*F*	*df*	*p*	η_p^2
Power	0.746	1, 159	.389	.005
Knowledge	130.907	1, 159	**< .001**	.452
Power x Knowledge	0.113	1, 159	.737	.001

Only devices as knowledge type: High power participants (M = 2.61, SD = 1.05) did not differ from low power participants (M = 2.53, SD = 0.94), $t(80) = 0.369$, p = .713. Only procedures as knowledge type: High power participants (M = 4.43, SD = 0.89) did not differ from low power participants (M = 4.24, SD = 1.05), $t(79) = 0.857$, p = .394.

Table S30

Results of 2 (High vs. Low Power) x 2 (Devices vs. Procedures) ANOVA for Experiment 1 with Preexplanation Ratings as Dependent Variable After Excluding Participants Based on Control Items

Effect	*F*	*df*	*p*	η_p^2
Power	1.030	1, 132	.312	.008
Knowledge	95.441	1, 132	**< .001**	.420
Power x Knowledge	0.287	1, 132	.593	.002

Study 1 - ANALYSES WITH POSTEXPLANATION RATINGS

Table S31

Results of 2 (High vs. Low Power) x 2 (Devices vs. Procedures) ANOVA for Experiment 1 with Postexplanation Ratings as Dependent Variable

Effect	*F*	*df*	*p*	η_p^2
Power	0.942	1, 159	.222	.006
Knowledge	189.058	1, 159	**< .001**	.543
Power x Knowledge	0.355	1, 159	.552	.002

Only devices as knowledge type: High power participants (M = 2.10, SD = 0.96) did not differ from low power participants (M = 2.33, SD = 0.91), $t(80) = -1.123$, $p = .265$. Only procedures as knowledge type: High power participants (M = 4.22, SD = 0.98) did not differ from low power participants (M = 4.28, SD = 0.93), $t(79) = -0.262$, $p = .794$.

Table S32

Results of 2 (High vs. Low Power) x 2 (Devices vs. Procedures) ANOVA for Experiment 1 with Postexplanation Ratings as Dependent Variable After Excluding Participants Based on Control Items

Effect	*F*	*df*	*p*	η_p^2
Power	0.153	1, 132	.696	.001
Knowledge	143.633	1, 132	**< .001**	.521
Power x Knowledge	0.016	1, 132	.893	.000

Study 1 - ANALYSES WITH JUDGE RATINGS OF PARTICIPANTS' EXPLANATIONS

Table S33

Results of 2 (High vs. Low Power) x 2 (Devices vs. Procedures) ANOVA for Experiment 1 with Explanation Ratings by Judges as Dependent Variable

Effect	*F*	*df*	*p*	η_p^2
Power	6.709	1, 159	**.010**	.040
Knowledge	156.350	1, 159	**< .001**	.496
Power x Knowledge	0.059	1, 159	.908	.000

Only devices as knowledge type: High power participants (M = 2.14, SD = 0.60) did significantly differ from low power participants (M = 2.53, SD = 0.73), $t(80) = -2.601$, $p = .011$.

Only procedures as knowledge type: High power participants (M = 3.88, SD = 1.10) did not differ from low power participants (M = 4.20, SD = 0.95), $t(79) = -1.397$, $p = .167$.

Table S34

Results of 2 (High vs. Low Power) x 2 (Devices vs. Procedures) ANOVA for Experiment 1 with Explanation Ratings by Judges as Dependent Variable After Excluding Participants Based on Control Items

Effect	*F*	*df*	*p*	η_p^2
Power	4.660	1, 132	.033	.034
Knowledge	118.329	1, 132	**< .001**	.473
Power x Knowledge	0.055	1, 132	.814	.000

Study 2

Table S35

Results of Moderated Mediation Analysis (Experiment 2) With Preexplanation Rating as Outcome

