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MINDS MEETING THROUGH MINDREADING AND MINDSPEAKING:

THE ROLE OF SOCIAL-COGNITIVE ABILITIES IN INTERPERSONAL FUNCTIONING IN TYPICALLY DEVELOPING ADULTS AND ADULTS WITH PATHOLOGICAL FEAR OF SOCIAL EVALUATION

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LIST OF ORIGINAL PUBLICATIONS

STUDY 1

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STUDY 2

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STUDY 3

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SUMMARY

Thinking about thoughts, desires and feelings allows individuals to understand themselves (metacognition) and others (mindreading). The present dissertation investigates the ability to read other people's minds from the stance of a third-person observer of naturalistic social interaction. Furthermore, it examines mental state communication (mindspeaking), introduced as a concept reflecting communicative manifestations of first-person metacognition and second-person mindreading, i.e., individuals actively listening and talking to each other about their mental states. The general aim of this work is to advance an integrative research perspective on social-cognitive abilities and their role in interpersonal functioning, particularly social fear, avoidance, distress and conflict, across adults with (different) psychiatric disorders and typically developing adults.

Study 1 (Wacker, Bölte, & Dziobek, 2017) considered social psychological, biological, and developmental perspectives to characterize gender- and age-related individual differences in mindreading performance using the ecologically valid Movie for the Assessment of Social Cognition (Dziobek et al., 2006) in a large sample. By demonstrating that women performed better (specifically in reading the mind of females), and that age had a non-linear negative effect on mindreading across the life span, the results of this study contribute to a better understanding of interindividual variation in typically developing adults.

Study 2 (Buhlmann, Wacker, & Dziobek, 2015) investigated mindreading deficits with the same measure in adults with pathological social evaluation fear (social anxiety and body dysmorphic disorder) based on a transdiagnostic approach. Both groups showed a lower performance in understanding other people's mental states in social situations as compared to a clinical and a typically developing control group. The results confirm cognitive-behavioral models of social anxiety and body dysmorphic disorder emphasizing that biased interpretation of social information is a maintaining factor. Moreover, they show that mindreading difficulties generalize to situations in which individuals take a third-person observer perspective.

Study 3 (Wacker & Dziobek, 2018) evaluated the effects of a 3-day training in Nonviolent Communication (NVC; Rosenberg, 2015) on mental state communication skills, perspective taking, empathic concern, empathic distress and social stressors at work in typically developing adults in health professions. A pre-post design including a newly

developed NVC questionnaire and an established coding system for the observation of communication behavior was realized in the field setting of a public health organization. The training reduced empathic distress and prevented social stressors and conflict with colleagues and supervisors via increased verbalization of negative emotions in naturalistic social situations. This intervention study demonstrates that mental state communication can be effectively promoted in typically developing adults in professional roles demanding good socioemotional skills.

The insights gained through the empirical studies emphasize that being able to understand other people's minds and (verbally) reflect upon thoughts, desires, and feelings is not only an issue for adults with social-cognitive difficulties, but also substantially relevant for typically developing adults, given that it plays a pivotal role in interpersonal functioning in particular professions such as healthcare. The dissertation closes with suggestions for interventions and future research with regard to social-cognitive bias modification in socially anxious individuals, conflict communication in heterosexual romantic couples, and empathic distress fatigue prevention in helping professionals.

ZUSAMMENFASSUNG

Das Nachdenken über Gedanken, Wünsche und Gefühle ermöglicht Individuen, sich selbst (Metakognition) und andere (Mindreading) zu verstehen. Die vorliegende Dissertation untersucht die Fähigkeit, die mentalen Zustände anderer Personen in naturalistischer sozialer Interaktion aus der Dritte-Person-Perspektive eines Beobachters zu verstehen. Des Weiteren behandelt sie die Kommunikation mentaler Zustände (Mindspeaking). Dieses Konzept reflektiert die kommunikativen Manifestationen von Metakognition aus der Erste-Person-Pespektive und Mindreading aus der Zweiten-Person-Perspektive, d.h. Individuen, die über ihre mentalen Zustände sprechen und einander aktiv zuhören. Das allgemeine Ziel dieser Arbeit ist die Förderung einer integrativen Forschungsperspektive auf sozial-kognitive Fähigkeiten und ihre Rolle für interpersonale Erlebens- und Verhaltensweisen, insbesondere soziale Ängstlichkeit, Vermeidung, Distress und Konflikt, in Erwachsenen mit (verschiedenen) psychiatrischen Störungen und typisch entwickelten Erwachsenen.

Studie 1 (Wacker, Bölte, & Dziobek, 2017) berücksichtigt sozial-psychologische, biologische und entwicklungspsychologische Perspektiven, um geschlechts- und altersbezogene individuelle Unterschiede in Mindreadingperformanz zu charakterisieren auf Basis des ökologischen validen “Movie for the Assessment of Social Cognition” (Dziobek et al., 2006) in einer großen Stichprobe. Indem demonstriert werden konnte, dass Frauen eine bessere Performanz zeigten (insbesondere für das Verstehen mentaler Zustände von Frauen), und dass Alter einen nicht-linearen negativen Effekt auf Mindreading über die Lebensspanne hat, tragen die Ergebnisse dieser Studie dazu bei, interindividuelle Variation in typisch entwickelten Erwachsenen besser zu verstehen.

Studie 2 (Buhlmann, Wacker, & Dziobek, 2015) untersucht Mindreadingdefizite mit dem selben Maß in Erwachsenen mit pathologischer Angst vor sozialer Evaluation (soziale Angststörung und körperdysmorphe Störung) basierend auf einer transdiagnostischen Perspektive. Beide Gruppen zeigten, im Vergleich zu einer klinischen und einer typisch entwickelten erwachsenen Kontrollstichprobe, eine niedrigere Performanz in der Fähigkeit, die mentalen Zustände anderer Personen in sozialen Situationen zu verstehen. Die Ergebnisse bestätigen kognitiv-behaviorale Modelle sozialer Angst- und körperdysmorpher Störung, die betonen, dass verzerrte Interpretation von sozialen Informationen ein aufrechterhaltender Faktor ist. Zudem zeigen sie, dass Mindreadingprobleme generalisierbar

sind hinsichtlich Situationen, in denen Individuen die Dritte-Person-Perspektive eines Beobachters einnehmen.

Studie 3 (Wacker & Dziobek, 2018) evaluiert die Effekte eines dreitätigen Trainings in Gewaltfreier Kommunikation (NVC; Rosenberg, 2015) auf die Kommunikation mentaler Zustände, Perspektivübernahme, Mitgefühl, empathischen Distress und soziale Stressoren am Arbeitsplatz in typisch entwickelten Erwachsenen in Gesundheitsberufen. Ein Prä-Post-Design einschließlich eines neu entwickelten NVC-Fragebogens und eines etablierten Kodiersystems zur Beobachtung von Kommunikationsverhalten wurde im Feld einer Organisation des Gesundheitswesens realisiert. Das Training reduzierte empathischen Distress und hatte einen präventiven Effekt auf soziale Stressoren und Konflikte mit Kollegen und Vorgesetzten durch gesteigerte Verbalisierung negativer Emotionen in naturalistischen sozialen Situationen. Diese Interventionsstudie demonstriert, dass die Kommunikation mentaler Zustände effektiv gefördert werden kann in typisch entwickelten Erwachsenen in professionellen Rollen, die gute sozioemotionale Fähigkeiten erfordern.

Die Erkenntnisse der empirischen Studien betonen, dass die Fähigkeit, die mentalen Zustände anderer Personen zu verstehen und (verbal) über Gedanken, Wünsche und Gefühle zu reflektieren, nicht nur ein Problem für Erwachsene mit sozial-kognitiven Schwierigkeiten ist, sondern auch von wesentlicher Relevanz für typisch entwickelte Erwachsene, da es eine zentrale Rolle für sozioemotionale Fähigkeiten in bestimmten Berufen wie etwa im Gesundheitswesen spielt. Die Dissertation schließt mit Anregungen für Interventionen und zukünftige Forschung bezüglich der Modifikation sozial-kognitiver Verzerrungen bei sozial ängstlichen Individuen, Konfliktkommunikation in heterosexuellen romantischen Beziehungen, und Prävention von Erschöpfung durch empathischen Distress bei Personen in helfenden Berufen.

1 GENERAL INTRODUCTION

1.1 SOCIAL-COGNITIVE ABILITIES

I closed my mouth and spoke to you in a hundred silent ways.

- Jalāl ad-Dīn Rūmī (Persian poet and mystic, 1207-1273)

A human being is a spatially and temporally limited piece of the whole, what we call "Universe". He experiences himself and his feelings as separate from the rest, an optical illusion of his consciousness.

- Albert Einstein (German physicist and mystic, 1879-1955)

The myriad ways in which human beings can connect with each other might yet lie beyond the scope of what current scientific inquiry is capable of grasping. However, within the scope of the historically still relatively young field of empirical psychology (Titchener, 1921), we are able to examine certain mental phenomena relevant to individual minds "meeting" each other. In particular, research in social cognition aims at understanding the nature of cognitive processes and representations related to others and the self in social contexts, or, simply put, "how people make sense of other people and themselves in order to coordinate with their social world" (Fiske & Taylor, 2013, p. 16). One straightforward yet sophisticated way to understand others and the self as social agents is to think about thoughts, desires and feelings, i.e., representing others' and meta-representing one's own cognitive, affective, and motivational states. Understanding the mental states of another person is referred to as mindreading (Baron-Cohen, 1994; Whiten, 1991), whereas reflecting on one's own mental states is conceptualized as metacognition (Carruthers, 2009; Frith & Frith, 2012). The remarkable human capacity for complex symbolic representations through language and communication allows people to intertwine both in a dynamic process, as conversation partners can explicitly and mutually talk about their own and listen to each other's inner world.

In the following sections, I will first separately review the multifaceted literature on mindreading and metacognition with a specific focus on conceptual aspects relevant to the scope of this dissertation. Then, I will introduce the notion of mental state communication (mindspeaking) as an emerging concept embedding mindreading and metacognition in the context of verbal interaction, an area currently receiving relatively little attention by social cognition research. This effort is guided by the present dissertation's integrative perspective, which suggests that the understanding of social-cognitive abilities and their role in interpersonal functioning - especially with regard to their applications in personal and professional life - will benefit from taking a broader vantage point overlooking the research landscape across different psychological disciplines.

1.1.1 MINDREADING

1.1.1.1 DIVERSE PERSPECTIVES

Mindreading has been studied in diverse disciplines and by so many authors that alternative terms for the general ability to understand others´ mental states have been introduced throughout the past decades. It has been prominently referred to as theory of mind (e.g., Happé, Cook, & Bird, 2017), mentalizing (e.g., Frith & Frith, 2003), cognitive empathy (e.g., Dziobek et al., 2008), empathic accuracy (Ickes, Stinson, Bissonnette, & Garcia, 1990), and mental state inference (e.g., Ames, 2004). Like mindreading, these terms serve as umbrella concepts within which researchers group more specific abilities, for instance, perspective taking (Davis, 1983), and reading others´ cognitive (e.g., false belief understanding; Wimmer & Perner, 1983) and affective mental states (e.g., emotion recognition; Goldman & Sripada, 2005). I will generally use the umbrella term mindreading in this dissertation, although the alternative terms will appear on occasion for the purpose of linguistic variation. When applicable, I will use more narrow terms for specific mindreading abilities.

After Premack and Woodruff (1978) first asked whether chimpanzees are capable of theory of mind, it was traditionally researched in comparative and developmental psychology in order to understand which species have the capacity, and the age at which it develops in human infants (Lieberman, 2013). With respect to adults, an initial study on the development of mindreading in typical ageing indicated increasing "social wisdom" (Happé, Winner, & Brownell, 1998), but later research evidenced a negative age effect (Henry, Phillips, Ruffman, & Bailey, 2013). In the meantime, personality and social psychology became increasingly interested in the accuracy of mindreading as a perceiver-target interaction phenomenon (Zaki & Ochsner, 2011), and in the question of gender-related differences (Ickes, Gesn, & Graham, 2000), whereas sex-related mindreading differences were proposed by biological accounts (Baron-Cohen, 2002). Moreover, social psychological research also investigated how the tendency to take the perspective of another person's mind positively affects social behavior and relationships (e.g., Clary & Orenstein, 1991; Franzoi, Davis, & Young, 1985).

Another fairly large portion of mindreading literature addresses its psychopathology, with a specific focus on autism as a prototypical mindreading disorder (Baron-Cohen, 1995).

Yet social-cognitive deficits and biases were also found in various other psychiatric conditions, e.g., borderline personality disorder (Preißler, Dziobek, Ritter, Heekeren, & Roepke, 2010) and schizophrenia (Penn, Sanna, & Roberts, 2008). Furthermore, a negative bias in the interpretation of social information has been linked to the maintenance of social anxiety disorder (e.g., Amir, Foa, & Coles, 1998). Social-cognitive mechanisms in the context of pathological fear of social evaluation will be introduced in more detail in section 1.2.1.

Mindreading and closely related social-cognitive concepts were studied in applied psychological disciplines as well. For instance, understanding a patient's subjective experience was recognized as an important factor of the therapeutic relationship in psychotherapy and medical care (Rogers, 1957; Larson & Yao, 2005). Beyond clinical practice, organizational and occupational psychology explored social cognition in professional interaction, e.g., the multifaceted concept of emotional intelligence (encompassing emotion recognition) in leadership and management (Mayer, Salovey, & Caruso, 2000). Finally, mindreading in the workplace, termed social astuteness as a facet of political skill, is considered highly relevant for socially effective behavior in organizations viewed as micro-political arenas (Ferris, Perrewé, & Douglas, 2002).

Taken together, the interest in mindreading across psychological disciplines is omnipresent but, naturally, highly specific to their respective scopes. This dissertation's integrative approach, however, is inspired by the diversity of research perspectives in these areas. Firstly, study 1 combines social psychological, biological, and developmental perspectives on neurotypical mindreading differences related to gender and age. Literature on differences and biases was largely dominated by a psychopathological perspective, while variation in typically developing adults is relatively less researched and understood (Turner & Felisberti, 2017). This might be due to the scarcity of mindreading paradigms assessing neurotypical performance differences in a sensitive, reliable and ecologically valid way. Thus, in study 1, my co-authors and I address open research questions concerning gender and age effects on neurotypical adult mindreading by applying a measure that meets these methodological requirements.

1.1.1.2 Imagining, Observing Or Interacting with the Other?

It is truly intriguing that mentalizing about others´ inner worlds can be such an easily excitable function in typically developing individuals (or even a default mode of cognition; Lieberman, 2013; Schilbach, Eickhoff, Rotarska-Jagiela, Fink, & Vogeley, 2008) that it does not even require the existence of another person. The target of mindreading can be either purely imagined, merely observed, or actually interacted with. This fact gave rise to a pluralistic landscape of measures mirroring different modes of mindreading.

For instance, others´ mental states can be vividly pictured through pure fiction (e.g., in literature and arts; Kidd & Castano, 2013), or attributed to physical objects such as moving geometric figures (e.g., "troublesome" triangles; Heider & Simmel, 1944) and pictures of car shapes (e.g., the "happy car face"; Windhager et al., 2012). However, if the other mind is that of an existing individual, she still does not have to be involved in an interaction with the mentalizing person. A person's mind can be read through mere observation from a third-person perspective (representing natural situations, e.g., bystander role in social interaction). This perspective is reflected in numerous behavioral measures including naturalistic video or photo stimuli (e.g., Baron-Cohen, Jolliffe, Mortimore, & Robertson, 1997; Dziobek et al., 2006, 2008). Finally, inferring the mind of the other from a second-person perspective, for instance in a dialogue, is a further highly naturalistic setting for social cognition in action. However, taking accurate and objective measures within this dynamic setting can be methodologically challenging because it is by definition less structured and controlled, and may be more vulnerable to confounds. Thus, apart from supposed theoretical biases against the second-person perspective in current social cognition literature (i.e., spectatorial, intellectualist accounts seeing mindreaders as detached observers; Schilbach et al., 2013), the mentioned methodological difficulties might as well explain why mindreading in real interaction continues to be under-researched (but see wide application of the unstructured dyadic interaction paradigm of empathic accuracy; Mast & Ickes, 2006).

Within the studies of this dissertation, an established behavioral measure capturing the third-person perspective, the Movie for the Assessment of Social Cognition (MASC; Dziobek et al., 2006), is applied in study 1 and 2, and a self-report measure assessing second-person mindreading in verbal interaction (i.e. empathic listening subscale) is developed and applied in study 3.

1.1.2 METACOGNITION

The ability to meta-represent one's own mental states and report them claims a historical role in psychological research. Since 1879, trained and systematic introspection ("Selbstbeobachtung") was one of the standard methods used in the world's first psychological laboratory established by Wilhelm Wundt, considered the founding father of modern psychology (Titchener, 1921). Despite behaviorists´ later attempt to completely ban introspection from the discipline's toolkit (Watson, 1913), it remains a building block for all kinds of psychological self-report measures. Current experimental evidence supports the assumption that introspective reports are actually accurate and reliable (Questienne, van Dijck, & Gevers, 2017). This might partially explain why metacognition went above and beyond its role as a classical research method to being studied as a research object itself. One central question regarding metacognition is the ways in which individuals reflect on their mental states.

For instance, the tendency to attend to one's own feelings and thoughts (private self-consciousness) has been differentiated from attention to the self as a social object, i.e., through the eyes of others (public self-consciousness; Fenigstein, Scheier, & Buss, 1975). Mindfulness, a concept underlying modern mental health interventions based on Buddhist meditation traditions, has been extensively studied in the past few decades (Keng, Smoski, & Robins, 2011). Mindfulness can be described as a mode of awareness consisting of non-evaluative, accepting attention to present moment-to-moment experiences (Kabat-Zinn, 2015). More precisely, besides further facets, it encompasses the observation of sensations, perceptions, feelings and thoughts, as well as the labelling of these experiences with words (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Mindful affect labelling is a way of reporting one's own feelings, and has been related to the internal regulation of negative emotions (Creswell, Way, Eisenberger, & Lieberman, 2007). While introspection was measured through behavioral observation in Wundt's laboratory (i.e., observing subjects verbalizing their experience), self-report measures are more commonly applied in current research (e.g., Mindfulness scale; Baer et al., 2006). The crucial ability to meta-represent specifically affective states was further explored in literature on individual differences in alexithymia. It was originally considered a subclinical trait defined as an impaired ability to identify and describe one's own emotions (Taylor & Bagby, 2004). Its exact role in disturbed emotion processing in psychiatric conditions has been the subject of controversial debate (e.g., "alexithymic depression subtype"; Vanheule, Desmet, Verhaeghe, & Bogaerts, 2007; alexithymia in autism; Bird & Cook, 2013).

This brief outline demonstrates the relevance of metacognition for the relationship of the self with itself. But how does it simultaneously relate to specifically social functions? Even the most lonesome individuals use language, a social tool, to verbalize the contents of their introspection, an observation pointed out by Cummins (2013) in reference to a famous example: "Even Descartes, in his presumed solipsistic introspection, expressed the thought `Cogito, ergo sum` in language – a means made possible only by recurrent practices of mutual coordination among individuals, and hence intersubjectively constituted in every way" (p. 416).[1] Elucidating the role of metacognition in social interaction was recognized as a future issue for social cognition research some time ago (Frith & Frith, 2012), but is still waiting to receive adequate attention. It is this particular blind spot which the present dissertation addresses in what follows.

1.1.3 MENTAL STATE COMMUNICATION

I aim to broaden the theoretical perspective on social-cognitive abilities by focusing on metacognition and mindreading at the same time. First, I will briefly summarize the discussion regarding various accounts of the link between these two abilities. Then, I will embed both within the general concept of mental state communication. I will end this section by referring to an existing applied approach which hitherto has remained virtually unnoticed in academic literature.

1.1.3.1 LINKING METACOGNITION AND MINDREADING

The link between metacognition and mindreading has been proposed more or less explicitly by many authors. In a comprehensive article, Carruthers (2009) thoroughly categorizes various conceptions of this link as falling under four different accounts. Firstly, it has been argued that mindreading and metacognition are separate and independent (Nichols & Stich, 2003), but the existing literature has mainly focused on the question of their interdependence. One of Carruthers´ earlier ideas implies that they share the same social-cognitive mechanism to represent mental states but are dissociable due to differing modes of access to these states (perception-based in mindreading vs. introspective in metacognition). Another account is that metacognition is a precursor mechanism of

[1] The idea that language has evolved by or for social interaction remains, however, a controversial hypothesis (Chomsky, 1986; Tomasello, 2008).

mindreading, as in simulating other people's mental states from a first-person perspective ("as if"-experience) enables individuals to infer their minds (e.g., Goldman, 2006). Finally, Carruthers defends the opposing claim, i.e., that mindreading is prior to metacognition. He argues that metacognition is based on "quasi-perceptual" inputs such as inner speech, imagery or somatosensation, and is thus ultimately inferential too ("turning our mindreading capacities upon ourselves", p. 121), which might appear as a counterintuitive idea.[2] His point of view suggests that metacognition and mindreading mechanisms are not strictly dissociable.

