

Group Openness and Cohesion as Group Personality Characteristics – Conceptualization, Measurement and Influence on Training Transfer

Dissertation

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II. Zusammenfassung

Der Hauptfokus dieser Arbeit liegt auf der Konzeptualisierung und Messung von Gruppen-Offenheit und Kohäsion als Dimensionen einer Gruppenpersönlichkeitsstruktur. Diese Konzeptualisierung und Messung wurden als Teil eines größeren Forschungsprojektes unternommen, in welchem ein Trainingsprogramm für Pflegekräfte evaluiert wurde. Vorherige Forschungsergebnisse legten nahe, dass der erfolgreiche Übertrag von Fortbildungsinhalten in das normale Arbeitsleben nach Trainingsmaßnahmen (wie der zu evaluierenden) von den individuellen Persönlichkeitseigenschaften der Teilnehmenden und von Eigenschaften ihres Arbeitsteams abhängt. Bisher existieren allerdings keine Untersuchungen dazu, welcher dieser beiden Faktoren der wichtigere Prädiktor des Trainingsübertrags ist. Um einen solchen Vergleich zu ermöglichen, wurde die Gruppenpersönlichkeitsstruktur mit den Dimensionen Gruppen-Offenheit und Kohäsion mit dem Ziel der Parallelität zu individuellen Persönlichkeitseigenschaften konzeptualisiert. Für letztere wurde deren Anwendbarkeit auf verschiedene Individuen und deren zeitliche Stabilität in Studien gezeigt, weshalb sie als Bausteine einer übergeordneten, latenten Persönlichkeitsstruktur gesehen werden. Im Gegensatz dazu sind existierende Konzepte von Gruppeneigenschaften oft nur auf eine spezifische Art von Gruppen anwendbar, und ihre zeitliche Stabilität wurde selten untersucht. Die in dieser Arbeit präsentierte Gruppenpersönlichkeitsstruktur wurde unter Berücksichtigung der Faktoren der Anwendbarkeit auf verschiedene Gruppen und der zeitlichen Stabilität konzeptualisiert und füllt daher diese Konzeptionslücke. In dieser Hinsicht ermöglichte das vorgestellte Konzept einen valideren Vergleich zwischen individueller Persönlichkeit und Gruppen(persönlichkeits)-Eigenschaften bezüglich ihrer Fähigkeit, Trainingsübertrag im übergeordneten Forschungsprojekt zu präzisieren, und könnte in zukünftiger Forschung auch einen Vergleich zwischen verschiedenen Gruppen ermöglichen.

Die Dimensionen Gruppen-Offenheit und Kohäsion wurden aus zwei Forschungszweigen hergeleitet, denen verschiedene Ansätze in der Konzeptualisierung von Gruppeneigenschaften zugrunde liegen: ein direkter Ansatz, in welchem die Gruppenmitglieder eine Eigenschaft ihrer Gruppe einschätzen und in welchem diese Einschätzungen gemittelt werden, um eine Gruppeneigenschaft zu repräsentieren, und ein indirekter Ansatz, in welchem die Gruppenmitglieder eine Eigenschaft ihrer Selbst einschätzen und in welchem diese Selbsteinschätzung innerhalb der Gruppe gemittelt werden, um eine Gruppeneigenschaft zu repräsentieren. Aus vielen Studien, welche diese Ansätze verwenden, wurden in der vorliegenden Arbeit die Dimensionen Gruppen-Offenheit und Kohäsion abgeleitet, als Repräsentationen der Orientierung der Gruppe nach außen und nach innen. Ein neues Instrument zur Messung dieser Dimensionen wurde entwickelt. Die empirischen Ergebnisse dieser Arbeit sind in drei Forschungsberichten zusammengefasst, in denen die folgenden Schlussfolgerungen gezogen werden. Gruppen-Offenheit und Kohäsion stellen sich als reliabel und valide messbare Konstrukte heraus, welche zeitstabil und (theoretisch) auf verschiedene Gruppen anwendbar sind. Eine detaillierte Analyse des Antwortverhaltens der Gruppenmitglieder konnte zeigen, dass diese Antworten zu einem größeren Teil von der eigenen Perspektive als von der tatsächlichen latenten Gruppeneigenschaft beeinflusst werden, und dass die eigene Perspektive ihrerseits von der individuellen Persönlichkeit beeinflusst wird. Der indirekte Ansatz stellt sich als unkorreliert zum neu entwickelten Konzept heraus. Trainingsübertrag wird durch Kohäsion und die mittlere Gewissenhaftigkeit der Gruppenmitglieder (eine Variable des indirekten Ansatzes) beeinflusst, und wird durch individuelle Persönlichkeit nicht beeinflusst. Insgesamt deuten die Ergebnisse auf eine größere Wichtigkeit von Team-Eigenschaften für Trainingsübertrag und auf eine erfolgreiche Konzeptualisierung und Messung von Gruppen-Offenheit und Kohäsion als Dimensionen einer Gruppenpersönlichkeit hin. Die allgemeine Abschlussdiskussion fasst den theoretischen und praktischen Ertrag der präsentierten Forschungsergebnisse zusammen

und listet Limitationen und Richtungen für zukünftige Forschung auf. Letztere beinhalten beispielsweise weitere Vergleiche mit unterschiedlichen Operationalisierungen des indirekten Ansatzes und die Konzeptualisierung neuer Messmethoden, welche die Anwendbarkeit auf verschiedene Gruppen in den Fokus nehmen.

III. Abstract

This thesis focuses on the conceptualization and subsequent measurement of group openness and cohesion as dimensions of a group personality structure. This conceptualization and measurement were done as part of a larger research project, in which a training program for nurses was to be developed and evaluated. Earlier research had shown a relevance of personality at the individual level and team characteristics for successful transfer of training contents into daily work life following interventions such as the to be evaluated training program. However, no studies exist than examine which of these factors is the more important predictor of training transfer. In order to facilitate such a comparison, the group personality structure with the dimensions group openness and cohesion was conceptualized to parallel individual personality characteristics. The latter have been shown to be applicable to a wide range of individuals as well as being stable over time, forming a person's personality based on overarching, latent traits. In contrast, existing concepts of group characteristics are mostly applicable to one specific type of group and their stability over time has hardly been examined. The group personality structure presented in this thesis was conceptualized to be applicable to a wide range of groups and stable over time, filling this conceptual gap. Therefore, the newly created concept enabled a more valid comparison between individual personality characteristics and group (personality) characteristics in their ability to predict training transfer for the presented study and might additionally enable comparisons between different groups in future research.

The group openness and cohesion dimensions were derived from two research branches concerned with different conceptual approaches to group characteristics: A direct approach, in which the group members rate characteristics of their group and in which those ratings are averaged to create a group score, and an indirect approach, in which the group members rate characteristics of themselves, which are then averaged to create a group score. From multiple studies involving these approaches, the dimensions group openness and

cohesion were derived as group personality characteristic that represent the group's outward and inward orientation, respectively. A new questionnaire instrument was created to measure these group characteristics. The empirical results of this thesis are presented in three research papers, in which the following conclusions are made. Group openness and cohesion are shown to be distinguishable and reliably and validly measurable constructs, stable across time and (theoretically) applicable to a large variety of groups. A detailed analysis of the individual response patterns of the team members revealed that the ratings of group openness and cohesion are influenced by the individual perspective more than by the presumed latent group characteristic and that this individual perspective is, in turn, influenced by individual personality. The indirect approach to group characteristics is found to not correlate with the newly created concept. Finally, training transfer is found to be influenced by group cohesion and group mean conscientiousness (a variable from the indirect approach), and to not be influenced by individual personality. Overall, the results point towards a larger importance of team characteristics for training transfer and for a valid conceptualization of group openness and cohesion as dimensions of group personality. The general discussion summarizes the theoretical and practical contributions of the new concepts and the results presented here, and lists limitations and future research directions. Examples for the latter include further comparisons with different operationalizations of the indirect approach to group characteristics, as well as the conceptualization of a new set of measurements that focus more on the applicability to different types of groups.

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1 General Introduction and Thesis Structure

One of the overarching goals in personality psychology is to identify central latent traits that explain stable interindividual and intraindividual patterns in human cognition and behavior (Friedman & Schustack, 2012), which has resulted in popular models such as the Five Factor Model (FFM; McCrae & Costa, 1999) or the HEXACO model (Ashton & Lee, 2007, 2008). These traits are thought to be applicable to all individuals (Lee & Ashton, 2008) and stable across time (Costa & McCrae, 1994), forming what is called a personality. This thesis aims to expand this idea of characterization through few central latent traits to the characterization of groups instead of individuals. The following general introduction will explain the structure of the thesis, outline the larger research project this thesis was part of, and summarize the background and the main research questions. The second section will summarize the contents and topic contributions of the three research papers this thesis consists of, while the third section will contain the research papers themselves. The fourth section will outline some additional results not contained in the research papers and the fifth and final section will contain a general discussion and conclusion of the thesis.

The main topic of this thesis is the conceptualization and subsequent measurement of group openness and cohesion as group characteristics that parallel personality traits of individuals in that they are (theoretically) applicable to multiple types of groups and are also stable across time within a group. As a measure of these group characteristics, the GOCQ (Group Openness and Cohesion Questionnaire) was created, for which reliability and validity evidence will be presented. The main body of the thesis consists of three research papers concerned with the GOCQ and its underlying concepts. The contributions of each paper will be explained in section 2, and the papers are integrated into the thesis (sections 3.1, 3.2, and 3.3, respectively).

1.1 Project embedment and background

This thesis was embedded into a larger research project named empCARE. In this project, an empathy-based training program for nurses with the goal to reduce psychological strain was to be developed and evaluated. The work presented in this thesis was part of this evaluation.

The developed training program focused on emotionally challenging situations that could arise in interactions with patients or relatives in daily work life – specifically, the so-called pseudo-empathic response (Schönefeld, 2019) and its short- and long-term psychological effects on the nurses were in focus. The pseudo-empathic response stabilizes the challenging emotions in the person who experiences empathic feelings (the nurse) in the short term but does not take the emotional situation of the recipient (the patient) into consideration. An example of such a response are popular expressions such as “keep your chin up, it will get better!”, which often do not match the emotions of the recipient, but allow the person who experiences empathic feelings to achieve short-term stabilization of their own emotions. This might be functional in the short-term, but in social professions with a high occurrence of emotionally and empathically challenging situations such as nursing, it is deemed psychologically straining in the long-term, especially given that neither the patients / relatives nor the nurses benefit meaningfully from this type of response. The concept of pseudo-empathy and the empCARE training program are based on earlier work on the empathic process and how it can influence emotional maladjustment (Altmann, 2013; Altmann & Roth, 2013; Altmann, Schönefeld, & Roth, 2015). The pseudo-empathic response and the underlying psychological model and mechanisms are explained in detail by Schönefeld (2019).

The empCARE training uses Nonviolent Communication (Rosenberg & Chopra, 2015) as an alternative to pseudo-empathic responses in emotionally challenging situations, which comes with a variety of benefits, including the facilitation of self-other-differentiation

and authentic communication, both of which are jeopardized in pseudo-empathic responses (Schönefeld, 2019). In Nonviolent Communication, both parties' feelings and needs are examined and acknowledged, and new behavior and strategies are “negotiated” that meet the needs of both parties. In the empCARE training, this method of communicating is used as an alternative to pseudo-empathy and the tendency to quickly stabilize the emotions of the person experiencing empathy, as it enables both parties to share their feelings in an authentic way. In other words, the empCARE training uses Nonviolent Communication as a tool to prevent the (frequent) usage of pseudo-empathy and its long-term detrimental effects. More details on the empCARE training are given by Thiry, Schönefeld, Deckers, and Kocks (in press).

The empCARE training consisted of a 2-day training intervention, combined with a 4-hr coaching session approximately 3 months later, which involved the following key units summarized in Table 1.

Table 1. Summary of the empCARE training program

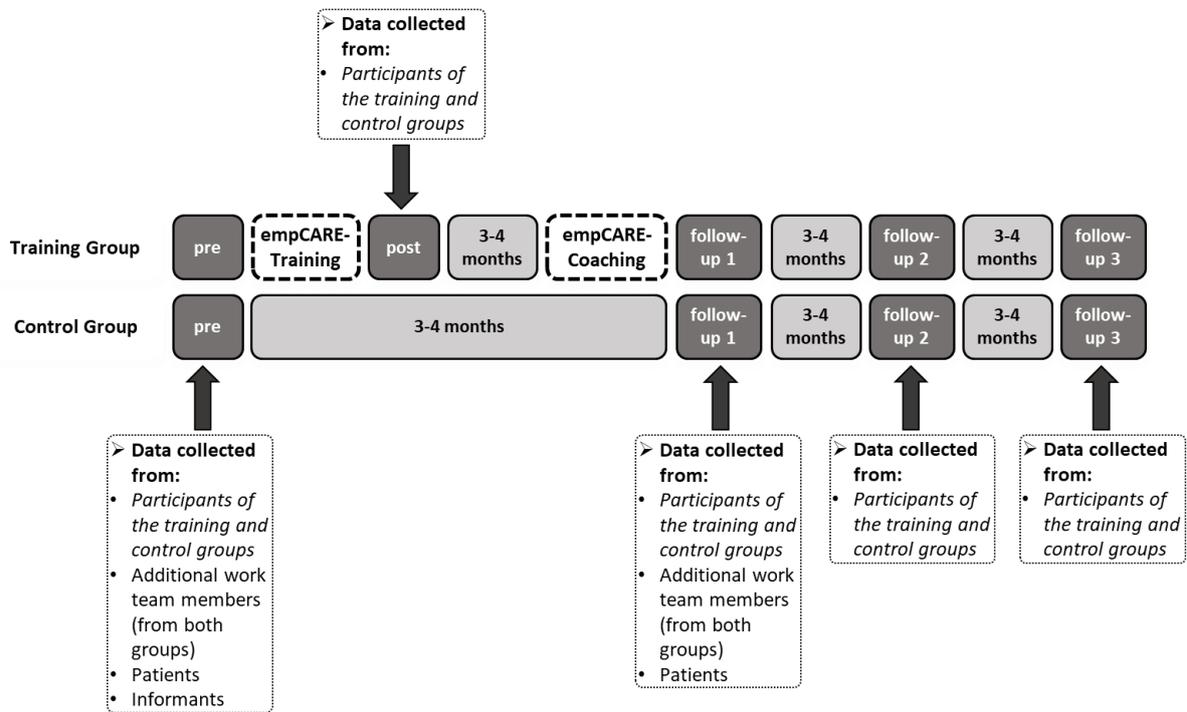
Training Unit	Description	Goal(s)
Active introduction – day 1	The participants talk in couples or small groups about questions that start general and get closer to the topics of the training as the exercise progresses	Giving the participants an opportunity to get to know each other, creating mutual trust, and easing into the topics
An everyday dilemma	The participants are presented with a case where a non-compliant patient creates additional stress during an already stressful workday – they are asked what they are thinking and feeling and how they react to the situation	Creating empathic and pseudo-empathic reactions to the situation organically and out of the everyday reality of the participants
The Empathy / Pseudo-Empathy Process Model	A presentation about the Empathy / Pseudo-Empathy Process Model, which explains the psychological mechanisms behind empathic and pseudo-empathic behavior	Educating the participants on these mechanisms and their short- and long-term effects
Introduction to Nonviolent Communication (NVC)	A presentation about the basics of Nonviolent Communication	Introducing the basic premises of focusing on feelings and needs to create mutually satisfying outcomes
Introduction to interrelations between behavior, feelings, and needs	The participants work with the trainer to create an overview of the connections between feelings, unmet needs and the resulting behavior based on the theory behind Nonviolent Communication	Creating an understanding of how unmet needs lead to feelings and behaviors, and how this can be used to communicate about these feelings and needs
The difference between observing and evaluating	A short presentation about why differentiating between observations and evaluations is important in NVC	Creating awareness of how evaluations can shape perceptions and interactions between persons
Secret boss	A practical exercise in which the participants have to non-verbally recognize the “boss” of the group (chosen by the trainer without their knowledge)	Allowing the participants to witness how different preconceived notions and evaluations can shape perceptions and expectations
Describing behavior without evaluations, and clarifying emotions	A role-play in which participants describe each other’s behavior and try to guess the underlying feelings in a work situation	Putting the just-introduced theories and experiences into practice
My most important need	Participants are asked about which needs of theirs are the most important in everyday work, and which ones they could resign	Making participants aware of how needs cannot be resigned and cannot easily be put into a hierarchy

Theory on needs and strategies	A presentation about the differences between needs and the strategies that people use to fulfill those needs	Allowing the participants to more easily differentiate between strategies and their underlying needs, which is difficult in everyday situations
Which of my needs is not being met?	An introspection exercise, in which participants are asked to reflect which important need of theirs was not being met in a tense past situation at work	Creating awareness for the participants own needs and recognizing these needs in tense situations
A conflict within the nursing team	A case exercise in which the needs of a colleague showing challenging behavior are examined	Showing that behavior of others can be challenging, but needs are neutral and both parties involved in conflict can often have similar needs
Short- and long-term effects of empathic and pseudo-empathic interactions	A presentation summarizing the main points of the first training day	To close to first training day by summarizing the main points, which also serves as an opportunity to discuss unanswered questions
My most important need this evening	Closes the first day by letting the participants reflect what their active needs are right now and how they plan to fulfill them on this day	To finish the first training day with an exercise that the participants perceive as positive and enjoy.
Active introduction – day 2	A short talk about how the last evening went and in how far the participants were able to fulfill their needs	Re-introducing trust within the group and shifting the focus onto needs immediately
Three in one	A role-play in which the participants once again reflect on their own feelings and needs in a tense past situation	To allow the participants to re-live a past situation with the newly acquired knowledge about feelings and needs, creating a different perspective
Understanding and showing understanding	A partner exercise in which participants explain the tense situation they worked with in the previous exercise to a partner, who asks for their feelings and needs until they think they are understood	Allowing participants to experience the satisfying and hopeful feelings that arise from being fundamentally understood, creating more awareness of the conflict-resolving potential of communicating in this way
Reflecting favoring and inhibiting factors	The participants reflect on which factors in their work life would favor and inhibit communication about feelings and needs – inhibiting factors are collected within the group	Collecting specific reasons why communicating in such a way might not always be possible
What really matters to me	The participants translate the inhibiting factors collected in the previous exercise into needs of theirs – for example, the need for effectiveness might cause them to be unwilling to communicate about every patient’s feelings and needs	Creating awareness on how needs can shape decisions and how being aware of those needs can change our behavior to be more in contact with ourselves and others

Communicating needs	A partner exercise where participants try to communicate their active needs to a partner, who optionally role-plays as a “difficult” patient or colleague	Putting the theory and self-reflections of one’s own needs into practice by communicating them – and noticing potential roadblocks in such a communication
Theory on negotiating new strategies	A presentation on how strategy suggestions and requests are formulated in NVC	Dissolving the (potential) roadblocks discovered in the previous exercise by showing clear communication guidelines when suggesting new strategies
Negotiating strategies in practice	A role-play in which the feelings and needs of all parties are already clarified and the goal is to discuss new strategies	Putting the newly learned concepts about strategies into practice without having to clarify feelings and needs beforehand, to ease participants into the final exercise
Concluding case-work	The final role-play, in which the participants dissolve a conflict based on a real case using all the steps of empathic and non-violent communication that were in focus during the training – the results are discussed within the group	Concluding the training with an exercise that puts all elements of the training together and summarized the most important aspects once again
Outro	The group discusses open questions and the second day ends with each participant writing down a small step they wish to put into practice after the training	To end the training with a small, achievable, and clear goal
Coaching session (3 to 4 months later)	Discussion of difficult situations that have occurred after the training, recollection of key theoretical components	Re-activation of the principles taught in the training, and discussing situations in which the participants were unable to successfully apply the training contents and communicate empathically and non-violently

The empCARE training and its effectiveness were to be evaluated in the corresponding research project. In a longitudinal study over the span of one year, a training group and a control group were examined at four measurement occasions. The first measurement occasion took place right before the training for the training group (with some data being collected at the beginning of the first day and some data being collected at the beginning and end of the second day, see also Figure 1), while the next three measurements were taken at three to four months, seven to eight months, and eleven to twelve months after the first one, respectively. The time spans were matched in the control group, which did not receive the empCARE training. This study design allowed for a differentiated examination of potential long-term effects of the training in comparison with the control group. The nurses of the training group were recruited from two university hospitals (Cologne and Bonn) and one ambulant intensive care unit in Germany, while the nurses of the control group were recruited from two different university hospitals in Germany (Essen and Düsseldorf), and a different department (in a different city) of the same ambulant intensive care unit. The training and control groups were not recruited in the same institutions for confidentiality reasons: There would not have been a possibility to ensure no contact between the groups if they were from the same institutions. A timeline of the evaluation, along with the different groups that data were collected from, is given in Figure 1.

Figure 1. A timeline of the evaluation of the empCARE training and coaching, including markers for who data were collected from.



Note. Informants were friends or relatives of the participants (chosen by the participants themselves) that delivered additional data about the participants, such as other-ratings of their personality. The data collected from patients and informants are outside of the scope of this thesis. On the measurement occasion labelled “post” in the training group, the empCARE training was evaluated for quality and practical applicability. Data from this occasion are also outside of the scope of this thesis.

As a long-term reduction in psychological strain was the main goal of the training, special attention was given to operationalizing and measuring this psychological strain using multiple measures, for example, the Copenhagen Burnout Inventory (CBI; Kristensen, Borritz, Villadsen, & Christensen, 2005), the Symptom-Checklist-90 (Derogatis & Unger, 2010; Franke, 2014), and the Irritation-Scale (Mohr, Rigotti, & Müller, 2007). The general handling of empathy, as well as specific pseudo-empathic behaviors, were also evaluated. These were expected to covary with the development of psychological strain, as described in the works of Altmann (2013) and Schönefeld (2019). This was done through instruments such

as the Toronto Empathy Questionnaire (Schönefeld & Roth, 2016; Spreng, McKinnon, Mar, & Levine, 2009) and the Emotional Contagion Scale (ECS; Doherty, 1997; Falkenberg, 2005), among various scales developed specifically for this study. Overall, differences between the training and control group were expected to occur following the empCARE training, both in psychological strain, and empathic behavior and knowledge. More detail on the evaluation of the empCARE training is also given in Thiry et al. (in press), while the sample is detailed in section 4 of this thesis, which contains additional results not included in the research papers, as well as in research paper 3 (section 3.3.3).

The work presented in this thesis was part of the evaluation of the empCARE training in the corresponding research project. The research project went beyond testing for differences in the development of psychological strain and empathic behavior in the training and control group: it was also a goal to detect under which specific circumstances the training is effective. In other words, it was to be examined which factors influence the intended reduction of psychological strain in the intervention group.

1.2 Training transfer and moderators

It is assumed that in order to for a reduction of psychological strain to occur following the empCARE training, the participants need to apply the contents of the training to their daily working routine. In turn, this application should then lead to the intended reduction in psychological strain over time. In the literature, the process of applying newly learned concepts and behaviors in the work environment following a training program or another type of intervention is known as training transfer (Baldwin & Ford, 1988; Burke & Hutchins, 2007; Cheng & Ho, 1999; Colquitt, LePine, & Noe, 2000; Ford & Weissbein, 1997; Grossman & Salas, 2011).

Prior work on training transfer had shown that successful training transfer not only depends on characteristics of the individuals participating in the training (e. g., Eid & Quinn, 2017; Le Blanc, Hox, Schaufeli, Taris, & Peeters, 2007), but also depends on characteristics

of their work environment (e. g., Clarke, 2002; Pisanti et al., 2016; Velasco & Harder, 2014). It was therefore clear that a list of potential moderators of training transfer needed to include both individual and team characteristics. Importantly, the training transfer literature is lacking in studies that directly compare individual-level and group- or team-level moderators of training transfer (Burke & Hutchins, 2007; Cheng & Ho, 1999; Colquitt et al., 2000; Grossman & Salas, 2011), meaning that it is unknown which factor is more important. The concepts and the instrument presented in this thesis were created to contribute to the training transfer literature by gaining more knowledge about influences of individual and team characteristics on training transfer.

On the side of individual-level predictors of training transfer, individual personality traits have been identified to be particularly relevant (Beehr, Ragsdale, & Kochert, 2015; Burke & Hutchins, 2007; Castillo-Gualda, Herrero, Rodríguez-Carvajal, Brackett, & Fernández-Berrocal, 2019). Personality traits of individuals have been found to be stable over time (Costa & McCrae, 1994) and applicable to a wide range of individuals (Lee & Ashton, 2008), which makes them fundamental and stable aspects of human perception and behavior – it is therefore unsurprising that they have emerged as trans situational predictors of many different phenomena (Chaplin, John, & Goldberg, 1988; Davis, Visser, Volk, Vaillancourt, & Arnocky, 2019; Leone, Desimoni, & Chirumbolo, 2012; Visser & Pozzebon, 2013), including training transfer.