Effect				95% CI	
	b	*SE*	*p*	LL	UL
Power on IOED (X →Y)	0.13	0.19	.245 [a]	-0.24	0.51
Construal style on IOED (M → Y)	0.04	0.02	**.013** [a]	0.01	0.08
Power on construal style (X → M)	-0.21	0.66	.376 [a]	-1.52	1.11
Narcissism (moderator)	0.02	0.15	.902	-0.27	0.31
Power x narcissism	0.06	0.30	.423 [a]	-0.54	0.66
Indirect effect	-0.01	0.04	-	-0.09	0.05

Note. One-tailed bootstrapped 95% Confidence Intervals (CI, LL = lower limit; *k* = 10,000 samples) for the indirect effect were reported based on Davidson-MacKinnon heteroscedasticity-consistent standard errors.

[a] one-tailed *p*-values

Table S36

Results of Moderated Mediation Analysis (Experiment 2) With Preexplanation Rating as Outcome After Exclusions

Effect				95% CI	
	b	*SE*	*p*	LL	UL
Power on IOED (X →Y)	-0.09	0.23	.349 [a]	-0.53	0.36
Construal style on IOED (M → Y)	0.04	0.03	.064 [a]	-0.01	0.09
Power on construal style (X → M)	-0.78	0.80	.165 [a]	-2.37	0.80
Narcissism (moderator)	0.10	0.15	.512	-0.20	0.40
Power x narcissism	0.11	0.29	.345 [a]	-0.46	0.69
Indirect effect	-0.03	0.04	-	-0.14	0.03

Note. One-tailed bootstrapped 95% Confidence Intervals (CI, LL = lower limit; *k* = 10,000 samples) for the indirect effect were reported based on Davidson-MacKinnon heteroscedasticity-consistent standard errors.

[a] one-tailed *p*-values

Table S37

Results of Moderated Mediation Analysis (Experiment 2) With Postexplanation Rating as Outcome

Effect	*b*	*SE*	*p*	95% CI	
				LL	UL
Power on IOED (X →Y)	0.02	0.18	.461 [a]	-0.34	0.38
Construal style on IOED (M → Y)	0.06	0.02	**.002** [a]	0.02	0.10
Power on construal style (X → M)	-0.21	0.66	.376 [a]	-1.52	1.11
Narcissism (moderator)	0.12	0.15	.436	-0.18	0.41
Power x narcissism	-0.06	0.30	.421 [a]	-0.66	0.54
Indirect effect	-0.01	0.04	-	-0.10	0.06

Note. One-tailed bootstrapped 95% Confidence Intervals (CI, LL = lower limit; *k* = 10,000 samples) for the indirect effect were reported based on Davidson-MacKinnon heteroscedasticity-consistent standard errors.

[a] one-tailed *p*-values

Table S38

Results of Moderated Mediation Analysis (Experiment 2) With Postexplanation Rating as Outcome After Exclusions

Effect	*b*	*SE*	*p*	95% CI	
				LL	UL
Power on IOED (X →Y)	-0.13	0.24	.300 [a]	-0.60	0.35
Construal style on IOED (M → Y)	0.04	0.03	.048 [a]	-0.01	0.09
Power on construal style (X → M)	-0.78	0.80	.165 [a]	-2.37	0.80
Narcissism (moderator)	0.11	0.18	.545	-0.25	0.47
Power x narcissism	0.22	0.16	.236 [a]	-0.39	0.29
Indirect effect	-0.03	0.05	-	-0.14	0.03

Note. One-tailed bootstrapped 95% Confidence Intervals (CI, LL = lower limit; *k* = 10,000 samples) for the indirect effect were reported based on Davidson-MacKinnon heteroscedasticity-consistent standard errors.