More recent advancements in empirical social cognition research have further contributed to the understanding of the above relationship. For instance, emotion recognition deficits in autism have been shown to be predicted by alexithymia (Cook, Brewer, Shah, & Bird, 2013). Beyond its original definition as a selective impairment of emotional self-awareness, alexithymia was found to be indicative of a general failure of interoception (i.e., bodily, visceral self-awareness) in neurotypical individuals as well as individuals with depression, anxiety, autism spectrum or eating disorder (Brewer, Cook, & Bird, 2016). Interoceptive awareness is considered the basis of a mental model of the embodied self (Seth, 2013), and is actually associated with the ability to differentiate the self from others (Tajadura-Jiménez & Tsakiris, 2014). Interestingly, the predictive coding framework of social cognition (i.e., that the brain infers self- and other-representations by Bayesian reasoning; Moutoussis, Fearon, El-Deredy, Dolan, & Friston, 2014) deems interoception a critical factor in mindreading. In line with the above mentioned simulation account, the argument is that individuals *also* simulate the internal physical states of others to inform their mental state inferences (Ondobaka, Kilner, & Friston, 2017). From my point of view, this observation seems to imply a perfect reconciliation between the view that metacognition is a precursor mechanism of mindreading and Carruther's account that metacognition is based on inferences derived from internal inputs.

[2] This idea is illustrated by Carruthers using the following example of a person becoming aware of the decision to retrieve a book: „His mindreading system has access to a variety of forms of evidence in addition to overt behavior (which in this case is lacking). The agent might, for example, have verbalized or partially verbalized his intention, in "inner speech." And then, since inner speech utilizes the same perceptual systems that are involved in the hearing of speech (…), this will be available as input to the mindreading system. Or he might have formed a visual or proprioceptive image of himself selecting that particular book, which will be similarly available (…). Or the context provided by his prior verbalized thoughts and visual images, together with a shift in his attention towards the door, might make it natural to interpret himself as having decided to walk to his study to collect that particular book" (p. 124).

However, from the perspective of a social psychologist interested in naturalistic behavior, it is even more interesting to better understand the active employment of metacognition and mindreading in dynamic interpersonal communication. Introspecting and mindreading individuals may actually communicate their mental representations regarding the self and the other *with* each other. In what follows, I will introduce a general concept embedding the communicative manifestations of metacognition and mindreading.

1.1.3.2 EMERGING CONCEPT

Researchers across psychological disciplines have investigated self- or other-understanding within professional and everyday communication. (Cognitive) Empathy, expressed through active listening, i.e., paraphrasing and reflecting what clients feel and think, was defined by Rogers (1957; Rogers & Farson, 1987) as a central condition of change in client-centered psychotherapy. Moreover, mentalizing about the feelings and thoughts of clients in the course of professional verbal interaction is considered generally important for the psychotherapeutic and medical effectiveness of clinicians (Allen, Fonagy, & Bateman, 2008; Larson & Yao, 2005). Regarding the effectiveness of salespersons, a fairly different kind of profession, the positive outcomes of mindreading through careful and active listening have also been studied (Comer & Drollinger, 1999; Drollinger, Comer, & Warrington, 2006). Furthermore, research on communication behavior in romantic couples has continuously examined the role of emotional self-expression, and attentive listening to and exploration of the partner's feelings and thoughts (Coan & Gottman, 2007; Pistrang, Picciotto, & Barker, 2001). Mothers´ mental state utterances were investigated in naturalistic interaction with their infants to examine how maternal language influences the development of children's mental state language (Taumoepeau & Ruffman, 2008). Regarding adolescents´ communication, self-disclosure through talking about intimate feelings and thoughts (with peers or parents) was studied to better understand its role for their socio-emotional development (Davis & Franzoi, 1986; Rivenbark, 1971). More generally, mutual sharing of subjective experience in communication was shown to be related to better individual and joint decision making since explaining, justifying and discussing with each other optimizes decisions (Frith & Frith, 2012).

To sum up, the particular focus of past literature was mostly on mindreading *or* metacognition in various communication settings (though Gottman's couple research focused on both). The notable fact that individuals in many personal and professional

contexts actually balance both simultaneously, or juggle them by constantly shifting roles, deserves closer attention. To my knowledge, a general and comprehensive concept, which incorporates the manifestations of metacognition and mindreading in naturalistic verbal communication has not been presented thus far.

I conceptualize the verbal communication of mental states as the sharing of messages explicitly referring to one's own or one's communication partner's mental states. More precisely, its components are defined as conveying one's own mental states from a first-person metacognitive perspective (e.g., "I feel…", "I believe that…"), and active listening to others´ mental states from a second-person mindreading perspective (e.g., "I guess you feel...", "Do you think that…"). Following up on established terminology in the field, specifically the term mindreading, I use the term *mindspeaking* as a synonym of mental state communication. Figure 1.1 depicts the respective intersections of mindreading and metacognition with mental state communication as a concept emerging in between.

Figure 1.1. Mental state communication as a concept intersecting with mindreading and metacognition.

This broader concept of mental state communication completes my earlier notion of empathic communication (i.e., active listening to another person's mental states; Wacker, 2011) by adding the act of communicating one's own mental states. Importantly, I do not consider nonverbal communication of mental states. An extensive amount of psychological, anthropological and linguistic literature is dedicated to the study of facial, manual, postural or vocal gestures, all of which have a communicative function (e.g., affective vs. dominant smiles, shrugging shoulders, rolling eyes, etc.) beyond mere mental state expression (Bavelas, Black, Lemery, & Mullett, 1986; Eibl-Eibesfeldt, 1972; Kendon, 1997;

Niedenthal, Mermillod, Maringer, & Hess, 2010).[3] However, the broad field of nonverbal communication is beyond the scope of the concept as introduced here.

Mental state communication is presumably among the most sophisticated forms of social-cognitive interaction enabling advanced social behaviors. It might be employed, for instance, when political leaders navigate peace negotiations while attempting to integrate the desires of their in-group with the opaque belief and norm system of an out-group from a foreign culture. In personal life, mental state communication might be key for exploring and successfully integrating one another's individual emotional makeup for the sake of maintaining a mutually satisfying long-term relationship. Among work colleagues, it might play a role in coordinating personal needs and interpersonal boundaries in the context of emotionally challenging occupational settings.

These examples illustrate the ways in which mental state communication might be useful as a concept that integrates metacognition and mindreading in their naturalistic context: dynamic social interaction between individuals whose minds meet *through* verbal communication. So far, the meeting minds metaphor used by authors at the frontiers of social cognition research (e.g., Amodio & Frith, 2006) was limited to solitary or silent meetings - i.e., situations of minimal to no interaction among study participants – in the absence of verbal communication (but see empathic accuracy research; Mast & Ickes, 2006). Of note, social psychological investigations of naturalistic behavior show that individuals talk with others about emotional events in at least 90% of all cases (primary emotion sharing; Rimé, Philippot, Boca, & Mesquita, 1992), and that exposure to emotion sharing itself is experienced as emotion-inducing which in turn is shared in 66% of all cases (secondary emotion sharing; Christophe & Rimé, 1997). In current social cognition literature, the need for more ecologically valid assessment paradigms has already been pointed out (Dziobek, 2012; Schilbach et al., 2013). Additionally, I suggest that it might be of value to consider mindspeaking as an ecologically valid concept for the study of naturally occurring social cognition in verbal action.

[3] The notion of communicative gestures refers to perceivable bodily actions with a semiotic or symbolic function (Kendon, 2000). Meaning and frequency of gestures are highly culture-specific (Ekman & Friesen, 1969).

1.1.3.3 APPLICATION

From an applied perspective, closely capturing the concept of mental state communication, Marshall B. Rosenberg introduced and trained the approach of nonviolent communication (NVC; Rosenberg, 2005). He studied under Carl Rogers and was influenced by his client-centered psychotherapy approach rooted in the tradition of humanistic psychology (Rogers, 1957). As a clinical psychologist and mediator, Rosenberg (2005; Rosenberg & Molho, 1998) described NVC as entailing the communication of

(a) one's non-evaluative observations,

(b) one's own feelings and needs without criticizing others,

(c) clear, non-demanding requests towards others, and

(d) empathic listening to the observations, feelings, needs, and requests of communication partners.

NVC has neither been rooted in any broader social cognition framework or concept by Rosenberg, nor noticed by social cognition literature. However, it is evident that this approach emphasizes the identification and communication of one's own and others´ mental states from a first- and second-person perspective, respectively. The following physician-patient example illustrate NVC in tense interactions (Rosenberg & Molho, 1998; p. 339).

> "A 23-year-old patient contaminated with HIV came to a haemophilia center to ask for a prescription for anti-haemophilic factor; after the prescription was written, he asked the physician to add a sleeping pill. The physician, knowing that he was a drug addict, already using several sleeping pills, refused, and the patient got extremely angry (…), to which the physician responded by tearing up the prescription. (…). In such a case, a physician using NVC would have answered (…), `I am feeling worried about writing this prescription, and, as for any medication, I would like to better understand what is leading you to ask for it; are you having trouble sleeping?´ (…) Then, when the patient says ´anyway all your prescriptions are shit`, an empathic response using NVC would sound like: ´Are you still feeling angry about the HIV contamination and needing more understanding of how it has impaired your life?`"

According to Rosenberg, this communication style is effective in the prevention or resolution of interpersonal conflict, as well as for individual wellbeing in social interactions and relationships because it allows for talk about each other's mental states and subjective

experiences separately from such as defense, criticism or judgements. NVC is implemented in interventions targeting communication skills in various applied settings like healthcare, school education, social work, political conflict resolution, or rehabilitation programs in prisons (Center for Nonviolent Communication, 2016). Despite the widely spread international application of this approach, it has thus far won very little recognition in academic literature. No controlled effectiveness study has been published so far, nor a comprehensive assessment measure of NVC as originally conceptualized by Rosenberg developed.

Therefore, in study 3 of this dissertation, we examined the effectiveness of NVC training in an intervention and a control group using a pre-post evaluation design within a naturalistic field setting. We developed a new questionnaire assessing NVC for this purpose. Additionally, an established coding system for the observation of naturalistic communication behavior (Discussion Coding System; Schermuly & Scholl, 2012) has been applied to objectively assess individuals´ verbalization of affective states from a first-person perspective to their communication partners in a group discussion.

1.2 Social-Cognitive Abilities and Interpersonal Functioning

Social cognition allows people to navigate the social world by building a subjective "social map" that includes representations of themselves, other people and the nature of the relationships between the self and others. These maps guide individuals through different "social landscapes" with changing situational affordances of personal and professional life. The construction of un-/differentiated, mal-/adaptive, accurate/biased representations depends on numerous social-cognitive abilities and processes (Fiske & Taylor, 2013; Happé et al., 2017). Whatever the makeup of these internal representations might be, they unquestionably influence how individuals subjectively experience their interpersonal relatedness, and how they objectively behave in social interactions.

As the preceding literature review has shown, mindreading and mental state communication play an important role for interpersonal functioning in personal relationships (e.g., parenting, romantic couples, peer friendships), as well as professional interactions (e.g., with clients, customers, colleagues at work). Within the framework of interpersonal theory (Kiesler, 1983), social experience and behavior can be generally characterized along two independent dimensions: affiliation and dominance (see Fig. 1.2). Dominance (or

agency) in relation to others is marked by competence, control, personal ambition, and goal-orientation, while affiliation (or communion) represents cooperation, prosocial concern, integration of the self with others, and emotional expressivity (Abele & Wojciszke, 2007).

These two dimensions of the interpersonal circumplex were used to describe and assess individual differences in general social dispositions as well as interpersonal problems (Alden, Wiggins, & Pincus, 1990; Wiggins, Trapnell, & Phillips, 1988), e.g., interpersonal fear and avoidance, exploitability, or lack of assertiveness (low dominance), and interpersonal indifference, coldness, withdrawal or hostility (low affiliation). The notion of these "Big Two" is supported by theoretical and empirical convergence in literature on social information processing and behavior (e.g., Abele & Wojciszke, 2013; Schröder, Netzel, Schermuly, & Scholl, 2013), and is thus viewed as an approach potentially integrating diverse psychological research targeting the interpersonal domain.

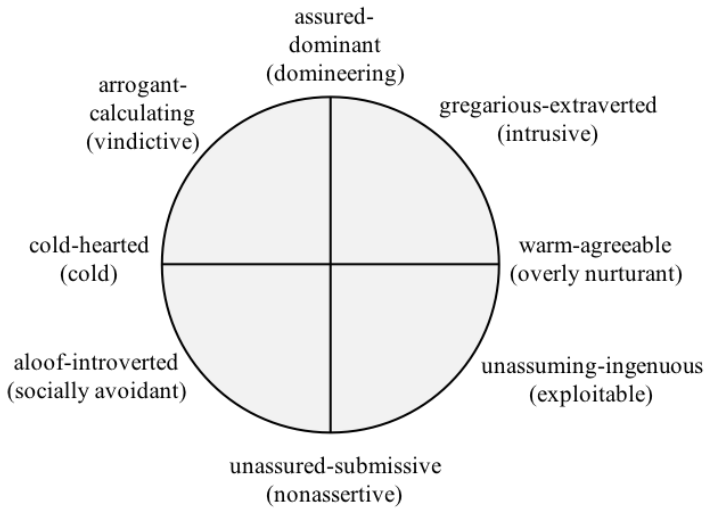

Figure 1.2. Affiliation (horizontal axis) and dominance (vertical axis) within the interpersonal circumplex describing basic interpersonal dispositions (Wiggins et al., 1988) and problems (in parentheses; Alden, Wiggins, & Pincus, 1990).

Considering once more the integrative approach of this dissertation, I take a perspective across clinical and occupational health psychology in investigating the role of social cognition in low interpersonal functioning with a focus on fear, avoidance, distress and conflict (all characterized by low dominance and low affiliation). In the following two sections, I will briefly review literature demonstrating that social-cognitive processes and mechanisms are related to the mentioned interpersonal affects and behaviors in adults with pathological fear of social evaluation, and in typically developing adults in health professions.

1.2.1 Adults With Pathological Fear of Social Evaluation

An excessive fear of social or performance situations potentially bearing negative evaluations by others (e.g., scrutiny, embarrassment, rejection, criticism, or humiliation), and avoidance of these situations constitute central diagnostic criteria of social anxiety disorder (SAD; American Psychiatric Association, 2013). It is one of the most common psychiatric conditions, given a lifetime prevalence of 12% in US-American (Kessler, Berglund, Demler, Jin, & Walters, 2005), and close to 7% in European samples (Fehm, Pelissolo, Furmark, & Wittchen, 2005; Lecrubier et al., 2000). SAD is associated with an impaired ability to initiate and maintain social relationships, as well as lower occupational success and socio-economic status (Lecrubier et al., 2000). What contributes to the pathological fear of being evaluated as socially inadequate or incompetent?

Cognitive models of SAD emphasize the role of attentional and interpretational biases in social situations in the maintenance of SAD (Clark & Wells, 1995; Clark & McManus, 2002). Indeed, various studies show that socially anxious individuals are negatively biased to process neutral or ambiguous social information, e.g., others´ gaze, facial expressions, or verbal statements as aversive, threatening, angry, or judgmental (e.g., Amir et al., 1998; Joormann & Gotlib, 2006; Schulze, Renneberg, & Lobmaier, 2013; Stopa & Clark, 2000). Following the SAD model of Clark and Wells (1995), negative social interpretations (e.g., "Others are angry at me/dislike me", "I am failing") and the resulting anxiety are further amplified by a strong focus on the self as a social object (e.g., "Others see me failing"), and maintained by avoidant and safety behaviors as well as self-monitoring thoughts used to prevent the expected negative social reactions (e.g., rehearsing conversations and actions in extreme detail).

The intense fear of social evaluation present in SAD sufferers is shared by individuals affected by body dysmorphic disorder (BDD), though their concerns are specifically related to negative judgements of their physical appearance (Fang & Hofmann, 2010; Pinto & Phillips, 2005). This condition has been referred to as "imagined ugliness" (Phillips, 1991), and is defined as a dysfunctional preoccupation with a perceived defect in one's own appearance (American Psychiatric Association, 2013). It used to be categorized as a somatoform disorder in older versions of the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 2000), and is currently viewed as an obsessive-compulsive-related disorder since a newly added diagnostic criterion refers to

compulsive behaviors and mental acts, e.g., mirror checking, camouflaging, and appearance comparisons (Hartmann & Buhlmann, 2017). Importantly, individuals with BDD experience equally strong self- and social-evaluative appearance anxiety (Anson, Veale, & Silva, 2012), and often have delusional ideas of reference, e.g., "Everyone is staring at me/talking about me" (Phillips et al., 2010). The prevalence amounts to 2.4% in the US (Koran, Abujaoude, Large, & Serpe, 2008), and 1.8% in Germany (Buhlmann et al., 2010). Both BDD and SAD, typically set on in early adolescence or childhood, and their comorbidity in different studies varies between 12-68.8% for SAD in BDD, and 4.8-12% for BDD in SAD (Fang & Hofmann, 2010).

Similar to the aforementioned social-cognitive accounts of SAD, a negative interpretation bias for ambiguous social information is considered to play a crucial role in maintaining BDD (Buhlmann, McNally, Etcoff, Tuschen-Caffier, & Wilhelm, 2004; Buhlmann, McNally, Wilhelm, & Florin, 2002; Feusner, Neziroglu, Wilhelm, Mancusi, & Bohon, 2010), and is therefore discussed in the context of nosological overlap of SAD and BDD (Fang & Hofmann, 2010). Whereas individuals with SAD tend to interpret social information as evidence for their personal incompetence or inadequacy, individuals with BDD are biased to interpret social information as evidence for their unattractiveness (e.g., "Others find me ugly/disgusting"). Furthermore, the compulsive checking rituals in BDD can be understood as avoidance and safety behaviors (Neziroglu, Khemlani-Patel, & Veale, 2008), and as functionally analogous to the behavioral strategies in SAD as described above.

In sum, these striking similarities call for a transdiagnostic approach to SAD and BDD to better understand the role of social-cognitive mechanisms in conditions characterized by a pathological fear of social evaluation. The general idea of transdiagnostic or translational research is to investigate common underlying functional mechanisms *across* different disorders, which can be viewed as a more progressive approach towards psychiatric diagnosis (as prominently proposed by the Research Domain Criteria project of the National Institute of Mental Health; Cuthbert & Insel, 2013). This transdiagnostic perspective is reflected in study 2 of this dissertation. My co-authors and I examined the mindreading profile of adults with SAD and BDD in comparison with a clinical and a typically developing control group using the MASC as a naturalistic paradigm representative of a third-person observer perspective on dynamic social interaction.

1.2.2 Typically Developing Adults in Health Professions

In occupational health and organizational psychology, social-cognitive as well as emotional abilities have been widely acknowledged as crucial factors of interpersonal effectiveness and socio-emotional experience in interactions with clients, colleagues and supervisors (Ferris et al., 2002; Grandey, 2000). For instance, much attention has been directed to the link between emotional intelligence and social skills at work, e.g., leadership effectiveness (Caruso, Mayer, & Salovey, 2001), or conflict resolution (Jordan & Troth, 2002). The latter is particularly important since interpersonal conflict and disharmonious relationships at work cause depressive symptoms in employees (e.g., Dormann & Zapf, 2002). Therefore, like most employees working in teams and organizations, health professionals are faced with the general job demand of managing relationships with colleagues and supervisors, including potential conflict and social stressors at work.

Working in the health sector, however, can be even more socioemotionally challenging since jobs aimed at healing, helping or supporting others demand particularly good interpersonal functioning in interactions with clients and patients (Hochschild, 1983; Grandey, 2000). Literature on counseling and psychotherapy underscored early on that "empathic understanding of the client's internal frame of reference" (Rogers, 1957; p. 96) is a central therapeutic factor, an observation continuously supported by later studies (Lambert & Barley, 2001; Patterson, 1984). A similar view was also adopted in medical psychology by focusing on the importance of "clinical empathy" for the quality of the physician-patient relationship (Larson & Yao, 2005), but also on its complex role in the etiology of emotional exhaustion and job burnout in physicians (e.g., Lamothe, Boujut, Zenasni, & Sultan, 2014), which is not surprising given that interactions with suffering clients can be viewed as emotional labor consisting of potentially effortful emotion regulation work (Grandey, 2000; Hochschild, 1983). Within this line of research, empathy was usually conceptualized as a multidimensional concept (Davis, 1983) with a cognitive (i.e. taking the psychological perspective of others) and an affective component (i.e., other-oriented, empathic concern), while empathic distress represents the opposite affective response (i.e., self-oriented anxious withdrawal form others; Batson, Fultz, & Schoenrade, 1987). I suggest that it reflects low affiliation and low dominance within the interpersonal circumplex. Empathic concern, on the other hand, is strongly affiliative and moderately dominant as it implies compassionate initiative and protective control. Notably, more recent accounts in social cognition research

stress that the ability to differentiate another person's psychological perspective from one's own, i.e. self-other distinction (Happé et al., 2017), is highly relevant for interpersonal functioning in health professionals in terms of regulating empathic distress in socioemotionally challenging interactions that require a compassionate rather than self-oriented response (e.g., Klimecki & Singer, 2012; Singer & Klimecki, 2014). Klimecki and Singer (2012) point out that "the realization of being different from the suffering person without being indifferent towards him or her is an important prerequisite for the development of prosocial behavior" (p. 378). Hence, the vital question is, what could promote health professionals´ ability to differentiate the mental states of (suffering) others form their own, and vice versa, in order to prevent low interpersonal functioning given their professional role as empathic healers?