Given this fundamentality in conceptualization, their applicability to many different individuals, and their stability over time, as well as their shown relevance for training transfer, individual personality characteristics were chosen as to be examined moderators of training transfer in the study evaluating the empCARE training. Conceptually, for this longitudinal study, moderators of training transfer should not covary with psychological strain or other factors that are influenced by the empCARE training, so that they can be seen as the cause of differences in training transfer between individuals or teams, instead of merely covarying with

those differences (Baron & Kenny, 1986; Holmbeck, 1997). In other words, a successful training transfer and subsequent reduction of psychological strain should not covary with a change in the individual-level or team-level predictors – otherwise, the order of causality is not clear. Individual personality characteristics fit these criteria, given their known stability over time.

Individual personality characteristics were chosen as the to be examined individual-level moderator of training transfer. As mentioned, they were to be compared to team characteristics in their ability to moderate training transfer – therefore, it was best for those team characteristics to be parallel to individual personality characteristics in as many regards as possible. This includes stability over time, which is also a conceptual requirement for a moderator variable in this longitudinal study, as explained above. This also includes applicability to different types of groups, just like individual personality characteristics are applicable to different individuals. Therefore, given the conceptual requirements for stability over time and applicability to multiple different types of groups, what was needed was essentially a concept of a “group personality structure”. Such a concept should include dimensions that are applicable to a variety of groups and remain stable over time. This thesis explains the derivation and creation of such a concept.

At this point, it should be noted that the concept and label “group personality” itself can be a topic of controversy. In fact, the ideas that different groups are comparable to each other at all, or if group characteristics can be inferred from group member traits or must be assessed differently, or that groups even “posses” traits at all that can be measured in some way, are all points of considerable debate in group characteristics research and theory (Carron & Brawley, 2000; Chan, 1998; Forsyth, 2018). This controversy was also displayed in the review processes of the research papers presented in this thesis, which is summarized well by the following comment made by an anonymous reviewer: “I am not sure that “group personality” is really fully equatable [sic] to the notion of individual personality, in that group

personality probably does shift based on membership composition (...).” Obviously, personality characteristics are traditionally assigned to individuals, which exhibit behavioral consistencies across situations and between themselves. Group behavior is based on interactions between any number of individuals, who by themselves already show complex behavioral patterns. In other words, group behavior is exponentially more complex than its already complex “building blocks”, which can additionally leave of join groups. Therefore, it is important to outline and discuss what the work presented in this thesis achieves and does not achieve, and what its contributions mean for the relevant research fields.

This thesis systematizes different literature branches concerned with group characteristics and group composition to derive a concept of a group personality structure and create a corresponding measurement instrument. For the purpose of this work, group characteristics should only be considered group personality characteristics if they are applicable to different types of groups and stable over time within groups. The implications of these concepts and the evidence for stability over time will be discussed in more detail in the general discussion. This thesis demonstrates that group openness and cohesion can be seen as dimensions of a group personality structure that have appeared in different forms in multiple research branches and that are stable over time, underlining their utility. However, this work does not attempt to present conclusive answers to how group characteristics in general and group personality specifically should be conceptualized and measured. Its limitations, also in terms of the group personality controversy, will be addressed in the general discussion.

1.3 Prior research on group characteristics and conceptualization of the GOCQ

A literature search was conducted¹ with the goal of finding conceptualizations of group characteristic structures that contain the most fundamental and basic aspects of group characteristics that can influence the behavior of a group in different situations, parallel to

¹ This search was conducted using the terms *team(s)*, *group(s)*, *personality*, *trait(s)*, *characteristic(s)*, and *composition*, along with many close variations of these terms.

how personality dimensions at the individual level are conceptualized. It was apparent that none of the existing concepts and instruments completely fit the criteria for team characteristics that were required, which ultimately led to the creation of a new concept and instrument (the GOCQ). The reasons why existing concepts and measurements of group characteristics did not suffice are summarized in the following sections and detailed in research paper 1 (section 3.1.2). The conceptual problem with group characteristics being used as predictors of other phenomena without meeting the conceptual criteria outlined here is persistent in group characteristic research (Campion, Medsker, & Higgs, 1993; De Jonge, Van Breukelen, Landeweerd, & Nijhuis, 1999), which has been criticized (Chan, 1998), highlighting the need for the conceptualization of a group personality structure that is more widely applicable and more stable than existing concepts.

During the literature inspection, it became apparent that the literature on psychological group characteristics was essentially divided into two approaches. These differ fundamentally in their underlying assumptions, conceptualizations and measurements and can be labelled a *direct* and an *indirect* approach. The dimensions conceptualized in this thesis draw from both approaches and the results obtained with them. The next sections summarize these approaches and how group openness and cohesion are derived from them; research papers 1 and 2 go into more detail (see section 3.1.2 and 3.2.2, respectively).

1.3.1 The direct approach and the derivation of Cohesion.

The direct approach conceptualizes group characteristics as characteristics that are rated by all group members, whose ratings are then averaged to represent the group characteristics. As an example, all members fill out an instrument measuring the group's effectiveness, and a mean that is calculated from those ratings represents the group's score on the effectiveness dimension. This approach is labelled the direct approach because it involves the members directly rating a characteristic of their group (instead of a characteristic of themselves, which they do in the indirect approach (see below)).

A multitude of different instruments for group characteristics conceptualizations and measurements have been developed using this approach. Most commonly, these instruments are used to assess some form of “group climate”, which has been assessed in different forms and in different types of groups, for example as work team climate (Anderson & West, 1996), family climate (Bjornberg & Nicholson, 2007; Kurdek & Fine, 1993), or therapy group climate (Law et al., 2012), among others (Carron & Spink, 1995; Carron, Widmeyer, & Brawley, 1985). Depending on which type of group this group climate was conceptualized for and assessed in, the subfacets comprising it differ – for example, work team climate is divided into the following four factors that create the *four-factor theory of climate for work group innovation: vision, participative safety, task orientation and support for innovation* (Anderson & West, 1996), while family climate consist of (*emotional*) *warmth, conflict, supervision and order* (Kurdek & Fine, 1993). More information on the different conceptualizations can be found in the first research paper, which introduces the GOCQ (see section 3.1.2).

Such facet-specific and group-specific climate conceptualizations are not applicable to all types of groups and can therefore not be considered (part of) a group personality structure. In order to derive a group personality characteristic that is applicable to all groups, a facet that is contained in all conceptualizations of group climate or other group characteristic concepts that follow the direct approach was explored. Such a facet is *cohesion*, which, in one form or another, is always found in group climate concepts. Cohesion within a group is always represented by the individual group members’ positive feelings towards the group and each other, containing closeness, trust, the impression of the group being “one entity”, and the common agreement on a goal for the group (Carron & Brawley, 2000). A generalized concept of cohesion can therefore be described as the group’s *inward orientation*. In fact, it can even be argued that a conglomerate of people needs to exhibit a certain degree of cohesion before it can be considered a group (Forsyth, 2018). Because every group can be defined by its extent of such an inward orientation, represented by cohesion, it was decided that the first dimension

that is assessed by the GOCQ should be Cohesion. The second requirement for a group personality structure, stability over time, was to be examined empirically (for results, see section 4). More information on the Cohesion facet of the GOCQ and its conceptualization can be found in the first research paper (see section 3.1.2).

1.3.2 The indirect approach and the derivation of Group Openness.

The indirect approach conceptualizes group characteristics as conglomerates or composites of characteristics of the group members. As an example, in this approach, the group members fill out an inventory measuring their personality characteristics, and these characteristics are then averaged within the group: a mean is calculated for e. g. extraversion of all group members, and that mean is then treated as a characteristic of this group. There are other methods of calculating a group characteristic score from member characteristics (such as using variability between members or using extremes within the group) but calculating a mean across the individual personality characteristics of the group members is the most common version of the indirect approach (Barrick, Stewart, Neubert, & Mount, 1998), and most commonly within that, individual personality scores of the group members are measured on the dimensions of the Five Factor Model (FFM; McCrae & Costa, 1999).

Concerning this approach, the very idea of calculating group characteristic scores from member personalities has been criticized (Dang & Ilgen, 2006; Shoda, LeeTiernan, & Mischel, 2002). This criticism stems mainly from the fact that, for all cases where a group characteristic score is somehow calculated from characteristics of the group members, a composition theory that explains the relationship between the individual-level and the group-level constructs involved is important to give meaning to the group-level characteristic score that is created; this idea is explained in great detail by Chan (1998). However, such a composition theory has never been given for cases where individual personality characteristics of the Five Factor Model are applied to the group level (this is also expanded on in the second research paper, see section 3.2.2). This was a major factor in the decision to

not exclusively rely on group-level means of individual member personalities as a conceptualization of a group personality structure for the empCARE project.

However, the fact that the indirect approach lacks a theoretical underpinning in this way does not mean it is without merit – group mean personality characteristics could still be useful predictors of other phenomena. For example, the average running speed of people in a randomly assembled group would still be able to predict which group wins a relay race, regardless of the speed of each individual person having nothing to do with the group. Therefore, group means of individual personality characteristics were ultimately included in the empCARE research, but with the caveat that they must be compared to other concepts of group characteristic structures, which the GOCQ provides. This has resulted in a comparison between the GOCQ structures (direct approach) and group means of individual personality (indirect approach) in their ability to moderate training transfer, which is expanded on in the third research paper (see section 3.3.4).

As explained before, the idea of cohesion can be summarized under a general importance of the group's *inward orientation*. However, a group needs to define its characteristics and behavior not only regarding everything within the group, but also regarding how the group interacts with everything outside of the group. Therefore, the openness of a group towards outside influences, such as new members, impulses or ideas, builds a counterpart to the inward orientation, in that it describes a generalized *outward orientation* of the group – which is what group openness in the GOCQ is conceptualized as at its core. Group openness is the culmination of attitudes in the group towards everything that can influence the group and its behavior from the outside. This idea is also further expanded on in the first research paper (see section 3.1.2).

Group openness is derived from research results obtained with the direct and indirect approaches as follows: The training transfer literature has provided evidence towards the importance of a groups' outward orientation: One of the often-explored team-level predictors

of training transfer is “transfer climate” (Cheng & Ho, 1999; Velasco & Harder, 2014), which is usually measured as per the direct approach and describes a teams’ willingness to adapt new ways of working following an intervention of any kind. This idea, when generalized, also fits the concept of an outward orientation of the team, as the intervention is an outside influence on the team that must be adapted to, and how open the team is towards this influence predicts how severe the resulting behavior change is (Baldwin & Ford, 1988; Burke & Hutchins, 2007; Clarke, 2002; Colquitt et al., 2000; Ford & Weissbein, 1997; Grossman & Salas, 2011; Lehman, Greener, & Simpson, 2002).

Group openness was also derived from past research results obtained with the indirect approach (specifically, with results involving the Five Factor Model applied to the group level). Some studies report an influence of group means of individual openness to experience on various other group level outcomes (Baer, Oldham, Jacobsohn, & Hollingshead, 2008; Bond & Shiu, 1997; Homan et al., 2008). This is more evidence for a general importance of how open the group members are towards influences outside of the group. However, it should be noted that meta-analyses concerned with group personality composition (Bell, 2007; Peeters, van Tuijl, Rutte, & Reymen, 2006) did not show a general predictive power of group mean openness to experience, slightly diminishing the presumed importance of mean openness to experience of the group members.

To sum up, group openness was conceptualized as the second dimension of a group (personality) characteristic structure for the GOCQ as the groups generalized outward orientation and therefore a conceptually fitting counterpart to the groups generalized inward orientation described by cohesion. This was based on the literature on training transfer showing an importance of transfer climate for successful training transfer, which can be seen as a specific expression of a general group openness, and an importance of group mean individual openness to experience of the members in predicting other group-level phenomena.

With this overall conceptualization of cohesion and group openness in mind, items were formulated for the GOCQ. These items were formulated to measure specific behaviors and attitudes influenced by the latent group openness and cohesion characteristics that can be exhibited by a team of nurses as the exemplary group used in this thesis. The initial item pool, the final item pool (obtained through the process described in research paper 1, section 3.1.3) and the questionnaire as it was used in the empCARE project are found in the appendix.

In general, personality concepts should aim to describe behavioral tendencies of the individuals (or groups) they apply to as completely as possible (Ashton & Lee, 2019), which can be assumed to be the case for a group personality structure that incorporates both the group's inward and outward orientations in cohesion and group openness, respectively. Additionally, the conceptualization of a generalized group personality structure through cohesion and group openness (which are, at least in theory, applicable to all types of groups) can be considered more complete than past concepts, which are often only applicable to specific types of groups (see also the first research paper, section 3.1.2). As mentioned, stability over time of these two characteristics was to be empirically determined as part of this thesis. Since group personality has also been conceptualized as aggregated personality characteristics of the group members in past research (the indirect approach, see section 1.3.2), the newly developed concept was also to be compared to this indirect approach.

1.4 Overarching research questions

Based on the theoretical developments outlined above and the corresponding conceptualization of the group personality structure and the GOCQ, the following overarching research questions were to be addressed in this thesis:

1. Can group openness and cohesion be reliably and validly measured using the GOCQ?
2. How are the group openness and cohesion characteristics related to the indirect approach to group personality, in which personality traits of the individual group

members are averaged within the group, and how are they related to individual personality in general?

3. Are group openness and cohesion, as well as individual personality traits, (uniquely) able to predict training transfer?
4. Can group openness and cohesion be considered group personality characteristics by nature of their conceptualization, how they develop over time, how they differentiate between groups, and how they trans-situationally consistently influence behaviors of groups?

The general discussion will include how the research papers, as well as the additional results presented in section 4, answer these overarching questions.

2 Research Paper Overview and Thematical Connections

As mentioned above, this thesis' main body consists of three research papers. This chapter briefly outlines the contents of each paper and explains the thematical connections between them. The papers themselves form the next chapter.

2.1 Research paper 1 overview

The first research paper focuses on the instrument GOCQ. It gives a detailed description of the theory development for the underlying concept and the item selection process, shows the psychometric properties of the instrument, and provides reliability and initial validity results. The item selection was based on a confirmatory factor analysis (using a structural equation model) in one sample, during which some items were removed because they showed unsatisfactory factor loadings and / or caused to overall model fit to be unsatisfactory. The so developed final version of the instrument was cross-validated with another confirmatory factor analysis using a different, independent sample. The final instrument showed satisfactory to excellent psychometric properties and was validated through team size and team age.

With the completion of the psychometrics and reliability analyses for the GOCQ, more evidence for validity of the underlying constructs and of the utility of the new concept of a group personality structure was warranted, which is the main topic of research paper 2.

2.2 Research paper 2 overview

The first research paper had shown group openness and cohesion to be distinguishable and reliably measurable constructs rated by the group members, along with providing initial validity evidence. However, it was yet unclear how the new measurement is related to aggregated group-level means of the personality of individual group members – it could be reasoned that group openness is nothing more than the aggregated openness to experience of the group members, and that a group high in cohesion is simply a group consisting of

members high in agreeableness and / or extraversion. Additionally, it was unclear in how far the individual personality characteristics of the group members (and other individual characteristics) influence how they rate the characteristics of their group. These questions are addressed in research paper 2, as they provide important further validity evidence for the GOCQ. To model individual personality, the HEXACO-model (Ashton & Lee, 2007) was chosen, as this model aims to describe individual personality as completely as possible (Ashton & Lee, 2019).

The second research paper describes general caveats in group characteristic conceptualization and describes the criticisms concerning the indirect approach in detail. It demonstrates the differences between the direct approach (using the GOCQ) and the indirect approach (using the personality inventory HEXACO-PI-R (Ashton & Lee, 2007)) by showing that the team-level means obtained through each instrument do not correlate with each other. Research paper 2 also demonstrates that individual responses in the GOCQ are highly dependent on the individual-level perspective of the group members and can differ considerably even in the same group. It is also shown that the individual perspective of the group members that influences how these members rate characteristics of their group in the GOCQ is, in turn, influenced partially by the members' own personality traits. For these reasons, paper 2 also explains how meaningful group level variables can be created from individual-level GOCQ responses by assigning the mean rating of all other team members on the respective dimension to each member.

Taking the caveats for calculating meaningful group-level variables representing the latent group-level characteristics as best as possible without being influenced by the individual-level differences within the group into consideration, research paper 3 uses the GOCQ and HEXACO-PI-R response patterns to answer the question whether individual or team characteristics are more important for training transfer, delivering another comparison

between the direct and indirect approaches in the process. In doing so, more validity evidence for the GOCQ is obtained.

2.3 Research paper 3 overview

The third research paper circles back to the initial motivation for the creation of the GOCQ. Here, individual personality characteristics (operationalized through the HEXACO-PI-R) and team personality characteristics (operationalized through the GOCQ, as well as the HEXACO-PI-R used according to the indirect approach) are examined for their ability to predict training transfer following the empCARE training (see section 1.2). Overall, the third research paper provides evidence for a higher importance of team characteristics than individual characteristics for training transfer, which is operationalized as changes in psychological strain over time following the training. It is shown that both the direct and the indirect approach uniquely explain differences between individuals in training transfer. In this way, the third research paper provides further validity evidence for the GOCQ and its underlying proposed group characteristic structure, but also provides evidence for a unique utility of the indirect approach to group personality (composition), regardless of the theoretical criticism of this approach. The third research paper also shows an unexpected inability of the group openness construct to predict differences in training transfer, along with an influence of cohesion on training transfer.

Overall, the connection between the three research papers is therefore the underlying concepts of group characteristics and group personality composition, the GOCQ with its underlying concepts and their utility in practice, a detailed analysis of the properties of the instrument, and evidence for the validity of both the direct approach to conceptualizing group characteristics (which the GOCQ follows) and the indirect approach. For the latter, unique utility was more surprising, given the criticisms it was subjected to before (see research paper 2 (section 3.2.2) and section 1.3.2).

3 Research Papers

3.1 Research paper 1: Conceptualizing and Measuring Group Openness and Cohesion as Dimensions of Group Personality²

3.1.1 Abstract

Groups exhibit behavioral consistencies similar to individuals, such as making more or less bold decisions or struggling more or less frequently. However, previous research findings focus only on specific dimensions of groups instead of the general structure of group personality.

Based on previous research findings on group and team efficiency, we derived two basic dimensions of group personality, group openness and cohesion, representing the group's outward and inward orientation, respectively. We present the "Group Openness and Cohesion Questionnaire" (GOCQ) as a measure to assess these two group personality dimensions in groups independent of their context. Confirmatory factor analysis confirmed the proposed two-dimensional structure with good to excellent psychometric properties. Evidence of validity is provided through group age, group size, and by the fact that the ratings reflect team characteristics. In general, the results support the conceptualization of these two basic dimensions of group personality and provide first indications of validity of the presented measure GOCQ.

3.1.2 Introduction

The concept of personality is usually only applied to individuals and defined by different traits that are intra-individually consistent across situations and stable over time, such as the Big Five of the Five-Factor model (McCrae & Costa Jr, 1999). However, whenever several individuals join together to form a group, we find that this group as a new

² Citation: Deckers, M., Altmann, T., & Roth, M. (2018). Conceptualizing and Measuring Group Openness and Cohesion as Dimensions of Group Personality. *Psychology*, 09(01), 80-100. doi:10.4236/psych.2018.91006

entity also begins to exhibit aspects of coherent beliefs, perceptions, and behavioral styles. Thus, the group acts in ways that are consistent across situations and stable over time (Dang & Ilgen, 2006), and therefore possesses what might be called group personality.

Historically, personality dimensions are conceptualized as behavioral tendencies of individuals on a latent level that are consistent across situations and stable over time. As they are related to behavior and cognition, individual personality dimensions are largely based on the way individuals interact with and perceive the world and themselves. This is reflected in the content of the items that personality dimensions are assessed with, for example “*I would be quite bored by a visit to an art gallery*” or “*I often push myself very hard when trying to achieve a goal*” (Ashton & Lee, 2007).

With our goal to conceptualize group personality dimensions, another level is added to the concept of interaction with and perceiving the world. When viewing the group as the entity that a personality dimension is assigned to, one needs to consider the fact that the group members not only interact with the world outside of the group, but also with the other group members. This means that group personality dimensions should take both the interactions of the group members as well as the interactions the entire group has with its environment into consideration. Groups need to define themselves in regard to how they behave and think inwardly and outwardly and group personality dimensions should reflect that.

The term group personality dimension, as it is used here, refers to a comprehensive group trait that describes very generalized behavioral tendencies of groups. It is not meant to replace group traits as they are researched in social psychology and organizational psychology. It originates from the perspective of personality psychology that aims to find the smallest number of superordinate constructs which account for the largest amount of behavioral tendencies in individuals in general. Because we apply this concept to the group level, the label “group personality” is used. Other authors describe the same aspect as “group climate” or “group culture”. With the term “group personality” we want to emphasize the

perspective from personality psychology, i.e., the behavioral aspect of the group interactions as well as the universal and comprehensive character of these dimensions.

In this paper, we propose that groups can be characterized by an overarching group personality structure that describes stable cognitive and behavioral patterns of a group as a whole and that is distinct from personality structures on the individual level. In the following, we briefly summarize the existing literature on both approaches to conceptualize group personality, suggest a bi-dimensional structure that is independent of specific group contexts, and present an inventory to assess these dimensions.

3.1.2.1 Current approaches to group personality

There are basically two approaches to group personality in the literature so far: an indirect and a direct approach. The indirect approach argues that a group's personality is simply the average of the individual members' personalities. This approach, however, assumes without substantiation that the basic structure of group personality is the same as the basic structure of individual personality. In contrast, the direct approach assumes that the group is characterized by dimensions beyond those of individual personality. The main difference between the two approaches is that the indirect approach bases group personality on the personality of the individual members (which in turn is based on the behavior of the individual group members), while the direct approach bases group personality directly on the behavioral tendencies of the group *as a whole*. The latter approach is also referred to as group climate or sometimes as group culture (see below). Several approaches have been made to capture dimensions of group personality, however, to our knowledge, a coherent concept or theory of its fundamental structure is still missing.

3.1.2.1.1 Indirect Approach

The indirect approach to measuring group personality proposes that the personality traits of the individual group members alone can be used to calculate the group personality, with no further information about the group needed (Barrick, Stewart, Neubert, & Mount,

1998). In the literature, there are three ways of doing such a calculation: mean score, mean score as well as variability, and extremes.

The first and most common way is to calculate a mean score of the values of each group member on a given personality trait. This method has been applied to personality traits such as extraversion, dominance (Heslin, 1964), and even intelligence (Williams & Sternberg, 1988). This approach views group personality as a collective pool of a given characteristic that each group member contributes to. What is problematic about this type of approach is that personality characteristics are abstract constructs, and there is neither theory nor rationale as to why a group personality should be able to be calculated by means of individual personality score, and which behavioral tendencies on the group level it should result in.

The second way takes the variability of personality characteristics in the group into consideration as well (Barry & Stewart, 1997; Schneider, 1987). As differences between groups can be obstructed by calculating the mean only, comparing variances, ranges, and other proportions can help reveal those differences. For example, two groups might have the same mean conscientiousness score, but the trait is normally distributed in one group, while in the other it is bimodal, i.e., composed of two subgroups, one of which scores very high and the other very low on the trait. Therefore, comparing variance in individual traits (Jackson et al., 1991; Tsui, Egan, & O'Reilly, 1992) and assessing the proportion of group members exhibiting high parameter values on a certain trait (such as extraordinarily high extraversion; Barry & Stewart, 1997) reveal influences that might be obstructed by using the mean score only. However, the rationale for these evaluations has not been defined sufficiently and methodological concerns remain, such as most importantly, the lack of an underlying theory explaining the link between individual traits and overarching group traits.

The third way, calculating extremes, looks at the highest or lowest individual trait value within a group, with the idea that individuals far from the average on a certain trait can significantly influence the behavior of an entire group (Kenrick & Funder, 1988). For

example, in assembly line work, the slowest worker influences the speed of the entire line, while in problem solving tasks, the input of the member with the highest general mental ability is essential to quickly solving the problem (Steiner, 1972). As these examples show, this way is based on highly specific conditions that do not apply to all groups equally.

In general, the indirect approach with its three subtypes shows a lack of theoretical underpinning and should be considered methodologically questionable. Most of the studies that used the indirect approach employ it using the Five-Factor Model of personality (McCrae & Costa Jr, 1999) or selected sub-facets of it assessed at the individual level (Bear, Oldham, & Jacobsohn, 2008; Homan et al., 2008).

Findings in this research tradition yielded inconsistent results. As an example, studies trying to predict group performance from group personality composition have found that the personality dimensions of the Five-Factor Model (neuroticism, extraversion, agreeableness conscientiousness, and openness to experience) greatly differ in their predictive power depending how they were calculated at the group level, which types of groups were assessed and how group performance was operationalized (for an overview, see: Barrick, Stewart, Neubert, & Mount, 1998; van Vianen & De Dreu, 2001). However, in many studies, openness to experience emerged as a dimension with high predictive power for different group-level outcomes, such as group performance (Barrick & Mount, 1991; Homan et al., 2008), group creativity (Bear et al., 2008) or within-group information exchange (Bond & Shiu, 1997). Overall, openness to experience at the individual level seems to be the only personality dimension that can relatively consistently predict a wider range of group-level outcomes.

These findings in past research point towards a general importance of openness at the group level, regardless of the methodological and the theoretical difficulties associated with the indirect approach.

This lead us to conceptualizing group openness as the first key dimension of group personality that seems applicable to all groups independent of their context. Group openness

describes a group's *outward orientation*, which entails in how far a group is willing to and interested in welcoming new ideas, impulses, principles, activities, and members. Just like personality dimensions at the individual level explain behavioral tendencies in individual persons, this dimension explains a behavioral tendency that can be observed in groups. However, a concept of openness at the group level also requires the measurement at the group level, instead of at the individual level.