[a] one-tailed *p*-values

Table S39

Results of Moderated Mediation Analysis (Experiment 2) With Judge Rating of Explanation as Outcome

Effect				95% CI	
	b	*SE*	*p*	LL	UL
Power on IOED (X →Y)	0.14	0.15	.180 [a]	-0.16	0.44
Construal style on IOED (M → Y)	0.01	0.02	.307 [a]	-0.02	0.04
Power on construal style (X → M)	-0.21	0.66	.376 [a]	-1.52	1.11
Narcissism (moderator)	0.04	0.11	.719	-0.17	0.25
Power x narcissism	-0.17	0.20	.208 [a]	-0.57	0.24
Indirect effect	0.00	0.01	-	-0.02	0.02

Note. One-tailed bootstrapped 95% Confidence Intervals (CI, LL = lower limit; *k* = 10,000 samples) for the indirect effect were reported based on Davidson-MacKinnon heteroscedasticity-consistent standard errors.

[a] one-tailed *p*-values

Table S40

Results of Moderated Mediation Analysis (Experiment 2) With Judge Rating of Explanation as Outcome After Exclusions

Effect				95% CI	
	b	*SE*	*p*	LL	UL
Power on IOED (X →Y)	0.10	0.18	.288 [a]	-0.26	0.47
Construal style on IOED (M → Y)	-0.01	0.02	.283 [a]	-0.05	0.03
Power on construal style (X → M)	-0.78	0.80	.165 [a]	-2.37	0.80
Narcissism (moderator)	0.08	0.12	.534	-0.17	0.33
Power x narcissism	-0.464	0.25	**.031** [a]	-0.95	0.03
Indirect effect	0.01	0.02	-	-0.03	0.06

Note. One-tailed bootstrapped 95% Confidence Intervals (CI, LL = lower limit; *k* = 10,000 samples) for the indirect effect were reported based on Davidson-MacKinnon heteroscedasticity-consistent standard errors.

[a] one-tailed *p*-values

Study 3

Table S41

Results of Moderated Mediation Analysis (Experiment 2) With Preexplanation Rating as Outcome

Effect	*b*	*SE*	*p*	95% CI	
				LL	UL
Power on IOED (X →Y)	0.09	0.10	.187 [a]	-0.10	0.28
Construal style on IOED (M → Y)	0.05	0.02	**.002** [a]	0.02	0.08
Power on construal style (X → M)	0.93	0.38	**.008** [a]	0.18	1.67
Narcissism (moderator)	0.08	0.12	.516	-0.16	0.31
Power x narcissism	-0.06	0.11	.309 [a]	-0.28	0.17
Indirect effect	**0.04**	0.02	-	0.01	0.10

Note. One-tailed bootstrapped 95% Confidence Intervals (CI, LL = lower limit; *k* = 10,000 samples) for the indirect effect were reported based on Davidson-MacKinnon heteroscedasticity-consistent standard errors.

[a] one-tailed *p*-values

Table S42

Results of Moderated Mediation Analysis (Experiment 2) With Preexplanation Rating as Outcome After Exclusions

Effect	*b*	*SE*	*p*	95% CI	
				LL	UL
Power on IOED (X →Y)	0.10	0.10	.174 [a]	-0.11	0.30
Construal style on IOED (M → Y)	0.05	0.02	**.003** [a]	0.01	0.08
Power on construal style (X → M)	0.75	0.42	**.039** [a]	-0.08	1.57
Narcissism (moderator)	0.05	0.12	.704	-0.20	0.30
Power x narcissism	-0.09	0.12	.229 [a]	-0.33	0.15
Indirect effect	0.04	0.02	-	-0.00	0.10

Note. One-tailed bootstrapped 95% Confidence Intervals (CI, LL = lower limit; *k* = 10,000 samples) for the indirect effect were reported based on Davidson-MacKinnon heteroscedasticity-consistent standard errors.

[a] one-tailed *p*-values

Table S43

Results of Moderated Mediation Analysis (Experiment 2) With Postexplanation Rating as Outcome

Effect	*b*	*SE*	*p*	95% CI	
				LL	UL
Power on IOED (X →Y)	0.04	0.09	.330 [a]	-0.14	0.23
Construal style on IOED (M → Y)	0.05	0.02	**.001** [a]	0.02	0.08
Power on construal style (X → M)	0.93	0.38	**.008** [a]	0.18	1.67
Narcissism (moderator)	0.16	0.12	.196	-0.08	0.39
Power x narcissism	-0.05	0.10	.310 [a]	-0.26	0.15
Indirect effect	**0.05**	0.02	-	0.01	0.07

Note. One-tailed bootstrapped 95% Confidence Intervals (CI, LL = lower limit; *k* = 10,000 samples) for the indirect effect were reported based on Davidson-MacKinnon heteroscedasticity-consistent standard errors.