Study 3 of this dissertation addresses this question by emphasizing mental state communication, i.e., active listening to others´ mental states from a second-person mindreading perspective and conveying one's own mental states from a first-person metacognitive perspective (see section 1.1.3.2). Since NVC represents a promising practical application of mental state communication (see section 1.1.3.3), we evaluated an NVC training in health professionals in a public health organization by investigating its effects on self-reported and objectively observed mental state communication skills, and on perspective taking, empathic concern, empathic distress and social stressors at work. Studies examining interventions aimed at training social-cognitive abilities and promoting interpersonal functioning in typically developing adults are just as scarce as literature on neurotypical variation in social cognition (Turner & Felisberti, 2017). Given this research gap, it is necessary to examine intervention approaches for this population, especially for professionals with occupational roles explicitly requiring good interpersonal functioning.

1.3 Summary of Research Aims

This work is motivated by the endeavor to take a bird's eye view on the multifaceted landscape of studies in social cognition and beyond. By bringing together diverging lines of research traditions from different psychological disciplines, the general aim of this dissertation is to advance an integrative perspective on social-cognitive abilities and their role in interpersonal functioning across adults with (different) psychiatric conditions and typically developing adults. Working towards this goal was realized in three empirical studies (see Fig. 1.3) with more specific aims that are summarized as follows.

Study 1: Gender and Age Effects on Mindreading in Typically Developing Adults

Combining social psychological, biological, and developmental perspectives to characterize gender- and age-related individual differences in mindreading performance in typically developing adults on the basis of a sensitive, reliable and ecologically valid paradigm.

Study 2: Mindreading in Adults with Pathological Fear of Social Evaluation

Taking a transdiagnostic perspective on social cognition deficits in pathological social evaluation fear by comparing mindreading profiles of adults with SAD and BDD with a clinical and a typically developing control group.

Study 3: Training Mental State Communication in Typically Developing Adults in Health Professions

Evaluating the effects of an NVC training on mental state communication skills, perspective taking, empathic concern, empathic distress and social stressors at work in typically developing adults in health professions using a pre-post design in a field setting, including a newly developed NVC questionnaire and an established coding system for the observation of naturalistic communication behavior.

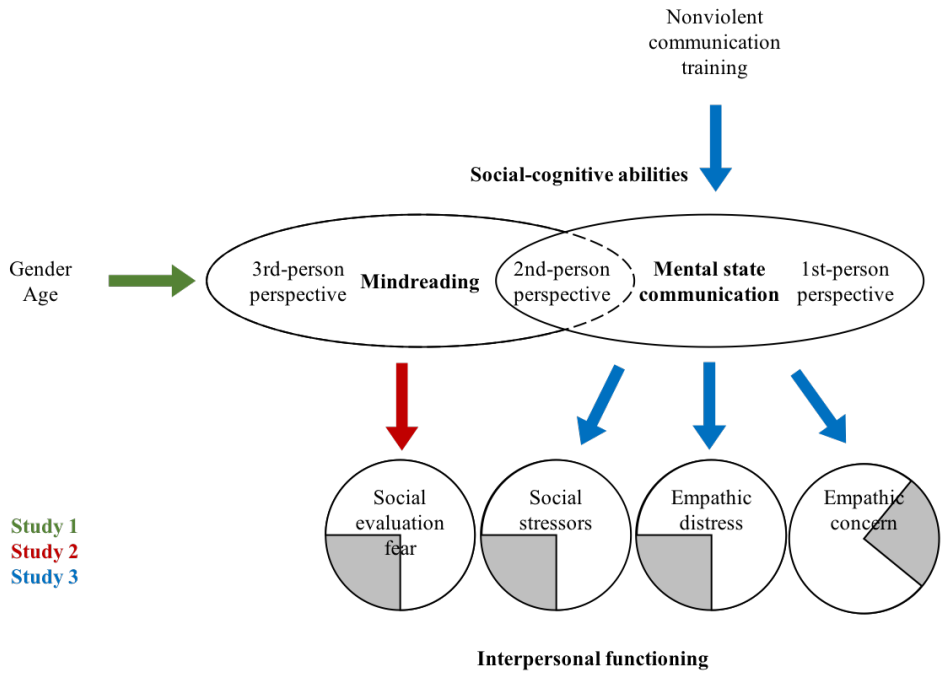

Figure 1.3. Overview of concepts and study foci.

Note. Theoretical variable locations within the interpersonal circumplex (see Fig. 1.2) are roughly indicated by grey areas.

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2 STUDY I: GENDER AND AGE EFFECTS ON MINDREADING IN TYPICALLY DEVELOPING ADULTS [4]

2.1 ABSTRACT

Research recurrently shows that females perform better than males on various mindreading tasks. The present study contributes to this growing body of literature by being the first to demonstrate a female own-gender mindreading bias using a naturalistic social cognition paradigm including female and male targets. We found that women performed better at reading others´ minds, and that they were specifically more capable to read female targets, an own-gender target effect absent in men. Furthermore, a non-linear negative effect of perceiver age on mindreading performance was examined within a sample covering the age range of 17-70 years, as indicated by a stronger performance decrease setting on by the age of 30 years and continuing throughout middle and old age. These findings add to a more comprehensive understanding of the contextual factors influencing mindreading performance in typically developing adults.

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2.2 INTRODUCTION

Much of social interaction occurs "in silence", as people exchange information about emotions, thoughts, and intentions in implicit ways. Thus, everyday social life requires us to hypothesize based on our interaction partners´ nonverbal expressions and behaviors, implicit or ambiguous verbal messages, and actions conveying thoughts and intentions indirectly. This social-cognitive capacity to infer others´ emotional, cognitive, or motivational mental states is referred to as mindreading. It relies on various visual, verbal and symbolic cues (e.g., facial expressions, voice, gestures, body movements) occurring in social interaction. Thus, the abilities serving this capacity range from emotion recognition and empathic accuracy to attributing intentions, inferring thoughts, Faux pas and false beliefs understanding. Social psychological research increasingly recognizes the crucial role of contextual factors, e.g., perceiver characteristics or perceiver-target interactions, for a better understanding of the interpersonal functions of mindreading beyond its intrapersonal mechanisms and neural correlates (Zaki & Ochsner, 2011; Thomas & Fletcher, 2003).

Research recurrently demonstrates that females perform better on various mindreading tasks such as mindreading accuracy (Thomas & Fletcher, 2003), mental state inference (Kirkland, Peterson, Baker, Miller, & Pulos, 2013), Faux Pas understanding (Ahmed & Miller, 2011), facial expression processing (McClure, 2000), or emotion labeling (Montagne, Kessels, Frigerio, de Haan, & Perrett, 2005). Gender differences in mindreading have been linked to biological sex differences. Although this account is not uncontroversial (Valla et al., 2010), Baron-Cohen (2002) proposes that the "typical female" brain would engage more strongly in understanding mental states of (social) agents, whereas the "typical male brain" tends to analyze non-agentic systems. Connellan, Baron-Cohen, Wheelwright, Batki, and Ahluwalia (2000) actually observed sex-specific stimuli preferences in newborns (face in females vs. moving mobile in males). This study is the only one demonstrating such early sex differences using these two objects. However, it has also been found that female newborns have a stronger interest in eye contact as compared to male newborns (Hittelman & Dickes, 1979). These early sex differences are assumed to initiate sex-specific integration of brain systems, which develop as differences in social perception and cognition (Byrd-Craven & Geary, 2013; McGuinness & Pribram, 1979). Differences in interest also seem to exist in adult life since women prefer to work with people, and men with things (Cohen's d = .9 in the meta-analysis by Su, Rounds, and Armstrong, 2009).

It has been debated whether women have a higher ability or "just" a stronger motivation to read others´ minds. Since this controversy started (Ickes, Gesn, & Graham, 2000), the performance enhancing effects of the specifically female gender role motivation to be an accurate mindreader have been examined (e.g., Thomas & Maio, 2008). Hodges, Laurent and Lewis (2011) conclude that despite higher mindreading motivation "women probably hold a slight general edge over men" (p. 59) given the consistently found female advantage even in the absence of motivational factors. They further relate it to some specific features of the female standard stimulus person used in these studies, speculating that a female target might appeal stronger to women than to men. Unfortunately, this line of research did not consider the possible interaction of perceiver gender and target gender systematically. In face recognition literature, however, a bias for own-gender targets in women but not in men has been consistently reported (Herlitz & Lovén, 2013; Lewin & Herlitz, 2002). Herlitz and Lovén (2013) provide a developmental explanation by arguing that female newborns´ stronger interest for faces, and the fact that their primary caregivers are women, result in perceptual expertise for female faces based on mutual reinforcement of preference and familiarity over time. Females´ stronger tendency to establish more intimate "face-to-face" same-gender friendships (as opposed to males´ activity oriented "side-by-side" friendships) might further strengthen their same-gender face recognition bias (Rehnman & Herlitz, 2007). Face perception is considered as one core mechanism of social cognition since Schultz et al. (2003) had provided evidence for the notion that the fusiform face area, a region specialized for face perception, also represents semantic information about "peopleness" (personal agency), and is thus involved in attributing mental states to objects. This basic idea, i.e., that recognizing people's faces is linked to reading their mental states, combined with the mentioned developmental explanation for the own-gender face recognition bias in women leads to the question whether a specifically female own-gender mindreading bias actually exists. We argue that females´ perceptual expertise for female faces presumably also facilitates their social-cognitive expertise for female minds.

Age is another perceiver variable affecting the ability to understand other people's mental states. While earlier evidence had suggested a positive effect of age on mindreading as a manifestation of increasing "social wisdom" (Happé, Winner, & Brownell, 1998), a more recent meta-analytic review clearly demonstrated that younger adults perform better on mindreading tasks than older adults across various domains (affective/cognitive/mixed) and modalities (verbal/visual, static/dynamic; Henry, Phillips, Ruffman, & Bailey, 2013).

Yet, most of these findings rely upon performance differences between extreme age groups, not continuous age data. Therefore, a comprehensive picture of adult mindreading performance in women and men across the whole adult lifespan is still lacking. An exception is evidence derived from a sample of > 70,000 adults (18-90 yrs.) indicating an inverted u-shaped relationship of age and self-reported perspective taking with a performance peak at 50-60 years (O'Brien, Konrath, Grühn, & Hagen, 2012). This hints towards a positive relationship between age and mindreading until mature adulthood, and a negative relationship in old age. Though perspective taking captures only one aspect of the ability to read other people's minds, this result does not fit well with other literature on aging and mindreading as younger adult groups have been almost consistently found to perform better on mindreading tasks as compared to any older age group. However, the finding reported by O'Brien and colleagues suggests a possible non-linear relationship between age and mindreading but the exact nature of this relationship has yet to be investigated on the basis of a more objective task measuring various components of mindreading.

In the present study, we examined effects of perceiver gender and age, and target gender on mindreading performance as assessed with an ecologically valid test that captures the broad composite of everyday mindreading targeting multiple characters of both genders. We hypothesized (i) a perceiver gender effect on mindreading, i.e. women perform better than men; (ii) a specifically female own-gender mindreading bias, i.e. women read female targets more accurately than male targets; (iii) a negative non-linear relationship of perceiver age and mindreading.

2.3 Materials and Methods

Participants

The presented data are based on a multi-site data collection comprising 14 studies conducted in Germany (e.g., Preißler, Dziobek, Ritter, Heekeren, & Roepke, 2010; Ritter et al., 2011; Montag et al., 2011; Buhlmann, Wacker, & Dziobek, 2015). Only data from typically developing participants were used for the current analyses while individuals with documented clinical diagnosis were excluded. The resulting total sample (N = 545) comprised 304 females (56%), and 241 males (44%). This large and statistically powerful sample of convenience was used with no a priori sample size calculation. Participants´ average age was M = 31.93 years (SD = 11.42; range: 17.62-70.00), and their mean duration

of education was *M* = 13.49 years (*SD* = 2.67; range: 9.00-20.00).[5] Females were significantly older (*M* = 32.95, *SD* = 12.15) than males (*M* = 30.63, *SD* = 10.32; *p* = 0.16). No gender difference was present for education duration. The studies were approved by the respective local ethics committees, e.g., Ethics Committee of Charité - Universitätsmedizin Berlin. Two of the 14 studies included typically developing individuals only and, thus, did not legally require ethics approvals for collecting behavioural data with our measure. In addition, all subjects gave written informed consent in accordance with the Declaration of Helsinki.

Measure

Mindreading was measured with The Movie for the Assessment of Social Cognition (MASC; Dziobek et al., 2006). The MASC is an explicit mindreading performance test based on a narrative fictional film providing naturalistic verbal and non-verbal stimuli of dynamic social interaction. It captures affective and cognitive mental state inference, such as Theory of Mind, emotion recognition and perspective taking. It includes four targets who exhibit the full variety of verbal and non-verbal information, and express their emotions, thoughts and intentions in dynamic interaction. The 15-minute movie is about two female and two male middle aged adults preparing and getting together for dinner, and focuses on their social communication and interaction. The movie is stopped 45 times in order to inquire about the characters' thoughts, intentions or emotions (e.g., "What is Cliff thinking?", "Why is Betty saying this?", "What is Michael feeling?"). The response format of the current MASC version is a multiple-choice structure with one correct response and three distractors for each of the 45 questions. The possible total scores range from 0 to 45, and the subscore for female/male targets from 0 to 100%. Subscores represent the percentage of correctly answered items (based on 26 items targeting female characters, and 18 items targeting male characters; one item targets 3 characters at once, and thus is not included). The MASC was administered with Microsoft Office PowerPoint or Presentation. In the original validation study (Dziobek et al., 2006) high correlations of the MASC score with social functioning were found in individuals on the autism spectrum, and the test has been shown to have high

[5] Information on education was available for *N*=229.

test-retest reliability (ICC = .97). For further details with regard to test development, stimuli and administration see Dziobek and colleagues (2006).

We assessed the psychometric properties of the MASC based on classical item analysis and confirmatory factor analysis. A larger sample of *N* = 713 with 56% female and 44% male participants was available for this purpose.[6] Participants´ average age was *M* = 30.80 years (*SD* = 11.62; range: 12.61-70.00) and their mean duration of education was *M* = 14.02 years (*SD* = 2.26; range: 9.00-20.00).[7] The item analysis (item difficulties, item-total correlations) and reliability analysis in terms of internal consistency (Cronbach's alpha) were performed using SPSS 21.0, and the confirmatory factor analysis for categorical data was conducted with Mplus 6.1 (Muthén & Muthén, 2010-2012). Mc Donald's (1999) omega was computed based on the estimated item-loadings.

The average MASC total score was *M* = 34.15 (*SD* = 5.25; *Mdn* = 35.00) and ranged from 9 to 45. The item difficulty as represented by item mean ranged from *M* = .52 (Item 35) to *M* = .94 (Item 11 and 45). The item-total correlations ranged from r_{it} = .08 (Item 13) to r_{it} = .37 (Item 11 and 28). To assess the assumption of unidimensionality the confirmatory factor analysis was performed with only one latent factor using the WMSLV estimation method. The RMSEA indicated good model fit, but the CFI and TLI were below the threshold for acceptability of .95 ($\chi^2(945) = 1261.08$, p<.05; CFI = .83; TLI = .82; RMSEA = .022). The discrepancy between the CFI, TLI and the RMSEA could be explained by the relatively low average tetrachoric correlation between the items. The factor loadings of the unidimensional model ranged from $\hat{\lambda}_i$ = .16 (Item 04) to $\hat{\lambda}_i$ = .71 (Item 11), indicating that item 04 has the lowest and item 11 the highest association with the latent factor. The estimated communalities ranged from $\hat{h}_i^2$ = .02 (Item 13) to $\hat{h}_i^2$ = .50 (Item 11), referring to the relative proportion of the latent response variable's variance that is explained by the factor. The threshold parameters ranged from $\hat{\tau}_i$ = -1.59 (Item 11) to $\hat{\tau}_i$ = -.07 (Item 35), which means that item 11 is the easiest and item 35 the most difficult item to solve. Cronbach's α based on the classical item analysis was .74, and Mc Donald's ω was .88. The results of the classical item analysis and confirmatory factor analysis are displayed in the Appendix (see Supplementary Material), allowing for a detailed overview of the items' psychometric properties.

[6] Information on gender was available for *N*=548.
[7] Information on age was available for *N*=632, and on education for *N*=354.

The MASC is widely used in clinical studies as a sensitive test of mindreading deficits in, e.g., autism (Dziobek et al., 2006; Preißler et al., 2010; Buhlmann et al., 2015), and also recognized as a suitable measure of individual differences in typically developing adults (Turner, & Felisberti, 2017). Examination of the psychometric properties in the present study's sample demonstrated that the MASC is an internally consistent, unidimensional test of medium difficulty well-suited to assess individual differences in mindreading.

Statistical Analyses

To assess the relationships between perceiver gender, perceiver age, and mindreading performance, we conducted a multiple robust regression of MASC total score on age (centered) and gender (dummy coded, 0 = female, 1 = male), using the package "robustbase" (Hlavac, 2015) of the software R 3.1.0 (R Core Team, 2013) due to its robustness against outliers.[8] We also included the quadratic term of age (centered) in order to examine its non-linear effect. Secondly, we performed a 2 x 2 repeated-measures ANCOVA in SPSS to examine the interaction effect of perceiver gender (between-subject factor) and target gender (within-subject factor) on MASC subscores (age and age squared were both centered and entered as covariates). Post hoc within- and between-group comparisons were Bonferroni corrected, and group differences were compared by effect size as measured by partial eta squared.

2.4 RESULTS

Effects of Perceiver Gender and Perceiver Age on Mindreading Performance

Participants´ predicted MASC score was equal to 35.609 - 1.067 (Gender) - 0.074 (Age) - 0.004 (Age^2), R^2 = .121. Gender predicted mindreading performance with males scoring lower on the MASC than females (p = .005). Age was a negative predictor (p = .002), and the quadratic term of age was also significant (p = .005), indicating a non-linear relationship of age and mindreading during adulthood. As illustrated by Figure 2.1, the decrease of MASC score was more pronounced in middle and old adult age than in late

[8] Seven participants scored lower than 3 standard deviations below the MASC mean score.

adolescence and young adulthood (<30 years). There was no evidence for a significant age x gender interaction effect.

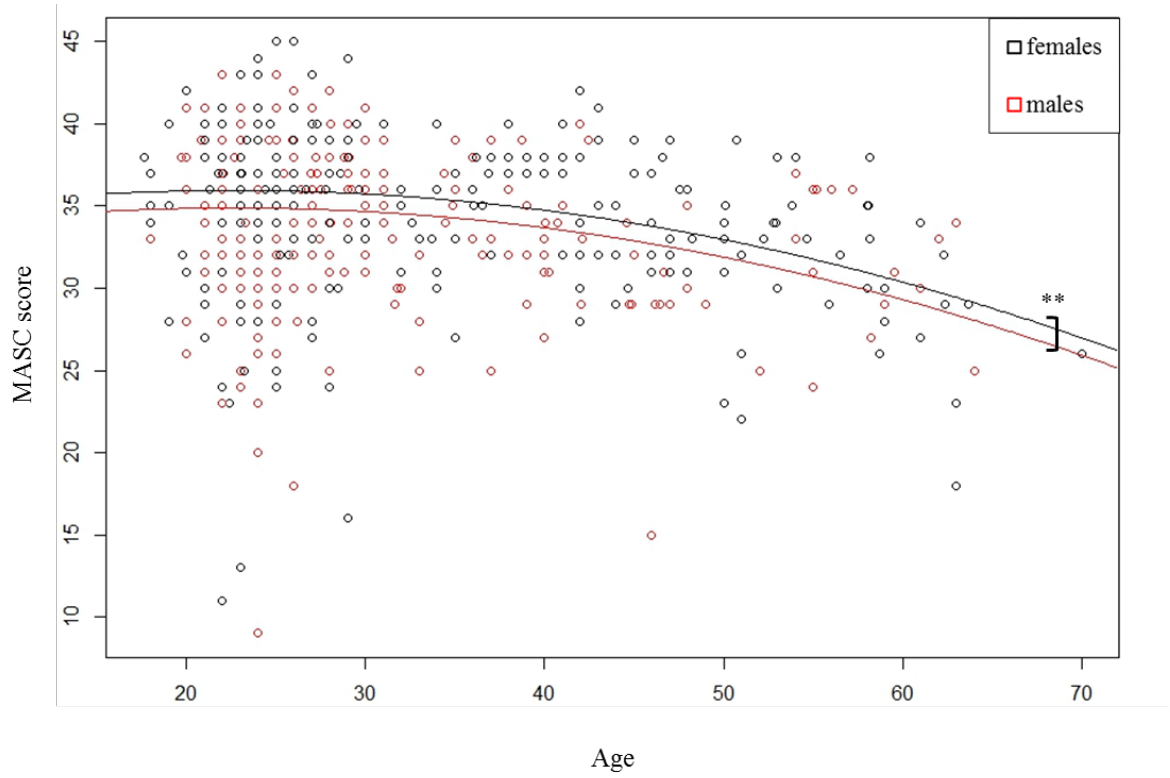

Figure 2.1. Nonlinear relationship between age and mindreading performance for females and males.