3.1.2.1.2 Direct Approach

The direct approach tries to conceptualize relevant dimensions of group personality by having the group members directly rate their respective group as a whole. Each member rates the whole group as one entity regarding, e.g., its effectiveness, creativity, etc. Systematic research in this field is primarily focused on the concept of *climate*, which has been assessed as work team climate (Anderson & West, 1996), family climate (Bjornberg & Nicholson, 2007; Kurdek & Fine, 1993), or therapy group climate (Law et al., 2012).

Climate has been defined slightly differently in each context in which it has been assessed, which is most frequently in work organizations (as indicated by the large number of publications in this specific research area, as opposed to, for example, climate research in families or therapy groups). As Patterson et al. (2005) stated, the “dominant approach conceptualizes climate as employees’ shared perceptions of organizational events, practices and procedures” (p. 380). In contrast to organizational culture, that primarily contains the perceived shared beliefs and values, organizational climate is more behaviorally oriented, describing patterns of interactions and behaviors in the organization (Schneider, 2000). With the focus on group personality, i.e., the stable and consistent cognitive and behavioral patterns of a group, group personality and climate appear naturally close to each other.

The most commonly used instrument for measuring work team climate is fittingly called the Team Climate Inventory (TCI) (Anderson & West, 1998). In the TCI, team climate is divided into the following four factors: *vision*, *participative safety*, *task orientation*, and

support for innovation. *Vision* refers to a collective motivating force for the work team through the presence of a clear, common, achievable goal. *Participative safety* describes the degree to which each group member can interact with the rest of the group without facing threats or judgement and while receiving trust and support. *Task orientation* refers to the extent to which the team is committed to good task performance and is willing to adjust and improve work practices to perform more efficiently. *Support for innovation* describes a general atmosphere of support for new and improved ideas for working processes within the team.

Such a measurement for facet-specific team climate (e.g., *support for innovation*) naturally falls short of being universally useful to describe all possible teams or groups in general. As mentioned by Schneider & Reichers (1983), other facet-specific types of climate might be more useful in other team contexts where innovation is not the main concern, but when instead the team is striving for quality (e.g., health care providers) or change (e.g., a new political party). Even more so, people can form groups that are not work teams, e.g., societies and clubs, which require different measurements of climate. In sum, the direct approach so far only applies to specific teams and is hence mostly applied in organizational work team research (Anderson & West, 1998; Cheng et al., 2013; Zhu et al., 2016).

In contrast to work teams, climate in families is conceptualized by the dimensions (*emotional*) *warmth*, *conflict*, *supervision*, and *order* (Family Climate Inventory (FCI); Kurdek & Fine, 1993); by *acceptance*, *conflict*, *supervision*, and *autonomy granting* in an updated version of the FCI (Kurdek, Fine, & Sinclair, 1995); and by *cohesion*, *process*, and *intergenerational interaction style* (Family Climate Scales (FCS); Bjornberg & Nicholson, 2007). All of these family climate concepts emphasize emotional connection, dealing with disagreement, and how the family is organized (which, in contrast to company teams, is not fixed in families). Because the FCI as the usual measure of choice for family climate was created to be answered by children, some authors interested in assessing the viewpoints of

other family members derive or create their own measurements (Sbicigo & Dell'Aglio, 2012). There does not seem to be a well-established international family climate questionnaire that is designed to be answered by the entire family. Furthermore, there is also no universally accepted family climate theory or concept – multiple authors have created their own questionnaires for their individual studies, each of which has different items and subscales depending on the specific research question and conditions.

Finally, therapy group climate (although rarely assessed, see Law et al., 2012) is conceptualized as consisting of *engaged*, *conflict*, and *avoiding* (Group Climate Questionnaire (GCQ); MacKenzie & Tschuschke, 1993). Here again, climate in this context is composed of different subscales, but there are unfortunately very few publications on them.

These differences in climate definitions and subscales can likely be attributed to differences in values, goals, and desired outcomes in different kinds of groups. Overall, taking all these different climate constructs, definitions and subscales into consideration, the common denominator is the individual group members' feelings towards the group, the extent to which they feel close to each other, how much they trust each other, how much the group feels like a coherent entity to them, and the extent to which the group shares and agrees on a common goal. All of these facets can be subsumed by the term *cohesion*.

In the TCI (Anderson & West, 1998), this facet is found in the *participative safety* subscale, which includes team members receiving trust and support from each other, and to a lesser extent in the *vision* subscale, which includes collective motivation and the presence of a common goal. In the first version of the FCI, the subscale (*emotional*) *warmth* includes the strength of the family members' emotional connection. This notion is also found in the second version of the FCI as part of the *acceptance* subscale, which includes perceived levels of emotional warmth and support (Kurdek et al., 1995). The FCS includes a *cohesion* subscale, which is subdivided into *emotional cohesion*, the strength of emotional connections among family members, and *cognitive cohesion*, the conformity of views on general topics within the

family (Bjornberg & Nicholson, 2007). In the GCQ, the subscale *engaged* describes a group climate of mutual trust and support, while the other subscales describe groups in which such a climate is absent (MacKenzie & Tschuschke, 1993). Inventories that measure group constructs in other contexts (e. g. sports groups or school classes) often either include cohesion or are based on cohesion as well (Carron, Widmeyer, & Brawley, 1985; Eys et al., 2009; Johnson & Johnson, 1983).

Since cohesion appears to be a stable and consistent variable in climate inventories for groups in highly differing contexts, the concept can be assumed to constitute a general dimension of group personality. Although the conceptualization of cohesion differs to some extent depending on the context in which it is assessed and used (Carron & Brawley, 2000), it always describes how individual members of a group feel like they belong to the group, how affectionate they are to one another, and to what extent the group shares a common goal. Cohesion is independent of which specific people form a group and of the group's goals, values, and outcomes. We therefore conceptualize it as the second dimension of group personality, forming the group's *inward orientation*, which consists of the group members' affection for the group, the degree to which they get along and how well they treat each other, as well as the degree to which they share and agree on a common goal.

In the past, instruments that included cohesion as a facet were always specifically created for specific teams or groups (such as work-related teams, sport teams, families, or therapy groups). There is not yet a concept nor measurement of cohesion that is comprehensive and therefore applicable to all groups independent of their context and setting. Corresponding to the concept of individual personality, in which all dimensions are applicable to all individuals in the general population, dimensions of group personality should also be applicable to all common types of groups.

3.1.2.2 Hypotheses

For the present research, we propose that group personality can be conceptualized with two dimensions, group openness and cohesion, as outlined above. Group openness refers to the extent to which a group is interested in and willing to incorporate new impulses, strategies, principles, methods, ideas and members, describing an outward orientation. Cohesion can be seen as the tendency of a group to feel like a cohesive entity, to exhibit mutual trust and affection among group members and to agree on and share a common goal, describing an inward orientation.

Since there currently is no inventory to measure group personality that is independent of specific contexts (e.g., organizational, sport, or family groups), we developed an inventory to measure this construct that includes group openness and cohesion.

For our first hypothesis, we expect that a structural model with the two factors group openness and cohesion will have an at least satisfactory model fit to the data obtained with the instrument. For our second hypothesis, we expect team membership to have a significant influence on factor-level answer patterns, so that being in a certain team will by itself will be predictive of answer patterns.

Concerning the validity measurements, we expect that the longer a group stays together, the higher its mean cohesion will be (third hypothesis), as cohesion can be expected to increase as group members know each other and interact frequently with each other over a longer period of time, as this will also likely increase how close they feel to each other (Harrison, Price, & Bell, 1998). We further predict that the longer a group stays together, the higher its group openness will become (fourth hypothesis), because outside changes will be less likely to be perceived as a threat to the group and more likely to be perceived as an asset to an already established group structure. Additionally, we predict that the larger a group is, the lower its cohesion will be (fifth hypothesis), as intimacy and feelings of closeness are more difficult to achieve in larger groups, as past research has demonstrated (Carron & Spink,

1995; Wheelan, 2009; Widmeyer, Brawley, & Carron, 1990). The more people are added to a group, the harder it becomes for individual group members to perceive the group as one instead of several subgroups. We also predict that increased group size will lead to larger group openness (sixth hypothesis), as the increased diversity will once again make outside changes more likely to be perceived as an asset and less likely to be perceived as a threat, given that members with “unusual” characteristics are more likely to already be part of the group.

To reliably assess the new constructs, we needed the teams in which we administered our questionnaire to meet a few requirements. To ensure clear team affiliation, we looked for an organization with several small, clear-cut teams (and without members who switch frequently between teams). The members of these teams also needed to frequently interact with one another and work together interdependently so that each team member is able to reliably judge their team. One profession that meets these requirements is nursing in a hospital setting; thus, we conducted our study with the nursing staff of two university hospitals.

3.1.3 Method

3.1.3.1 Sample

Our sample consisted of 399 nurses at two university hospitals in Cologne and Bonn, Germany. 84.3% of the nurses were female, 14.2% were male, and 1.5% did not indicate their gender. The first hospital yielded 207 participants (referred to hereafter as the “Cologne sample”), while the second yielded 192 (referred to hereafter as the “Bonn sample”). Age within the samples ranged from 20 to 62 ($M = 35.8$, $SD = 11.31$). On average, each team consisted of 21.4 members, of which a mean of 39.5% were assessed. All participants in the study participated voluntarily in a larger research project that the administration of the questionnaire presented here was a part of.

3.1.3.2 Procedure

The questionnaires were filled out either at the beginning of a professional development training or during normal working hours whenever the situation permitted doing so. To calculate the test-retest reliability of the instrument, 35 nurses filled out the questionnaire twice, with the timeframe between administrations ranging from 2 to 11 weeks.

3.1.3.3 Measures

For group openness, we formulated items asking each team member for an assessment of their entire team, in accordance with the direct approach described in the introduction. Existing items for the openness subscale at the individual level, such as “*Sometimes I just like to watch the wind as it blows through the trees*” (Ashton & Lee, 2007), certainly make sense to answer at the individual level, but summarizing these answers across individuals cannot logically be expected to yield group behavior or group personality. In fact, we suggest that behavioral patterns of openness at the group level are slightly different from those of openness at the individual level. Whereas the latter manifests itself in behaviors such as visiting an art gallery or travelling more often, at the group level, the resulting behaviors and characteristics are more basal, such as welcoming new members in a friendly and encouraging manner or asking fellow group members for advice. Therefore, we measured what we conceptualized as group openness with items in which individual members had to rate their entire group (in the case of this study, their work teams). Example items are: “New ideas are considered in our team” and “The team is open to changes”.

For cohesion, new items were created with our more general explanation of the construct in mind to avoid formulating items that only fit a specific group, which would have gone against the notion of a general group personality instrument independent of any specific assessed group. As was the case for group openness, the cohesion items were formulated in a way that asked each individual to evaluate their entire team, in accordance with the direct

approach. Example items are: “In our team, we have a ‘we’re all in the same boat’ attitude” and “In our team, problems can be freely brought up”.

The items we generated formed the initial version of the Group Openness and Cohesion Questionnaire, which consisted of 9 group openness items and 11 cohesion items (see Appendix A for the items and translations and Appendix B for the questionnaire as it was used in the research project). All items were answered on a 5-point Likert scale, with answer alternatives worded “totally agree”, “mostly agree”, “somewhat agree”, “agree a little bit”, and “do not agree at all”. All items were in German.

Aside from administering the initial version of the Group Openness and Cohesion Questionnaire, we assessed participants’ gender and age, as well as how many members their team consists of and the duration of their team membership so far.

3.1.4 Results

3.1.4.1 Internal Structure

Our first goal was to find a final version of the Group Openness and Cohesion Questionnaire. In order to do so, we tested the full instrument with the Cologne sample using confirmatory factor analysis (CFA) through a structural equation model, made adjustments to the instrument on the basis of the CFA results, and finally cross-validated the final instrument with the Bonn sample.

To assess model fit, we used a combination of common fit indices. For the Root Mean Square Error of Approximation (RMSEA) and Comparative Fit Index (CFI), we followed the cutoff criteria suggested by Hu & Bentler (1999); for the Goodness of Fit Index (GFI) and the Adjusted Goodness of Fit Index (AGFI), we followed the recommendations of Jöreskog (Jöreskog, 1993). If we obtained an unsatisfactory model fit, we planned to use the modification indices and factor loadings to decide which items to delete and which covariances between item errors to allow. We predetermined factor loadings of .40 or less to

be unsatisfactory; absolute cutoff values for modification indices are not possible to predetermine, as these indices can only be interpreted relative to each other.

Generally speaking, the Cologne sample was used to test and modify the model. To ensure that the improvements in fit shown by the modified model were not due to capitalization on chance, the model was cross-validated with the second data set (Bonn sample).

When testing model 1 for the full instrument (two latent variables, group openness and cohesion, with 9 resp. 11 measured variables loading onto those latent variables) on the Cologne sample, we noticed a very high correlation of .80 between the latent factors openness and cohesion. Therefore, we tested how a model with only one latent factor instead of the proposed two fit the data. In the model with only one latent factor, all items were assigned to that one factor, while in the two-factor model, each item was assigned to its respective factor (openness or cohesion). We used the comparative model fit indices Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) to compare these two models, which revealed the clear superiority of the solution with two latent factors: The model with one latent factor had an AIC value of 649.61 and a BIC value of 782.92 associated with it, while the model with two latent factors had an AIC value of 472.38 and a BIC value of 608.88 associated with it. AIC and BIC values cannot be interpreted individually and only serve to compare two models to one another. As the model with smaller AIC and BIC values always fits the data better, the model with one latent factor was rejected. As these models are not nested, only AIC and BIC are reported (comparing χ^2 statistics and fit indices that rely on those is not permissible). All further analyses were carried out with the two-factor model.

The RMSEA of the initial instrument with the Cologne sample was .08 and the Comparative Fit Index (CFI) was .907; thus, both showed room for improvement. For a full list of fit indices and associated results, see Table 2. To improve model fit, the modification indices called for the removal of Item 10 (originally part of the openness factor), which covaried to a larger degree with the cohesion factor than it did with the openness factor (M.I.

for cohesion: 26.440, M.I. for openness 17.205). Translated, the item reads, “In our team, we support each other with the implementation of new ideas”, which in retrospect obviously fits the underlying ideas behind both constructs rather than that of openness only. This led to the item’s exclusion. Additionally, a modification index of 33.932 suggested allowing the error variances of Item 14 and Item 16 to covary. Doing so made sense with regard to the content of the items as well: Translated, Item 14 reads, “In our team, we have a ‘We have always done it this way’ attitude”, and Item 16 reads, “Changes to our ways of working are blocked in our team”. These items have a specific “active blocking of changes in work processes” factor in common that exceeds the generic group openness factor. All other modification indices were very small in relative value (all < 15.746) and therefore did not lead to further adjustments. Finally, Items 02 (translated: “My team has a difficult time deviating from routine.”) and 13 (translated: “Personal things are sometimes discussed in the team.”) were excluded because of factor loadings of .40 or less. In sum, the version of the questionnaire where Item 10 was deleted, the errors of Item 14 and Item 16 were covaried, and Items 02 and 13 were deleted was selected as the final version, as all further deletions and adjustments did not improve model fit. The model resulting from these modifications (with 7 measured variables loading on openness and 10 measured variables loading on cohesion) is referred to as Model 2a (see Table 2). Although χ^2 is significant, the other fit indices indicate that the model now provides reasonable fit to the data.

The final version of the instrument was then cross-validated with the Bonn sample, again using a confirmatory factor analysis through a structural equation model. All fit indices are reported in Table 2 as Model 2b. The model of the final instrument along with the factor loadings, the between-factor correlation and the measurement errors obtained in the Bonn sample are shown in Figure 2. As indicated by the Fit indices in Table 2, the instrument is stable across samples.

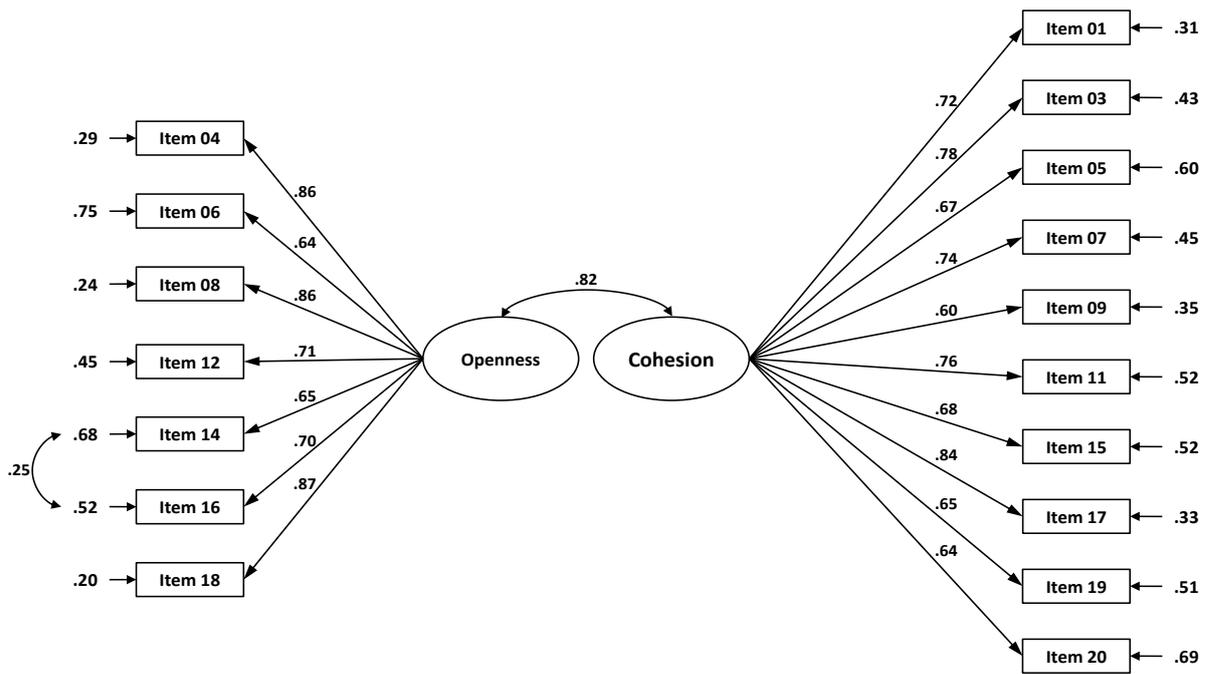


Figure 2. The final model after all adjustments is displayed here, along with the factor loadings, the between-factor correlation and measurement errors obtained in the Bonn sample. For Items 14 and 16, the covariance between their respective errors is displayed as well.

Table 2. Fit indices from both the initial version of the instrument with 20 items (first row), and the adjusted instrument (second and third rows), i.e., the final version of the instrument with 17 items

Model	χ^2	DF	p	GFI	AGFI	RMSEA	PClose	CFI
Model 1: Initial instrument (Cologne sample)	390.238	169	<.001	.843	.805	.080	.000	.907
Model 2a: Final instrument (Cologne sample)	205.633	117	<.001	.897	.865	.061	.100	.956
Model 2b: Final instrument (Bonn sample)	223.805	117	<.001	.871	.831	.069	.013	.945

3.1.4.2 Psychometric Properties of the Final Instrument

Item and scale statistics were also calculated for both samples (using the final instrument). These are shown in Table 3.

Table 3. Psychometric properties of the items in the final instrument separated by sample. Means and standard deviations for both scales and their respective items, item-scale correlations and item difficulties for the items only

Scale/Item	<i>M (SD)</i>		<i>r_{it}</i>		<i>p_i</i>	
	Cologne	Bonn	Cologne	Bonn	Cologne	Bonn
Cohesion	3.35 (0.77)	3.54 (0.73)				
Item01	3.65 (0.85)	3.70 (0.80)	.71	.67	.66	.68
Item03	3.26 (1.05)	3.46 (1.06)	.78	.73	.56	.62
Item05	2.83 (1.16)	3.01 (1.04)	.69	.63	.46	.50
Item07	2.94 (1.00)	3.34 (1.00)	.76	.70	.48	.58
Item09	3.99 (0.77)	4.24 (0.74)	.59	.57	.75	.81
Item11	3.08 (1.02)	3.38 (1.10)	.71	.73	.52	.59
Item15	3.30 (0.98)	3.46 (0.98)	.76	.64	.57	.62
Item17	3.64 (1.07)	3.75 (1.07)	.80	.81	.66	.69
Item19	3.50 (0.91)	3.64 (0.95)	.57	.61	.63	.66
Item20	3.31 (1.17)	3.41 (1.08)	.68	.61	.58	.60
Openness	3.23 (0.72)	3.29 (0.81)				
Item04	3.25 (0.93)	3.37 (1.05)	.73	.80	.56	.59
Item06	3.06 (1.00)	3.07 (1.13)	.71	.63	.51	.52
Item08	3.14 (0.91)	3.22 (0.96)	.76	.81	.54	.56
Item12	3.04 (0.88)	3.15 (0.96)	.62	.64	.51	.54
Item14	3.32 (0.98)	3.25 (1.09)	.58	.66	.58	.56
Item16	3.59 (0.87)	3.60 (1.01)	.67	.70	.65	.65
Item18	3.22 (0.88)	3.37 (0.91)	.74	.79	.56	.59

Note. Cronbach's α for the full Cohesion scale was .921 in the Cologne sample and .908 in the Bonn sample. Cronbach's α for the full Group Openness scale was .891 in the Cologne sample and .903 in the Bonn sample.

Taken together, the CFA results and psychometric properties of the final version of the instrument confirm that the response structure of our results fits the instrument's expected structure. From here on, the final version of the instrument will be referred to as the Group Openness and Cohesion Questionnaire (GOCQ).

3.1.4.3 Test-Retest Reliability

To assess the test-retest reliability of the GOCQ, the questionnaire was administered twice to a group of $N = 35$ participants in the Cologne sample with the amount of time in between administrations ranging from 2 to 11 weeks. Test-retest reliability was very good for the cohesion scale ($r_{tt} = .84$) and good for the openness scale ($r_{tt} = .72$).

3.1.4.4 Validity

Validity was assessed using the full sample (Cologne and Bonn). Participants were asked how long they had been a member of their respective team as well as how many members their team consisted of during the investigation. This information was used to provide first hints of the validity of the group openness and cohesion-scales (see above). Team size and average membership time were categorized into three categories each.

When creating the three categories for team size, each team was assigned the median of what participants from this team had entered as their team size. The median was chosen instead of the arithmetic mean to cancel out the influence of outliers, who either overestimated or underestimated the size of their teams considerably. This resulted in 15 small teams (7 to 13.5 members), 18 medium-sized teams (15 to 22.5 members) and 15 large teams (24 to 60 members).

The average membership time on a team was used as a proxy for team age, which refers to how long team members had known each other and how long they had been working together at the point at which the questionnaire was administered. In order to ensure the reliability of this proxy measure, only teams in which more than 50% of team members filled out the instrument were included into calculations involving average membership time. In order to identify these teams, once again the median number of members given by the members of each team was used. This led to the identification of 18 teams in which more than 50% of members were surveyed. These teams were divided into three categories according to

average membership time, resulting in 5 young teams (22.7 to 54.5 months), 8 medium-aged teams (60.5 to 97.6 months) and 5 old teams (112.7 to 170 months).

To validate the group openness and cohesion scales with team age, two ANOVAs were calculated with categorized mean team membership time (as a proxy for team age) as the independent variable and the scale mean of the cohesion and group openness scales, respectively, as the dependent variable. The first one-way ANOVA revealed a significant difference in cohesion depending on mean membership time, $F(2,192) = 4.622, p < .05, \eta^2 = .046$. Bonferroni-corrected post-hoc comparisons showed that while there was no significant difference between young and medium-age teams ($p = .996$), the difference between old teams and medium-age teams ($p = .014$) as well as the difference between young teams and old teams ($p = .022$) turned out to be significant. The second one-way ANOVA showed a significant influence of team membership time on openness as well, $F(2,192) = 3.7, p < .05, \eta^2 = .037$. Bonferroni-corrected post-hoc comparisons showed that only the difference between old teams and medium-age teams was significant ($p = .02$). Our expectation that older teams will have greater cohesion was partially supported, although the difference between young and medium-age teams turned out to be insignificant. The predicted influence of team age on group openness was also partially supported, with old teams being significantly more open than medium-age teams, but all other differences failed to reach significance.

To validate the group openness and cohesion scales with team size, two more ANOVAs were calculated with categorized median team size as the independent variable and the scale mean of the cohesion and team openness scales, respectively, as the dependent variable. The first one-way ANOVA revealed a significant influence of team size on cohesion, $F(2,395) = 3.389, p < .05, \eta^2 = .017$. Bonferroni-corrected post-hoc comparisons showed that only medium-sized teams and large teams differed significantly in cohesion ($p = .026$). The second one-way ANOVA revealed no significant differences in openness

depending on team size, $F(2,395) = 1,894$, n.s. Therefore, our expectation that larger teams are less cohesive was partially supported, as large teams were significantly less cohesive than medium teams, but team size had no influence on team openness in this sample.

For an overview of the means and standard deviations of the cohesion and group openness scale means depending on team size and team age, see Table 4.