[a] one-tailed *p*-values

Table S44

Results of Moderated Mediation Analysis (Experiment 2) With Postexplanation Rating as Outcome After Exclusions

Effect	*b*	*SE*	*p*	95% CI	
				LL	UL
Power on IOED (X →Y)	0.08	0.10	.203 [a]	-0.11	0.27
Construal style on IOED (M → Y)	0.05	0.02	**.002** [a]	0.02	0.08
Power on construal style (X → M)	0.75	0.42	**.039** [a]	-0.08	1.57
Narcissism (moderator)	0.17	0.12	.155	-0.07	0.42
Power x narcissism	-0.16	0.10	.066 [a]	-0.35	0.41
Indirect effect	0.03	0.02	-	-0.00	0.07

Note. One-tailed bootstrapped 95% Confidence Intervals (CI, LL = lower limit; *k* = 10,000 samples) for the indirect effect were reported based on Davidson-MacKinnon heteroscedasticity-consistent standard errors.

[a] one-tailed *p*-values

Table S45

Results of Moderated Mediation Analysis (Experiment 2) With Judge Rating of Explanation as Outcome

Effect				95% CI	
	b	*SE*	*p*	LL	UL
Power on IOED (X →Y)	0.00	0.08	.495 [a]	-0.15	0.15
Construal style on IOED (M → Y)	0.04	0.01	**.007** [a]	0.01	0.06
Power on construal style (X → M)	0.93	0.38	**.008** [a]	0.18	1.67
Narcissism (moderator)	-0.10	0.09	.274	-0.29	0.08
Power x narcissism	0.00	0.09	.481 [a]	-0.19	0.18
Indirect effect	**0.03**	0.02	-	0.00	0.08

Note. One-tailed bootstrapped 95% Confidence Intervals (CI, LL = lower limit; *k* = 10,000 samples) for the indirect effect were reported based on Davidson-MacKinnon heteroscedasticity-consistent standard errors.

[a] one-tailed *p*-values

Table S46

Results of Moderated Mediation Analysis (Experiment 2) With Judge Rating of Explanation as Outcome After Exclusions

Effect				95% CI	
	b	*SE*	*p*	LL	UL
Power on IOED (X →Y)	0.01	0.08	.457 [a]	-0.16	0.17
Construal style on IOED (M → Y)	0.04	0.02	**.008** [a]	0.01	0.07
Power on construal style (X → M)	0.75	0.42	**.039** [a]	-0.08	1.57
Narcissism (moderator)	-0.14	0.10	.158	-0.33	0.05
Power x narcissism	-0.18	0.09	**.039** [a]	-0.36	-0.01
Indirect effect	0.03	0.02	-	-0.00	0.06

Note. One-tailed bootstrapped 95% Confidence Intervals (CI, LL = lower limit; *k* = 10,000 samples) for the indirect effect were reported based on Davidson-MacKinnon heteroscedasticity-consistent standard errors.

[a] one-tailed *p*-values

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Hiermit erkläre ich, Robert Körner, an Eides statt, dass ich diese Dissertationsschrift ohne unzulässige Hilfe Dritter sowie ohne Benutzung anderer als der angegebenen Hilfsmittel, eigenständig angefertigt habe. Gedanken, welche aus fremden Quellen direkt oder indirekt entnommen wurden, sind als solche kenntlich gemacht. Zudem versichere ich, dass die Dissertationsschrift weder im Inland noch im Ausland in gleicher oder ähnlicher Form einer anderen Prüfungsbehörde vorgelegt wurde.

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