Interaction Effect of Perceiver Gender and Target Gender on Mindreading Performance

We found a trend for an interaction effect of perceiver and target gender on mindreading performance, $F(1,541) = 2.81$, $p = .09$, $\eta^2 = .005$, 95% CI (.000, .024). Post hoc within-group comparisons (Fig. 2.2) revealed that subscores for own-gender targets (M = 80.34, SE = 0.84) were significantly higher as compared to other-gender targets (M = 76.76, SE = 0.94) in female participants, $F(1,541) = 17.84$, $p < .001$, $\eta^2 = .032$, 95% CI (.009, .066), whereas the reverse pattern occurred in male participants (own-gender targets: M = 75.36, SE = 0.99; other-gender targets: M = 77.26, SE = 0.88; $F[1,541] = 4.53$, $p = .03$, $\eta^2 = .008$, 95% CI [.000, .030]). Post hoc between-group comparisons indicated that females´ subscore for female targets was significantly higher than males´ subscore for female targets, $F(1,541) = 9.66$, $p = .002$, $\eta^2 = .018$, 95% CI (.002, .045), and that subscores for male targets did not differ significantly between females and males, $F(1,541) = 1.57$, $p = .211$, $\eta^2 = .003$, 95% CI (.000, .019). In addition to the interaction effect, the main effect of target gender was significant with higher mindreading performance for female targets (M = 77.20, SE = 0.49)

than male targets (M = 75.21, SE = 0.55), $F(1,541) = 14.89$, $p < .001$, $\eta^2 = .027$, 95% CI (.007, .059).

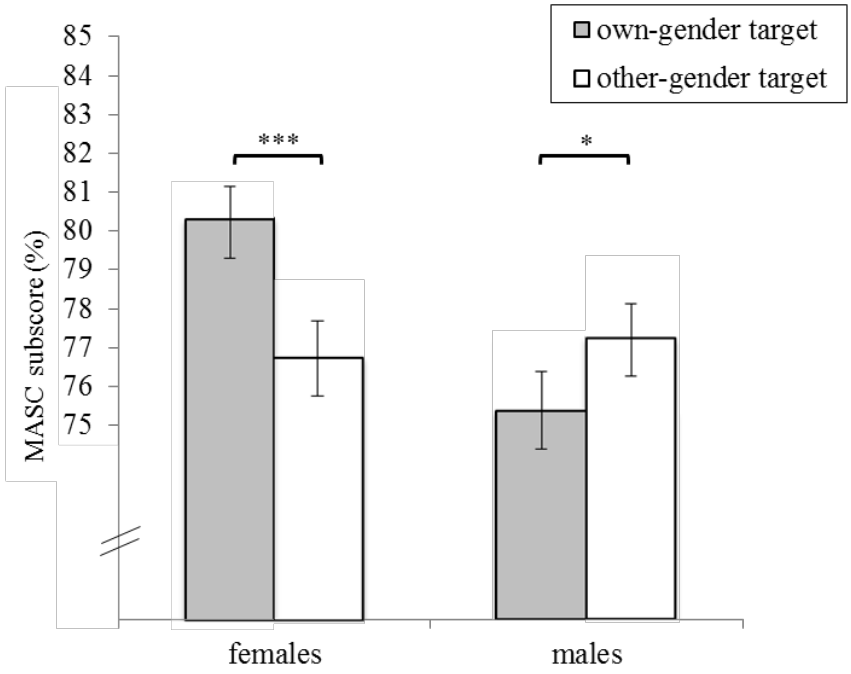

Figure 2.2. Interaction effect of perceiver and target gender on mindreading performance.

Note. Age (covariate) is evaluated at the level of 31.93 years. Error bars represent ±1 *SE*. * $p < .05$, *** $p < .001$.

2.5 DISCUSSION

We provide evidence that women are better able than men to infer other women's mental states. This result specifies the understanding of gender effects which have been reported by previous research showing that women hold an advantage over men across various components of mindreading (Kirkland et al., 2013; McClure, 2000; Montagne et al., 2005; Thomas & Fletcher, 2003; Ahmed & Miller, 2011). In the present study, women outperformed men particularly when asked to read female targets, whereas no such own-gender bias was found in men. To the best of our knowledge, this is the first evidence to demonstrate the specifically female own-gender mindreading bias. It parallels the gender effects repeatedly found in face recognition literature showing that women have a stronger advantage in recognizing female faces (Herlitz & Lovén, 2013). How could females´ perceptual expertise for female faces have developed into a social-cognitive expertise for

female minds? First, we assume an equal-mindreaders effect. Apart from women's interest for and familiarity with other females, their bias might be further reinforced by higher reciprocity in interactions with females possessing equal social-cognitive skills as compared to male mindreaders with relatively lower skills, and thus draw females more towards equal interaction partners throughout their social-cognitive development. Additionally, positive relationship outcomes of mindreading and perspective taking, such as greater intimacy and closeness (Chow, Ruhl, & Buhrmester, 2013), might further reinforce reciprocal mindreading between females, since women seek talking and emotion sharing in same-gender friendships more than men (Caldwell, & Peplau, 1982). Another developmental explanation is a superior-mindreader effect, which could manifest the female own-gender bias especially during adolescence. This period's most important developmental task is identity formation (Kroger, Martinussen, & Marcia, 2010; Erikson, 1968). Possibly, seeking self-understanding motivates young females to engage in astute social communication with older and "wiser" women, since the recursive nature of social-cognitive inferences ("I think that she thinks that I believe…") allows for learning about one's own thoughts and feelings through the reflection of the self in the mind of another. Given that women are better mindreaders than men, adolescents might prefer them for the sake of better self-understanding. Adolescent girls actually self-disclose more with their mother than father, whereas boys share less with their father than mother (Rivenbark, 1971). This interaction pattern seems to persist beyond adolescence since women generally disclose more than men towards same-gender targets (Dindia & Allen, 1992). Finally, the female own-gender mindreading bias could be also explained by the fact that women are more stimulating as a target of mindreading. They have shown to be more emotionally expressive than men (Gross, & John, 1995), and therefore might provide richer input and a stronger appeal for others to read them. This could also account for men's higher performance in reading female targets as compared to male targets in our sample. However, female targets´ expressivity might specifically interact with other womens´ higher mindreading ability, thus resulting in a better understanding of a more expressive target by a more astute perceiver.

Taken together, we propose various mechanisms of the specifically female own-gender bias in mindreading: Women are better at understanding other females´ feelings and thoughts because interactions with other women might offer them higher reciprocity of mindreading skills, a realization of their relationship motives (e.g., emotion sharing), self-reflection with a superior mindreader (especially during adolescence), and a more stimulating, emotionally expressive target of mindreading. These putative mechanisms

should be further examined in future research to better understand why the female own-gender bias exists.

Furthermore, the non-linear negative effect of age on mindreading performance found in the present study extends the existing literature on age and social cognition by providing a more differentiated picture of mindreading across the adult life span. The vast majority of previous studies relied upon mean differences between extreme age groups and/or lacking groups representing mature adulthood. These designs were not suited to detect non-linear trajectories across the entire adult life span. Our regression analysis using age-continuous data ranging from 17-70 years shows the onset of a negative trajectory by the age of approximately 30 years, and continuation throughout middle and old age. A non-linear effect of age on perspective taking was already reported by O'Brien and colleagues (2012). Their results differed as they found an inverted u-shaped trajectory peaking around 50-60 years. However, perspective taking represents only a very specific component of mindreading which, especially when measured via self-report, might be confounded with a prosocial *motivation* (i.e. willingness to take the perspective of another). Prosociality itself increases with age (Sze, Gyurak, Goodkind, & Levenson, 2012). The more objective mindreading test used in the present study is presumably less prone to motivational confounds, and thus, better suited to measure actual performance differences related to age. Our results further complement to the literature on social-cognitive ageing as they are based on a naturalistic measure assessing the various components of everyday mindreading in a more comprehensive fashion as compared to previous studies, which for instance focused either on Theory of Mind or emotion labeling.

Since we did not use longitudinal data, a cohort effect could have possibly confounded the age effect. In order to explore this we repeated the regression analysis with a MASC total score reduced by 7 items which might be biased by specific (lack of) knowledge or social norms probably present in older participants (e.g., traditional view regarding the role of female host). The results, however, did not change which indicates genuinely age-related performance differences. Nonetheless, it should be replicated with longitudinal data to exclude the possibility of cohort effects. Another limitation of our analysis is the missing inclusion of indicators of general cognitive ability. The negative age effect on mindreading appears to be similar to age-related differences in general cognitive performance (Salthouse, 2009). However, previous literature has shown that the negative

relationship of age and mindreading is only partly associated with age-related general cognitive impairments such as executive functioning and fluid intelligence (Moran, 2013). Finally, we cannot exclude the possible performance enhancing effect of the overt task demand given that participants are explicitly asked to infer the MASC characters´ mental states. At the same time, the test does not produce ceiling performance effects and is a psychometrically sound measure of the individual differences presented in this study.

2.6 CONCLUSION

This work contributes to the growing literature on the contextual factors of mindreading such as perceiver and target characteristics. By using a mindreading test that includes female as well as male targets, we demonstrated a specifically female own-gender bias in the ability to understand what others think and feel. The proposed social-cognitive mechanism and developmental factors of this bias have to be examined in following studies.

The negative non-linear age effect on mindreading, marked by age-related performance differences setting on by the age of approximately 30 years, further clarifies how this ability might differ throughout adult life. This finding, however, has to be replicated with longitudinal age data in future research.

Finally, other than many of the previous studies on mindreading (or specific components thereof), the results of the present work rely upon a naturalistic social cognition test that captures the broadness of various mindreading components, and accurately assesses subtle individual differences in typically developing adults. As has been already suggested elsewhere (Turner, & Felisberti, 2017), using this kind of measures in mindreading studies contributes to the validity of research findings and their applicability to everyday social life.

2.7 REFERENCES

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2.8 APPENDIX

Table 2.1. MASC item analysis and confirmatory factor analysis ($N = 713$)

#	M	r_{it}	$\hat{\lambda}_i$	$\hat{h}_i^2$	$\hat{\tau}_i$
01	.83	.24	.41	.17	-.97
02	.83	.23	.41	.16	-.94
03	.60	.14	.23	.05	-.25
04	.59	.12	.16	.03	-.24
05	.81	.23	.39	.15	-.88
06	.73	.20	.29	.09	-.63
07	.81	**.29**	.49	.24	-.89
08	.81	.21	.37	.14	-.88
09	.72	.21	.33	.11	-.57
10	.80	.20	.31	.10	-.83
11	.94	**.34**	**.71**	.50	-1.59
12	.63	.09	.17	.03	-.32
13	.62	.08	.13	.02	-.32
14	.67	.20	.30	.09	-.45
15	.68	.21	.35	.12	-.47
16	.87	**.29**	**.50**	.25	-1.11
17	.90	.23	.43	.18	-1.26
18	.92	.22	.44	.20	-1.38
19	.74	.20	.31	.10	-.65
20	.91	**.32**	**.60**	.35	-1.32
21	.55	.19	.29	.08	-.12
22	.70	.20	.30	.09	-.52
23	.79	**.33**	**.52**	.27	-.82
24	.86	**.27**	.45	.21	-1.07
25	.89	**.28**	**.51**	.26	-1.22

Table 2.1. (continued)

Item	*M*	r_{it}	$\hat{\lambda}_i$	$\hat{h}_i^2$	$\hat{\tau}_i$
26	.55	.19	.31	.10	-.13
27	.85	.23	.41	.17	-1.05
28	.92	**.34**	**.66**	.44	-1.43
29	.76	.18	.28	.08	-0.72
30	.79	.24	.39	.15	-.80
31	.65	.19	.29	.09	-.38
32	.65	**.28**	.44	.20	-.40
33	.76	**.29**	**.46**	.21	-.71
34	.83	.22	.38	.14	-.96
35	.53	.16	.26	.07	-.07
36	.92	**.25**	**.50**	.25	-1.39
37	.60	.17	.25	.06	-.26
38	.85	**.33**	**.54**	.29	-1.03
39	.83	.12	.19	.04	-.96
40	.63	.14	.21	.04	-.33
41	.84	**.28**	.45	.21	-.99
42	.48	**.24**	.36	.13	-.06
43	.72	.10	.17	.03	-.60
44	.86	**.28**	.49	.24	-1.07
45	.94	.21	.44	.20	-1.58

Note. Coding of item responses: 0 = wrong, 1 = right; r_{it} = item-total correlation, $\hat{\lambda}_i$ = estimated standardized loading, $\hat{h}_i^2$ = communality, $\hat{\tau}_i$= estimated threshold parameter; r_{it} ≥ .25 and and $\hat{h}_i^2$ ≥ .50 marked in boldface.

3 STUDY 2: MINDREADING IN ADULTS WITH PATHOLOGICAL FEAR OF SOCIAL EVALUATION[9]

3.1 ABSTRACT

Background: Social anxiety disorder (SAD) and body dysmorphic disorder (BDD) are characterized by fears of negative evaluation by others (related to ones own incompetence or flawed appearance, respectively). Previous research has shown that individuals with SAD and BDD exhibit difficulty identifying facial expressions and interpretive biases for threat in social situations. The current study aimed at further investigating social cognition in SAD, BDD, and mentally healthy controls (35 individuals per group, respectively). Further 35 individuals with obsessive-compulsive disorder (OCD) as a clinical control group not characterized by evaluation fears were included.

Methods: The Movie for the Assessment of Social Cognition (MASC) was applied. It consists of 45 video sequences depicting interactions among four people at a dinner party. Participants are instructed to evaluate each scenario with respect to the characters` emotions, thoughts, and intentions while being in a bystander perspective (i.e., other-referent context).

Results: Only the socially anxious groups (SAD and BDD) were overall less accurate than the other groups in correctly interpreting the social situations, whereas no difference was obtained between the OCD and control groups. Further analyses indicated that the SAD and BDD groups were less accurate in identifying other people's thoughts and intentions, whereas, again, no difference was observed between the OCD and control groups. In addition, the SAD group was less accurate in inferring thoughts and intentions than the OCD group. Interestingly, the groups did not differ with respect to identifying other people' emotions.

[9] This study has previously been published as:

Buhlmann, U.*, Wacker, R.*, Dziobek, I., (2015). Inferring other people's states of mind: Comparison across social anxiety, body dysmorphic, and obsessive-compulsive disorders. *Journal of Anxiety Disorders, 34,* 107-113. https://doi.org/10.1016/j.janxdis.2015.06.003
* shared first authorship

Conclusions: These results mostly confirm existing cognitive-behavioral models of SAD and BDD emphasizing that biased interpretation of what others think or intend is one of the key factors maintaining social anxiety and appearance-related concerns. Our study shows that this bias generalizes to social situations in which individuals take a third-person observer perspective.

3.2 INTRODUCTION

Social anxiety disorder (SAD) is a common and disabling anxiety disorder characterized by strong fears and/or avoidance of social or performance situations in which the individual might feel embarrassed or scrutinized by other people (American Psychiatric Association [APA], 2013). Body dysmorphic disorder (BDD) is defined by a preoccupation with perceived defects or flaws in one's own physical appearance, often tied to some facial aspects (e.g., size or shape of the nose or eyes). If the person has a slight physical defect, the concern about it has to be markedly excessive (APA, 2013). Both SAD and BDD are characterized by strong fears of negative evaluation by others (related to one's own appearance or feelings of incompetence, e.g., Pinto & Phillips, 2005). Thus, the ability to correctly read other people's minds (intentions, thoughts, and emotions), also referred to as theory of mind (ToM), is important in determining threat in social situations.

According to cognitive-behavioral models of SAD (e.g., Clark & Wells, 1995; Rapee & Heimberg, 1997) and BDD (e.g., Feusner, Neziroglu, Wilhelm, Mancusi, & Bohon, 2010; Veale, 2008) biased interpretation of ambiguous social or appearance-related information is one of the key factors maintaining social anxiety and/or appearance-related concerns. For instance, a person with SAD or BDD might interpret somebody laughing as evidence for having said something foolish or for looking disgusting, which, in return, leads to significant distress and avoidance of such situations. These behaviors, in turn, are believed to play a crucial role in the maintenance of SAD (Hofmann, 2007; Clark, 2001) and BDD (e.g., Wilhelm, 2006). Someone without SAD or BDD, however, might interpret the same situation in a non-threatening way („The person is laughing because I said something funny or interesting“) and, thus, not be distressed about or avoid the situation.

Indeed, there is clear evidence for biased interpretation of ambiguous social information in SAD (e.g., Amir, Foa, & Coles, 1998; Foa, Franklin, Perry, & Herbert, 1996; Hirsch & Mathews, 1997; Stopa & Clark, 2000) and BDD (e.g., Buhlmann et al., 2002; Clerkin & Teachman, 2009). Amir and colleagues (1998), for example, used an interpretation questionnaire, in which individuals with SAD, individuals with OCD, and mentally healthy control participants read a series of ambiguous social scenarios (e.g., "someone you are dating says 'hello' to you") Participants were presented with a negative, positive, and neutral interpretation and were asked to rank them in terms of how likely they would come into their mind (self-referent) or into the mind of another person when being in that situation (other-referent). The authors found that the SAD group was more likely to

interpret the scenario in a negative way, relative to the other groups. This bias was specific to the self-referent context. Further, in a previous study, individuals with BDD, individuals with OCD, and mentally healthy controls were presented with ambiguous social scenarios and it was found that only the BDD group interpreted the scenarios as threatening (Buhlmann et al., 2002).

A growing body of research shows emotion recognition deficits and biases in SAD and BDD. Simonian, Beidel, Turner, Berkes, and Long (2001) found deficits in facial expression recognition in socially anxious children. Joormann and Gotlib (2006) showed that individuals with SAD were more sensitive to recognizing facial expressions of anger than of sadness, and that they needed less emotional intensity to recognize angry faces than did depressed and control participants. In another recent study by Hezel and McNally (2014) individuals with SAD exhibited impaired emotion recognition ability for negative affective expressions. When studying individuals with BDD Buhlmann, McNally, Etcoff, Tuschen-Caffier, and Wilhelm (2004) found that they performed poorer in recognizing emotional expressions, and specifically misinterpreted disgust more often as anger than the OCD, and control group. Further, BDD was associated with difficulties in identifying emotions in situations that directly focus on the self rather than someone else (Buhlmann, Etcoff, & Wilhelm, 2006). Given the strong evaluation fear and the frequent presence of ideas of reference (e.g., that others stare at them), individuals with SAD and BDD might be particularly sensitive to facial expressions. For example, they might interpret a person's expression as negative when it is actually neutral. Therefore, an impaired ability to recognize facial expressions and to decode other people's thoughts and intentions may be crucial for maintaining or causing disorders that are characterized by strong fears of negative evaluation.

Taken together, the above-mentioned studies confirm that SAD and BDD are characterized by negative socially-relevant interpretive and emotion recognition difficulties. To the author's knowledge though, these studies used words or static pictures such as faces as the experimental stimuli, leaving the question open about the ecological validity of these paradigms. Further, previous findings suggest that social cognitive deficits related to SAD and BDD are generally less manifest regarding other-referent situations (Amir et al., 1998; Buhlmann et al., 2006). However, the majority of these studies examined the ability to infer mostly cognitive states (rather than emotions) in SAD, and emotional states (but not thoughts or intentions) in BDD, respectively. Overall, the generalizability of these suggestions

remains somehow limited. Thus, this study aim was to further examine social cognition among individuals with SAD and individuals with BDD in order to test the hypothesis that they exhibit deficits in accurately inferring cognitive and emotional states in other-referent situations. Individuals with OCD, and mentally healthy participants served as control groups. OCD was chosen as a clinical control condition to examine whether the hypothesized deficits in social cognition would also be evident in other psychological disorders that are not characterized by anxiety and avoidance related to social situations. To test the hypothesis the Movie for the Assessment of Social Cognition (MASC; Dziobek et al., 2006) was administered. This ecologically valid video-based measure might better capture the specific social anxiety and BDD-related concerns (rather than previously used words or static pictures) since the movie displays dynamic interactions among multiple persons and thus approximates the characteristics of everyday social life. At the same time, it represents an other-referent situation as participants take a bystander perspective observing a self-unrelated interaction. Lastly, a crucial feature of the MASC is that it allows to specifically assess the affective vs. cognitive mental state category, which was made use of in order to differentiate the ability to read other people's emotions vs. thoughts and intentions. This was also aimed at extending the results of Hezel and McNally (2014) who found lower MASC scores in their SAD group as compared to a non-SAD group. The authors did not, however, quantify to which extent this mindreading deficit was based on the misinterpretation of others' emotional versus cognitive mental states.