Table 4. Means (Standard Deviations) of Cohesion and Group Openness Depending on Team Age and Team Size

Scale	Team Age			Team Size		
	Young	Medium	Old	Small	Medium	Large
Cohesion	3.342 (0.102)	3.353 (0.079)	3.774 (0.125)	3.450 (0.075)	3.564 (0.066)	3.336 (0.058)
Group- Openness	3.259 (0.101)	3.164 (0.077)	3.558 (0.123)	3.303 (0.094)	3.288 (0.086)	3.192 (0.116)

3.1.4.5 Team Differentiation and Relevance of the Team Level

We expected that individuals' ratings of team cohesion and team openness would be reflective of these characteristics at the team level. Therefore, we analyzed whether team membership served as a relevant predictor of individuals' experience of cohesion and openness within the team.

Teams were only included in the calculations if (A) at least 10 persons per team answered the questionnaire, and (B) team size was no greater than $N = 20$ (so that at least 50% of the team was represented by the 10+ persons). The final sample consisted of 245 participants belonging to 18 teams. To check whether team membership was a relevant predictor of individual experience of cohesion and openness, intraclass coefficients (ICC) were calculated. ICC coefficients refer to differences between teams, i.e., represent the

proportion of variance in cohesion and openness between teams. ICC were .27 for cohesion and .20 for openness, indicating that 27% and 20%, respectively, of the variance in these two constructs is located at the team level. This means that the remaining 73% and 80% of variance in cohesion and openness, respectively, occurs at the individual level.

As a second way to analyze the relevance of the team level, Euclidean distances between each person's location (the combination of the person's individual scores for cohesion and openness) and the 18 team centers (the combination of each team's means in cohesion and openness) were calculated, resulting in 18 distance measures per person. We then determined two indices for each person: the distance between the person's location and their own team center (diteam), and the mean distance between the person's location and the other 17 team centers (disother). Using a within-subject ANOVA, significantly greater Euclidean distances to the other team centers (disother: $M = 1.01$, $SD = 0.48$) than to one's own team center (diteam: $M = 0.74$, $SD = 0.46$) were found, with $F(1, 244) = 119.46$, $p < .001$, $\eta^2 = .33$. In sum, both analyses show clear evidence that team membership is a relevant predictor of individuals' ratings of their team's cohesion and openness, in line with our expectations.

3.1.5 Discussion

The aims of this paper were to provide a theoretical framework for personality at the group level with two group personality dimensions, introduce a measurement instrument to assess these dimensions, and provide evidence for the validity of this instrument.

A clear concept of personality at the group level that could be applied to different groups independent of their context and setting has been noticeably absent from psychology. In this paper, we suggested group openness and cohesion as two basic dimensions of group personality.

Group openness, the first dimension of group personality, describes the *outward orientation* of a group. It refers to a group's ability and willingness to adapt to outside

influences, such as new members, new ways of working and of working together, and new information and knowledge. Many studies have tried to assess groups' openness using the personalities of individual group members in order to predict outcomes such as group performance (Barrick et al., 1998; Homan et al., 2008). While this approach obviously lacks a justifiable rationale, the concept of openness at the group level continues to be a relevant characteristic of a group or team.

Cohesion, the second dimension of group personality, is a construct describing the *inward orientation* of a group, including the extent to which a group shares a common goal, how affectionate the group members are toward one another, how much they support each other, and to what extent the group experiences itself as a "unity". Cohesion is often an implicit sub-facet or subscale in inventories measuring some form of group climate, such as work team climate (Anderson & West, 1998), family climate (Bjornberg & Nicholson, 2007), or therapy group climate (Law et al., 2012). In fact, it can be argued that a collection of people needs to experience a certain degree of cohesion before it can be classified as a group.

In this study, we created a questionnaire to assess these two dimensions, cohesion and group openness, at the group level, with each member rating their group on each item instead of rating themselves only. The resulting Group Openness and Cohesion Questionnaire (GOCQ) was validated using CFA in two independent samples and yielded satisfactory to excellent model fit indices.

The correlation between the two latent factors cohesion and group openness turned out to be higher than expected. Of course, cohesion and group openness are similar, as both use the group as a reference point. Furthermore, ratings for both dimensions may be influenced by the rater's experience of the group's general functioning, which may account for the large intercorrelation. In the present samples taken from a hospital setting in which groups (teams) are non-competitive, we assume that combinations of high cohesion and high openness are beneficial for the success of teams. Other combinations, such as teams high in cohesion and

low in openness, are more likely to be found in competitive environments such as finance or creative work, where disregarding other teams or outside ideas might be beneficial for workflow and success. Therefore, it seems necessary to examine in future research whether the high correlation found in our study also occurs in other types of groups, and to analyze which kinds of combinations are beneficial for which kinds of groups.

The validity of the GOCQ was analyzed using team size and team age. Regarding team size, large teams had significantly lower scores on cohesion than medium-sized teams, while all other differences were non-significant. In fact, of the three team sizes, large teams showed the smallest mean cohesion. Past research on group size and cohesion found similar results (Carron & Spink, 1995; Wheelan, 2009; Widmeyer, Brawley, & Carron, 1990). A possible explanation for this finding is that each team member took the behavior of all team members into consideration when rating the cohesion of his or her respective team. It follows that the larger the team, the more differentiated the behavior of the people within the team becomes, and the more diverse opinions and behaviors within the team become, the less likely team members will be to perceive their team as one cohesive entity. In other words, once a team reaches a certain size, it becomes much harder for an individual member to even perceive the team as a coherent group of people with similar behaviors and attitudes, which likely leads to the team to being perceived as less cohesive.

For team age, which was categorized into young teams, medium-aged teams, and old teams, significant differences were found regarding both cohesion and openness. With respect to the former, old teams showed significantly higher cohesion than both medium-aged teams and young teams, while the latter two did not differ significantly. This indicates that cohesion increases with the longer a team's members have been part of the team (on average). This aligns with the idea of cohesion being, to a large extent, defined by interpersonal attraction and the presence of common goals within a group, as these parameters can reasonably be expected to increase as a team "ages together". A group's cohesion increases as differences

are set aside and relationships are fostered, as is also reported by Harrison, Price, & Bell (1998). Similarly, team openness increases with age as well, although the results are not as clear-cut here: old teams score significantly higher on openness than medium-aged teams, while all other differences are non-significant. It seems that there is a certain threshold in team age that, once reached, leads to a significant increase in openness. It might be that this process is similar to that with cohesion: the older a team is, the less changes (such as new members, new ways of working, etc.) are perceived as a disruption and the more they are welcomed, which is the quintessence of group openness. High team openness therefore seems to be found more in older teams. All of these findings about the relations between cohesion / team openness and team size or team age support the validity of the scales.

Since the GOCQ assesses constructs at the team level, we were greatly interested in confirming that team membership affects response tendencies for individuals, i.e., whether the instrument can differentiate between teams. This was done by calculating intraclass correlation coefficients, which revealed that 27% of the response variance in cohesion and 20% of the response variance in openness is located at the team level. This indicates that the individual perspective still plays a very large role as a reference point when answering the items, even when items are formulated in a way that asks respondents to evaluate their entire team. However, the other team-level analysis, comparing the Euclidian distances between each respondent and their own team vs. all other teams showed that participants were significantly closer to their own team than to all other teams in their response structure. We are therefore confident in saying that the instrument does indeed represent the response tendencies of entire teams.

The limitations of this study include the large variation in team size and proportion of team members examined. Additionally, this study did not assess personality at the individual level. A direct comparison between the dimensions proposed here and the well-established individual-level dimensions of the Five-Factor- or HEXACO-models (Ashton & Lee, 2007;

McCrae & Costa Jr, 1999) would have shed additional light on the validity of cohesion and group openness as group personality dimensions. In future research, it would be fruitful to compare what we have labeled the *direct* and the *indirect* approaches to assessing group personality. For example, it would be interesting to see whether group openness really does have more predictive power than mean or maximum individual openness for outcomes such as team performance or acceptance of trainings.

3.1.5.1 Conclusion

Overall, this study took a further step towards conceptualizing and measuring personality at the group level. Through the creation and administration of a questionnaire measuring the two dimensions group openness and cohesion in a hospital setting with multiple work teams, we aimed to continue closing the gap in personality research on the personality of groups. This study was successful in showing that group openness and cohesion are meaningful constructs that can be measured at the group level using the presented questionnaire GOCQ, which was created for this study. This study also provides insight into how group size and group age affect members' perception of group openness and cohesion. The main contributions of this paper to the literature of group personality are the division and description of the indirect and the direct approach to measuring group personality constructs (and other group traits), the development of a theory regarding the structure of personality at the group level, and the successful application of this theory to practice by measuring two dimensions of group personality in group openness and cohesion. More studies comparing this approach to the individual-level personalities of group members and assessing correlates with and outcomes of group personality are called for.

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3.2 Research paper 2: The Role of Individual Personality in Conceptualizing and Measuring Group Characteristics³

3.2.1 Abstract

In previous research, group characteristics have often been measured without taking the individual perspective of the group members into account. Therefore, the influence of individual personality (and other individual-level characteristics) on group characteristic ratings beyond the influence of the actual group remains largely unexplored. Additionally, some studies use group means of individual personality as group characteristics, however, evidence for interrelations or differences between these approaches has not yet been empirically based. In the present study, we employed a sample of 301 individuals from 54 teams, all of which rated both characteristics of themselves and their teams. By averaging both self-ratings and group-ratings within each team, we were able to compare both approaches to group characteristics and found them to likely measure unrelated constructs. We also found influences of individual Extraversion and Agreeableness from the HEXACO model on direct group characteristic ratings beyond the influence of the actual group. Years of work experience and work strain operationalized through burnout symptoms did not predict group characteristic ratings beyond the influence of the actual group and individual personality. Our findings imply that individual ratings of a group characteristic are influenced to a larger degree by the raters' individual perspectives than by the presumed actual group characteristic itself. Further implications for research applying individual personality to groups are discussed.

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3.2.2 Introduction

Individual personality characteristics, such as extraversion or neuroticism, represent stable behavioral patterns of perceiving the world and interacting with it. Trait scores on personality dimensions such as the Big Five (McCrae & Costa, 1999) or dimensions of the HEXACO model (Ashton & Lee, 2007) have been shown to influence general lifestyle choices and aspirations (Visser & Pozzebon, 2013), as well as general worldviews and attitudes (Leone, Desimoni, & Chirumbolo, 2012).

When individuals rate characteristics of themselves, great care is usually taken to ensure the validity of these self-reports. Normally, self-reports in which individuals rate their usual ways of behaving and experiencing are not simply relied on, and the validity of such self-reports is often determined through multiple other criteria, such as by their consensus with peer-reports, by their ability to predict actual behavior, or through correlation with socially desirable response styles. However, when individuals rate characteristics of a group they belong to, it is assumed that these group ratings are valid representations of group characteristics, i.e., that individuals are able to reliably and validly rate characteristics of their actual group (for examples, see: Anderson & West, 1998; Bjornberg & Nicholson, 2007).

As a result of this assumption, the role of the individual perspective and what it is influenced by aside from the actual group is usually forgone and there is a lack of research on how individual personality (and other individual characteristics) predict how individuals perceive and rate characteristics of groups they belong to. An examination of this influence is rather important, as both its extent and its mechanics are unknown, and the finding of a large extent of influence would call the implicit assumption of valid group characteristic ratings by group members into question in a few ways. Such a finding would imply that group characteristics might have to be conceptualized and measured differently than they are now. This is especially relevant for research trying to establish connections between group characteristics rated by the group members and other group-level constructs such as work

performance or problem solving, as such connections rely on group characteristic ratings being reliable and valid in the first place.

Our study is also relevant for all research that involves group personality composition and the calculation of group means across individual member characteristics, which is very common (Barrick, Stewart, Neubert, & Mount, 1998), as we will outline both theoretical and potential practical shortcomings of this approach. Finally, this study challenges the validity of the also very common measures of group characteristics that rely on group members rating these characteristics (e. g. Anderson & West, 1998) and the usage of averages of those ratings per team. We were able to show that individual members' ratings of group characteristics are influenced to a considerable degree by factors beyond the influence of the actual group and its presumed latent characteristics.

In our research, we analyze group-level and individual-level influences on group characteristic ratings separately, which are usually difficult to separate at all, because a difficult-to-achieve sample collection and study design is required. In doing so, we will also examine the common approach of calculating group means of individual member personality traits.

3.2.2.1 Measuring Psychological Group Characteristics

In past research, group characteristics have been conceptualized and measured through what we label either an indirect or a direct approach. Both will be explained in detail below.

3.2.2.1.1 The indirect approach. Group characteristics are sometimes conceptualized as composites that can be calculated or inferred from the individual characteristics of the group members. This approach commonly employs the individual personality trait scores of the group members to calculate group averages for each trait, treating those means as characteristics of the group (e.g., Barrick et al., 1998; Dang & Ilgen, 2006). This approach usually employs group means in the dimensions of the Five Factor Model (McCrae & Costa, 1999) (e.g., Barrick et al., 1998; Halfhill, Nielsen, Sundstrom, & Weilbaecher, 2005; Homan

et al., 2008; Neuman, Wagner, & Christiansen, 1999; van Vianen & De Dreu, 2001). The typical areas of interest that this approach is used in are work teams and their performance (Barrick & Mount, 1991; Homan et al., 2008).

In studies using this indirect approach employing the Five Factor Model, individual personality traits applied to the group have been unable to consistently predict outcomes such as group performance (Barrick et al., 1998; Barry & Stewart, 1997; Bond & Shiu, 1997; Halfhill, Nielsen, et al., 2005; Neuman et al., 1999; van Vianen & De Dreu, 2001). Group performance is usually operationalized through task completion speed and accuracy and usually rated by a supervisor. These findings are summarized in two meta-analyses with an overlap of only eight studies (Bell, 2007; Peeters, van Tuijl, Rutte, & Reymen, 2006). Apart from group mean conscientiousness with small or small to medium effects (according to Cohen, 1992), these meta-analyses report different results for the influence of the group means in the Big Five traits on group performance. Even these two meta-analyses (concerned with the same phenomenon but citing mostly different studies) arrive at different conclusions, highlighting the inability of group-level means of individual personality to predict group performance specifically. These findings are to some extent in line with meta-analyses concerned with Big Five characteristics and job performance on the individual level (Barrick & Mount, 1991; Hertz & Donovan, 2000), in which only individual conscientiousness and emotional stability emerged as generalizable predictors; however, in our opinion, individual personality applied to the group level through group means should be treated as a different domain, which will be explained below.

To our knowledge, there is no theoretical justification or empirical evidence to support the assumption that individual-level traits can be applied to the group in such a way and that personality traits applied to the group can be treated as conceptually the same as at the individual level (the fact that extraversion has been established as an individual-level trait does not imply that extraversion is also necessarily a group-level trait). In his article on group

composition typology, Chan (1998) voices a similar concern: When individual characteristics are aggregated at the group level, a composition theory that specifies the supposed relationship between the individual-level and the group-level constructs is of critical importance to present a substantive meaning for the group mean. Chan also explains that this need for a composition theory remains true even for constructs where consensus within the group is not necessary or logical, which is the case when individual personality traits are averaged within the group. To our knowledge, such a composition theory for individual personality traits applied to the group-level has not been given so far. There also appears to be no rationale for how to choose the specific method for calculating a group trait score from individual scores. A simple group mean score might be just as plausible or implausible as extremity-weighted means (e.g., Halfhill, Sundstrom, Lahner, Calderone, & Nielsen, 2005) or variability measures (e.g., Homan et al., 2008).

For these reasons, the relation between individual group members' personalities and the group's characteristic has been up for debate, and the indirect approach to measuring group characteristics using individual-level personality scores has been criticized (Chan, 1998; Dang & Ilgen, 2006; Shoda, LeeTiernan, & Mischel, 2002).

3.2.2.1.2 The direct approach. In the direct approach to measuring psychological group characteristics, each group member rates their group's characteristic by rating their group's behavioral tendencies (e.g., "I believe that the team is open to changes" or "There is mutual trust in our team"). The group mean score of these ratings is then used as a characteristic on the respective dimension (for examples, see: Anderson & West, 1998; Bjornberg & Nicholson, 2007).

There are multiple conceptualizations of group traits using the direct approach, often under the label of group climate (Hellriegel & Slocum, 1974). Group climate has been researched in different types of groups, such as work teams (Anderson & West, 1998), families (Bjornberg & Nicholson, 2007; Roth, 2002), therapy groups (Law et al., 2012;

MacKenzie & Tschuschke, 1993), and sports groups (Carron, Widmeyer, & Brawley, 1985; Eys, Lougheed, Bray, & Carron, 2009).

Most group climate conceptualizations so far have been created primarily for specific types of groups, which makes it difficult to compare results of multiple studies using different types of groups. Therefore, a more universal group characteristic concept has been introduced by Deckers, Altmann, and Roth (2018) with the dimensions group openness and cohesion. Here, group openness is conceptualized as a generalized outward orientation of the group (i.e., how the group views and reacts to outside influences such as new members or other new impulses), whereas cohesion is conceptualized as a generalized inward orientation of the group (i.e., mutual support and affection between the group members). This group characteristic structure is conceptualized as applicable to various types of groups.

Numerous studies have explored group characteristics such as cohesion or within-group support as either predictors or outcomes of other group-level phenomena, such as group productivity or success (Carron & Spink, 1995; Cheng, Bartram, Karimi, & Leggat, 2016; Evans & Dion, 2012; Goh, Eccles, & Steen, 2009; Gully, Devine, & Whitney, 2012; MacKenzie & Tschuschke, 1993; Widmeyer, Brawley, & Carron, 1990). There is also a substantial body of literature on the influence of group-level characteristics on individual-level outcomes such as job satisfaction or social adjustment (Dackert, 2010; Glisson & James, 2002; Kivimaki et al., 2007; Kurdek, Fine, & Sinclair, 1995). There is also research on how individual-level traits, such as personality, influence how individuals perceive groups they are not part of. Much of this research is concerned with prejudice and intergroup conflict (for examples, see: Ekehammar, Akrami, Gylje, & Zakrisson, 2004; Turner, Dhont, Hewstone, Prestwich, & Vonofakou, 2014). The influence of individual traits on out-group attitudes is understandably deemed important to understand how out-group attitudes and prejudice are formed and how they can often be very far from the truth.

However, when individuals rate their own group, they are essentially treated as experts capable of valid group characteristic ratings: In comparison to the above research endeavors, the literature on how individual personality traits (and other individual-level traits) predict how individuals perceive and rate their own group is practically non-existent. Overall, differences in ratings between individuals in the same group are often neglected when these individuals rate their group (they are essentially voided and treated as measurement error when group means are calculated). Most studies are not designed in a way that allows for the separation of individual-level and group-level influences on how individual members perceive and rate their group, because studies with both multiple groups and multiple members per group rating the same characteristics are rare, as they require a difficult sampling process. Therefore, how individual personality characteristics and other individual-level traits influence how individuals perceive and rate their own group remains largely unexplored in the literature.

3.2.2.2 Research Goals

We had two research goals. First, we wanted to examine how the two approaches to measuring group characteristics are interconnected. We therefore examined the extent to which the group-level scores obtained by applying the indirect approach (the group average of individual personality self-ratings) would predict the group-level scores obtained by applying the direct approach (the group average of group characteristic ratings). Given that there is no inventory that can be used to assess both approaches assessing the same dimensions, we operationalized the indirect and direct approach by using two different inventories, as it has been done in previous research assessing the respective individual and group characteristics (for details, see Method section). Of course, differences between the two inventories include the specific item content and subscales. This problem will be discussed in detail in the discussion.

Second, we had specific expectations about which individual traits are related to the way individuals perceive and rate their groups' characteristics. As individual personality traits describe a general tendency to perceive and interact with the world, they can reasonably be assumed to influence how a person perceives and rates his or her own group independently from the actual characteristics of that group. In recent years, the HEXACO model of personality (Ashton & Lee, 2007) has been established as an alternative to the Five Factor Model (FFM; McCrae & Costa, 1999). It proposes six basic personality dimensions recovered from the personality lexicons of various languages (Lee & Ashton, 2008). Whereas the dimensions Extraversion, Openness, and Conscientiousness are similar to the corresponding FFM dimensions, the dimensions Emotionality and Agreeableness are only moderately correlated with the corresponding FFM dimensions (e.g., Ashton & Lee, 2009). In the HEXACO alignment, high Emotionality is a combination of low Emotional Stability and high Agreeableness, and high HEXACO Agreeableness is a combination of high Big Five Agreeableness and high Emotional Stability. The additional HEXACO dimension Honesty-Humility, which contains fairness and sincerity versus greed and conceit, has no direct counterpart in the FFM, but its highest correlation is with agreeableness from the FFM (Ashton & Lee, 2008). The HEXACO model explains additional variance in personality compared to multiple Big Five inventories. As shown by Ashton and Lee (2019), multiple Big Five inventories are lacking in at least one aspect captured by the HEXACO model. The HEXACO model can therefore be seen as a more complete operationalization of personality, which is why we employed it in this study. Especially the more "social" traits of the HEXACO model, agreeableness and extraversion, are likely to influence group perceptions. Besides the HEXACO dimensions, we found years of working experience and work strain as additional likely predictors in the literature. Age has been shown not to affect group cohesion ratings (Glass & Benshoff, 2002); we therefore wanted to examine whether this finding could be replicated using years of work experience as a predictor. Work strain (operationalized as

burnout symptoms) has been shown to negatively affect judgments of the self and others (Durkin, Beaumont, Hollins Martin, & Carson, 2016). It was therefore possible for work strain to affect an individual's perception of his or her (work) team as well.

In summary, we hypothesized the group means of the indirect approach to not significantly predict the group means of the direct approach, as outlined in our explanations for the theoretical issues with the indirect approach. We also hypothesized individual direct ratings of group characteristics to be significantly influenced by individual agreeableness and extraversion and by perceived work strain but not by years of working experience beyond the influence of the actual group characteristics.

3.2.3 Method

3.2.3.1 Sample, Data Structure, and Procedure

The sample for this study consisted of nurses organized in distinct teams in university hospitals. This specific sample was chosen because it was part of a larger research project, and team assignment is very distinct in nursing. The latter ensures that, when individuals rate the characteristics of their team, they have a clear picture of which group exactly they are rating. This provided a hierarchical data structure. Overall, 389 individuals participated in the study. We excluded teams in which fewer than four members participated in the study to ensure that calculating the means for each team would be meaningful. For the teams excluded in this way, the three or less team members representing their teams only formed an average of 8.71% of their team. This further justified their exclusion, as this percentage fell substantially below the percentage of representation in the non-excluded teams, from which we recruited an average of 25.97% of members per team. Team size ranged from seven to 71 members, with a mean team size of 26.6 members. The final sample consisted of 301 nurses from 54 different teams (80.5% women, 18.8% men, 0.7% did not indicate their gender). The age range in the sample was 20 to 61 years ($M = 37.5$, $SD = 11.2$). The range of years the participants had been working in nursing for was 1 to 42 years ($M = 16.0$, $SD = 10.45$). In

order to ensure valid ratings of group characteristics, we also assessed the time for which participants had been part of their team. Membership time ranged from 0.25 to 36 years ($M = 6.9$, $SD = 6.86$), median membership time was 4 years, and distribution of membership time was skewed, with a kurtosis of 2.667 and 65% of values being lower than the mean. Overall, only 3.7% of the sample had been with their team for less than one year.

Participants were recruited from four university hospitals in Germany (Cologne, Bonn, Essen, and Düsseldorf). They filled out all instruments employed in this study, along with items for demographic data, during normal working hours. All participants were informed about the purpose of this study in written form explaining that this study was part of a larger research project on psychological strain in nursing and its antecedents (both weakening and favoring) and development over time. All participants provided informed consent and participated voluntarily.

Data collection was done on set dates with all members of the team who were assigned to this work shift, which essentially ensured a random sampling per team, as the shift plans can be seen as largely random. This circumvents a potential selection bias. None of the participants selected in this way declined or withdrew from participation.

3.2.3.2 Operationalizations and Measures

All instruments used in this study were in the German language.

3.2.3.2.1 Individual personality and group characteristics obtained with the indirect

approach. To measure individual personality, we administered the German translation of the 60-item version of the HEXACO-PI-R (Ashton & Lee, 2009) by Ashton, Lee, Marcus, and De Vries (2007), which contains the dimensions Honesty-Humility (item example: “If I knew that I could never get caught, I would be willing to steal a million dollars”), Emotionality (item example: “I worry a lot less than most people do”), Extraversion (item example: “I rarely express my opinions in group meetings”), Agreeableness (item example: “People sometimes tell me that I am too critical of others”), Conscientiousness (item example: “I make

decisions based on the feeling of the moment rather than on careful thought”), and Openness to Experience (item example: “I would be quite bored by a visit to an art gallery”).

Cronbach’s alpha for the HEXACO-PI-R subscales was acceptable (Honesty-Humility $\alpha = .68$, Emotionality $\alpha = .74$, Extraversion $\alpha = .62$, Agreeableness $\alpha = .66$, Conscientiousness $\alpha = .68$, Openness to Experience $\alpha = .71$). All 6 dimensions were rated on a five-point Likert scale from 1 to 5. The response anchors were worded as the German equivalent to “strongly agree”, “agree”, “neutral (neither agree nor disagree)”, “disagree”, and “strongly disagree”. The HEXACO-model is an alternative to the Five Factor Model of personality (Ashton & Lee, 2007; McCrae & Costa, 1999), which captures individual personality as completely as possible, while still being close enough to the Big Five to enable comparisons between the present study and previous studies employing the indirect approach.