3.3 Materials and Methods

Participants

The SAD group was comprised of 35 individuals (21 females) whose diagnoses were confirmed by a licensed psychologist (U.B.) administering the German version of the structured clinical interview for the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; SCID; Wittchen, Wunderlich, Gruschwitz, & Zaudig, 1997). Social anxiety symptom severity was assessed with the German version of the widely used Liebowitz Social Anxiety Scale (LSAS; Liebowitz, 1987; Stangier & Heidenreich, 1997). It consists of the description of 24 social situations that are evaluated with respect to the corresponding anxiety and avoidance during the past week. Internal consistency in the current sample was $\alpha = .95$. The LSAS indicated moderate social anxiety symptom severity in the SAD group (see Table 3.1). Although SAD was the primary diagnosis in all cases (based on symptom

Table 3.l. Means and standard deviations by group for demographic and symptom-specific measures

Measure	BDD group (n = 35)			SAD group (n = 35)			OCD group (n = 35)			Control group (n = 35)		
	M	*SD*	Range	*M*	*SD*	Range	*M*	*SD*	Range	*M*	*SD*	Range
age (yrs.)	33.46_a	11.30	18-63	32.20_a	8.85	19-52	34.03_a	9.07	18-53	32.74_a	10.98	20-63
education (yrs.)	15.94_a	2.01	12-19	16.14_a	2.46	12-22	16.13_a	2.30	12-22	16.66_a	1.85	13-19
LSAS	67.57_a	26.23		76.50_a	23.40		41.28_b	22.36		25.88_c	15.18	
BDI-II	19.54_a	11.04		15.63_a	9.58		14.34_a	9.94		3.57_b	3.59	
YBOCS/BDD-YBOCS	28.21	7.71		-	-		24.64	6.81		-	-	

Note. SAD = Social anxiety disorder; BDD = Body dysmorphic disorder; OCD = Obsessive-compulsive disorder; YBOCS = Yale-Brown Obsessive-Compulsive Scale (possible range: 0 – 48); BDD-YBOCS = BDD Modification of the YBOCS (possible range: 0 – 48); LSAS = Liebowitz Social Anxiety Scale (possible range: 0 – 144); BDI-II = Beck Depression Inventory-II (possible range: 0 – 63); Means sharing subscripts do not differ (ps > .05, Bonferroni-corrected).

severity), SCID interviews revealed the following current comorbid Axis I diagnoses: specific phobia (n = 10), major depression (n = 5), dysthymia (n = 4), alcohol abuse (n = 4), alcohol dependence (n = 3), panic disorder without agoraphobia (n = 2), panic disorder with agoraphobia (n = 1), posttraumatic stress disorder (n = 1), and substance dependence (n = 1).

The BDD group was comprised of 35 individuals (21 females) whose diagnoses were confirmed by the first author administering the German version of the structured clinical interview for DSM-IV (SCID; Wittchen et al., 1997). Current BDD symptom severity was assessed using the Body Dysmorphic Disorder Modification of the Yale-Brown Obsessive-Compulsive Scale (Phillips et al., 1997), which is a clinician-administered interview assessing BDD symptom severity within the past week. BDD-YBOCS interviews indicated moderate BDD symptom severity in the BDD group (see Table 3.1). Social anxiety was assessed using the LSAS, indicating moderate social anxiety within the last week. Further, internal consistencies of both the BDD-YBOCS (α = .86) and LSAS (α = .95) were high. As in the other clinical groups, although BDD had to be the primary diagnosis in all cases (based on symptom severity), SCID interviews revealed the following current comorbid Axis I diagnoses: major depression (n = 14), specific phobia (n = 11), alcohol dependence (n = 3), dysthymia (n = 3), posttraumatic stress disorder (n = 3), alcohol abuse (n = 2), panic disorder with agoraphobia (n = 2), substance dependence (n = 2), binge eating disorder (n = 1), bipolar I disorder, currently depressive episode (n = 1), hypochondriasis (n = 1), and panic disorder without agoraphobia (n = 1).

The OCD group was comprised of 35 individuals (17 females) with a primary diagnosis of OCD, as determined by the SCID. OCD symptom severity was assessed with the German version of the clinician-administered Yale-Brown Obsessive-Compulsive Scale (YBOCS; Goodman et al., 1989). It consists of 10 items measuring the severity of OCD symptoms during the past week. Internal consistency within the OCD was good (α = .87). YBOCS interviews indicated moderate OCD symptom severity in the OCD group (see Table 3.1). Further, although OCD was the primary diagnosis in all cases (based on symptom severity), SCID interviews revealed the following current comorbid Axis I diagnoses: major depression (n = 7), panic disorder without agoraphobia (n = 2), specific phobia (n = 2), alcohol abuse (n = 1), chronic tic disorder (n = 1), dysthymia (n = 1), and hypochondriasis (n = 1).

The control group was comprised of 35 participants (21 females) with no current or past Axis-I psychiatric history, as determined by the SCID. For all groups, a history of psychotic disorders was an exclusion criterion. Further, a current or past diagnosis of comorbid SAD (BDD or OCD, respectively) was an exclusion criterion among the clinical groups. As evident from Table 3.1, the groups did not significantly differ with respect to age, $F(3, 136) = 0.22$, $p = .88$, $\eta_p^2 = .005$, years of education, $F(3, 136) = 6.93$, $p = .56$, $\eta_p^2 = .015$, and gender, $\chi^2(3) = 1.40$, $p = .71$. Except for one participant with a mixed ethnical background (Caucasian/Asian) participants were Caucasians. All participants were recruited through posted flyers in the greater Berlin area, Germany.

Materials

Self-Report Questionnaire. Participants completed the German version of the Beck Depression Inventory-II (BDI-II; Beck & Steer, 1987; Hautzinger, Bailer, Worall, & Keller, 1995). The BDI-II is a widely used 21 item self-report scale examining depressive symptoms during the past two weeks. Internal consistency in the current sample was $\alpha = .92$.

Figure 3.1. Example of an MASC scene, and corresponding multiple-choice responses (text above was not presented to participants). Copyright 2010 by Elsevier Ireland Ltd. Adapted with permission.

Movie for the Assessment of Social Cognition (MASC). The MASC (Dziobek et al., 2006) is a video-based test measuring the ability to accurately infer others´ mental states. Participants watch a 15-min movie about four characters (two females, two males) getting together at a dinner party. Participants are instructed to answer 45 multiple-choice questions

about the characters´ mental states (emotions, thoughts, and intentions) at given breaks throughout the movie. Questions mainly refer to complex mental states and allow a detection of subtle mindreading difficulties (Dziobek et al., 2006).

The MASC allows for a right/wrong response format (one correct response out of four possible responses) and provides a sum total score for all mental state decoding questions. It further allows for the quantification of the mindreading accuracy for the following subcategories: 1) thoughts and intentions (example item see Fig. 3.1), and 2) emotions (e.g., "What is Sandra feeling?). Participants were presented with positive (e.g., gratitude) as well as negative emotions (e.g. irritation) with varying levels of arousal. Facial and verbal expressions as well as contextual cues provided the relevant information to correctly answer the question. No specific instructions were given with respect to which specific cues are supposed to be used when answering the questions. Participants read a written instruction: "You will be watching a 15 minute film. Please watch very carefully and try to understand what each character is feeling or thinking. (….) When you answer, try to imagine what the characters are feeling or thinking at the very moment the film is stopped." The possible scores range from 0 to 45 (total score), 0 to 18 (thoughts and intentions), and 0 to 15 (emotions). Additionally, non-social inferencing is examined using six control questions (e.g., "How was the weather this evening?" The respective correct answer has to be inferred from the clothing of the arriving protagonists) in order to consider general intellectual functioning as a potential confound of social cognitive performance.

Procedure

The study was part of a larger project on cognitive and psychophysiological factors of BDD, funded by the German Research Society. It consisted of three separate visits. During the first visit, following informed consent, participants underwent the SCID interview conducted by the first author to establish the clinical status (or the absence of any current or past psychiatric history). The clinical groups additionally underwent the corresponding disorder-specific interviews after the completion of the SCID. The second and third visits, between two to six days later, were always kept 24 hours apart. During the third visit, the MASC was administered, followed by the completion of the BDI-II before being fully debriefed and receiving compensation for their participation.

3.4 RESULTS

Demographic and Clinical Characteristics

Means and standard deviations for the measures of social anxiety, BDD, OCD, and depressive symptoms are listed in Table 3.1. An analysis of variance (ANOVA) indicated that the groups significantly differed with respect to depressive symptoms, as measured with the BDI-II, $F(3, 136) = 20.10$, $p < .001$, $\eta_p^2 = .307$. Follow-up Bonferroni-corrected t-tests indicated that the clinical groups had significantly higher scores on the BDI-II, relative to the control group, *ps* < .001, Cohens d effect sizes ≥ 1.44, whereas no differences were observed among the clinical groups, *ps* > .10, *ds* ≤ .50. BDI score and MASC total score were not significantly related ($r = -.16$, $p = .06$). Further, the groups significantly differed with respect to their social anxiety symptoms, as measured with the LSAS, $F(3, 136) = 36.74$, $p < .001$, $\eta_p^2 = .47$. As expected, both the BDD and SAD groups had significantly higher scores than the OCD and control groups, *ps* < .02, *ds* ≥ 1.08, and the OCD group had higher scores than the control group, $p = .006$, $d = .81$. Further, the SAD and BDD groups did not differ from each other, $p = .33$, $d = .36$.

MASC Performance

First, to evaluate possible differences with respect to the overall ability to decode mental states, an univariate ANOVA with groups as the between-subject factor and the MASC total score as the dependent variable was computed. As evident in Table 3.2, the groups significantly differed with respect to their overall ability to read other people's mental states, $F(3,136) = 8.78$, $p < .001$, $\eta_p^2 = .16$. Follow up Bonferroni-corrected t-tests indicated that both the SAD and BDD groups had significantly lower scores than the control group, *ps* ≤ .04, *ds* ≥ .72. Further, the SAD group had significantly lower scores than the OCD group, $p = .001$, $d = .89$, whereas the BDD group scored in-between the SAD and OCD groups. That is, they neither differed from the SAD group, $p = .45$, $d = .37$, nor the OCD group, $p = .15$, $d = .55$. In addition, the groups did not differ with respect to non-social inferencing (control items), $F(3,136) = 1.82$, $p = .15$, $\eta_p^2 = .04$. Furthermore, the above reported group differences in total MASC score were still present when individual differences in non-social inferencing were included as another covariate in the ANOVA ($F(1,134) = 8.43$, $p < .001$, $\eta_p^2 = .16$). Also, follow up Bonferroni-corrected t-tests resulted in the same pattern of significant group differences. Taken together, this indicates that social cognitive deficits were likely independent of non-social intellectual functioning.

The MASC categories. Data were submitted to an ANOVA with groups as the between-subject factor and MASC category (emotion, thoughts and intentions) as the repeated measurement. The ANOVA yielded significant main effects for group, $F(3,136) = 8.74$, $p < .001$, $\eta_p^2 = .16$, and category, $F(1,136) = 153.54$, $p < .001$, $\eta_p^2 = .53$, but no significant groups by category interaction, $F(3,136) = 1.55$, $p = .21$, $\eta_p^2 = .03$.

With respect to the category "thoughts and intentions", exploratory analyses indicated that the pattern of results was similar to that found for the total MASC score, $F(3,136) = 9.46$, $p < .001$, $\eta_p^2 = .17$. Specifically, both the SAD and BDD groups had significantly lower scores than the control group, $ps \leq .001$, $ds \geq 0.82$. Further, the SAD group had significantly lower scores than the OCD group, $p = .001$, $d = .85$, whereas the BDD group scored in-between the SAD and OCD groups. That is, they neither differed from the SAD group, $p = .45$, $d = .36$, nor the OCD group, $p = .15$, $d = .54$. Interestingly, with respect to the category "emotions", no significant differences were obtained among the groups, $F(3,136) = 2.54$, $p = .06$, $\eta_p^2 = .05$, $ps \geq .08$, $ds \leq .53$. Only one trend was observed indicating that the SAD group, relative to the OCD group, was slightly worse identifying other people's emotions.

Table 3.2. Means and standard deviations by group for the MASC

Measure	BDD group (n = 35)		SAD group (n = 35)		OCD group (n = 35)		Control group (n = 35)	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
MASC (total score)	34.23_{ab}	4.12	32.57_{a}	4.88	36.31_{bc}	3.45	36.74_{c}	2.68
Emotions	11.71_{a}	1.76	10.89_{a}	2.55	12.06_{a}	1.78	11.94_{a}	1.63
Thoughts & Intentions	13.86_{ab}	1.99	13.03_{a}	2.56	14.80_{bc}	1.43	15.14_{c}	0.97

Note. SAD = Social anxiety disorder; BDD = Body dysmorphic disorder; MASC = Movie for the Assessment of Social Cognition (total score and subscores); OCD = Obsessive-compulsive disorder; Means sharing subscripts do not differ ($ps > .05$, Bonferroni-corrected).

3.5 DISCUSSION

The present study examined social cognition across SAD, BDD, and OCD by using the MASC as an ecologically valid measure, which assesses the ability to interpret others´ cognitive (thoughts and intentions) and emotional states within an other-referent context, i.e. situations where participants interpret social interactions from a bystander perspective. Inferring thoughts and intentions turned out to be significantly impaired in socially anxious individuals with SAD and BDD, which seems to underlie their lower overall mindreading performance in the context of a complex and dynamic social interaction. Interestingly, groups did not differ significantly in inferring other people's emotional states.

It was found that the overall mindreading performance was actually worse in both SAD and BDD groups. This result partially replicates that of Hezel and McNally (2014) who found a poorer MASC total score performance in individuals with SAD relative to a non-SAD group. More importantly, this finding poses the questions whether the social cognitive deficit actually generalizes over self- and other-referent situations, and if this generalized bias might be more strongly pronounced regarding inferences about others´ thoughts and intentions as compared to inferences about emotional states. The "double standard" hypothesis (Buhlmann, Winter, & Kathmann, 2013) poses that socially anxious people such as BDD sufferers apply biased interpretation more readily when situations are self-referent (Buhlmann et al., 2006), whereas being more neutral when performing other-referent tasks such as the "Reading the mind in the eyes" test (measuring emotion recognition from photographs of the eye region of strangers). This context factor might moderate emotion inferring in socially anxious individuals, i.e., they "turn off" the negativity bias in non-threatening other-referent conditions. However, this mechanism might not work when they infer others´ thoughts and intentions. Merely observing others´ interactions may already stimulate inaccurate and thus misleading interpretations. Supposedly, the "double standard" disappears in socially anxious individuals when they read other people's cognitive states. An underlying mechanism could comprise that thinking of other's thoughts and intentions inevitably activates habitual interpretations like "If I was part of this interaction, I would expect the character to have critical thoughts", since exaggeratedly self-focused apprehensions of social situations are central to social cognitive explanations of SAD (e.g., Rapee & Heimberg, 1997). Ultimately, even though a situation has no self-relevance socially anxious individuals expecting negative social outcomes and threat by others tend to habitually interpret it in a biased way. A similar explanation is proposed by Samson,

Lackner, Weiss, and Papousek (2012) who found that increased social anxiety was related to less enjoyment of cartoons requiring the understanding of others' mental states, and to higher response latencies in rating the funniest cartoons (as compared to non-mental state cartoons, respectively). The authors assume that socially anxious individuals experience threat when inferring the (false) beliefs of others which then biases information processing. Clearly, the cartoons used in their study represented an other-referent situation and yet induced biased social understanding. It should be noted though that another previous study in SAD found that biases are specific to self-referent social situations (Amir et al., 1998). Their results are based on written descriptions of other- vs. self-referent social scenarios. The discrepancy between their and this studies´ findings may be explained by the relatively higher ecological validity of the stimulus material used in the present study. Observing a vivid social interaction on a screen resembles a real life other-referent social situation much more closely than being asked to imagine a "typical person" while reading vignettes. Compared to a movie depicting concrete characters, the sole imagination of a non-specified proto-other unavoidably remains somewhat blurred and too abstract to capture the social significance of an other-referent situation, in which socially anxious individuals may regularly find themselves as a bystander. Especially, they likely take this stance in many kinds of group situations (e.g., parties, work meetings, family gatherings), where social anxiety hinders them from actively participating but rather leads to passive observation of others in social interaction. Thus, the results of the present study indicate that socially anxious individuals´ difficulties in understanding what other people are thinking or intending might generalize beyond self-referent context, i.e., they also misinterpret situations in which they are not directly involved.

Another line of argument explaining why this social cognitive deficit is especially apparent regarding the ability to infer others´ cognitive states but less evident for emotional states may lie in the different nature of social cognitive processing of others´ intentions and thoughts vs. emotions. Understanding thoughts and intentions encompasses a rather complex, higher-level mental operation (Frith & Frith, 2003), which can require elaborate multiple-order inference processes such as "A thinks that B believes that C thinks because D said..." (Kinderman, Dunbar, & Bentall, 1998). Inferring emotions, also referred to as empathic accuracy, on the other hand, is strongly intertwined with physical mirroring (e.g., facial mimicry) that facilitate immediate sharing of others´ emotional state rather effortlessly (Zaki & Ochsner, 2011). Understanding others´ cognitive states in complex social situations with multiple agents therefore may be a more demanding mindreading task than

understanding what a person feels, especially since emotion inference may be already well informed by direct mirroring. Notably, this deficit in reading other people's cognitive states is unrelated to general non-social cognitive functioning since the study groups did not differ with respect to years of education or performance on the MASC control items. This finding is consistent with a previous study showing that impaired MASC performance in individuals with SAD is unrelated to intellectual ability (Hezel & McNally, 2014).

Taking account of these differing social cognitive demands for cognitive vs. affective state inferencing, and considering etiological models of SAD and BDD (e.g., Clark & Wells, 1995; Feusner et al., 2010), the results can be explained as a consequence of the very cognitive nature of these disorders. Affected individuals who fear negative social evaluation may be particularly prone to disorder-specific biases when they perform complex social cognitive inferring tasks. For example, the process of reflecting on what a person expresses between the lines is probably much more easily accessible to habitual interpretative biases (i.e., generally expecting threatening social information) compared to more immediate emotion inferring processes operating at a lower cognitive level.

Though overall group differences in emotion inferring ability failed to reach statistical significance it should be briefly discussed that only the SAD group was slightly worse than the OCD group in identifying other people's emotions. It is possible that the scenarios used in the MASC were mostly relevant to individuals with SAD and, to some extent, less relevant to individuals with BDD, given that they were not specifically appearance-related.

A final explanation for the result that groups did not differ significantly in inferring other people's emotional states might refer to the fact that the MASC - unlike in previous studies where emotional stimuli were more static and distinct - provides a rich, audio-visual, dynamic, context-embedded informational basis which might enable individuals with SAD and BDD to use a broader range of contextual cues flexibly when inferring emotions. Possibly they compensate and combine emotional information from multiple sources allowing them to make up for a general emotion recognition deficit. Thus, future research needs to examine this (e.g., by developing a more self-referent versus other-referent version of the MASC).

Notwithstanding, when comparing the present results with previous findings the special quality of emotion recognition biases needs to be considered also. It has been shown

that inaccurate emotion inferring in BDD and SAD specifically comprises the misidentification of (neutral) faces as angry or contemptuous (e.g., Buhlmann et al., 2004, 2006) as well as an increased sensitivity for recognizing faces as angry (Joormann & Gotlib, 2006), respectively. Thus, the nature of emotion recognition inaccuracy in socially anxious individuals appears to be disorder-specific, i.e., a pronounced tendency to perceive social threat. However, in this study the quality of emotions within this MASC subcategory was not differentiated, and therefore the specificity of the social cognitive bias was not addressed. Taking this into account, the disorder-specific emotion recognition bias perhaps has not been fully provoked in the participants.

The current study has several limitations. First, the SAD and BDD samples consisted of slightly more female participants. Second, given that we recruited for this study using mainly posted flyers, we cannot exclude the possibility that our sample is self-selected and not entirely representative of these clinical populations. However, it should be mentioned that our clinical samples were comparably impaired (as determined with disorder-specific measures such as the (BDD)-YBOCS and LSAS) as clinical BDD, SAD, and OCD samples included in published treatment trials (e.g., Wilhelm et al., 2014; Williams et al., 2014; Kocovski et al., 2013). Third, another limitation of the presented findings concerns the fact that the group differences were rather small. The MASC is a global measure capturing a broad variety of contents (friendship, flirting, group dynamics, general social scripts, etc.). Therefore, the content of MASC characters´ mental states are not specifically related to the disorder-specific evaluation fear that the biases of socially anxious individuals rely upon. Presumably scenarios more closely related to negative evaluation fear might result in larger group differences between socially anxious and healthy control participants. Thus, future research should construct such scenarios for a film-based measure such as the MASC, which should include self-referent situations as well. That is, the movie would comprise scenes displaying characters that look directly into the camera and talk to the participant. In conclusion, it is strongly proposed to further investigate the differentiation between the self- vs. other-referent mode of mindreading in socially anxious individuals in order to better understand the role that social cognition plays for the maintenance or even etiology of disorders such as SAD and BDD.

3.6 CONCLUSION

Taken together, the findings provide further support for cognitive-behavioral models of social anxiety and BDD that emphasize the importance of negative socially-related beliefs for the presentation of symptoms directly tied to social anxiety (e.g., anxiety in or avoidance of social situations). One possible implication for cognitive-behavioral therapy of socially anxious patients could be to further expand the treatment focus on in vivo behavioral experiments involving observer-perspective social situations. For instance, SAD patients could be asked to interview non-anxious others about their actual thoughts during a performance evaluation (e.g. a talk) which they attend as a bystander. This external information (e.g. answers like "During the talk I had the feeling that the audience liked it") could be used by patients to challenge their own interpretations of other people's thoughts in putatively highly threatening social situations (e.g. "Surely he/she expected to bore the audience.").

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4 STUDY 3: TRAINING MENTAL STATE COMMUNICATION IN TYPICALLY DEVELOPING ADULTS IN HEALTH PROFESSIONS[10]

4.1 ABSTRACT

One major source of mental health problems in health professionals are personally demanding encounters at work. Thus, a crucial prevention focus is the development of emotional and social skills necessary to effectively manage interactions with clients, colleagues, and supervisors. The aim of our pre-post intervention field study was to evaluate an employee training in nonviolent communication (NVC) within a public health organization. A training group participated in a 3-day NVC training and completed questionnaires before and 3 months after training. Changes in NVC skills, empathic distress, empathy, and social stressors at work were compared with data from a control group without training. Additionally, we observed NVC-trained participants´ communication behavior immediately before and after the intervention. We found a promotion of communication skills in training participants as evidenced by increased emotion verbalization behavior and enhanced use of NVC at work. Empathic distress declined, and an increase of social stressors at work was prevented by enhanced emotion verbalization. The findings demonstrate that NVC training can be an effective means to foster emotional and interpersonal skills and to prevent empathic distress and social stressors at work in individuals working in socioemotionally challenging settings. Possible causal mechanisms explaining the training effects are discussed.

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4.2 INTRODUCTION

The prevention of socioemotional stressors in employees represents a key challenge for health institutions, since a stressed staff is more likely to be affected by mental health problems, absenteeism, and turnover (e.g., Dormann & Zapf, 2004; Michie & Williams, 2003; Tyssen, Vaglum, Gronvold, & Ekeberg, 2000; Wright & Cropanzano, 1998). This holds true not only for the health sector but for all other fields involving "people work", as they generally demand the skillful and professional handling of emotionally difficult encounters and interpersonal conflicts with interaction partners at work. In this paper, we present an empirical evaluation of an employee training in nonviolent communication (NVC; Rosenberg, 2005), which aimed at enhancing interpersonal skills and preventing empathic distress and social stressors at work among health professionals.

Emotional Labor in Health Professionals: Empathic Distress

Interactions with clients constitute one major source of work strain (Bolger & DeLongis, 1989; Dormann & Zapf, 2004; Grandey, 2000; Keenan & Newton, 1985; Zapf, Seifert, Schmutte, Mertini, & Holz, 2001). Especially in healthcare settings, dealing with illness and suffering represents a central psychological demand of employees´ daily work, since job stressors such as emotional pressure and patient demands (instead of more objective factors, e.g., high workload, on call sleeping hours) prove to be major predictors of mental health problems (Tyssen et al., 2000). In terms of emotional labor (Hochschild, 1983), showing compassion and avoiding expressions of negative feelings towards clients are essential job role expectations in healthcare (Diefendorff, Erickson, Grandey, & Dahling, 2011; Larson & Yao, 2005).

General models of emotional labor (Grandey, 2000; Hülsheger & Schewe, 2011) identify two possible emotion regulation strategies in professional interactions with clients. Deep acting refers to the internal modification of feelings and a genuine display of expected emotions, whereas surface acting is limited to the fake expression of role-consistent emotions without internal experience of corresponding feelings. While health professionals are expected to show empathy, the suffering of others can evoke an immediate reactive emotion that strongly contradicts this professional role. This response is referred to as empathic distress, a "self-focused, aversive, affective reaction to the apprehension of another's emotion" (Eisenberg, 2000; p. 672). It is a form of empathic overarousal that results from poor emotion regulation and lessened self-other distinction (Decety & Lamm,

2009; Eisenberg et al., 1994). Accompanying feelings are discomfort, tension, and anxiety, which promote egoistically motivated withdrawal from others in need (Batson, Fultz, & Schoenrade, 1987). Although Davis (1983) originally conceptualized it as a subcomponent of empathy, more recent empirical work strongly supports the assumption that empathic distress represents a distinct construct (Cliffordson, 2002; Hawk et al., 2013; Pulos, Elison, & Lennon, 2004) which clearly contrasts with empathic concern and compassion (Klimecki & Singer, 2011). Larson's and Yao's (2005) emotional labor model of clinical empathy thus considers the internal regulation of empathic distress as crucial for health professionals´ deep acting, and as a mediating factor of job burnout, one of the ultimate outcomes of clinical empathy. Based on the findings of a range of neuroscientific experiments, Klimecki and Singer (2011) similarly argue that burnout in caregivers is related to empathic distress fatigue. Indeed, in a previous study with Salvation Army officers, empathic distress was found to predict emotional exhaustion (Gross, 1994), which is the central aspect of job burnout (Maslach, Schaufeli, & Leiter, 2001).

Managing Relationships with Colleagues and Supervisors: Social Stressors at Work

While supporting social relationships and a nurturing emotional climate within work groups can buffer healthcare professionals´ strain due to emotional labor with patients (Grandey, Foo, Groth, & Goodwin, 2012), negative relationships and conflictual interactions with colleagues and supervisors can contribute to work-related psychological strain and cause depressive symptoms in employees (Dormann & Zapf, 2002). As pointed out by Frese and Zapf (1987), social stressors at work do not simply correspond to a lack of social support but are conceptualized as aversive social experiences and relationships with coworkers and supervisors, such as interpersonal conflicts and animosities, disharmonious interactions, and a negative work team climate. Diary studies revealed that employees report to be involved in interpersonal conflicts at work on half of the days (Hahn, 2000), and that social conflicts directly affect daily mood, accounting for 80% of its variance (Bolger, DeLongis, Kessler, & Schilling, 1989). Similarly, Bruk-Lee and Spector (2006) found that employees who had more interpersonal conflicts at work also experienced more negative job-related emotions. Social stressors at work seem to interfere with employees´ weekend recovery, as they are negatively related to psychological detachment and sleep quality (Pereira & Elfering, 2014). In addition, social stressors at work have a long-term negative impact on employees´ mental and physical health, as shown by longitudinal investigations (Berset, Semmer, Elfering, Jacobshagen, & Meier, 2011; Dormann & Zapf, 2002).

Nonviolent Communication

NVC is an approach aimed at handling socioemotionally demanding situations (Rosenberg, 2005; Rosenberg & Molho, 1998). The basic assumption of NVC is that individual emotional discomfort and relational conflict resulting from stressful interactions can be prevented through a certain style of communication. More precisely, NVC entails i) the communication of non-evaluative observations, ii) the expression of feelings and needs, iii) clear requests, as well as iv) empathic listening to dialogue partners. According to Rosenberg (2005), speakers should start potentially conflictual dialogues with specific descriptions of an observed behavior or event, while associated personal evaluations or subjective judgments should be left out in order to avoid perceptions of criticism and defensive reactions in dialogue partners. A subsequent step in the communication process is the expression of one's own feelings and (unmet) needs related to this observation. Such verbalization behavior requires emotional self-awareness (i.e. identification of inner affective states) on the one hand, and the knowledge and vocabulary of differentiated feelings and underlying needs on the other. Finally, clear requests specifying the concrete behavior that is supposed to fulfill those needs should be addressed towards the dialogue partner in a non-demanding way. When being in the role of the listener, NVC involves empathically receiving the observations, feelings, needs, and requests that are implicitly or explicitly communicated by others. Rosenberg (2005) refers to it as "a respectful understanding of what others are experiencing" (p. 91), and assumes that practicing this listening style fosters empathy between dialogue partners.

Previous studies in prisoners and parolees evaluated the effects of NVC training on empathy, self-compassion and communication skills (Marlow et al., 2012; Suarez, Lee, Rowe, Gomez, Murowchick, & Linn, 2014). A case study investigated the value of NVC in student online coaching and mentoring (Cox & Dannahy, 2005). Moreover, Nosek (2012) reports some anecdotal narratives on the use of NVC by nursing students. All these findings support the idea that NVC is effective in promoting interpersonal skills and relationship quality. However, given that the available studies are few in number, heterogeneous, and methodologically limited, more research is needed to evaluate NVC based interventions.

Present Study

We suggest that interpersonal and communication skills represent a promising scope for a secondary prevention intervention designed to target health professionals´ regulation

of empathic distress in emotional labor with patients, as well as their management of social stressors resulting from relationships with colleagues and supervisors. NVC builds the rationale of behavioral interventions designed to promote communication skills and empathy in various applied contexts (Rosenberg, 2005; Rosenberg & Molho, 1998). However, despite the work of nearly 500 certified NVC trainers around the globe, and the wide application of NVC trainings in fields like health care, education, and community work (Center for Nonviolent Communication, 2016), academic effectiveness studies are scarce. Thus, the purpose of our study was to investigate whether NVC training enhances communication skills and empathy, and if it has the potential to prevent empathic distress and social stressors at work. We expected that the training has a proximate learning effect as well as a transfer effect (Kirkpatrick, 1998) on communication skills. Thus, we hypothesized that NVC training will increase emotion verbalization immediately after the training (Hypothesis 1a), as well as the later use of NVC at the workplace (Hypothesis 1b). As empathic listening is a central component of NVC, we also expected that NVC training promotes empathy (Hypothesis 2). Given that NVC entails intrapersonal emotion management (i.e., awareness, labeling, and expression of own emotions), we further hypothesized that NVC training will reduce empathic distress (Hypothesis 3). Ultimately, NVC is conceptualized as an effective means of interpersonal relationship management (i.e., non-judgemental, non-demanding, and empathic interaction). Therefore, we expected NVC training to reduce social stressors at work (Hypothesis 4).

4.3 METHODS

We carried out a pre-post intervention study in the field setting of a public health organization in Germany. The organization has several branches with more than 600 employees, including physicians, nurses, and administrative personnel. A sample of employees who voluntarily participated in a 3 day NVC training took part in a questionnaire survey before and 3 months after the training. Pre-post changes in NVC skills, empathy, empathic distress, and social stressors at work were compared with questionnaire data collected in a control sample of employees who did not receive any intervention. In addition, we examined more proximate training effects by observing participants´ emotion verbalization behavior during a group discussion immediately before and after the training. Figure 4.1 presents an overview of the study design and number of participants. Both study

design and procedure were approved by the Ethics Committee of the Psychology Department of the Humboldt University Berlin, Germany.

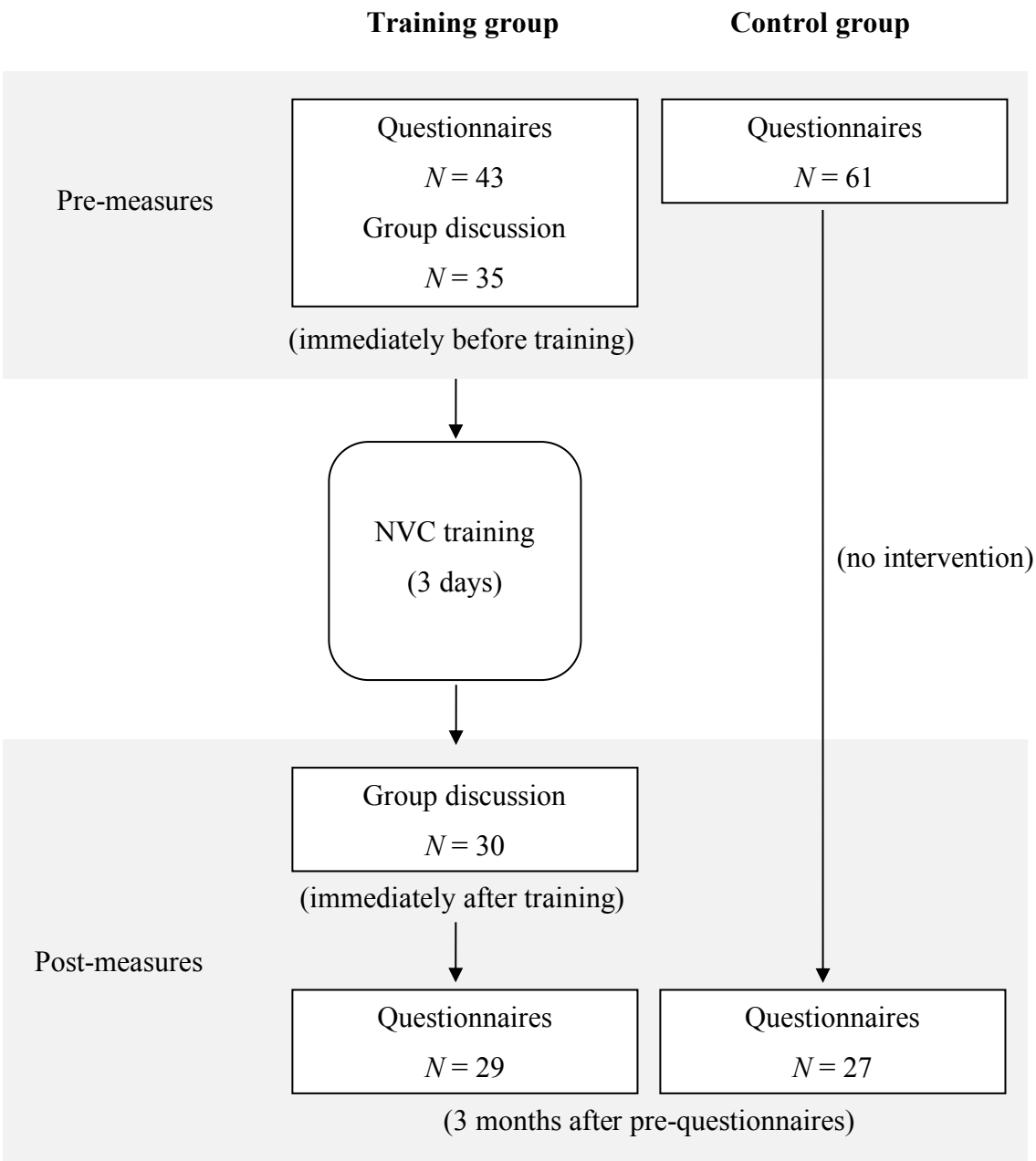

Figure 4.1. Study design and participants.

Participants

The organization's human resources department offered the opportunity to voluntarily participate in the NVC training via e-mail and intranet blackboard to the entire staff. At the same time, employees were informed that before and after the training participants would be invited to take part in the collection of questionnaire and video data,

which would be used by the authors for scientific purposes. Random assignment of 89 interested participants to a training group (TG) and control group (CG) was not feasible because of practical and organizational constraints. Overlap in organizational unit membership across TG and CG participants had to be ruled out in order to avoid possible confounds through everyday personal interaction among employees during the course of the study (e.g., social learning effects). At the same time, individual scheduling preferences had to be matched with fixed training dates and limited participant numbers.

Considering these constraints, 46 of the 89 interested employees were assigned to the TG and invited to take part in our study. At the day of the training, two participants failed to appear, and one person, despite completing the training, refused to participate in the study. An additional 14 TG participants did not reply to the post questionnaire. The other 43 employees were assigned to the CG. As we expected relatively lower response rates in this group, we also invited 95 additional employees to the study via email. They had been invited to participate in the training but had not responded to the initial training announcement. Again, non-overlap in organizational unit membership with TG participants was considered. The pre-questionnaire was completed by 55 CG participants, and 6 other participants for whom organizational unit membership could not be established were excluded from the study. Another 28 CG participants did not reply to the post-questionnaire.

The final pre-post analysis sample comprised 29 participants in the TG and 27 in the CG.[11] Participants' mean age was 49.2 years (SD = 7.4) in the TG, and 47.3 years (SD = 7.9) in the CG (t[48] = .92, p = .36). The high percentage of female participants (TG: 85%; CG: 89%; χ^2[1] = .17, p = .69) represented the organization's personnel structure (82% female employees). Participants´ average organizational tenure amounted to 12.22 years (SD = 9.30) in the TG, and 10.10 years (SD = 8.10) in the CG (t[50] = .90, p = .37). Groups were not equivalent with respect to educational level. TG participants had more years of education (M = 15.9, SD = 4.4) than CG participants (M = 12.3, SD = 3.6; t[48.16] = 3.22, p < .01).

[11] We conducted an attrition analysis. Of the total of 98 participants who provided pre-questionnaire data and were included in the analysis, 56 (57.1%) completed the study and provided post-questionnaire data. Chi-square analyses revealed that attrition levels differed marginally significant between study groups (TG: 32.6%, CG: 50.9%; χ^2(1) = 3.32, p = .07). However, there was no significant Group (TG vs. CG) x Attrition (dropouts vs. completer) interaction effect on demographic or training outcome variables as a series of ANOVAS revealed.

Procedure

Intervention. The training intervention was designed and carried out by one experienced NVC trainer who had been commissioned as an external consultant by the organization. The aim of the training intervention was to develop and foster NVC skills in the participants, particularly for potentially tense or conflictual interactions with clients and colleagues at work. A special focus was placed on expressing and responding to strong emotions like frustration and anger (for further details on the concept and methods of the NVC training, see Weckert, 2012). The 3 day program (7 hr of training per day) included theoretical explanations (one-third) and practical exercises (two-thirds) of the core components of NVC (non-evaluative observations, feelings and needs, clear requests, empathic listening). Brief introductory presentations, group role plays, dyadic conversations, nonverbal communication, and self-exploration techniques were applied. During the practical parts, participants were encouraged to use real communication situations that they had experienced at work. Instructional handouts supported the exercises. The in-house-trainings were provided in three groups of 14 to 15 participants in the organization's own facilities in spring 2012.

Data collection. To assess training effects over 3 months, communication skills, empathy, and stress were assessed via self-report measures. In the TG, paper and pencil questionnaires were administered on the first day of the training before its start. In the CG, the questionnaires were provided online after acceptance of invitation to participate in the study. Three months after pre-data collection, we asked participants in both groups via e-mail to answer the same online-questionnaires again. The second data collection was announced to all participants when they received the first questionnaires.

Additionally, we examined the proximate training effect by observing the communication behavior of TG participants in a group discussion on the first day of the training before it started, and on the last training day after it ended. Thirty-five participants (80%) of the TG were willing to join discussion groups, which were randomly composed of four to six persons. Five participants dropped out at post-discussion because of other obligations after the training. We chose "work assignment" as discussion topic. Based on a detailed written description of a scenario, we asked participants to picture themselves being part of a team which receives an extra high workload from their team supervisor while being understaffed. The task was to discuss this issue and decide on the individual work assignments among the team members while the group was instructed to agree on only two

(in groups of up to four persons) or three (in groups of six persons) group members who would be responsible for the extra work. Topic and task were chosen because they resemble a moderately conflictual but common workplace situation for employees. Discussions lasted for on average of 8 min (*SD* = 2.5) and were terminated if they exceeded 10 min. The interactions were video-recorded on the basis of written informed consent and coded as described below.

Group Discussion

Emotion verbalization. Adding a behavioral observation measure of emotion verbalization, the frequency of verbal expressions of emotional states during group discussion was assessed by coding the videotaped interactions with the Discussion Coding System (DCS; Schermuly & Scholl, 2012). The coding procedure for the purpose of this study entails i) the group discussion being segmented into individual statements on the basis of a set of rules defining when a new statement is coded (e.g., when speakers change, or when they address a new person), and ii) the communicative function of each statement being coded with regard to the verbalization of positive or negative emotions. Emotional statements are specified as messages by which speakers express their own positive or negative feelings explicitly, e.g., "I am satisfied/content/glad/happy" or "I feel disappointed/irritated/distressed/under pressure" (Schermuly & Scholl, 2012). Frequency was calculated as the sum of the person's emotional statements divided by the sum of the person's total statements. Coding of communicative function based on the DCS categories proved to have a strong interrater agreement throughout various studies (Cohen's kappa ranging from .72 to .91; Schermuly & Scholl, 2012).

Data analysis. To assess whether NVC training had a proximate effect on emotion verbalization, we analyzed pre- to post-training changes in the frequency of verbal expressions of emotional states during group discussion in the TG. We conducted separate analyses for changes in frequency of expressions of positive and negative emotional states by performing Wilcoxon signed rank tests, as the assumption of normal distribution was not met.