Group characteristic scores obtained with the indirect approach were also calculated using the team members’ individual HEXACO scores, meaning that each team was assigned a team-mean score for each of the six HEXACO dimensions.

3.2.3.2.2 Group characteristics obtained with the direct approach. Using the direct approach, group characteristics were measured with the Group Openness and Cohesion Questionnaire (GOCQ; Deckers et al., 2018). The GOCQ asks the individual to rate his or her entire group/team on seven items that measure Group Openness and 10 items that measure Cohesion (example item for Group Openness: “New ideas are considered in our team”; for Cohesion: “In our team, we have a ‘we’re all in the same boat’ attitude”). Cronbach’s alpha was good (Group Openness $\alpha = .90$, Cohesion $\alpha = .91$). Both dimensions were rated on a five-point Likert scale from 1 to 5 with the response anchors being worded the German equivalent to “totally agree”, “mostly agree”, “somewhat agree”, “agree a little bit”, and “do not agree at all”.

3.2.3.2.3 Work strain. Work strain was operationalized as burnout symptoms and measured with the Copenhagen Burnout Inventory (CBI; Kristensen, Borritz, Villadsen, & Christensen,

2005), which differentiates between three sources attributed to the burnout symptoms: Personal Burnout (six items, $\alpha = .87$), Work-Related Burnout (seven items, $\alpha = .86$), and Client-Related Burnout (six items, $\alpha = .78$). All three dimensions were rated on a five-point Likert scale from 0 to 4, as the authors recommended, with the response anchors being the same as for the GOCQ. A German translation of the CBI was created specifically for this study and its content equivalence was confirmed by native speakers of the German and English languages.

3.2.4 Results

Means and standard deviations of all used variables, along with their intercorrelations, are summarized in Table 5.

Table 5. Means and Standard Deviations for the GOCQ, Work Experience, HEXACO-PI-R, and CBI Variables, Combined with a Full Correlation

Table

	Descr. Stats.		Correlations											
	M	SD	Group Openness	Cohesion	Work Experience	Honesty-Humility	Emotionality	Extraversion	Agreeableness	Conscientiousness	Openness to Experience	Personal Burnout	Work-Related Burnout	Client-Related Burnout
Group Openness	3.11	0.73	1	.690*	.062	.070	.059	.179*	.215*	.101	-.088	-.171*	-.227*	-.139*
Cohesion	3.26	0.73		1	-.020	.079	.058	.199*	.220*	.078	-.114*	-.156*	-.215*	-.115*
Years of Work Experience	16.02	10.45			1	.110	-.105	.013	.030	.082	.161*	-.107	-.061	-.021
Honesty-Humility	3.61	0.55				1	-.154*	.043	.223*	.155*	.057	-.231*	-.218*	-.238*
Emotionality	3.12	0.54					1	-.197*	-.194*	.008	-.130*	.324	.234*	.107
Extraversion	3.59	0.41						1	.121*	.170*	.109	-.303*	-.309*	-.343*
Agreeableness	3.17	0.46							1	.025	-.063	-.249*	-.257*	-.209*
Conscientiousness	3.63	0.46								1	.127*	-.119*	-.113	-.044
Openness to Experience	3.38	0.58									1	-.050	-.013	-.039
Personal Burnout	2.01	0.67										1	.815*	.484*
Work-Related Burnout	1.65	0.70											1	.589*
Client-Related Burnout	1.20	0.63												1

Note. All correlations are based on individual scores and not team average scores. $N = 301$. Correlations flagged with a * are significant at

the $p < .05$ level.

3.2.4.1 Comparing the Group Mean Scores from the two Approaches

To assess the extent to which the two approaches for measuring group characteristics measured similar constructs, we ran two linear multiple regression analyses using the aggregated team-level means of the HEXACO dimensions as the predictors and the team-level means of the GOCQ dimensions Group Openness and Cohesion as the respective outcomes. The results, based on 54 teams, are presented in Table 6.

Table 6. Linear Multiple Regression Analysis with the Group-Level Means of the HEXACO Dimensions as Predictors of Group-Level Ratings of Group Openness (left) and Cohesion (right)

	Group Mean Group Openness Ratings						Group Mean Cohesion Ratings					
	B	SE (B)	β	p	R^2	Adj. R^2	B	SE (B)	β	p	R^2	Adj. R^2
Constant	-0.039	1.998		.985	.236	.138	-0.477	2.165		.827	.221	.122
Group mean Honesty-Humility	0.462	0.270	0.244	.094			0.290	0.293	0.142	.327		
Group mean Emotionality	0.168	0.223	0.109	.457			0.505	0.242	0.306	.043		
Group mean Extraversion	0.522	0.300	0.251	.089			0.650	0.325	0.291	.051		
Group mean Agreeableness	0.377	0.340	0.168	.273			0.346	0.369	0.144	.353		
Group mean Conscientiousness	-0.171	0.303	-0.080	.575			-0.258	0.329	-0.113	.437		
Group mean Openness to Experience	-0.446	0.225	-0.275	.054			-0.412	0.244	-0.237	.098		

Note. Group-level analysis with $N = 54$ teams.

Table 6 shows that group mean Emotionality was a significant positive predictor of group mean Cohesion, and all other B and β weights were nonsignificant. The overall regression model for group mean Group Openness was significant ($F(6, 47) = 2.418, p < .05$), while the overall regression model for group mean Cohesion was not significant ($F(6, 47) = 2.229, p = .057$). The adjusted R^2 showed that 13.8% of the variance in the group means in the Group Openness scale and 12.2% of the variance in the group means in the Cohesion scale were explained by the group means of the individual personality dimensions. In combination with the nonsignificant B and β weights, these small R^2 values are likely to be a product of chance instead of an indication of an actual connection in the population. Further evidence towards this is given by the fact that the only significant prediction was part of a model that failed to reach overall significance.

3.2.4.2 Predicting Individual Ratings of Group Characteristics from Other Constructs

Intraclass-Correlation-Coefficients (ICCs) for Group Openness and Cohesion revealed that 23% of the variance in Group Openness ratings and 37% of the variance in Cohesion ratings was variance at the group-level, respectively. These variance components are too low to conclude that the response patterns in the instrument GOCQ are only or even primarily influenced by a latent group characteristic structure. The amount of individual-level variance in these response patterns is substantial, which means that individual ratings of the group are likely influenced by other individual characteristics as well.

We used hierarchical regression analyses to find the incremental predictive contribution in explained variance of each dimension beyond the influence of the actual group. A method to exclude the influence of the actual group (characteristics) from the individual self-reported group characteristic ratings was needed, which we achieved as follows: As the best available proxy for the characteristics of the actual group, we calculated a new variable that assigned the mean team characteristic ratings to each individual but from which the respective individual was excluded. As an example, for a team with four members,

Member A was assigned the means of Group Openness and Cohesion ratings of Members B, C, and D, and the same procedure was applied to Members B, C, and D, respectively. Using this variable in the first step of the hierarchical regression analysis allowed us to exclude the group-level variance component (representing the influence of the actual group) in the first step, so that all subsequent steps used only the remaining individual-level variance in the dependent variable. Evidence for the success of this method is given by the fact that more variance was explained in this step for the variable with the higher ICC (Cohesion), as a higher ICC shows greater group-level influence.

After this step, the second predictor entered into the hierarchical regression was years of working experience, as we had no reason to expect any significant prediction through this factor, especially of variance that is explained by the other factors, as years of working experience only had a small significant correlation with openness to experience (see Table 5), which was by itself unlikely to contribute significantly to group characteristic ratings. The third step included individual personality, as this was our primary focus and has the broadest applicability of our research to other research involving group characteristic ratings in other domains. The inclusion of burnout symptoms was the final step. From the literature, we expected its contribution to the explained variance to be small, and we were interested in the effects of burnout symptoms beyond personality, which was our main focus. Personality is applicable to all human beings and therefore to all cases where individual group members rate characteristics of their group, while burnout is very likely specific to the sample used for this study. Therefore, using this order for the predictors somewhat strengthened generalizability. However, the alternative order for entering these last two predictors was equally justifiable, with burnout symptoms being used as a control variable before the influence of personality. We therefore performed additional analyses with this order, which did not affect the results in any substantial way.

Years of work experience, individual personality, and burnout symptoms were entered as predictors in subsequent steps in the hierarchical regression analyses. Tables 7 and 8 show the results for Group Openness and Cohesion, respectively.

Table 7. Hierarchical Regression Analysis with the Individual Rating of Group Openness as the Dependent Variable

	Step 1				Step 2				Step 3				Step 4				r_{cp}
	B	SE(B)	β	p													
Intercept	1.555	0.272		.000	1.482	0.279		.000	-0.723	0.682		.290	-0.398	0.771		.606	
Group Openness ratings (self excluded)	0.500	0.087	0.316	.000	0.500	0.087	0.316	.000	0.433	0.085	0.274	.000	0.420	0.086	0.265	.000	.316
Years of Work Experience					0.004	0.004	0.064	.244	0.005	0.004	0.074	.172	0.005	0.004	0.071	.194	.062
Honesty-Humility									0.010	0.074	0.007	.895	0.003	0.075	0.002	.969	.070
Emotionality									0.150	0.077	0.110	.051	0.179	0.079	0.131	.024	.059
Extraversion									0.264	0.098	0.150	.007	0.241	0.103	0.137	.020	.179
Agreeableness									0.299	0.088	0.190	.001	0.274	0.089	0.174	.002	.215
Conscientiousness									0.090	0.088	0.056	.309	0.072	0.088	0.045	.416	.101
Openness to Experience									-0.094	0.070	-0.074	.180	-0.085	0.070	-0.067	.222	-.088
Personal Burnout													0.027	0.103	0.025	.790	-.171
Work-Related Burnout													-0.195	0.103	-0.187	.060	-.227
Client-Related Burnout													0.099	0.080	0.084	.220	-.139
ΔR^2					.004				.074				.017				
R^2	.100				.104				.178				.195				
Sign. ΔR^2	<.001				.244				<.001				.110				

Note. Individual-level analysis with $N = 301$ individuals. r_{cp} shows the Pearson-correlation between the dependent variable and the predictors. The p -values for ΔR^2 for each model are obtained through the respective F-statistic, which is not displayed in the table.

Table 8. Hierarchical Regression Analysis with the Individual Rating of Cohesion as the Dependent Variable

	Step 1				Step 2				Step 3				Step 4				r_{cp}
	B	SE(B)	β	p													
Intercept	1.011	0.234		.000	1.036	0.240		.000	-1.108	0.620		.075	-0.955	0.691		.168	
Cohesion ratings (self excluded)	0.690	0.071	0.491	.000	0.690	0.071	0.491	.000	0.657	0.070	0.467	.000	0.651	0.070	0.464	.000	.491
Years of Work Experience					-0.002	0.004	-0.023	.645	-0.002	0.003	-0.023	.642	-0.002	0.003	-0.028	.575	-.020
Honesty-Humility									0.045	0.067	0.034	.505	0.046	0.069	0.035	.503	.079
Emotionality									0.056	0.071	0.041	.433	0.089	0.073	0.065	.226	.058
Extraversion									0.279	0.089	0.158	.002	0.274	0.094	0.155	.004	.199
Agreeableness									0.312	0.080	0.197	.000	0.294	0.081	0.186	.000	.220
Conscientiousness									0.057	0.080	0.036	.478	0.036	0.080	0.022	.653	.078
Openness to Experience									-0.082	0.064	-0.065	.200	-0.073	0.064	-0.058	.251	-.114
Personal Burnout													-0.002	0.094	-0.002	.986	-.156
Work-Related Burnout													-0.166	0.094	-0.159	.079	-.215
Client-Related Burnout													0.134	0.073	0.114	.067	-.115
ΔR^2					.001				.078				.016				
R^2	.241				.242				.320				.336				
Sign. ΔR^2	<.001				.645				<.001				.074				

Note. Individual-level analysis with $N = 301$ individuals. r_{cp} shows the Pearson-correlation between the dependent variable and the predictors. The p -values for ΔR^2 for each model are obtained through the respective F-statistic, which is not displayed in the table.

Individual ratings of both Group Openness and Cohesion were significantly influenced by individual personality, specifically by Extraversion and Agreeableness values, with those predictions being positive. The other four HEXACO dimensions were not significant predictors. Years of work experience and burnout symptoms did not explain a significant amount of variance in group characteristic ratings beyond the other constructs. The results were the same for the Group Openness and Cohesion ratings concerning the significance of the predictors. The overall regression model for Group Openness ratings was significant ($F(11, 289) = 6.365, p < .001$), as was the overall regression model for Cohesion ratings ($F(11, 289) = 13.306, p < .001$). Further analyses with the order of the last two steps switched did not provide different results.

3.2.5 Discussion

3.2.5.1 Summary of Goals and Interpretation of Results

The first goal of this study was to compare two approaches (direct and indirect) to conceptualizing and measuring psychological group characteristics to see if they measured similar constructs. These approaches describe different ways of creating group characteristics from either individual self-ratings or individual group-characteristic ratings. The second goal was to further examine influences on individuals' perspectives on their ratings of group characteristics in the direct approach. We examined individual personality on the HEXACO dimensions, years of work experience, and work strain (operationalized as burnout symptoms) as predictors of group characteristic ratings.

In the present study, the scores obtained by applying the indirect approach did not predict the scores obtained by applying the direct approach, indicating that the two approaches might measure unrelated constructs. However, the question remains whether the missing associations are attributable to the constructs actually being unrelated or to differences between the modes of measurement.

Of course, the HEXACO-PI-R asks the respondents to rate themselves, while the GOCQ asks the respondents to rate their group. However, the inventories also differ with respect to their respective subscales. The HEXACO-PI-R assesses honesty-humility, emotionality, extraversion, agreeableness, conscientiousness, and openness to experience as fundamental traits in individuals (Ashton & Lee, 2007). The GOCQ assesses cohesion and group openness as the fundamental characteristics of groups (Deckers et al., 2018). It can be argued that GOCQ cohesion may be comparable with HEXACO agreeableness and GOCQ group openness with HEXACO openness because of somewhat similar item content in the two inventories, e.g., “I tend to be lenient in judging other people” for HEXACO-PI-R agreeableness and “Everybody can freely bring up mistakes in the team” for GOCQ cohesion, and “I like people who have unconventional views” for HEXACO-PI-R openness to experience and “New ideas are considered in our team” for GOCQ group openness. However, the subscales differ of course in many other items and their primary focus. For instance, HEXACO openness is based more strongly on cultural and intellectual orientation than GOCQ group openness. With the presented findings, it remains uncertain to what extent the two inventories assess comparable or related constructs (independently of the respective approach to individual or group characteristics).

Therefore, it is also possible that the non-significant associations must simply be attributed to differences between the measures on the item and subscale levels – the measures may differ too much to detect similarities between the underlying constructs. Therefore, when interpreted conservatively, this study is only able to show that the indirect and direct approaches create unrelated group-level variables when operationalized through the HEXACO and GOCQ domains. However, for more conclusive evidence towards the two approaches being unrelated, future studies need to operationalize both approaches using the same items content.

Such a measure could be a re-wording of the HEXACO-PI-R with the entire team as the referent. However, this is problematic, as many of the HEXACO-PI-R items turn out to lose their meaning when re-worded in such a way, as they are not applicable to the group level. Examples include the item “The first thing that I always do in a new place is to make friends”, which is difficult to rate at all for an already established group, or “When I suffer from a painful experience, I need someone to make me feel comfortable”, or “I’ve never really enjoyed looking through an encyclopedia”, which are hardly applicable to the group level. We therefore decided on the GOCQ as the best available proxy for the “actual” latent group characteristics we aimed to measure. A specific direction for future research can be the development of an inventory that measures characteristics that are applicable to both individuals and groups to better compare the indirect and direct approaches.

The ICCs for the direct approach ranged from 23% (group openness) to 37% (cohesion). ICCs between .2 and .4 are rarely found when multiple individuals rate the same characteristic and can be considered high (Hox, 2010). Combined with our results, this seems to indicate that individual ratings of a group characteristic are always influenced to a larger degree by the raters’ individual perspectives than by the presumed actual group characteristic itself.

Only extraversion and agreeableness were significant predictors of individual ratings of group openness and cohesion beyond the influence of the group, and all predictions were positive (e.g., higher extraversion was associated with a higher rating of cohesion). Higher agreeableness might lead an individual to avoid conflict situations (McCrae & Costa, 1999), therefore missing the type of group behaviors that might negatively affect ratings of group openness and cohesion. Higher extraversion generally leads to more social interaction with a tendency to seek positive interactions (McCrae & Costa, 1999), allowing an individual to more accurately rate group openness and cohesion and to rate his or her group more positively.

Years of work experience did not significantly predict ratings of group characteristics. This finding was expected, given that years of work experience was highly correlated with age, and age was shown to not predict individual ratings of cohesion (Glass & Benshoff, 2002).

The three facets of burnout did not significantly predict ratings of group characteristics. High work strain (manifested as burnout symptoms) might be a phenomenon that is more “contained” within the individual, and it might be that individuals do not let burnout symptoms affect how they view their team.

It is possible that the similar relationships that we observed for both group openness and cohesion in strength and direction of the predictions reflect members’ positive attitudes towards their group. Future research could include an explicit or implicit measure of positive and negative affect to examine such a possible moderation effect.

Overall, only 19.5% of group openness rating variance and 33.6% of cohesion rating variance was explained by the variables we included. Other factors likely influence how an individual perceives and rates his or her team, but such factors have not been explored in past research and were not included in our study.

This study was conducted in a workplace setting. Although group openness and cohesion are hypothesized to be applicable to all groups, group members in different types of groups might rate them differently. On the other hand, this sample comes with high ecological validity: Work teams are not artificially created as groups in laboratory studies often are, and instead share a longer and more intimate history, and frequently spend multiple hours per day together.

3.2.5.2 Limitations

Most importantly, we operationalized the indirect and direct measurements through instruments containing different items and conceptually different subscales. This offers an alternative explanation for the absence of significant connections between the approaches, as

discussed above. Further evidence for connections between the approaches, or a lack thereof, could be obtained through the development of a more parallel measure that is applicable to both individuals and groups, e.g., by using the same or very similar items for both self- and group ratings (e.g.: “Changes make me / us uncomfortable”).

We cannot test to what extent the findings of this study translate to very small teams (e.g., with five or less members), as the smallest team in our sample consisted of seven members. In the initial publication of the GOCQ (Deckers et al., 2018), it has been shown that cohesion ratings differ only between medium-sized teams (15-22 members) and large teams (24-60 members), and that group openness ratings are unaffected by team size. GOCQ ratings in this study might therefore be applicable to small teams, but it is unknown to what extent the indirect approach variables are affected by team size.

It was rarely possible for us to recruit full teams (due to organizational and time constraints); therefore, we essentially sampled team members per team. Results might differ when full teams are assessed, especially for the indirect approach, as recruiting full teams should lead to a more accurate result when group means are calculated. However, standard deviations in each team for both the direct and the indirect approach measures did not significantly correlate with the percentage of assessed team members, indicating that, at least for dispersion measures, assessing a larger portion of the teams would likely not have affected the results.

Related to this, we did not examine minima and maxima in the indirect approach, as we could not ensure that the team member with the highest individual characteristic value was part of the sample.

As this study was neither longitudinal nor experimental in its nature, it is not possible to draw causal conclusions from it. Finally, it is possible that the responses obtained through the instruments are affected by common method bias, although the many insignificant correlations between the variables provide some evidence against this.

This study was conducted in a workplace setting, so the results obtained here might not be applicable to other types of groups. Even though Group Openness and Cohesion are hypothesized to be applicable to all groups, group members in different types of groups might rate them in different ways. Related to this, the work setting might make it less likely for groups to contain individuals with similar individual personality characteristics, compared with, for example, friendship groups. In a work setting, the members are often assigned to a group by supervisors, and thus, the group members most likely do not play a role in the decision.

The findings presented in Table 6 are based on team averages with a sample size of $N = 54$ teams. With this relatively low sample size, a satisfactory statistical power of $1 - \beta > 0.8$ can only be reached for medium to large effects ($f^2 > 0.28$). It is therefore possible that small population-level effects could not have been detected with this sample.

Finally, for a comparison of this study with past research involving the Big Five personality traits applied to the group level, differences between the Five Factor and HEXACO models must be taken into consideration.

3.2.5.3 Conclusion

We recommend that researchers who are interested in group-level characteristics use a direct measure to assess these characteristics by having all group members rate the group directly. However, if the data show that there is a lack of overlap between the group members in rating this characteristic, the individual perspective of the group members should be examined further. Based on this study, important goals of future research should be to better understand how individual ratings of group characteristics are formed, and how individual-level characteristics can be used to construct meaningful group-level characteristics.

Additionally, future research concerned with comparisons between the direct and the indirect approaches to group characteristics should include external criteria of validity for both. The results of this study, along with the results of the cited meta-analyses, provide some

evidence against the validity of the indirect approach, however, more research is needed for meaningful conclusions about it.

This study also provides an interesting avenue for potential new ways to characterize groups through member ratings: The approach of excluding variance explained by the ratings of the other group members from each individual rater could potentially be reversed to obtain a better proxy for the actual latent group characteristic than simple group means could ever be.

Overall, this study provides theoretical and practical implications for both direct and indirect conceptualizations of group characteristics, and therefore for researches using either approach to characterize groups and assess connections with other group-level phenomena.

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3.3 Research paper 3: The Influence of Individual Personality Traits and Team Characteristics on Training Transfer: A Longitudinal Study (Working Title)⁴

3.3.1 Abstract

Previous research has established that the successful transfer of training contents into daily work life depends on both the trainee's individual characteristics and the characteristics of their work team. Specifically, multiple meta-analyses and reviews have confirmed that individual openness to experience, agreeableness, and neuroticism, along with cohesion and transfer climate within the team influence training transfer. The present study is the first to operationalize and measure both individual and team characteristics in the same sample with a longitudinal study design, enabling a comparison. Training transfer was operationalized as changes in psychological strain following an intervention. In a sample of 275 nurses, using multilevel analysis techniques, influences of individual personality characteristics on training transfer were not found, but influences of team cohesion and the mean conscientiousness of the team members on training transfer were found. However, these influences were not in the expected direction. This can be explained in part by the development pattern in the data, where individuals with higher initial values on psychological strain improved more, but some aspects of the results remained unexplained. Generally, the results suggest that team characteristics are more important than individual characteristics for training transfer. Theoretical and practical implications for future studies are discussed.

3.3.2 Introduction

In all types of work, organizations frequently conduct some form of job training aimed at improving either the performance or the psychological well-being of their employees (e.g., Hayes et al., 2004; Maddi, Kahn, & Maddi, 1998; Shapiro, Brown, & Biegel, 2007; Slaski & Cartwright, 2003). However, it has been known for some time that such training does not

⁴ Based on: Deckers, M., Altmann, T., & Roth, M. (submitted). The Influence of Individual Personality Traits and Team Characteristics on Training Transfer: A Longitudinal Study.

always lead to actual changes in behavior on the job - an observation that has been labeled the “transfer problem” (Burke & Hutchins, 2007; Ford & Weissbein, 1997) because it is believed to arise from an insufficient transfer of the training contents to daily work life. This has resulted in the questions: Under which specific circumstances is training effective, and which factors influence training transfer?

Broadly defined, training transfer refers to the application of new information or behavior from an intervention or training to daily work life (Burke & Hutchins, 2007). In practice, training transfer is rarely dichotomous in the sense that an intervention or training either has an effect or does not, but it is rather differential in that individuals participating in training can experience anything from strong negative to strong positive effects (Burke & Hutchins, 2007; Cheng & Ho, 1999; Colquitt, LePine, & Noe, 2000; Grossman & Salas, 2011). Essentially, training transfer can be seen as the extent to which training results in the desired effect.

Important factors influencing training transfer beyond the design of the training or the intervention itself (Rowe, 2000) have been identified in past research. It is well-accepted that the characteristics of the individuals participating in the training (e.g., extraversion) as well as the characteristics of the teams or organizations these individuals work in (e.g., team cohesion) have been shown to (independently) affect training transfer (Burke & Hutchins, 2007; Cheng & Ho, 1999; Colquitt et al., 2000). What is missing from the literature on training transfer are studies that directly compare the characteristics of the individual and the characteristics of their work environment in their ability to influence training transfer. Such a direct comparison has been called for multiple times in literature reviews of the phenomenon. For example, Cheng and Ho (1999) maintain that “some new individual, motivational and environmental constructs are recommended to be incorporated in newly created models” (p. 115) and “(...) a set of critical constructs will be distilled” (p. 115), highlighting that the goal of new research should be to identify which factors are more important for training transfer

and which play less of a role. Burke and Hutchins (2007) stated that “Research should theorize and assess training transfer as a multidimensional phenomenon with multilevel influences” (p. 287), with the latter referring to the fact that both individual and team characteristics influence training transfer simultaneously and independently. In addition, both reviews, along with older work (Baldwin & Ford, 1988; Ford & Weissbein, 1997), call for more longitudinal research to be conducted on training transfer. For these reasons, there is a need for longitudinal studies to examine the influence of both individual and team characteristics on training transfer in order to find out which is the more important influential factor.