Questionnaires

Nonviolent communication. As, to the best of our knowledge, no published comprehensive measure of NVC as conceptualized by Rosenberg (2005) exists, we used a self-developed 18-item scale that represents the four core components of NVC, i.e., i)

observing without evaluating (e.g., "I describe my perception to my dialogue partner without evaluating [positively or negatively]."), ii) expressing feelings and needs (e.g., "I find it easy to tell my dialogue partner about my feelings."), iii) clear requesting (e.g., "When I ask my dialogue partner for something, I express myself as clearly as possible in order to avoid misunderstandings."), and iv) empathic listening (e.g., "I can understand my dialogue partner's feelings, even if he expresses them indirectly."). Reliability of the scale was α = .91. Further information regarding scale development can be found in appendix A.

Cognitive and emotional empathy. Trait empathy was assessed by two subscales (four items each) of Paulus´ (2009) "Saarbrücker Persönlichkeitsfragebogen (SPF)", which is a German variant of the Interpersonal Reactivity Index (Davis, 1983). The perspective taking subscale measures the understanding of another person's psychological point of view (e.g., "I try to look at everybody's side of a disagreement before I make a decision"), and thus, represents cognitive empathy. The empathic concern subscale focuses on feelings of warmth and sympathy for unfortunate others (e.g., "I have tender, concerned feelings for people less fortunate than me"), and thus, represents affective empathy. Internal consistency was α = .80 (perspective taking) and α = .64 (empathic concern). We chose these subscales as the most established self-report empathy measures, and because they, despite representing a trait-based measure, have been successfully used in similar studies to examine intrapersonal change over short time periods (e.g., 8 weeks; Birnie, Speca, & Carlson, 2010).

Empathic distress. Empathic distress, i.e., self-oriented feelings of discomfort and anxiety that emerge when apprehending another's emotion, was measured by the corresponding SPF personal distress subscale (four items, α = .76; e.g., "Being in a tense emotional situation scares me", "In emergency situations, I feel apprehensive and ill-at-ease").

Social stressors at work. Intensity of social stressors was assessed using a 10-item scale developed by Frese and Zapf (1987). The scale focuses on animosities and conflicts with colleagues and supervisors, and a negative social climate at the workplace (e.g., "One's hash is settled even for minor matters", "My supervisor pushes all the time", "I have to work together with people who do not understand fun"). The internal consistency was α = .88.

All questionnaire items were answered on five-point rating scales ranging from 0 = *not at all true* to 4 = *completely true*.

Data analysis

We separately conducted 2 x 2 repeated-measures ANCOVAS with Group (TG vs. CG) as between-subject factor and Time (pre vs. post) as within-subject factor. Years of education were included as a covariate in each model, since TG and CG were not equivalent in terms of educational level.

4.4 RESULTS

Proximate Effect of NVC Training on Emotion Verbalization

Means and standard deviations for emotion verbalization during group discussion are presented in Table 4.1. The frequency of negative emotional state expressions significantly increased (z = - 3.39, p < .001, r = - 0.62), while the frequency of statements containing positive emotional states did not change significantly (z = -.98, p = .33, r = - 0.18). Thus, the training specifically increased the capability to verbally convey negative emotions to communication partners during a conflictual group discussion (Hypothesis 1a).

Table 4.1. Means and standard deviations of immediate outcomes in the training group

Outcome	*M (SD)*
	pre/post
Emotion verbalization in % (negative states)	2.80 (9.64)/10.51 (13.16)
Emotion verbalization in % (positive states)	0.88 (3.23)/1.53 (3.32)

Note. N = 30.

Table 4.2 provides an overview of means and standard deviations of training outcomes in TG and CG over 3 months.

Table 4.2. Means and standard deviations of outcomes in the training group and control group over 3 months

	M (SD)	
	TG (*N* = 29)	CG (*N* = 27)
Outcome	pre/post	pre/post
Nonviolent communication	2.09 (.47)/2.32 (.43)	2.54 (.51)/2.45 (.55)
Perspective taking	2.50 (.66)/2.60 (.57)	2.69 (.72)/2.71 (.81)
Empathic concern	2.74 (.61)/2.60 (.58)	2.72 (.55)/2.61 (.64)
Empathic distress	2.04 (.81)/1.70 (.72)	1.44 (.91)/1.49 (.89)
Social stressors at work	1.05 (.68)/0.97 (.71)	0.70 (.54)/0.93 (.75)

Note. TG = training group; CG = control group.

Effect of NVC Training on NVC Skills over 3 Months

The ANCOVA of changes in NVC skills yielded a significant interaction effect, $F(1,48) = 4.66$, $p < .05$, $\eta_p^2 = .09$, 90% CI [.003, .227]. Bonferroni-corrected post hoc comparisons further revealed a significant increase in the TG ($M_{pre} = 2.14$, $M_{post} = 2.33$, $p < .05$), while mean scores in the CG did not change significantly ($M_{pre} = 2.51$, $M_{post} = 2.43$, $p = .38$), supporting our assumption that NVC training increases NVC skills (Hypothesis 1b).

Effects of NVC Training on Cognitive and Emotional Empathy over 3 Months

We conducted two separate analyses in order to examine changes in cognitive and emotional empathy. For perspective taking the ANCOVA interaction effect failed to reach statistical significance, $F(1,49) = 1.76$, $p = .19$, $\eta_p^2 = .04$, 95% CI [.000, .148]. Furthermore, no significant interaction effect resulted for empathic concern, $F(1,49) = 0.18$, $p = .67$, $\eta_p^2 = .004$, 95% CI [.000, .073]. Taken together, there was no conclusive evidence for our hypothesis that NVC training promotes cognitive and emotional trait empathy as measured via self-report questionnaire (Hypothesis 2).

Effects of NVC Training on Empathic Distress and Social Stressors at Work over 3 Months

Training effects on empathic distress and social stressors at work were analyzed separately. The ANCOVA yielded a significant interaction effect for empathic distress,

$F(1,49) = 4.71$, $p < .05$, $\eta_p^2 = .09$, 95% CI [.003, .225]. In Bonferroni-corrected post hoc analyses we found a significant decrease in the TG ($M_{pre} = 2.25$, $M_{post} = 1.90$, $p < .01$), but no significant change in the CG ($M_{pre} = 1.26$, $M_{post} = 1.32$, $p = .64$). A different pattern resulted regarding changes in social stressors: The marginally significant interaction effect ($F[1,47] = 3.56$, $p < .10$, $\eta_p^2 = .07$, 95% CI [.000, .205]) was based upon the increase in the CG ($M_{pre} = 0.64$, $M_{post} = 0.92$, $p < .05$), and a stable level of social stressors in the TG ($M_{pre} = 1.06$, $M_{post} = 1.02$, $p = .71$) as Bonferroni-corrected post hoc comparisons revealed. In summary, these results support the assumption that NVC training reduces empathic distress (Hypothesis 3). NVC training, however, did not decrease social stressors at work as expected (Hypothesis 4), but prevented its increase instead.

Training Intention Analysis within the CG

We analyzed possible training intention effects within the CG. Nine participants (33%) reported that they had responded to the initial training announcement, while 17 participants (63%) indicated that they had not. One participant did not answer that question. These two CG subgroups did not differ in age ($t[22] = -.70$, $p = .49$), educational level ($t[11.92] = -1.74$, $p = .11$), tenure ($t[24] = .80$, $p = .43$), and gender ratio ($\chi^2[1] = .19$, $p = .67$). However, given that varying levels of the intention to participate in the training may differently affect changes over time, we conducted a series of 2 x 2 repeated-measures ANOVAS with CG Subgroup ($CG_{responder}$ vs. $CG_{non\text{-}responder}$) as between-subject factor and Time (pre vs. post) as within-subject factor. No Group x Time interaction effect resulted for any training outcome variable, indicating that patterns of changes among CG participants were actually independent of their initial intention to take part in the NVC training.

Mechanism of Preventing Social Stressors at Work Through Proximate NVC Training Effect on Emotion Verbalization

To explore whether the proximate training outcome, as measured through discussion analyses, was associated with training outcomes over 3 months, we first created variables quantifying change for all outcome variables ($M_{post} - M_{pre}$). We then separately regressed variables representing change over 3 months on change in verbalization of negative emotions in the TG only. As 9 of 30 group discussion participants had not fully completed the post questionnaire, the following results are based on $N = 21$. Analyses identified increase in emotion verbalization during group discussion as a significant negative predictor ($B = -.48$, $p < .05$) of increase in social stressors at work, with 23% variance explained, $R^2 = .23$, $F(1,19)$

= 5.64, p <.05. Thus, prevention of an increase in social stressors at work through NVC training seems to in part rely on the enhanced capability to express negative emotions to interaction partners. There were no further significant relationships with changes in the other outcome variables.

4.5 DISCUSSION

The aim of our study was to examine the effectiveness of a training in NVC (Rosenberg, 2005) in employees of a public health organization. NVC includes the communication of non-evaluative observations, expressions of feelings and needs, clear requests among dialogue partners, and empathic listening. We found that the 3-day intervention promotes communication skills as evidenced by an increase in verbalization of negative emotions during a conflictual group discussion, as well as enhanced NVC skills in everyday communication at work 3 months after the training. Furthermore, participants showed a decline in empathic distress, while the increase of social stressors at work was prevented by an enhanced capability to verbalize negative emotions during a group discussion. There was no conclusive evidence to assume that NVC training is beneficial in promoting cognitive and emotional trait empathy within 3 months. Overall, we conclude that NVC training is an effective means to foster emotional and interpersonal skills and to prevent empathic distress and social stressors at work in health professionals. This study demonstrates the effectiveness of a short employee training preventing psychological stressors that have been shown to cause mental health problems in health professionals. Despite the wide use of NVC based interventions in various applied fields, empirical evaluations in the workplace have been lacking so far. To our knowledge this is the first controlled NVC effectiveness study to address this research gap.

When discussing a conflictual work situation in the group, participants verbalized their negative emotions (for example, frustration or stress), more frequently after the NVC training. The verbalization of positive emotions did not increase, which is plausible because this above scenario is not likely to elicit positive affect. In addition, this proximate training effect was followed by an improvement in NVC skills employed in communication situations at work 3 months after the training. Taken together, the results support the assumption that NVC is a sustainably trainable communication skill (Rosenberg, 2005; Rosenberg & Molho, 1998). While NVC is practiced by nearly 500 trainers in various applied contexts (Center for Nonviolent Communication, 2016), to date there has been little scientific evidence examining the effectiveness of this intervention approach. Our study

contributes to the scarce academic publications addressing NVC and fills this gap with a controlled and quantitatively based evaluation. Drawing on Kirkpatrick's (1998) four-level training evaluation model we consider the change in observed emotion verbalization to constitute a proximate effect on the learning level ("principles, facts, and techniques understood and absorbed", p. 4), whereas increase of self-reported communication skills in work settings is interpreted as a transfer effect on the behavior level ("applying learned principles and techniques on the job", p. 5). The improvement of communication skills in our participants corresponds to a certain extent to the enhancement of NVC skills in male prisoners after NVC training (Suarez et al., 2012), and to the qualitative evidence of another study (Marlow et al., 2012), where residents of a substance abuse treatment facility for men on parole reported to have enhanced listening skills after NVC training. Since our participants represent a non-deviant sample, which was predominantly composed of women, our findings further contribute to the generalizability of NVC training effectiveness.

Besides improved communication skills we also found a decrease of empathic distress in training participants. This result supports the assumption that NVC is an effective way to manage one's own feelings occurring in emotionally tense interactions (Rosenberg, 2005). Referring to the account of empathic distress as an aversive empathic overarousal, which results from low emotion regulation capabilities accompanied by a failure to disentangle the self from the other (Decety & Lamm, 2009; Eisenberg et al., 1994), we propose that NVC training reduces empathic distress by promoting these crucial regulation and distancing processes. Observing others´ negative affective states in a non-judgemental manner and being aware of one's own feelings and needs enables health professionals to establish a psychological distance to interaction partners in emotionally charged situations, e.g., when talking to suffering clients or upset colleagues. This inner distance contributes to the prevention of other-induced negative affect like discomfort and anxiety. Evidence supporting the positive effects of non-judgementality and, especially, self-awareness has been provided by mindfulness literature (Brown & Ryan, 2003; Grossman, Niemann, Schmidt, & Walach, 2004; Hülsheger, Alberts, Feinholdt, & Lang, 2012).[12] Birnie and colleagues (2010) found a reduction of empathic distress through a mindfulness based stress reduction program, concluding that mindfulness prevents observers from becoming

[12] Given that aware, non-evaluative, and accepting attention to present experiences is the defining characteristic of mindfulness (Brown & Ryan, 2003), it possesses strong conceptual overlap with NVC.

emotionally overwhelmed by others´ suffering. Further insight into the underlying brain mechanisms comes from a neuroimaging study (Creswell et al., 2007), in which mindfulness was shown to be positively associated with enhanced prefrontal cortical regulation of negative affect during emotion labeling. The authors suggested that mindful labeling of negative emotions triggers a process of inner detachment from these affects. Similarly, we assume that awareness and expression of emotions through NVC may activate similar distress regulating mechanisms. Even if, in especially delicate situations at work, it seems inadequate to frankly express one's own negative feelings towards others, merely becoming consciously self-aware of them without judging oneself or others might help to down-regulate strong emotional states. An additional explanation of how NVC training reduces empathic distress refers to the primarily cognitive nature of empathic listening, as it includes active and attentive decoding, processing, and inferring of information about the other's inner states (Bodie, 2011; Drollinger, Comer, & Warrington, 2006; Janusik, 2007). Approaching conversations in a rather analytical mode of listening may further contribute to the regulation of negative affect in highly tense situations. At the same time, distress-promoting overlap of the self and the other becomes less likely as the other's inner state becomes rather objectified.

A further stress-related NVC training benefit was the prevention of an increase in social stressors at work. Taking into account that the effect was predicted by the proximate change in verbalization of negative emotional states towards others, this seems to be one causal mechanism in the prevention of interpersonal problems with colleagues and supervisors. How may the expression of one's own negative feelings possibly relate to the dynamics of dysfunctional social interactions? First, we argue that emotion verbalization has an important self-regulation function. As outlined above, emotional self-awareness in terms of affect labeling has shown to be associated with enhanced emotion regulation (Creswell et al., 2007). This may help soothe emotionally charged situations at an early stage. Considering that in NVC verbalized emotions are clearly self-referring (e.g., "I feel disappointed.") instead of other-referring, judgmental, or accusing (e.g., "You disappoint me."), expressing one's own affects can function as an adequate and non-provocative "cooling-off" strategy right at the beginning of potentially conflictual interactions with colleagues or supervisors. Second, we assume that emotion verbalization possesses a social integration function. Going beyond initial self-regulation, expressing one's own affective state through verbal and non-verbal displays elicits others´ affective empathy (de Vignemont & Singer, 2006; Dziobek et al., 2008). As it is positively related to prosocial behavior (e.g.,

empathy-altruism-hypothesis; Batson et. al, 1987) empathy-inducing emotion verbalization may thus strengthen cooperative tendencies in others, and may thereby prevent conflict escalation or facilitate conciliation. Finally, emotion verbalization may also function as important behavioral feedback for others because it provides rich information on the interpersonal consequences of their statements or actions. This assumption is in line with Van Kleef's (2009) Emotions as Social Information Model, according to which emotional expressions trigger inferential processes in others, which subsequently influence their behavior. For example, verbalizing disappointment may lead interaction partners to realize that their behavior did not meet certain expectations. As a consequence they may seek further information that would help them clarify others´ expectations and eventually alter their behavior in order to rebuild a satisfactory interpersonal exchange and harmonious relationship. Clearly, this feedback function of emotion verbalization depends on the fact that – except for temporary animosities and conflicts – interaction partners have a cooperative orientation towards each other. That being said, it is possible that proximate changes in other NVC components, which we did not examine, may also have played a comparable role in preventing social stressors at work. For example, we speculate that disputes among colleagues may be hampered by the expression of clear requests to fulfill specific needs.

As perspective taking and empathic concern did not significantly increase, the assumed promotion of empathy through NVC training (Rosenberg, 2005; Rosenberg & Molho, 1998) was not supported. Possibly, the intervention promotes the awareness of one's own inner states, which does not directly lead to enhanced cognitive and affective empathy for others but merely builds its basis. As studies in alexithymia (i.e., impairment in identification and description of feelings) show, emotional self-awareness is a central precondition of empathy (Grynberg, Luminet, Corneille, Grèzes, & Berthoz, 2010; Moriguchi et al., 2007). Learning to sense and express what oneself is observing, feeling, needing, and requesting through NVC thus can be regarded as the preceding condition before empathic reception of the same states in others can be cultivated. Therefore, we assume that during the first 3 months after training, participants place a relatively stronger emphasis on developing emotional self-awareness in communication situations, while working on their empathic listening skills take the back seat, and may have a delayed effect on their capability to empathize with others. Still, despite this possible explanation of our findings, they actually differ from the results of the study by Marlow et al. (2012), where the authors found heightened levels of self-reported emotional empathy in their participants after a NVC

training. However, their study design lacked a control group leaving open whether other factors, e.g., pretest sensitization, drove the results. Moreover, in addition to NVC, a substance abuse treatment was applied to the same group of individuals, and it is possible that this treatment led to the observed increase in empathy. Thus, the causal role of that study's NVC intervention on fostering empathy remains unclear. Yet, when interpreting our own results we must consider the specific nature of the empathy measure we used. The SPF (IRI) assesses trait empathy, which is a general disposition that conceptually differs from situation-specific state empathy. It is possible that a potential effect of NVC training on empathy does not generalize over a multitude of situations but is limited to specific contexts, e.g., when interacting with clients and colleagues but not when talking to others in settings outside the workplace. With regard to future investigations of NVC training effectiveness, we propose to apply performance based empathy tests. For example, the photo based Multifaceted Empathy Test (Dziobek et al., 2008), as well as the Movie for the Assessment of Social Cognition (Dziobek et al., 2006) allow to assess participants´ objective performance scores of empathic functioning. We consider these measures to be more sensitive to intraindividual changes in affective and cognitive empathy, and thus particularly appropriate for the scope of pre-post intervention studies.

A limitation of our study is that the proximate training effect on emotion verbalization as assessed via discussion analysis was not controlled in terms of a comparison group. Unfortunately, due to organizational reasons, it was not possible to invite the CG participants to take part in separate group discussions. Therefore, we cannot rule out that the emotion verbalization increase resulted from general group climate changes after 3 days of joint training. On the other hand, our analysis showed that changes in emotion verbalization systematically predicted changes in social stressors at work. Since a short-termed unspecific effect on the emotional climate within the training group would be unlikely to predict the reported prevention of social stressors increase at the workplace 3 months later, this relationship somehow validates the uncontrolled, yet reasonable, proximate training effect. Nevertheless, future studies should replicate this finding by including an active control group, which, ideally, receives a non-specific communication training that shares the formal and didactical features of the NVC training. In doing so, other researchers may also be interested in investigating proximate changes in the other components of NVC, which we did not examine. This would further clarify the relative role of non-judgmental observations, clear requests, and empathic listening in the prevention of interpersonal conflict at work, thereby shedding more light on the core causal mechanisms of NVC in enhancing

interpersonal functioning and preventing stressors in socioemotionally challenging fields like healthcare.

Finally, the NVC training as a secondary prevention intervention could be useful in combination with a primary intervention targeting psychological strain resulting from emotionally and socially challenging interactions in health professionals´ work. As has been shown by Bond, Flaxman, and Bunce (2008), individuals with higher psychological flexibility (i.e., capacity for mindful, focused, goal-directed action) benefit more strongly from a primary control-enhancing redesign intervention in terms of reduction of non-specific psychological distress. Similarly, we propose that the promotion of NVC skills could enhance the strain-reducing effects of a primary intervention aimed at, for example, changing health professionals´ emotional display rules or advancing emotion regulation and acting strategies in interactions with clients.

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4.7 APPENDIX

As a first step in developing the Nonviolent Communication Scale, we generated a list of items which represent the core components of the construct, i.e., i) observing without evaluating, ii) expressing feelings and needs, iii) clear requesting, and iv) empathic listening. Next, we presented the item list to the professional NVC trainer who conducted the training intervention in this study. Unclear or controversial items were discussed and rephrased. The 22-item list was then administered to the initial sample of participants in the TG and CG with the instruction to "think of normal communication situations with dialog partners in the context of your work". Data of a total of $N = 104$ were collected. We performed exploratory factor analysis (principal components analysis, varimax rotation), and found the theoretically supposed 4-factor structure based upon the Kaiser-Guttman criterion and the Scree test. Three items were removed due to double-loadings and one item due to low loading (<.40). The remaining 18 items were re-analyzed, and 4 factors generated with a total of 72.14% explained variance. Internal consistency of the final Nonviolent Communication Scale was $\alpha = .91$. An overview of descriptive and reliability statistics for the original German items is presented in Table 4.3 (which is not included in the appendix of the published paper).

Table 4.3. Descriptive and reliability statistics of the Nonviolent Communication Scale

[Table 4.3 is not included in the online version.]

5 GENERAL DISCUSSION

5.1 The Role of Social-Cognitive Abilities in Interpersonal Functioning

Among numerous social-cognitive abilities employed by individuals in order to make sense of others and themselves in social life (Fiske & Taylor, 2013), mindreading and mindspeaking are particularly intriguing as they enable individual minds to meet, i.e., to represent each other´s mental states through observing and talking with each other. In the theoretical background of this dissertation, I introduced mental state communication (mindspeaking) as an emerging concept reflecting communicative manifestations of metacognition and mindreading in verbal communication (see section 1.1). Furthermore, I positioned specific aspects of interpersonal functioning in adults with pathological fear of social evaluation and typically developing adults in health professions within the general interpersonal circumplex (see section 1.2) of affiliation and dominance as the two fundamental dimensions of social interaction (Abele & Wojciszke, 2013). The insights gained throughout the empirical studies of this dissertation emphasize that being able to understand other people's minds and (verbally) reflect upon mental states is by far not only a particular issue for adults with clinically relevant social information processing biases, but also a substantial concern for typically developing adults - considering, firstly, the interindividual variation in social-cognitive performance and, secondly, the fact it plays a pivotal role in interpersonal functioning in particular professions such as healthcare.

Study 1 advanced knowledge regarding age and gender associated individual differences in mindreading ability in typically developing adults based on an objective and sensitive assessment paradigm. The observed perceiver-target interaction effect was characterized by the superior performance of women, especially for female targets, whereas no such own-gender bias was present in male participants. Moreover, in our large sample covering an age range from 17 to 70 years, a nonlinear age effect on mindreading with a negative trajectory setting on by approximately 30 years shows how this ability differs across the adult life span. An intervention aimed at improving social-cognitive abilities in typically developing adults, specifically health professionals, was evaluated in study 3. This NVC training, targeting mental state communication with interaction partners at work, had a positive effect on interpersonal functioning, as it reduced empathic distress, and prevented social stressors and conflict with colleagues and supervisors via increased verbalization of negative affective states in naturalistic social situations. In study 2, an impaired ability to understand others´ thoughts and intentions from a third-person observer perspective was

found to be present in adults with SAD and BDD, which are both characterized by low interpersonal functioning in terms of social evaluation fear as a shared transdiagnostic feature. Taken together, these studies demonstrate that inferring and/or explicitly talking about mental states is relevant for different aspects of low interpersonal functioning, such as social fear, avoidance, distress and conflict, and, furthermore, that mental state communication can be effectively promoted in typically developing adults in professional roles demanding good interpersonal functioning.

This dissertation set out to broaden the theoretical perspective on social-cognitive abilities by focusing both on first-person perspective metacognition and second-person perspective mindreading within the concept of mental state communication, which is proposed as an ecologically valid concept given that interaction partners actually talk about their own and listen to each other's inner states in naturalistic everyday conversations (e.g., frequent social sharing of emotions; Rimé et al., 1992). Because listening to conversation partners´ mental states involves mindreading, we expected that NVC training would promote the general social-cognitive ability to take the psychological perspective of others. This prediction, however, was not fully supported by our results as the increase in perspective taking in the training group was not statistically significant. Neither did empathic concern change as a result of NVC training. Beyond the discussion of these findings as presented in section 4.5 (possibly delayed effect beyond post-measurement 3 months after the training; self-report questionnaire perhaps insensitive to more subtle changes in objective ability), they are further discussed in the following paragraph by considering another intervention study's results which were published after our NVC study.

Within a larger mental training program for typically developing adults over the course of 3 months (ReSource project; Singer et al., 2016), the social-cognitive training module included a weekly exercise that is conceptually very similar to the NVC approach. In this "Perspective Dyad" task, participants talked about and listened to each other's emotions, thoughts and desires which they were instructed to narrate from the perspective of a prototypical "inner part" (e.g., judge, mother, explorer). This task is designed as a contemplative dialogue between a speaker taking a meta-perspective on the self, and an active, investigative listener engaging in perspective taking to find out which inner part of the dialogue partner is actually speaking. This intense training had a significant positive effect on mindreading as measured with an objective performance task (Trautwein, Kanske, Böckler-Raettig, & Singer, 2017). In addition, the weekly social-cognitive training had a

positive effect on experienced feelings of care, warmth, and benevolence towards others. In our study, however, empathic concern did not increase. A possible explanation could be that 3 consecutive days of mental state communication training, despite reducing empathic distress, do not necessarily promote prosocial, affiliative motivation at the same time. Maintaining self-other boundaries and regulating empathic distress are necessary but not entirely sufficient preconditions for developing empathic concern for others (Klimecki & Singer, 2012). Therefore, the attenuation of distressing self-other overlap might not immediately lead to higher empathic concern. Apparently, the latter relies more strongly on a regular interpersonal exercise over the course of several months, as demonstrated in the ReSource study. The comparably lower intervention duration in our study could be another factor explaining why perspective taking did not increase significantly, although we assume that a more sensitive measure would have been needed to test subtle changes as discussed above. Given the field setting of our NVC study, it was, unfortunately, not possible for us to assess pre-post changes in mindreading using a more time-consuming performance task such as the MASC (Dziobek et al., 2006) in the participating public health organization. However, taken together, the positive effect of the dyadic conversational exercise on mindreading in the ReSource study further supports the above presented conceptualization of mental state communication as a communicative manifestation of second-person perspective mindreading, i.e., social cognition in dynamic verbal interaction. Moreover, it confirms the prediction that training mindspeaking promotes the general ability to accurately understand other people's mental states.

Based on this dissertation´s insights and conclusions regarding the respective links between mindreading, mindspeaking and interpersonal functioning, further ideas for psychological interventions and future research are proposed in the following section. In particular, I will discuss suggestions regarding social-cognitive bias modification in socially anxious individuals, conflict communication in heterosexual romantic couples, and empathic distress fatigue prevention in helping professionals.

5.2 INTERVENTIONS AND FUTURE RESEARCH

5.2.1 PSYCHOTHERAPY FOR SOCIALLY ANXIOUS PATIENTS

Practicing to explicitly communicate about one's own and others´ mental states in naturalistic social interaction could potentially change how psychiatric patients with systematic social-cognitive biases represent others, themselves, and their relationships, especially if these dysfunctional biases operate rather implicitly in (mis)guiding social experience and behavior.

In the case of social anxiety resulting from a tendency to interpret other people's mental states as negative social evaluations, existing approaches have shown to correct negative biases by increasing the occurrence of more positive interpretations of others´ intentions and evaluations. For instance, a computerized program presenting written ambiguous social vignettes and reinforcing participants to choose benign over threatening interpretations (e.g., "Your boss wants to meet with you" - "praise" or "criticize"; "An old friend comments on how you look different now" - "attractive" or "ugly") effectively modified interpretation bias in socially anxious individuals (Beard & Amir, 2008). Such standardized procedures for interpretational and attentional cognitive bias modification (CBM) are successful in the treatment of various anxiety disorders (MacLeod & Mathews, 2012), but "enabling CBM to be delivered outside the laboratory also could enhance transfer of training in ways that increase the impact of CBM in real-world settings" (p. 207). Indeed, lab-field generalizability and ecological validity of training stimuli and procedures is crucial, specifically for interventions targeting *social* cognition in patients with interpersonal difficulties such as social evaluation fear and avoidance behavior. Although the real social world is less standardized and controlled as compared to a computerized learning environment, it actually offers rich opportunities for semi-structured, more naturalistic social interaction as a source of social-cognitive bias modification.

Established cognitive-behavioral intervention approaches for SAD (e.g., Foa, 1994; for overview see Hofmann, 2007) focus on exposure to feared social situations, either in sensu or in vivo in the (group) therapy room, or in situ in everyday social settings. These exercises are usually combined with formal pre- and post-exposure cognitive restructuring methods to change dysfunctional general beliefs (e.g., "I am a social failure") or situation-specific thoughts (e.g., "Others find my behavior xy ridiculous") through standardized conversation techniques. For instance, therapists have a Socratic dialogue with patients and,

moreover, instruct them on how to engage in a rhetorical monologue by proposing self-disputing questions (e.g., "Is it true that no one likes me?") and pre-generated rational responses (e.g., "I can recall several people who like me") which they are supposed to apply when mentally conversing with themselves (Foa, Huppert, Herbert, Forman, & Yuen, 2009). For homework assignments, a paper form is given to patients to exercise this inner monologue in the context of self-guided exposure outside the therapy setting.

These cognitive restructuring techniques, however, operate "offline" without taking full advantage of the presumably corrective mechanisms of naturalistic conversation with real-life interaction partners. In addition to the sophisticated therapist-patient dialogue and self-affirmative inner monologue, it may also be highly informative for patients to learn about others´ views directly *from others* by explicitly asking them in given social situations. I propose that therapists would further benefit patients by instructing them on how to use in situ conversation techniques for "online" cognitive restructuring through communicative exploration of others´ actual (non-)evaluations with suitable dialogue partners in their social environment. In order to correct their biased inferences about how others view them, patients could be prepared and encouraged to ask neutral interaction partners to explicitly convey what they think about their social performance or appearance and its consequences. For instance, brief semi-structured questions can be used to interview participants or observers in a given social situation about their perceptions of the patients´ behavior. Of course, this more advanced self-guided exposure is less well suited for patients with extremely high and/or acute symptoms, and more feasible for sufficiently motivated patients maintaining a certain level of functioning.

For example, a work colleague could be asked about her perception of a presentation using questions that openly explore the other's mind without a strong focus on social evaluation, e.g.,

- "What was going through your mind during the presentation?"
- "What did you notice about the presentation? What did you mostly attend to?"

Alternatively, patients could ask more targeted questions to challenge their exaggerated expectations of negative social evaluations, e.g.,

- "What did you think of my behavior/performance/appearance during the presentation?"

- "How incompetent vs. skilled/stupid vs. smart/inadequate vs. appropriate/ anxious vs. confident did I appear to you during my presentation?" (specify according to patients´ individual expectations)
- "Would you be willing to attend another presentation of mine/work with me again?"

Additionally, patients could ask interaction partners a range of further questions potentially endorsing unexpected positive social evaluations, e.g., "What did you like about my presentation/appearance/behavior?" Alternative scenarios in personal life could be, for instance, dinners with friends and new acquaintances. Patients could address similar questions to more intimate friends directly after the group interaction.

An advanced version of this cognitive restructuring interview may include self-disclosure as well. Patients could be encouraged to explicitly convey their own (biased) thoughts and evaluation concerns towards interaction partners (e.g., "I fear that you found my presentation horrible") in order to create direct opportunities for communication partners to correct patients´ unjustified mental state inferences. A less challenging version of the interview could also be conducted via e-mail or chats with real-life interaction partners, given that socially anxious individuals feel safer using internet-mediated communication (Lee & Stapinski, 2012). A further variant of the interview could be applied in bystander-situations without direct self-exposure but with an opportunity to modify other-referent social-cognitive biases (e.g., "She knows that the audience found her presentation horrible"). As shown in study 2 of this dissertation, mindreading difficulties in socially anxious individuals generalize to situations in which they are not involved but merely observe other people's behavior. Thus, similar interview questions could also be targeted at challenging patients´ other-referent inferences in such settings (see conclusion of study 2 in section 3.6). Finally, the mental state questions could be used in group therapy settings, in which the corrective feedback of multiple communication partners during guided group discussion could potentially amplify the effectiveness of social-cognitive bias modification through mindspeaking.

Taken together, future intervention research could examine different variants of "online" cognitive restructuring to test the hypothesis that explicit communication about others´ mental states and one's own (biased) mental state inferences in naturalistic social interaction could possibly help socially anxious individuals to modify the social-cognitive biases that play a role in the maintenance of their condition.

While the mentioned standard therapy manuals consider possibly available intervention confederates as feedback providers (e.g., obtaining ratings from a trained confederate after role play), real-life interaction partners could be taken more thoroughly into account in the context of self-exposure homework. In terms of the ecological validity of corrective social information, people within the natural social environment, e.g., work colleagues, neighbors or acquaintances, represent useful "training stimuli". Ultimately, in the mind of patients these individuals are the original source of anticipated judgement, criticism, rejection and embarrassment. Thus, it is worth exploring whether they can learn through systematic practice of naturalistic mental state communication that evaluations of people outside the therapy room are much less negative than expected or even positive.

5.2.2 COUNSELING FOR ROMANTIC COUPLES

Research on communication in heterosexual romantic couples consistently finds that relationship functioning is particularly well predicted by how effectively partners communicate with each other during conflict, and that female and male partners show gender-specific behavioral patterns (Gottman, Markman, & Notarius, 1977; Gottman, Swanson, & Murray, 1999).

"Negative mindreading", defined as statements conveying mental state attributions with negative affect (e.g., "You don't care about how I feel") without directly asking about others´ feelings and thoughts, is categorized as a communicative indicator of criticism in the Specific Affect Coding System for couples (Coan & Gottman, 2007). Observational studies of naturalistic couple interaction show that negative mindreading statements are indicative of distressed couples, while mindreading statements with neutral affect represent functional behavior because partners use them as sensitive probes in exploring each other's mental states (Gottman et al., 1977). Interestingly, not wives´ but only husbands´ neutral mindreading statements predicted increased marital satisfaction for *both* partners over the course of three years in a longitudinal study (Gottman & Krokoff, 1989). This means that men who actively engage in neutral exploration of their partner's feelings and thoughts through explicit mental state communication are more likely to have mutually satisfying romantic relationships. This gender effect might be associated with the slightly lower ability of men (as compared to women) to accurately infer women's mental states, as reported in

study 1.[13] Exploring mental states through communication could represent a reasonable *compensatory* strategy to clarify mental state (mis)attributions, particularly in cross-gender interaction. Future research could examine the hypothesis that in functional (heterosexual) romantic relationships (male) partners apply mindspeaking strategically when their partner's mental states are unclear to them and accurate mindreading is perceived as challenging (see Fig. 5.1 for anecdotal evidence).

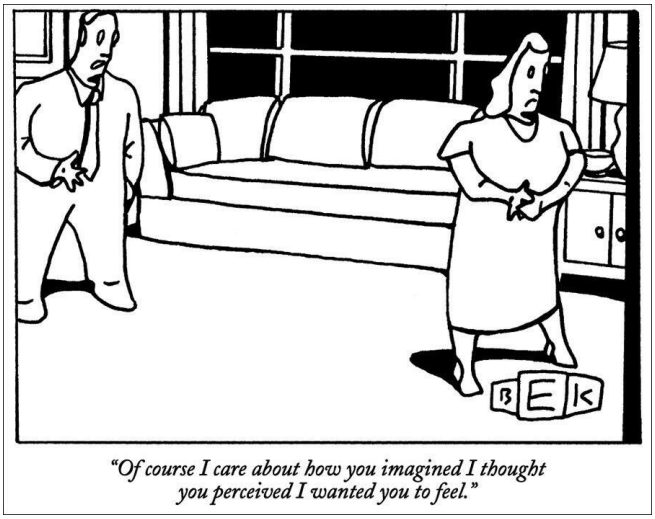

Figure 5.1. A male cartoonist's depiction of mindspeaking in cross-gender interaction shows a man communicating a complex mental state inference to a woman. Copyright 1998 by The New Yorker Collection/Bruce Eric Kaplan from cartoon-bank.com. Used with Permission.

Moreover, the study by Gottman and Krokoff (1989) also revealed that women's relationship satisfaction was positively predicted by their expression of anger and contempt during conflictual discussions with their male partners. This corresponds with the finding in the predominantly female sample of our training study (see section 4), that verbalizing negative emotions actually prevented later social stressors and conflict (with interaction partners at work though). Therefore, mindspeaking trainings such as Rosenberg's (2005) NVC approach could probably be successfully integrated into couple counseling, particularly for those clients facing acute relationship conflict and dysfunctional communication patterns. In these cases, both males and females might benefit from practicing to empathically listen to their partners´ feelings, needs and thoughts, and to assertively express their own (negative) feelings without criticizing the other.

[13] Though we do not have data regarding the degree of representativeness of our findings for heterosexual relationship partners as we did not assess sexual orientation and relationship status in our sample.

5.2.3 MENTAL HEALTH PREVENTION FOR HELPING PROFESSIONALS

Occupational choices of people entering jobs that include any kind of help, care or support in a professional relationship are usually prosocially motivated (Ben-Shem & Avi-Itzhak, 1991; Duffy & Raque-Bogdan, 2010). Unfortunately, these groups are themselves at risk to be affected by particular mental health problems (Williams, 1989) rooted in the occupational role demand of being supportive, altruistic, and emotionally responsive towards their patients and clients, i.e., emotional labor (Larson & Yao, 2005; Zapf, Seifert, Schmutte, Mertini, & Holz, 2001). Previous research has demonstrated that unregulated emotional reactivity to unfortunate others in need, i.e., empathic distress, can undermine a directed prosocial response, and eventually cause burnout in caretakers (i.e., empathic distress fatigue; Klimecki & Singer, 2012). This is one mechanism explaining the paradox of socio-emotional exhaustion and withdrawal in initially compassionate individuals in helping professions. A social-cognitive mechanism that has been found to lie at the heart of empathic distress is poor self-other differentiation (Singer & Klimecki, 2014). Based on this research, we discussed the effect of NVC training on reducing empathic distress in health professionals (study 3 of this dissertation) in terms of improved self-other differentiation through mindful self-awareness in social interaction and a rather analytical stance when empathically listening to others´ thoughts, feelings and needs. The practical significance of this mechanism is exemplified by a clinician working with traumatized patients: "(...), you have to recognize that after a client leaves and if you don't get rid of the stress then it just kind of builds up pretty soon. Then you're getting all the stuff confused and mixed up—What's my stuff and what's your stuff´" (Killian, 2008, p. 36).

The basic take home message for occupational mental health prevention is that training the ability to communicate about "stuff", i.e., verbally describing and differentiating distressing mental states of others´ vs. the self, could have similar effects in employees in other helping professions given the effectiveness of NVC training as demonstrated in our study. Empathic distress fatigue has been found in various jobs ranging from physicians (Gleichgerrcht & Decety, 2014), nurses (Yoder, 2010), psychotherapists (Figley, 2002) to social workers (Adams, Boscarino, Joseph, & Figley, 2006), lawyers (Levin & Greisberg, 2003) and police officers (Andersen & Papazoglou, 2015). NVC represents a general practical approach of mental state communication and is thus well suited to be applied in diverse interpersonal contexts at work. Human resource managers seeking to increase their employees´ wellbeing and effectivity could consider NVC training as an evidence-based method to prevent empathic distress fatigue in their staff.

5.3 Final Remark: Call for Action

This dissertation investigated people who suffer from a mental health disorder and people who work with suffering people and are thus at risk of occupational mental health problems. Both might experience their vulnerability in very different ways given their respective roles as patient or healer. However, both might be facing the same social stigma of mental health issues which represents an obstacle to seeking care among the general population (Corrigan, 2004), and especially among clinicians (Miles, 1998). Policy makers and health institution managers are called to take action in at least two ways.

First, the health care system has to make sure that mental health services become more visible and more readily available. In Germany, recent policy changes aimed at improving immediate availability of psychotherapy but seem to have had no effect as people seeking treatment still have to wait twenty weeks on average (Bundespsychotherapeutenkammer, 2018). Regarding occupational health management in health organizations, human resource managers should systematically implement preventive programs with low-threshold accessibility for their physicians, nurses, therapists and all other employees engaging in patient care. Second, public marketing campaigns should increase social acceptance for seeking psychological help in the general population. Health professionals should be specifically encouraged to take preventive care of themselves, for a healthy society depends upon their ability to heal without experiencing unnecessary suffering.

5.4 REFERENCES

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6 APPENDIX

6.1 List of Abbreviations

ANCOVA	Analysis of covariance
BDD	Body dysmorphic disorder
BDD-YBOCS	BDD Modification of the YBOCS
BDI-II	Beck Depression Inventory-II
CG	Control group
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders 4th edition
LSAS	Liebowitz Social Anxiety Scale
MASC	Movie for the Assessment of Social Cognition
NVC	Nonviolent Communication
OCD	Obsessive-compulsive disorder
SAD	Social anxiety disorder
SCID	Structured clinical interview for DSM
SPF	Saarbrücker Persönlichkeitsfragebogen
TG	Training group
DCS	Discussion coding system

6.2 LIST OF TABLES

6.3 List of Figures

6.4 CURRICULUM VITAE

[The CV is not included in the online version for privacy reasons.]

6.5 EIDESSTATTLICHE ERKLÄRUNG

Hiermit erkläre ich an Eides statt,

- dass ich die vorliegende Arbeit selbstständig und ohne unerlaubte Hilfe verfasst habe,
- dass ich mich nicht bereits anderwärts um einen Doktorgrad beworben habe und keinen Doktorgrad in dem Promotionsfach Psychologie besitze und
- dass ich die zugrunde liegende Promotionsordnung vom 02.12.2008 kenne.

Ort, Datum Renata Wacker