The present study adds to the literature on training transfer by examining the extent to which characteristics of individuals and characteristics of their work teams influence training transfer after an intervention. We implemented the suggestions made in past work by conducting a longitudinal study and examining both individual and team characteristics in our sample, enabling a comparison between them.

3.3.2.1 Effects of Personality and Team Characteristics on Training Transfer

3.3.2.1.1 Overviews and meta-analyses on training transfer. In the following sections, we summarize literature reviews and meta-analytic results of studies that have been concerned with training transfer and have assessed individual personality or team characteristics. In general, the literature has shown that studies have examined the influence of individual or team characteristics, but so far, these two levels of characteristics have not been directly compared in the same study. As a typical example and a frequently cited review of early work, Cheng and Ho (1999) reported that effective transfer is based on individual-level and organization- or team-level (often also called environmental-level) variables. The authors also explained that motivation variables and locus of control have been researched as predictors of training transfer at the individual level, but personality dimensions such as the Big Five have not yet been the focus of such studies. They also explained that successful

training transfer is more likely to occur when some form of social support and some form of what is often called “transfer climate,” with members being more open to change and innovation, exist at the team level.

With the intention of creating an overarching theory of training motivation, Colquitt et al. (2000) conducted a meta-analysis with a large body of studies concerned with many different types of training (e.g., job skill trainings or active stress reduction interventions) in which differential training transfer effects were reported. The authors identified the relevance of trait anxiety on the individual level and positive climate on the team level for training transfer. They reported that more anxious people had less successful transfers (and other training outcomes), and a more positive general organizational climate led to more successful transfers. The authors found mixed results for conscientiousness (from the Five Factor Model; McCrae & Costa, 1999), which had a positive relationship with motivation to learn but a negative relationship with skill acquisition in training. Their study once again underlined the relevance of both individual-level and team- or organization-level premises for training transfer as both personality and climate explained variance in training transfer independently of each other and beyond several other more proximal predictors (e.g., self-efficacy). Overall, the authors explained that personality should be considered a particularly important predecessor of successful training transfer, and they called for more research in this area: “(...) the fact that so few personality variables have been examined with great frequency suggests that much more research needs to be done in this area. Future research might expand the breadth of personality variables, possibly by examining trait goal orientation, other Big Five variables [i.e., other than conscientiousness; author’s note], or affectivity” (p. 699).

An integrative review of the literature on training transfer (using studies concerned with a variety of training forms involving some form of skill acquisition), containing a closer inspection of individual characteristics, intervention design factors, and work environment characteristics, was given by Burke and Hutchins (2007). Individual characteristics that were

found to be especially relevant included neuroticism (with a negative relationship with training transfer) and openness to experience (with a positive relationship with training transfer). Among the less influential factors, conscientiousness was identified as having “mixed support” (in line with Colquitt et al., 2000) and extraversion as having only received minimal attention in empirical research. Relevant work environment factors included a transfer climate (in line with Cheng & Ho, 1999), which describes a general climate of openness and encouragement for the acquisition and use of new skills, and peer support, which describes a climate of mutual support and high cohesiveness within the organization or team. The effects of peer support have also been found to differ from those of supervisor support as both can influence training transfer independently. The authors also once again stated that a comparison of multiple different factors in successful training transfer should be the focus of research.

3.3.2.1.2 Single studies on training transfer. Our study focuses on an intervention aimed at reducing psychological strain. Therefore, to provide additional relevant information here, we first summarize recent studies that have evaluated training transfer for interventions concerned with psychological strain.

In a study that reported differential training effects of a burnout intervention program for oncology care providers (based on support group meetings in which work-related feelings were shared and problems were discussed), Le Blanc, Hox, Schaufeli, Taris, and Peeters (2007) found that changes in burnout over time covaried with changes in job characteristic perceptions in the training group. However, effects based on personality or team characteristics were not explored. In a study with somewhat counterintuitive results, Beehr, Ragsdale, and Kochert (2015) found that individual responses to a training situation in which stress increased (a 3-month soldier training program aimed at increasing relevant skills and physical fitness) depended on the individuals’ neuroticism, which worked to *decrease* the stress response. This was unexpected, especially because individuals high in neuroticism had

higher overall stress levels at the beginning of the program. Finally, in a study on the effectiveness of a intervention to reduce burnout in teachers that was based on improving their socioemotional skills when interacting with students, Castillo-Gualda, Herrero, Rodríguez-Carvajal, Brackett, and Fernández-Berrocal (2019) found that teachers higher in agreeableness had a larger burnout reduction effect after the intervention. But this study also did not assess differences in intervention effectiveness due to team- or organization-level factors.

To sum up, the literature on effects of personality traits and team characteristics on training transfer has relatively clearly shown the importance of peer support and transfer climate. The literature is less clear on the importance of individual personality, although there is some evidence that openness to experience and agreeableness are beneficial for successful transfer and even specifically for burnout reduction in the case of agreeableness (Castillo-Gualda et al., 2019). There is also evidence that neuroticism has an effect, although the direction is not clear-cut given the counterintuitive results found by Beehr et al. (2015). Similarly, conscientiousness has received mixed results concerning its importance in explaining differential effects in training transfer. Taking these results into consideration, a comparison of the abilities of individual and team characteristics to predict training transfer is a logical step, which is also in line with the conclusions of the literature reviews (Burke & Hutchins, 2007; Cheng & Ho, 1999; Colquitt et al., 2000).

3.3.2.2 Approach of the Present Study

The goal of the present study is to compare individual and team characteristics in their ability to uniquely predict training transfer by overcoming the limitations of the previous studies described above. For this purpose, we assessed individual and team characteristics, individual training transfer, and team membership in a sample of healthcare professionals before and 3 to 4, 7 to 8, and 11 to 12 months after they took part in a professional 2-day training program using a longitudinal multilevel modeling approach. Individual characteristics

were operationalized as individual personality traits from the HEXACO model (Ashton & Lee, 2007), which has been established as an alternative to the Five Factor Model and has been shown to represent human personality more completely (Ashton & Lee, 2019). Team characteristics were operationalized according to direct and indirect measurement approaches, which we aimed to differentiate as a secondary goal (for an overview, see Barrick, Stewart, Neubert, & Mount, 1998; Dang & Ilgen, 2006).

We operationalized training transfer as reductions in psychological strain following the aforementioned intervention: We essentially assumed that individuals who successfully transferred the contents of the intervention into their daily work life would reduce their psychological strain over time, with better transfer leading to greater reductions in psychological strain. The intervention itself was based on empathy-based communication practices and self-reflection and is described in more detail in the Method section.

On the basis of the results found in the literature, we formulated the following expectations for our study: We expected that individual neuroticism would negatively influence training transfer after the intervention (even though the direction of this influence was unclear because of the mixed results from past research, there appeared to be slightly more evidence for a negative influence). We expected that agreeableness would positively influence training transfer, and we expected that team cohesion and transfer climate within the team would positively influence training transfer.

3.3.3 Method

3.3.3.1 Procedure

3.3.3.1.1 Intervention design. This study was part of a larger multicentric study in which the effectiveness of an intervention was examined. The intervention was aimed at reducing psychological strain in nurses and consisted of a 2-day professional training intervention, combined with a 4-hr coaching session approximately 3 months later. The training focused on empathic responses in emotionally challenging interactions and the long-

term psychological effects on caregivers of the so-called “empathic short-circuit” in such situations (Altmann & Roth, 2013). Through specific exercises on the perception of emotions and needs in oneself and others and through communication exercises on these topics, the training aimed to reduce psychological strain created through maladjustment to the emotional demands of the nursing profession. The contents and goals of the intervention are summarized in Table 9, and more information about the intervention is given in Thiry, Schönefeld, Deckers, and Kocks (in press).

Table 9. Contents of the Intervention

Training day	Key components
Day 1, first half	<ul style="list-style-type: none"> • Creating awareness of the topic • Psychological mechanics of empathy and pseudo-empathy
Day 1, second half	<ul style="list-style-type: none"> • Partner and group exercises on describing behavior without judgment and on recognizing and describing emotions in oneself and others • Partner and group exercises on empathic listening • Theory of needs and strategies
Day 2, first half	<ul style="list-style-type: none"> • Partner exercises on empathic communication • Discussing ideas for practical solutions
Day 2, second half	<ul style="list-style-type: none"> • Discussing the utility and feasibility of empathic communication in difficult situations • Integrating the contents into daily work life • Group and partner exercises using examples based on work experience
Coaching session	<ul style="list-style-type: none"> • Discussing and solving practical issues and situations that occurred after the training • Recollection of key theoretical components

3.3.3.1.2 Data collection and sample. The data were collected in four university hospitals in Germany at four evenly spaced measurement points (labeled t0, t1, t2, and t3) over the span of 1 year (with on average 3 to 4 months between the waves) for both an

intervention group and a control group. The first measurement occasion, t0, took place right before the intervention for the intervention group (see Table 10).

Table 10. Sample Data Presented Separately for the Intervention and Control Groups

	Measurement occasion	<i>N</i>	Dropout from t0	Dropout from previous occasion	Age <i>M (SD)</i>	Gender
Intervention group	t0	275			36.94 (11.00)	79.9% female
	t1	238	37	37		
	t2	198	77	40		
	t3	178	97	20		
Team analyses subsample	t0	245				
	t1	208	37	37		
	t2	169	76	39		
	t3	150	95	19		
Control group	t0	184			39.22 (11.34)	80.6% female
	t1	151	33	33		
	t2	143	41	8		
	t3	141	43	2		

Note. The “team analyses subsample” consisted of nurses from 38 teams from which we assessed three or more members at t0. On average, 28.12% of the respective team was represented in this way.

3.3.3.2 Measures

3.3.3.2.1 HEXACO-PI-R. We used the revised, 60-item form of the HEXACO Personality Inventory (HEXACO-PI-R; Ashton & Lee, 2009). The HEXACO model of personality has been established in recent years as an alternative to the Five Factor Model (Ashton & Lee, 2007, 2019; McCrae & Costa, 1999). The HEXACO model contains the dimensions Honesty-Humility (example item: “I would never accept a bribe, even if it were very large”), Emotionality (example item: “I sometimes can't help worrying about little things”), Extraversion (example item: “In social situations, I’m usually the one who makes the first move”), Agreeableness (example item: “I tend to be lenient in judging other people”),

Conscientiousness (example item: “I often push myself very hard when trying to achieve a goal”), and Openness to Experience (example item: “If I had the opportunity, I would like to attend a classical music concert”). All six dimensions were rated on a 5-point Likert scale from 1 to 5, and the response anchors were worded as *strongly agree*, *agree*, *neutral (neither agree nor disagree)*, *disagree*, and *strongly disagree* (all translated into German). For all scales, Cronbach’s alpha was acceptable (Honesty-Humility $\alpha = .68$, Emotionality $\alpha = .74$, Extraversion $\alpha = .62$, Agreeableness $\alpha = .66$, Conscientiousness $\alpha = .68$, Openness to Experience $\alpha = .71$). The HEXACO-PI-R was applied at t0 only.

3.3.3.2.2 Group Openness and Cohesion Questionnaire. To measure group characteristics, we employed the relatively new Group Openness and Cohesion Questionnaire (GOCQ; Deckers, Altmann, & Roth, 2018). This instrument measures group characteristics on the dimensions Group Openness and Cohesion, which are theorized to be fundamental to the characterization of groups and applicable to all types of groups. Each individual team member was asked to rate their entire team on 10 items that measure Cohesion (example item: “In our team, problems can be freely brought up”) and seven items that measure Group Openness (example item: “Bringing new ideas into our team is difficult”), all of which are rated on a 5-point Likert scale ranging from 1 to 5 with the response anchors being *totally agree*, *mostly agree*, *somewhat agree*, *agree a little bit*, and *do not agree at all* (translated into German). The dimensions from the GOCQ, Group Openness and Cohesion, are essentially generalized and widely applicable versions of within-group social support and a transfer climate: Cohesion is conceptualized as mutual trust and affection among group members, thus representing the group’s “inward orientation.” Group Openness is conceptualized as the group’s consensual response to any outside changes or impulses affecting the group, representing the group’s “outward orientation” (for more details, see Deckers et al., 2018). Therefore, both Cohesion and Group Openness could be expected to affect the changes in psychological strain/burnout following an intervention aimed at reducing burnout. Cronbach’s

alpha was good for both scales (Group Openness $\alpha = .90$, Cohesion $\alpha = .91$). Like the HEXACO-PI-R, the GOCQ was applied at t0 only.

3.3.3.2.3 Copenhagen Burnout Inventory. Psychological strain was operationalized with the Copenhagen Burnout Inventory (CBI; Kristensen, Borritz, Villadsen, & Christensen, 2005). The CBI differentiates between the facets of Personal Burnout (six items), Work-Related Burnout (seven items), and Client-Related Burnout (six items). Cronbach's alpha was good for all three facets (Personal Burnout $\alpha = .87$, Work-Related Burnout $\alpha = .86$, Client-Related Burnout $\alpha = .78$), and all three facets were rated on a 5-point Likert scale ranging from 0 to 4, with the response anchors being the same as for the GOCQ. Because this study was conducted in a hospital setting, the word "client" was replaced by the word "patient" for all items. All items retained their intended meaning through this replacement.

3.3.3.2.4 The Symptom-Checklist-90. Psychological strain was also operationalized with the Symptom-Checklist-90 (Derogatis & Unger, 2010; Franke, 2014). From the SCL, we employed the Somatization subscale, which measures psychological strain expressed as psychosomatic symptoms such as stomach pain or headache. Somatization comprises 12 items rated on a 5-point Likert scale, with respondents rating each symptom to answer the question "How much did you suffer from [symptom] in the last 7 days?" using the response anchors *not at all*, *slightly*, *moderately*, *strongly*, and *very strongly*. Cronbach's alpha for Somatization at t0 was good ($\alpha = .84$). The CBI and the Somatization scale were applied at all measurement occasions (t0, t1, t2, and t3).

3.3.3.3 Operationalization of Team-Level Variables

As mentioned in the Introduction, this study also further differentiates team-level effects into two different approaches to conceptualizing and measuring group characteristics. In the direct approach, individuals directly rated the characteristics of their group, and these ratings were then averaged for the group (for a detailed explanation, see Deckers, Altmann, & Roth, 2020). With this approach, the group characteristic scores were thereby formed from the

ratings of the group members, who directly rated the characteristics. In the indirect approach, the individual personality self-ratings were aggregated within the group to be used as proxies for the group-level characteristic (e.g., Halfhill, Nielsen, Sundstrom, & Weilbaecher, 2005; Homan et al., 2008; Neuman, Wagner, & Christiansen, 1999; van Vianen & De Dreu, 2001). With this approach, the group characteristic scores were thereby formed from the individual members' self-ratings and were therefore only indirect representations of the group characteristics, as no group characteristics were rated directly. This approach is common in the literature on group characteristics and has usually been employed by using the group members' individual personality characteristics (for an overview, see Barrick et al., 1998; Dang & Ilgen, 2006). This approach also has been discussed critically (Chan, 1998; Dang & Ilgen, 2006; Deckers et al., 2020; Shoda, LeeTiernan, & Mischel, 2002).

In the present study, the GOCQ ratings (Deckers et al., 2018) were used to operationalize the direct approach, whereas the HEXACO-PI-R self-ratings were used to operationalize the indirect approach. It was important to ensure that the team-level variables we used represented the latent characteristic of the team each individual belonged to as much as possible. To achieve this, we applied the following procedure to the GOCQ scores and the HEXACO-PI-R scores: We calculated a new variable that assigned the mean ratings of all other team members on the Group Openness and Cohesion dimensions, as well as all six HEXACO dimensions, to the respective individual. In other words, on a team with, for example, four members (A, B, C, and D), Member A was assigned the mean rating of Members B, C, and D on the GOCQ and HEXACO dimensions, and the same procedure was applied to Members B, C, and D, respectively. This procedure resulted in a team-level variable applied to each individual that served as the best available proxy for a latent team-level characteristic that was independent of the respective individual and his or her perspective. This method was applied only to the teams (from the intervention group) from which we assessed three or more members at t0, as mentioned above. By applying the same

procedure to both instruments' variables in the manner described above, (a) we could differentiate between these approaches in their ability to predict training transfer while (b) we could also ensure that the variables that were applied to each individual were the best available proxies for the latent group characteristic that was independent from how the individual would rate this characteristic him- or herself.

By applying this procedure, both the team mean of individual Openness to Experience from the HEXACO model and the team mean of the Group Openness ratings from the GOCQ can be seen as operationalizations of a transfer climate, given their underlying conceptualizations (Ashton & Lee, 2007; Deckers et al., 2018). Individuals high in Openness to Experience are inquisitive about new and unusual ideas and their creative implementation, and a team on which the mean level of Openness to Experience of the members is high can be expected to react more favorably to the intervention. The Group Openness scale from the GOCQ measures how the team reacts to any outside influence, including changes in how the team works and communicates.

3.3.3.4 Analysis Strategy

We used a repeated-measures multilevel analysis to analyze our data, for which dropout is far less relevant than it is for traditional analysis tools (e.g., repeated-measures ANOVA) because even individuals who participated in only the first wave of data collection can be used to estimate some of the parameters in the statistical models. In our analyses, measurement occasion data are “nested” within individuals, making the first level the measurement occasion level and the second level the individual level. The four dependent variables were Personal Burnout, Work-Related Burnout, Client-Related Burnout, and Somatization. Separate analyses were carried out for each dependent variable, and thus, a multivariate approach was not pursued. A linear trend was found to suffice for all dependent variables through analyses of the polynomial contrasts. Bottom-up model building (Hox,

Moerbeek, & van de Schoot, 2017) was used on the data, and we employed the restricted maximum likelihood (REML) method to estimate the model parameters.

Four models were sequentially applied for each dependent variable. These models and the statistical comparisons between them (where applicable) provided the following information: Model 1 (an intercept-only model) was used to calculate intraclass correlation coefficients (ICCs), which indicate the relation between first-level and second-level variance in the model. In the case of longitudinal models, this shows how much of the overall variance in the data is accounted for by variance within individuals (representing change over time) and how much is accounted for by variance between individuals. Model 2 adds a term for the average rate of change over time to the intercept-only model as a fixed slope. Model 3 adds a term for random variance to the average rate of change over time to the previous model. This random slope term can then be tested statistically by comparing Model 2 with Model 3. If the test indicates statistically significant differences between the fits of the models to the data, we can conclude that the variance of the slope is significant, which would indicate that individuals differ in their change in psychological strain over time. When analyzing only the intervention group, this significant slope variance would therefore indicate variance in training transfer. Model 4 then adds interaction effects with Level 2 variables to the previous model. Model 4 can be used to test whether differences in the rate of change over time for each individual can be explained by their membership in either the intervention or control group, serving as a test for differences between the groups in the development of the dependent variables. When the entire procedure is applied only to the intervention group, Model 4 can be used to test whether differences in rates of change over time can be explained by other individual-level variables, such as personality traits or the traits of their teams (assigned to each individual). Therefore, this analysis strategy allowed us to test for differences between the training and control groups (which were not the focus of this paper

but needed to be taken into consideration nonetheless) and to test for differences in psychological strain development, and therefore training transfer, in the intervention group.

The team characteristics could only be meaningfully calculated for a subsample of the intervention group with participants from the teams from which we assessed three or more members at t0. Therefore, all analyses involving team characteristics were done with this subsample and will be presented separately in the Results section.

3.3.4 Results

3.3.4.1 Comparisons between the Intervention and Control Groups

The focus of this study is on differential effects in training transfer in the intervention group. Still, an inspection of such differential effects would only be sensible if differences between the intervention and control groups emerged for the average rate of change over time as well as the variance of the rate of change over time. The first set of analyses revealed significant differences in average slopes between the intervention and control groups for all dependent variables (all $ps < .05$), indicating that (on average) the variables developed differently in the training and control groups. For all four dependent variables (Personal Burnout, Work-Related Burnout, Client-Related Burnout, and Somatization), the differences occurred in the expected direction in that the intervention group either experienced reduced psychological strain or remained stable, whereas the control group experienced increased psychological strain. A post hoc analysis of achieved power according to the calculations described by Snijders and Bosker (2012) showed that a power of 96% was achieved even for small posttest effects of $d = 0.3$, given the sample size. Further analyses revealed that, in the control group, no dependent variables showed a significant slope variance (all $ps > .05$), indicating that individuals in the control group did not differ from each other much in the development of their burnout symptoms or somatization symptoms over time. This was not the case for the intervention group, in which a significant slope variance was found for some but not all variables.

3.3.4.2 Training Transfer and Individual Personality

As the models for the individual personality characteristics as Level 2 predictors were calculated using the full intervention group sample, whereas the models for the team characteristics as Level 2 predictors were calculated using a subsample (as described above), the former will be presented first and in their own section. For two of the four dependent variables, Client-Related Burnout and Somatization, a significant slope variance was not found (in the full intervention group sample), with the model fit differences failing to reach statistical significance (both $ps > .05$). In other words, individuals in the intervention group did not differ significantly in how their Client-Related Burnout and Somatization developed over time and therefore did not show differences in training transfer for those variables. We therefore decided to present tables for only the dependent variables Personal Burnout and Work-Related Burnout, for which a significant slope variance was found (see Tables 11 and 12, respectively).

Table 11. Multilevel Model Parameters for Personal Burnout as the Dependent Variable and the Individual HEXACO Characteristics as Level 2

Predictors

Model	Model 1: Intercept-only	Model 2: +Occasion	Model 3: +Random slope occasion	Model 4: +Level 2 predictors		
Fixed part						
Predictor	Coefficient (Standard Error)	Coefficient (Standard Error)	Coefficient (Standard Error)	Coefficient (Standard Error)	Standardized (Model 4)	Significance (Model 4)
Intercept	1.9530 (0.0381)	2.0190 (0.0400)	2.0193 (0.0394)	2.0122 (0.0360)		$p < .01$
Measurement occasion		-0.0565 (0.0111)	-0.0567 (0.0126)	-0.0557 (0.0126)	-0.0912	$p < .01$
Honesty-Humility				-0.1504 (0.0721)	-0.1140	$p < .05$
Emotionality				0.3362 (0.0750)	0.2440	$p < .01$
Extraversion				-0.2938 (0.0855)	-0.1899	$p < .01$
Agreeableness				-0.1697 (0.0823)	-0.1174	$p < .05$
Conscientiousness				-0.0312 (0.0769)	-0.0223	$p = .69$
Openness to Experience				-0.0087 (0.0635)	-0.0073	$p = .89$
Honesty-Humility × Occasion				0.0243 (0.0264)	0.0311	$p = .36$
Emotionality × Occasion				0.0143 (0.0272)	0.0176	$p = .60$
Extraversion × Occasion				0.0489 (0.0295)	0.0556	$p = .10$
Agreeableness × Occasion				0.0342 (0.0279)	0.0417	$p = .22$
Conscientiousness × Occasion				-0.0116 (0.0268)	-0.0141	$p = .67$
Openness to Experience × Occasion				-0.0032 (0.0229)	-0.0045	$p = .89$
Random part						
σ^2_e	0.1230	0.1188	0.1029	0.1032		
σ^2_{u0}	0.3471	0.3435	0.3430	0.2724		
σ^2_{u1}			0.0103	0.0102		
r_{u01}			-0.067	0.019		

Note. The ICC for Personal Burnout in this analysis was 0.735 (calculated from Model 1) and was significant at the $p < .001$ level.

Table 12. Multilevel Model Parameters for Work-Related Burnout as the Dependent Variable and Individual HEXACO Characteristics as Level 2

Predictors

Model	Model 1: Intercept-only	Model 2: +Occasion	Model 3: +Random slope occasion	Model 4: +Level 2 predictors		
Fixed part						
Predictor	Coefficient (Standard Error)	Coefficient (Standard Error)	Coefficient (Standard Error)	Coefficient (Standard Error)	Standardized (Model 4)	Significance (Model 4)
Intercept	1.6220 (0.0372)	1.6208 (0.0396)	1.6220 (0.0397)	1.6178 (0.0375)		$p < .01$
Measurement occasion		0.0010 (0.0114)	0.0013 (0.0130)	-0.0008 (0.0131)	-0.0014	$p = .95$
Honesty-Humility				-0.1415 (0.0750)	-0.1104	$p = .06$
Emotionality				0.2090 (0.0780)	0.1562	$p < .05$
Extraversion				-0.2967 (0.0889)	-0.1976	$p < .01$
Agreeableness				-0.1885 (0.0856)	-0.1343	$p < .05$
Conscientiousness				0.0236 (0.0799)	-0.0174	$p = .77$
Openness to Experience				0.0065 (0.0661)	-0.0057	$p = .92$
Honesty-Humility × Occasion				-0.0101 (0.0273)	-0.0134	$p = .71$
Emotionality × Occasion				0.0132 (0.0282)	0.0168	$p = .64$
Extraversion × Occasion				0.0326 (0.0306)	0.0381	$p = .29$
Agreeableness × Occasion				0.0412 (0.0289)	0.0518	$p = .15$
Conscientiousness × Occasion				-0.0304 (0.0278)	-0.0384	$p = .27$
Openness to Experience × Occasion				0.0154 (0.0237)	0.0226	$p = .52$
Random part						
σ^2_e	0.1245	0.1247	0.1060	0.1062		
σ^2_{u0}	0.3298	0.3298	0.3461	0.2987		
σ^2_{u1}			0.0122	0.0123		
r_{u01}			-0.198	-0.169		

Note. The ICC for Work-Related Burnout in this analysis was 0.716 (calculated from Model 1) and was significant at the $p < .001$ level.

The statistical comparison of the model fits of Models 2 and 3 in Table 11 was significant ($p < .01$), which indicates that the variation in slopes between individuals should be integrated into the model, as such a model fit the data significantly better than a model without that variation. In other words, there was statistically significant variation in change over time between individuals for Personal Burnout, indicating differences in training transfer for this variable. Model 3 also contains the correlation between the intercepts and slopes of this random slope model ($r_{u_{01}}$). The negative value of -0.067 indicates that the regression slopes form a pattern of “fanning in,” meaning that there is more variance between individuals at the earliest measurement occasion (which is coded as 0 and therefore equal to the y-axis) than at later measurement occasions. In other words, for individuals in the intervention group who start with a higher Personal Burnout score at t_0 , their score tends to decrease more over time than individuals who start with a lower Personal Burnout score at t_0 . This is not an absolute effect, which would have been indicated by an $r_{u_{01}}$ closer to or equal to 1, but it is rather an average tendency. By itself, this result indicates that individuals in the intervention group who started with higher Personal Burnout had a better training transfer on average. It is very important to point out that this pattern in which the regression lines fan in, thereby representing the tendency for individuals with higher initial psychological strain to improve more, was not found in the control group. These findings were also in line with the aforementioned finding that there was no significant slope variance for the dependent variables in the control group, indicating that the patterns found in the intervention group are meaningful and not a product of chance.

Because of the interaction terms in Model 4 and the coding scheme of the measurement occasion variable, the direct effects describe influences of the HEXACO dimensions on the dependent variable at t_0 (before the intervention). Four of the HEXACO dimensions turned out to be significant predictors of Personal Burnout at t_0 (see Table 11): Higher Honesty-Humility, lower Emotionality, higher Extraversion, and higher Agreeableness

were all associated with a lower Personal Burnout score (all $ps < .05$). The standardized coefficients showed that the effect of Emotionality was the strongest.

In Table 11, Model 4 showed no statistically significant interaction terms. This indicates that no individual personality characteristic in the HEXACO model moderated the strength of the rate of change over time in Personal Burnout, indicating no influence of individual personality on training transfer.

The estimated random variance terms in Models 3 and 4 (Table 11) confirmed the interpretation that the HEXACO dimensions influenced the Personal Burnout score only at t_0 and did not explain variation in changes over time: The slope variance $\sigma^2_{u_1}$ and the residual individual-level variance σ^2_e barely changed from Model 3 to Model 4, whereas the intercept variance $\sigma^2_{u_0}$ (which refers to variance at t_0) decreased considerably from 0.3430 to 0.2724. For Model 4, the variance terms quantify the variance that is not explained by the predictors in the model, facilitating interpretation.

As Table 12 shows, the results were slightly different for Work-Related Burnout when considering the direct effects. Honesty-Humility did not have a significant direct effect on Work-Related Burnout at t_0 , whereas lower Emotionality, higher Extraversion, and higher Agreeableness were associated with lower Work-Related Burnout at t_0 (all $ps < .05$). Extraversion had the strongest effect.

As for Personal Burnout, Model 4 did not show any significant interaction terms for Work-Related Burnout or the individual HEXACO characteristics. Once again, the slope variance $\sigma^2_{u_1}$ also almost did not change at all between Models 3 and 4 (changing only from 0.0122 to 0.0123), further indicating that no slope variance was explained by the HEXACO variables. The average slope for Work-Related Burnout was close to 0, and the intercept-slope correlation $r_{u_{01}}$ was negative, once again indicating that the regression lines showed a pattern of fanning in.

For the dependent variables that are not shown in the tables (i.e., Client-Related Burnout and Somatization), no significant slope variance was found. A significant interaction effect was found for Agreeableness and Somatization, but this interaction effect should not be interpreted because the absence of a significant slope variance indicates that this significant interaction effect was the result of random chance. For the direct effects, higher Extraversion and Agreeableness were associated with lower Client-Related Burnout at t0, whereas higher Agreeableness and lower Neuroticism were associated with lower Somatization at t0.

Concerning the goal of this study, these results indicate a general lack of influence of individual personality on training transfer because no HEXACO characteristics of the participants in the intervention group explained any slope variance in Personal or Work-Related Burnout.

3.3.4.3 Training Transfer and Team Characteristics

The results of the models containing team characteristics as Level 2 predictors are displayed in Tables 13 and 14. Once, again, only the results for Personal Burnout (Table 13) and Work-Related Burnout (Table 14) are shown in tables, as only these variables were shown to have a significant slope variance. These results were obtained for a subsample from the intervention group as described above.

Table 13. Multilevel Model Parameters for Personal Burnout as the Dependent Variable and Team Characteristics as Level 2 Predictors

Model	Model 1: Intercept- only	Model 2: +Occasion	Model 3: +Random slope occasion	Model 4: +Level 2 predictors		
<hr/>						
Fixed part						
	Coefficient (Standard Error)	Coefficient (Standard Error)	Coefficient (Standard Error)	Coefficient (Standard Error)	Standardized (Model 4)	Significance (Model 4)
Predictor						
Intercept	1.9720 (0.0406)	2.0333 (0.0426)	2.0338 (0.0421)	2.0327 (0.0416)		$p < .01$
Measurement occasion		-0.0546 (0.0122)	-0.0552 (0.0139)	-0.0528 (0.0134)	-0.0853	$p < .01$
Team Mean Cohesion (Self Excluded)				-0.2574 (0.1197)	-0.1764	$p < .05$
Team Mean Group Openness (Self Excluded)				0.1576 (0.1121)	0.1141	$p = .16$
Team Mean Honesty-Humility (Self Excluded)				0.1769 (0.1776)	0.0689	$p = .32$
Team Mean Emotionality (Self Excluded)				0.1423 (0.1739)	0.0558	$p = .41$
Team Mean Extraversion (Self Excluded)				-0.3371 (0.1880)	-0.1144	$p = .07$
Team Mean Agreeableness (Self Excluded)				-0.2710 (0.2359)	-0.0871	$p = .25$
Team Mean Conscientiousness (Self Excluded)				-0.1526 (0.2187)	-0.0493	$p = .49$
Team Mean Openness to Experience (Self Excluded)				-0.1258 (0.1417)	-0.0539	$p = .38$
Team Mean Cohesion (Self Excluded) × Occasion				0.1305 (0.0394)	0.1527	$p < .01$
Team Mean Group Openness (Self Excluded) × Occasion				-0.0150 (0.0390)	-0.0181	$p = .70$
Team Mean Honesty-Humility (Self Excluded) × Occasion				-0.0104 (0.0578)	-0.0068	$p = .86$
Team Mean Emotionality (Self Excluded) × Occasion				-0.0828 (0.0637)	-0.0540	$p = .19$
Team Mean Extraversion (Self Excluded) × Occasion				-0.0055 (0.0614)	-0.0032	$p = .93$
Team Mean Agreeableness (Self Excluded) × Occasion				-0.0244 (0.0756)	-0.0134	$p = .75$
Team Mean Conscientiousness (Self Excluded) × Occasion				0.1494 (0.0707)	0.0819	$p < .05$
Team Mean Openness to Experience (Self Excluded) × Occasion				-0.0474 (0.0571)	-0.0330	$p = .41$

Random part				
σ^2_e	0.1260	0.1223	0.1045	0.1046
σ^2_{u0}	0.3553	0.3513	0.3546	0.3524
σ^2_{u1}			0.0116	0.0087
r_{u01}			-0.091	-0.021

Note. The ICC for Personal Burnout in this analysis was 0.736 (calculated from Model 1) and was significant at the $p < .001$ level.

Table 14. Multilevel Model Parameters for Work-Related Burnout as the Dependent Variable and Team Characteristics as Level 2 Predictors

Model	Model 1: Intercept- only	Model 2: +Occasion	Model 3: +Random slope occasion	Model 4: +Level 2 predictors		
<hr/>						
Fixed part						
	Coefficient (Standard Error)	Coefficient (Standard Error)	Coefficient (Standard Error)	Coefficient (Standard Error)	Standardized (Model 4)	Significance (Model 4)
Predictor						
Intercept	1.6456 (0.0404)	1.6386 (0.0428)	1.6402 (0.0432)	1.6412 (0.0429)		$p < .01$
Measurement occasion		0.0062 (0.0125)	0.0028 (0.0145)	0.0044 (0.0141)	0.0072	$p = .76$
Team Mean Cohesion (Self Excluded)				-0.1934 (0.1233)	-0.1345	$p = .11$
Team Mean Group Openness (Self Excluded)				0.1193 (0.1155)	0.0877	$p = .30$
Team Mean Honesty-Humility (Self Excluded)				0.1436 (0.1830)	0.0568	$p = .43$
Team Mean Emotionality (Self Excluded)				0.1108 (0.1792)	0.0441	$p = .54$
Team Mean Extraversion (Self Excluded)				-0.4099 (0.1937)	-0.1411	$p < .05$
Team Mean Agreeableness (Self Excluded)				-0.0110 (0.2431)	-0.0036	$p = .96$
Team Mean Conscientiousness (Self Excluded)				-0.2882 (0.2254)	-0.0946	$p = .20$
Team Mean Openness to Experience (Self Excluded)				-0.0799 (0.1459)	-0.0347	$p = .58$
Team Mean Cohesion (Self Excluded) × Occasion				0.0955 (0.0415)	0.1136	$p < .05$
Team Mean Group Openness (Self Excluded) × Occasion				0.0083 (0.0411)	0.0102	$p = .84$
Team Mean Honesty-Humility (Self Excluded) × Occasion				-0.0672 (0.0610)	-0.0450	$p = .27$
Team Mean Emotionality (Self Excluded) × Occasion				-0.1213 (0.0669)	-0.0803	$p = .07$
Team Mean Extraversion (Self Excluded) × Occasion				0.0254 (0.0648)	0.0150	$p = .70$
Team Mean Agreeableness (Self Excluded) × Occasion				-0.0450 (0.0799)	-0.0251	$p = .57$
Team Mean Conscientiousness (Self Excluded) × Occasion				0.1726 (0.0746)	0.0961	$p < .05$
Team Mean Openness to Experience (Self Excluded) × Occasion				-0.0754 (0.0597)	-0.0534	$p = .21$

Random part				
σ^2_e	0.1293	0.1294	0.1074	0.1067
σ^2_{u0}	0.3489	0.3494	0.3736	0.3648
σ^2_{u1}			0.0145	0.0124
r_{u01}			-0.237	-0.193

Note. The ICC for Work-Related Burnout in this analysis was 0.721 (calculated from Model 1) and was significant at the $p < .001$ level.

As Table 13 shows, a significant direct effect was found for team mean Cohesion, of which higher values significantly predicted lower Personal Burnout at t_0 ($p < .05$). All other direct effects were nonsignificant.

The average regression line for Personal Burnout was slightly negative, and the interaction effects showed that higher team mean Cohesion ratings and higher team mean Conscientiousness self-ratings significantly predicted a flatter regression line for the Personal Burnout score (both $ps < .05$). In other words, higher team mean Cohesion ratings and higher team mean Conscientiousness self-ratings were associated with less drastic changes in Personal Burnout over time, which indicates less training transfer. This potentially counterintuitive result will be elaborated on in the Discussion.

For Work-Related Burnout (Table 14), higher team mean Extraversion significantly predicted lower Work-Related Burnout at t_0 ($p < .05$), and all other direct effects were nonsignificant.

Significant interaction effects for Work-Related Burnout were parallel to those for Personal Burnout: Higher team mean Cohesion ratings and higher team mean Conscientiousness self-ratings significantly predicted a flatter regression line (both $ps < .05$). Because the direct effects of these two predictors were nonsignificant, this result can only be partially explained, which will also be elaborated on in the Discussion.

For Client-Related Burnout and Somatization (not shown in the tables), no significant slope variance was found in this subsample again, which would have rendered an interpretation of significant interaction effects inadmissible; regardless, none were found.

Concerning the goal of this study, these results indicate a limited importance of team characteristics for training transfer, as a team's Cohesion and mean Conscientiousness were able to predict the slope variance in Personal and Work-Related Burnout. Combined with the fact that no relevance of individual personality for training transfer was found, the results indicate that team characteristics seem to be more relevant than individual characteristics for

training transfer, at least out of the characteristics used in this study. Concerning the differentiation between the direct and indirect approaches to conceptualizing and measuring team characteristics, no clear results emerged, as variables from both approaches significantly predicted differences in training transfer.

3.3.5 Discussion

3.3.5.1 Summary of Goals and Results

This study was conducted to examine differential effects in training transfer following an intervention aimed at reducing burnout symptoms. After the intervention, changes in burnout symptoms and somatization over time were used to operationalize the effects of training transfer. Both individual personality as measured with the HEXACO dimensions and team characteristics were tested as predictors of training transfer. The team characteristics tested here were team-level means of individual HEXACO characteristics and team-level means of cohesion and group openness ratings. The goal in measuring these team characteristics as two different approaches was to differentiate between them in their ability to predict training transfer, as they could both be assumed to capture aspects of transfer climate and team cohesion.

For the individual-level personality dimensions as predictors, there were no significant interactions in subscales with a significant slope variance, indicating that none of the HEXACO dimensions influenced changes in burnout over time and therefore influenced training transfer. Therefore, our expectation that agreeableness would affect training transfer was not confirmed.

For the team-level characteristics as predictors, significant interaction effects with training transfer were found. In the intervention group, higher team cohesion and higher team mean conscientiousness were both associated with smaller (i.e., flatter) decreases in personal and work-related burnout. No interaction effects were found for client-related burnout or somatization, which may have been the case because neither variable showed a significant

slope variance for its development over time that could have been explained by other variables. For team mean conscientiousness, we did not pose any interaction hypotheses. Our hypotheses that higher team group openness and higher team means for individual openness to experience would influence training transfer were not confirmed because no significant interactions were associated with either variable. Overall, these results point toward the importance of a team's cohesion and the mean conscientiousness of its members for training transfer. These results and their unexpected direction will be discussed in detail below.

Concerning the main goal of this study, which was to compare individual characteristics and team characteristics in their ability to predict training transfer, these results point toward the higher (but generally limited) importance of team characteristics for training transfer, as significant interactions with training transfer were found only for these variables. Concerning the differentiation between the direct and indirect approaches to conceptualizing and measuring team characteristics in their ability to predict training transfer, the two approaches were found to uniquely predict aspects of training transfer, indicating that neither approach is superior to the other, at least in this regard.

3.3.5.2 Interactions between Training Transfer and Individual and Team Characteristics

3.3.5.2.1 Absence of significant interactions for individual personality traits. The fact that no significant interactions were found for any of the HEXACO domains was surprising with respect to agreeableness: We expected that agreeableness would influence training transfer, as a similar result was found in a past study with teachers that also involved a burnout-reducing intervention (Castillo-Gualda et al., 2019), but we did not find similar results in our study. Our results might therefore be highly specific to the profession of nursing, which relies more heavily on teamwork than teaching does (Kalisch, Lee, & Rochman, 2010). This would explain why we only found effects of team characteristics, and not of individual characteristics, on training transfer. Additionally, people high in openness to

experience tend to value learning because they are inquisitive and creative, and this may have resulted in a better transfer of their training. However, such a result has not been found in past studies.

3.3.5.2.2 Significant interaction effects for team characteristics. The only interpretable interaction effects were found for personal burnout and work-related burnout. In both cases, seemingly positive traits of the team (higher cohesion and higher mean conscientiousness) were associated with smaller (i.e., flatter) decreases in personal burnout and work-related burnout following the intervention, or, in other words, the effectiveness of the intervention was weaker, and therefore, the transfer of the training effect was weaker. This result needs to be interpreted with the knowledge that the correlations between the intercepts and slopes of the models were negative, which indicates a pattern of “fanning in” for the regression lines: Individuals with higher initial values on personal or work-related burnout at the first measurement occasion also showed larger decreases in personal and work-related burnout over the course of the study.

With this in mind, for cohesion and its influence on personal burnout, the results fit together quite well: Individuals from teams where cohesion was higher already reported less personal burnout before the intervention (direct effect), leaving less room for improvement; therefore, those same individuals also showed less improvement in their personal burnout following the intervention (interaction effect), indicating a weaker transfer of the training, which is in line with the regression line pattern of fanning in. A ceiling effect cannot fully explain this phenomenon, as only eight individuals reported personal burnout values near the low point of the scale (with values between 0 and 1 on a scale that went up to 4) before the intervention.

The results were less clear for team mean conscientiousness and its influence on personal burnout. Members from teams on which mean conscientiousness was higher also improved their personal burnout significantly less over the course of the study, a finding that

is in line with the overall regression line pattern. However, those same members did not report lower levels of personal burnout before the intervention. A possible explanation might lie in the standardized regression coefficients, which showed that the effects of cohesion were generally larger than for group mean conscientiousness. Because of this, the corresponding direct effect of group mean conscientiousness on personal burnout, which could be very small at the population level, might not have been detected because the power of the test was too low.

The effects for work-related burnout were even more challenging: On average, individuals with higher initial values improved more (indicated by the negative intercept-slope correlation). However, the individuals who improved more came from teams where cohesion and mean conscientiousness were lower (indicated by significant interaction effects and their direction), whereas those same individuals were not the ones who reported higher work-related burnout before the intervention (as indicated by nonsignificant direct effects).

Whereas the general patterns of the regression models painted a clear picture of the largest improvements in burnout happening where there was the most room for them, the specific influences on initial values and interaction patterns were mostly incomplete and counterintuitive. This may have been the case because they were governed by completely different mechanics and influences than the ones involved in this study—or it might point to general reliability issues with these results.

Another unexpected result was that we did not find any influence of either team group openness or team means of individual openness to experience on the development of the facets of burnout or somatization over time. The literature has shown the importance of the transfer climate for the transfer of training effects and training effectiveness multiple times (Burke & Hutchins, 2007; Velasco & Harder, 2014). Also, and the conceptualization of (a) the group openness dimension and (b) the individual personality dimension of openness to experience when applied to the group level both fit the idea of a transfer climate quite well.

Regardless, no interaction effects were found for either variable. It is possible that training transfer is less dependent on this specific group characteristic than initially assumed because the group's cohesion matters more, which would explain why we only found effects for cohesion and not for any operationalization of the transfer climate. The group openness dimension in the GOCQ was conceptualized on the basis of the idea that it should better reflect the "outward orientation" of the group than group means of individual personality characteristics (e.g., the group mean of openness to experience) could (Deckers et al., 2018), but this study found no effects of either operationalization.

On the basis of the existing literature on training transfer (Burke & Hutchins, 2007; Cheng & Ho, 1999; Ford & Weissbein, 1997), we expected that both individual and team characteristics would predict training transfer, but we did not expect either to be clearly superior to the other because no previous studies had ever compared these characteristics in the same study. The fact that no significant interactions were found in the present study for the individual personality traits when predicting training effectiveness but some interaction effects were found for the team characteristics might indicate that team characteristics are generally more important for the successful transfer of training effects than individual characteristics. However, given that the nursing profession relies heavily on constant teamwork, the results might be different in other professions.

3.3.5.3 Implications for Conceptualizations of Group-Level Characteristics

When examining the team characteristics, we also had the goal of comparing the direct and indirect approaches to conceptualizing and measuring these team characteristics (for an overview, see Deckers et al., 2020). In this study, we found evidence for the importance and merit of both approaches—both team-level means of individual personality characteristics and team-level means of team-characteristic ratings were found to influence training transfer (and also to be associated with differences in psychological strain cross-sectionally). Future research should try to incorporate both approaches when aiming to explain other group-level

phenomena because they both seem to provide unique insights into the characteristics and dynamics of a group.

3.3.5.4 Limitations of the Study and Directions for Future Research

For all dependent variables that showed a significant slope variance and therefore variance in their change over time, only a small proportion could be explained by the variables included in this study. As an example, the slope variance for work-related burnout (see Table 14) decreased from 0.0145 to 0.0124 when we took the interactions into account. The remaining variance remained unexplained and could not be captured by the individual-level or team-level characteristics explored here. By using the HEXACO-PI-R and GOCQ, we included only the general behavioral tendencies of the individual and the team. It is possible that the HEXACO characteristics are too abstract and that more specific characteristics, as described by McAdams and Pals (2006) as characteristic adaptations (e.g., affect, self-efficacy, or locus of control) are likely to explain additional training transfer variance. Locus of control in particular has been shown to be relevant for training transfer in past research (Burke & Hutchins, 2007; Cheng & Ho, 1999). Generally, many factors have been suggested or confirmed to influence training transfer (Burke & Hutchins, 2007) beyond the variables included in this study, some of which include the characteristics of the organization it is implemented in, along with multiple time- and place-based other factors, indicating that studies such as this one should be repeated with different scales and other predictors. More studies, for example, in the form of meta-analyses such as the one by Burke and Hutchins (2007), are necessary to unravel the highly complex network of influences on successful training transfer. Modern analysis methods such as structural equation modeling or multilevel modeling will help with this endeavor in the future. Our study is a small puzzle piece that points toward the general importance of team-level factors, specifically cohesion and the mean conscientiousness of a team, for training transfer, but unraveling the bigger picture will require more research.

3.3.5.5 Conclusion

The results of this study point toward the larger importance of team-level characteristics for successful training transfer, and they also showed the larger effectiveness of the intervention for individuals who have higher mean levels of psychological strain before the intervention. This study's results are important to consider in future work on the conceptualization and measurement of group-level characteristics in general and on differential training effectiveness and training transfer. Many factors involved in explaining training transfer and differential effects in it remain unexplored and should be included in future research.

3.3.6 References

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4 Additional Results not Contained in the Research Papers

The creation of the GOCQ was based on the idea of a “group personality structure”, as explained above. One aspect of personality characteristics at the individual level is that they are stable over time. Therefore, for the label “group personality” to apply to the dimensions measured with the GOCQ, they also need to fulfill this criterion. Research results were obtained for this criterion but did not thematically fit into the narrower scopes of the research papers, so they are presented here instead.

Since the empCARE project that the creation of the GOCQ was embedded into involved a training group and a control group, stability over time could be tested in general (using the control group), as well as following an intervention (using the training group). This was achieved through multilevel analyses for repeated measures, in which the individual data points form the lower level, which are nested within individuals, which form the higher level.

Data for this study were collected in four waves, all spaced evenly with about four months in between. The measurement occasions will be labelled t0, t1, t2, and t3 from here, with t0 referring to the occasion right before the training for the training group and simply the first occasion for the control group. The sample consisted of nurses from four university hospitals and one ambulant intensive care unit in Germany. The sample, separated by training and control groups, and the occurring dropout are summarized in Table 15:

Table 15. Sample Summary for the Training and Control Groups and the Combined Full Sample in the empCARE-Study, along with Dropout Data. All Participants were Nurses from either University Hospitals or Ambulant Intensive Care Units in Germany.

	Occasion	N	Dropout from t0
Training Group	t0	278	
	t2	239	39
	t3	198	80
	t4	178	100
Control Group	t0	186	
	t2	149	37
	t3	143	43
	t4	141	45
Full Sample	t0	464	
	t2	388	76
	t3	341	123
	t4	319	145

Two participants had to be excluded from all analyses because they did not participate at t0 but in at least one other measurement occasion.

Bottom-up multilevel model building was used to obtain the results presented in this section (Tables 16 to 18). Table 16 contains the results of the longitudinal multilevel analysis comparing the development of Cohesion ratings over time in the training and control groups, Table 17 contains these results for the Group Openness ratings, and Table 18 shows additional random slope model parameters for Cohesion and Group Openness ratings separated by group, which could not be obtained in the previous analyses.

As is customary in bottom-up multilevel model building, increasingly complex models were applied sequentially to both the Cohesion and Group Openness variables. The following information can be obtained from this analysis strategy. The first model can be used to calculate the intraclass-correlation-coefficient, which shows the percentage of variance in the data that is found between individuals, as opposed to within individuals over time. The second model quantifies the average rate of change over time, while the third model adds a random variance term for this rate of change over time. The fourth and final model adds a cross-level

interaction with the grouping variable (that denotes whether an individual belongs to the training group or the control group). The difference test between Model 2 and Model 3 can quantify the significance of slope variance, meaning that it denotes if there is significant variance in how the Cohesion and Group Openness variables change over time between individuals. Model 4 contains the important coefficients for the question of stability over time: Statistical significance of the measurement occasion variable would indicate that there is significant change over time, while a significant interaction effect with the grouping variable would indicate that the training and control groups develop differently. The results of these analyses are displayed in Table 16 (Cohesion) and Table 17 (Group Openness), respectively. Finally, when the same four models are calculated for the intervention and control groups separately, the random parts can be used to numerically (not statistically) compare how similar the slope variance terms are between the groups. These results will be summarized in Table 18.

Table 16. Multilevel Model Parameters for Cohesion Ratings and their Development over Time in the Training and Control Groups of the empCARE Study

Model	Model 1: Intercept-Only	Model 2: +Occasion	Model 3: +Random Slope Occasion	Model 4: +Level 2 Predictor 'Group'	
Fixed Part					
Predictor	Coefficient (Standard Error)	Coefficient (Standard Error)	Coefficient (Standard Error)	Coefficient (Standard Error)	Significance (Model 4)
Intercept	3.2985 (0.0296)	3.3222 (0.0314)	3.3221 (0.0320)	3.2654 (0.0506)	p<.0001
Measurement Occasion		-0.0199 (0.0088)	-0.0199 (0.0100)	-0.0207 (0.0154)	p=.179
Group				0.0939 (0.0653)	p=.151
Measurement Occasion × Group				0.0016 (0.0203)	p=.939
Random Part					
σ^2_e	0.1317	0.1312	0.1107	0.1106	
σ^2_{u0}	0.3543	0.3545	0.3884	0.3875	
σ^2_{u1}			0.0129	0.0130	
r^2_{u01}			-0.278	-0.278	
Fit Indices and Model Comparisons					
AIC	2248.94	2253.43	2235.11	2246.32	
BIC	2264.89	2274.70	2267.00	2288.83	
Statistical comparison with previous model		not possible	p<.0001	not possible	

Note. REML method was used for all parameter estimations. ICC for the Intercept-Only model for Cohesion was 0.73. Statistical comparisons were only possible between models not differing in their number of fixed effects (models 2 and 3).

Table 17. Multilevel Model Parameters for Group Openness Ratings and their Development over Time in the Training and Control Groups of the empCARE Study

Model	Model 1: Intercept-Only	Model 2: +Occasion	Model 3: +Random Slope Occasion	Model 4: +Level 2 Predictor 'Group'	
Fixed Part					
Predictor	Coefficient (Standard Error)	Coefficient (Standard Error)	Coefficient (Standard Error)	Coefficient (Standard Error)	Significance (Model 4)
Intercept	3.1869 (0.0305)	3.1826 (0.0326)	3.1823 (0.0329)	3.1157 (0.0520)	p<.0001
Measurement Occasion		0.0036 (0.0096)	0.0040 (0.0110)	-0.0164 (0.0168)	p=.328
Group				0.1094 (0.0671)	p=.104
Measurement Occasion × Group				0.0360 (0.0222)	p=.105
Random Part					
σ^2_e	0.1579	0.1580	0.1338	0.1336	
σ^2_{u0}	0.3698	0.3698	0.3983	0.3971	
σ^2_{u1}			0.0154	0.0152	
r^2_{u01}			-0.245	-0.257	
Fit Indices and Model Comparisons					
AIC	2466.24	2474.55	2457.64	2462.58	
BIC	2482.19	2496.82	2489.53	2505.09	
Statistical comparison with previous model		not possible	p<.0001	not possible	

Note. REML method was used for all parameter estimations. ICC for the Intercept-Only model for Group Openness was 0.70. Statistical comparisons were only possible between models not differing in their number of fixed effects (models 2 and 3).

Table 18. Additional Multilevel Model Parameters from Random Slope Models Calculated for Cohesion and Group Openness Ratings for the Training Group only (left) and Control Group only (right)

Random Parameter	Training Group		Control Group	
	Cohesion	Group Openness	Cohesion	Group Openness
σ^2_e	0.1221	0.1372	0.0938	0.1283
σ^2_{u0}	0.3403	0.3512	0.4586	0.4666
σ^2_{u1}	0.0146*	0.0136*	0.0112*	0.0175*
r^2_{u01}	-0.17	-0.162	-0.433	-0.361

Note. Slope variances that are significant at the $p < .05$ level are marked with *. The significance tests were done through statistical comparisons with model fits of models that do not contain a random slope parameter.

As the results in Tables 16 and 17 show, participants in the training group and the control group did not differ in their development of Cohesion and Group Openness ratings over time (shown by the non-significance of the interaction term between measurement occasion and group). Further, both analyses showed that the average change over time of Cohesion and Group Openness ratings did not differ from zero in either group (shown by the non-significance of the measurement occasion term), indicating that, on average, both Cohesion and Group Openness ratings remained the same in both groups. However, even with the average rate of change being zero, and there being no difference in average rate of change between the groups, both Cohesion and Group Openness ratings showed significant overall slope variance, as shown by the statistically significant difference between models containing the random slope parameter (Model 3) and those not containing it (Model 2). This finding indicates that there is significant variance between individuals in their development of Cohesion and Group Openness ratings over time. In fact, when treating the average rate of change over time as zero because of its non-significance, 95% of the rates of change in Cohesion ratings lie between ± 0.2276 , and 95% of the rates of change in Group Openness ratings lie between ± 0.2474 . These overall slope variances are not accounted for by participants belonging to either the training or control group, indicating that variances in rate change over time can be found in both groups.

This is further confirmed by the results in Table 18, which show parameters of random slope models that were calculated and compared with fixed slope models for the training and control group separately. Both groups showed statistically significant slope variance in both Cohesion and Group Openness ratings, however, both groups did not differ much in actual numbers. This needs to be interpreted with the caveat that the latter statement is only based on absolute numbers and not a statistical comparison, which is not possible.

For the goal of testing for stability over time, the regression weights of the measurement occasion variable and for the interaction variable of measurement occasion by

group (and their respective significance tests) are the important metrics. These metrics show that Cohesion and Group Openness ratings of the nurses are stable over the span of one year in both the training and the control group. The random slope model parameters which quantify deviation from this average trend of no change over time separated by group are shown for completion's sake – these parameters show that outliers who change their rating of Group Openness and Cohesion over time are found in both groups, and outliers exist for both decreases and increases in those ratings in both groups. However, even the most extreme outliers do not change their opinion by more than 0.2474 between measurement occasions, and Group Openness and Cohesion were measured on a Likert scale from 1 to 5, meaning that even the most extreme changes are rather small compared to the available scale. These results show rather conclusively that Group Openness and Cohesion ratings are stable over time.

5 General Discussion and Conclusion

The impetus of this thesis was the absence of a concept of a group personality structure that is both applicable to different types of groups as well stable over time, paralleling personality characteristics at the individual level. This thesis presents the theoretical development of such a concept, as well as the creation of an instrument to measure it. Group openness and cohesion were conceptualized and measured as dimensions of a group personality structure, and reliability and validity evidence was presented for the created instrument GOCQ (Group Openness and Cohesion Questionnaire). The main results of the thesis will be summarized in this chapter, theoretical and practical contributions will be discussed, and the thesis will close with limitations, which lead to future research directions.

5.1 Central results

Regarding the four overarching research questions presented in section 1.4, the following results can be summarized across the research papers and the additional results presented in section 4.

1. Can group openness and cohesion be reliably and validly measured using the GOCQ?

In the first research paper, the conceptualization of the group personality structure with the dimensions group openness and cohesion is explained and the GOCQ is introduced. The results of the first research paper show that group openness and cohesion are reliably measurable constructs from the perspective of the team members, as indicated by the satisfactory model fit of the structural equation model for the confirmatory factor analysis done as a cross-validation of the final instrument. The model fit indices showed that no further improvements to the instrument could be made by deleting more items or by allowing error terms to covary between certain items. Initial validity evidence was also shown through team size and team age, and through analyses revealing that team membership influences the

ratings. Therefore, first central result is the emergence of group openness and cohesion as reliably and validly measurable group characteristic constructs through the GOCQ.

2. How are the group openness and cohesion characteristics related to the indirect approach to group personality, in which personality traits of the individual group members are averaged within the group, and how are they related to individual personality in general?

The second research paper demonstrates that the team means of cohesion and group openness ratings (representing the direct approach) and the team means of individual personality characteristics on the HEXACO dimensions (representing the indirect approach) do not correlate, indicating that, at least when operationalized and measured in this way, the two group personality concepts are unrelated. This was achieved through multiple linear regression, where the group means on the six HEXACO dimensions were used as predictors for the group means of the cohesion and group openness ratings. In this analysis, no significant connections were found. Additionally, the second research paper shows that, while group membership does influence a members' rating of group openness and cohesion (which has also been shown in the first research paper), the individual perspective seems to matter more for those ratings. This individual perspective is, in turn, influenced by a group members' own agreeableness and extraversion, beyond the influence of the actual group. This was achieved through hierarchical regression analyses, in which the influence of other variables was partialized, so that the influence of subsequent variables could be quantified separately. In sum, the group openness and cohesion characteristics do not seem to be related to group means of individual personality characteristics at the group level, but the individual ratings of the group members of group openness and cohesion are influenced by their own personality (specifically, by agreeableness and extraversion), and these individual ratings depend more on the individual perspectives of the group members than on the presumed latent group characteristics themselves.

3. Are group openness and cohesion, as well as individual personality traits, (uniquely) able to predict training transfer?

The results of the third research paper demonstrate that, overall, individual personality characteristics on the HEXACO dimensions do not influence training transfer (in the empCARE study). This was shown through longitudinal multilevel analysis, in which no interaction effects between personality characteristics and training transfer (operationalized as changes in psychological strain over time) turned out to be statistically significant. Performing the same analyses for the team means of cohesion and group openness ratings, as well as the team means of the individual HEXACO dimensions, revealed that cohesion and team mean conscientiousness influenced training transfer, albeit not in the expected direction, which was partially explained by the general development pattern in the data (for more details, see research paper 3, section 3.3.5). Overall, it can therefore be concluded from the results of research paper 3 that certain team characteristics (cohesion and team mean conscientiousness) can predict training transfer, while individual personality characteristics cannot. This points towards a larger importance of team characteristics for training transfer compared to individual characteristics. Additionally, variables from both the direct approach (cohesion) and the indirect approach (group mean conscientiousness) emerged as predictors of training transfer, indicating that both approaches measure different, but equally valid, group characteristics.

4. Can group openness and cohesion be considered group personality characteristics by nature of their conceptualization, how they develop over time, how they differentiate between groups, and how they trans-situationally consistently influence behaviors of groups?

This research question is answered in part by research paper 1 (section 3.1.5), the theoretical explanations in the general introduction (section 1.3), the additional results presented in section 4, and research paper 3 (section 3.3.5). Overall, the concepts of cohesion

and group openness have been derived from multiple different group characteristic concepts and are a systematization of concepts that have appeared in the characterization of different types of groups. During this thesis, the applicability to different types of groups was not empirically determined. However, given the broad conceptualizations of cohesion and group openness as the groups inward and outward orientation, respectively, and their derivation from repeatedly occurring aspects of concepts applied to different groups in the first place, it can be assumed that both constructs are applicable to multiple types of groups. The absence of an empirical test is a limitation of this thesis, which will be discussed below.

For the development over time, the additional results presented in section 4 demonstrate that the cohesion and group openness ratings of the group members remain stable over time. It should be noted that all participants of the study remained in their respective team for the entire duration – however, it was rarely possible to recruit full teams due to organizational and time constraints, meaning that no absolute data on membership shift of the team members who did not participate in the study were obtained. Still, given the very high fluctuation in nursing in Germany (Neumann & Klewer, 2008), it is unlikely that all teams in the study remained the same completely. This indicates that the participants' group openness and cohesion ratings remained, on average, stable, regardless of potential slight team composition shifts. However, combined with the knowledge that it is mostly the individual perspective that influences how a member rates his team instead of an actual presumed latent team characteristic, this result is less surprising.

Group openness and cohesion have been shown to differentiate between the work teams assessed in this study in the results presented in all three research papers, which could not have been obtained if different teams did not exhibit different values on the group openness and cohesion dimensions. Considering descriptive statistics such as the standard deviation across the teams, as well as the validity evidence presented in research papers 1 and 3, where differences in group openness and cohesion influenced other phenomena, both

dimensions can be considered to differentiate between groups. Additionally, it has also been shown that the individual ratings of these dimensions can be considered to differentiate between the team members.

The trans-situational consistency of group openness and cohesion has been demonstrated by nature of the factor-analytical results presented in research paper 1. The item content asks the team members to rate different behaviors and attitudes of their team, and the emergence of group openness and cohesion as latent traits influencing these behaviors and attitudes in the factor analyses can be interpreted as evidence for trans-situational consistency. This is further strengthened by the results concerning the stability of these characteristics over time.

Overall, these theoretical conceptualizations, the evidence for the stability over time, the ability to differentiate between teams and individuals within the teams, and the trans-situational consistency, indicate that group openness and cohesion can be considered group personality characteristics, albeit with a few caveats. Those will be discussed in the limitations section.

5.2 Theoretical and practical contributions

Existing group characteristics concepts usually are only applicable to one type of group (e. g., families or work teams) and usually only describe a few specific aspects of the group's behavioral tendencies (e. g., innovation support or emotional warmth). The group openness and cohesion concepts outlined in this thesis offer two theoretical advantages over existing concepts: They can be applied to different types of group through their broader conceptualization, and can be considered more complete than existing concepts through taking a groups' inward and outward orientation into consideration. In these ways, the concepts parallel individual personality characteristics, as those offer comparability between different individuals (Lee & Ashton, 2008) as well as aiming to describe individual behavioral tendencies as completely as possible (Ashton & Lee, 2019). As applicability to different types

of groups has not been empirically determined as part of this thesis, these contributions remain theoretical.

As a practical contribution, group openness and cohesion have been shown to be stable over time in the individual group members' perspectives. This stability has emerged two different groups, of which one had participated in a training program aiming to reduce psychological strain, which can be seen as more evidence to the fundamentality of these concepts. Given that the individual perspective accounts for the majority of the overall variance in group openness and cohesion ratings, it can be assumed that the characteristics remain stable within the teams on average as well. Overall, this newly developed concept of a group personality structure therefore has utility for research in both differential and personality psychology, as well as social psychology, aiming to explain other group-level phenomena through stable group characteristics.

As another practical contribution, it has been demonstrated that the commonly used indirect approach to group personality characteristics (using group means of individual group members' personality traits, in this case with the HEXACO model) does not appear to measure similar group characteristics as the direct approach operationalized with the GOCQ. This implies that these approaches (at least using these instruments) cannot be used interchangeably, which is further confirmed by the fact that training transfer was predicted by constructs from both approaches.

It has also been demonstrated that, when group members rate their group's cohesion and group openness, the influence of the actual presumed latent group characteristic is smaller than the influence of the individual perspective of the group members. This is quantified through intraclass-correlation-coefficients (ICCs), which show that only 23% of group openness variance and 37% of cohesion variance is found at the team level (see also research paper 2, section 3.2.5). It has further been demonstrated that the individual perspective is influenced by individual extraversion and agreeableness beyond the influence of the group.

This result calls for more research involving group characteristic ratings using other existing instruments, as a large individual-level variance proportion, and therefore a large influence of the individual perspective, calls into question the practice of averaging these ratings to form a group characteristic score (see also: Chan, 1998).

A strong practical contribution of this thesis also lies in the method used to “extract” the influence of the group from the individual ratings: By assigning a variable to each team member that is the mean rating of all other team members, and removing the variance explained by this variable in the first step of a hierarchical regression analysis done at the individual level, the influence of the group can be separated from the influence of the individual perspective, which in turn can be examined in detail. Strong evidence for the effectiveness of this method is given by the fact that proportionally more variance was explained and removed in this step in the cohesion variable, which had a higher ICC, indicating higher group-level influence. Depending on the research question, this method can be used to supplement multilevel confirmatory factor analyses (Dyer, Hanges, & Hall, 2005; Muthén, 1994), given a large enough hierarchical sample. A detailed examination of the individual perspective of group characteristic ratings has not been a focus in past research, which often operates under the implicit assumption that ratings by the group members are reliable and valid and can be aggregated within the group, which the work presented here calls into question to an extent.

In the context of work teams, this thesis has demonstrated that cohesion seems to have a larger influence on training transfer than group openness, which, given the conceptualization of group openness as essentially a generalized version of transfer climate, was a surprising result. This might be explained by the fact that training transfer in the context of the empCARE training (see sections 1.1 and 1.2) includes that a participant challenges and changes their way of communicating in the work context. This requires this individual to experience trust within their work team, which in turn is part of cohesion. In other words,

given that training transfer for the empCARE training is a more individual-focused process as opposed to something the team collectively achieves, this training transfer does not depend on how open the team is for new impulses, but how the team reacts to changes in behavior of an already existing team member, which is much more in line with the teams inward orientation (cohesion) as opposed to its outward orientation (group openness). Of course, changes in the way a group members behaves because of a training can also be considered a new impulse from outside of the team, which might also explain the high correlation between the concepts of group openness and cohesion described in the first research paper (see section 3.1.4).

Overall, this training transfer result contributes to a deeper understanding of the interwoven nature of a groups' inward and outward orientation. How the group members react to changes brought from the outside that affect existing group members seems to be influenced more by their perception of the groups' cohesion than the groups' openness. However, many specific aspects of this dynamic remain unexplored in this work, which has some limitations.

5.3 Limitations and future research directions

The biggest limitation of this thesis lies in the fact that one aspect of the group personality concept introduced here was theoretically derived but not empirically tested: The applicability to multiple types of groups. Future research using this concept should aim to acquire not only different types of groups, but to also ensure that each type of group is represented by an adequate number of groups, who are in turn represented by an adequate number of members per group. In broader terms, the complex requirements for all types of multilevel analysis (Hox, Moerbeek, & van de Schoot, 2017; Snijders & Bosker, 2012) must be taken into consideration at the sampling stage of new research already, should the goal be to gain a deeper understanding of how group characteristics should be conceptualized and measured and how members from different groups might perceive and rate them.

Another limitation lies in the creation process of the GOCQ. In this work, the GOCQ has been successfully applied in the context of work teams in nursing. The results presented in

research papers 1 and 2 were promising in that they showed that individual responses to the GOCQ were influenced by the latent constructs of group openness and cohesion. Based on those results, the GOCQ should be applicable to different types of work teams as well, as the item content likely fits other professions and behaviors within those that are influenced by the cohesion and group openness of the work team. However, the specific item content is also a limitation of the GOCQ, for which the item creation process was faced with a conundrum: While the conceptualized dimensions group openness and cohesion were general, items still had to be designed to measure behaviors and attitudes that a specific group, a nursing team, can show and exhibit. The idea that the more general latent characteristics influence specific behaviors and attitudes is almost always used in questionnaire design (and is in fact the basis for almost all research involving latent traits), and the GOCQ is no exception – however, it must be noted that, although the dimensions group openness and cohesion are ones that every group can find its peculiarity on, the items that were formulated refer to behaviors and attitudes of a specific group, in this case, a nursing team. In other words, it is possible that the underlying latent characteristics are applicable to all groups, but can only influence a specific set of possible behaviors for each group that is unique to each group – this would mean that, in order to be truly generalizable, group openness and cohesion in other groups might need to be measured with a (slightly) different set of items. As mentioned, future research should be concerned with the applicability of the group openness and cohesion constructs to different groups, and it needs to find a way to formulate items that facilitate this comparability, for example through the creation of items that are as broad and generalized in nature as the constructs they aim to measure.

Creating new items is also how the next limitation could be addressed: The second research paper (section 3.2.4) showed that the indirect and direct approaches to group characteristics appear to measure unrelated characteristics, at least when operationalized using the HEXACO-PI-R and the GOCQ, respectively. As a limitation, this result cannot

conclusively rule out a connection between the approaches, as they were operationalized using two different measures, one where the members rate themselves (HEXACO-PI-R) and one where they rate their team (GOCQ). To obtain more information about possible relations between the approaches, future research could aim to create essentially a group version of the HEXACO-PI-R, where the items are re-worded to refer to the group as the entity to be rated. This new version could then be used to operationalize the direct approach, to create more parallels between the approaches. This was beyond the scope of this thesis, as re-wording of some HEXACO-PI-R items would have been necessary in cases where the item content does not make sense when responded to with the group as the to be rated entity, but the meaning and scale assignment would have needed to be preserved. Still, a more conclusive test about interrelations between the indirect and direct approaches should take this method into consideration.

The group personality structure presented in this thesis was derived from existing concepts of group characteristics and individual personality. Another possibility would have lied in a lexical study, which have a long history in personality research (Allport & Odbert, 1936; Cattell, 1943; Goldberg, 1990). Such a study perhaps could have found a different group personality structure based on a factor-analysis of a large number of adjectives that can reasonably be used to describe groups. Future research concerned with the conceptualization of group personality structures should take this possibility into consideration.

Finally, this thesis does not take other concepts of group characteristic measurements into consideration. For example, multiple studies use group characteristics rated by outsiders of the group to predict other phenomena. Oftentimes, this includes supervisor ratings of performance and their correlation with other group characteristics (e. g., Halfhill, Nielsen, Sundstrom, & Weilbaecher, 2005). This raises some new questions in the context of this work. When the group openness and cohesion concepts are rated by a person outside of the group who has an “overview” of it, does the individual perspective still play such a

considerable role in this rating, or is the rating now influenced to a greater extent by the actual latent group characteristic? How are these ratings related to how the group members rate themselves and their own group, and are they reliable and valid? These questions are also worth exploring in future research, as they help to gain additional understanding about the groups' characteristics and their conceptualization and measurement.

Overall, the main contributions of this thesis lie in the creation of a group personality characteristics structure based on the group openness and cohesion constructs, the creation of an instrument for the measurement of these constructs (the GOCQ), and the comparisons of the indirect and direct approaches to conceptualizing and measuring group characteristics. Future research in this field should primarily focus on the applicability of this group personality structure to other types of groups and the creation of a more general mode of measurement in the process. This mode of measurement should take the unique perspective of each group member and what it is influenced by into consideration and should also be compared to other modes of indirect group characteristic measurements, as well as group characteristics rated by individuals outside of the group. This thesis was also able to show a relevance of group cohesion for training transfer and other constructs, for which the exact mechanisms should also be unraveled in future studies.

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V. Appendix

Appendix A: GOCQ item list in German and English.

Nr.	Scale	Item	Item (Translated)
1	Cohesion	Die Teammitglieder vertrauen ihren Kollegen.	The team members trust their colleagues.
2	<i>Openness</i>	<i>Meinem Team fällt es schwer, von Routine abzuweichen.</i>	<i>My team has a difficult time deviating from routine.</i>
3	Cohesion	Im Team können Probleme offen angesprochen werden.	In our team, problems can be freely brought up.
4	Openness	Neue Ideen werden im Team berücksichtigt.	New ideas are considered in our team.
5	Cohesion	In unserem Team wird nur selten schlecht über Kollegen & Kolleginnen hinter deren Rücken gesprochen.	In our team, we very rarely talk badly about colleagues behind their back.
6	Openness	Neue Ideen in unser Team einzubringen ist schwer.	Bringing new ideas into our team is difficult.
7	Cohesion	Fehler werden in unserem Team offen und ehrlich diskutiert.	Mistakes are discussed freely and openly in our team.
8	Openness	Das Team ist Veränderungen gegenüber aufgeschlossen.	The team is open to changes.
9	Cohesion	In unserem Team fragt man sich gegenseitig um Rat.	In our team, we ask each other for advice.
10	<i>Openness</i>	<i>Im Team unterstützen wir uns gegenseitig bei der Umsetzung neuer Ideen.</i>	<i>In our team, we support each other with the implementation of new ideas.</i>
11	Cohesion	Im Team kann jeder Fehler offen ansprechen.	Everybody can freely bring up mistakes in the team.
12	Openness	In unserem Team herrscht eine hohe Bereitschaft, Arbeitsabläufe zu überdenken.	In our team, there is high readiness to reconsider how we work.
13	<i>Cohesion</i>	<i>Im Team werden auch persönliche Dinge besprochen.</i>	<i>Personal things are sometimes discussed in the team.</i>
14	Openness	In unserem Team herrscht eine „das haben wir schon immer so gemacht“ - Haltung.	In our team, we have a ‘We have always done it this way’ attitude.
15	Cohesion	Im Team haben wir eine „Wir sitzen in einem Boot“ – Einstellung.	In our team, we have a ‘we’re all in the same boat’ attitude.
16	Openness	Veränderungen von Arbeitsabläufen werden in unserem Team blockiert.	Changes to our ways of working are blocked in our team.
17	Cohesion	Wir halten als Team zusammen.	We stick together as a team.
18	Openness	Vorschläge für neue Arbeitsweisen können in unserem Team gut angebracht werden.	Proposals for new ways of working have a high chance of being accepted in our team.
19	Cohesion	Jede Ansicht wird angehört, auch wenn es die Meinung einer Minderheit ist.	Every opinion is heard, even if it is that of a minority.
20	Cohesion	In unserem Team fühlt sich niemand ausgeschlossen.	In our team, nobody feels excluded.

Note. Italicized items are not contained in the final version as per the results presented in research paper 1.

Appendix B: The GOCQ as it was presented in the research project. Note that it also contains other team-related items that were not part of the research presented in this thesis.

SPRÜCHT VOM



Bundesministerium
für Bildung
und Forschung



DLR Projektträger



Fragebogen

Team-Befragung

Ihr Team - Code:

--	--	--

Studienleitung

Vielen Dank für Ihre Teilnahme an unserer Studie!

Bitte beantworten Sie zunächst die folgenden Fragen zu Ihrem Team:

1	Wie viele Mitglieder hat ihr Team?	
2	Wie lange sind Sie schon Mitglied dieses Teams?	

Bitte geben Sie nun an, **wie sehr die folgenden Aussagen auf Ihr Team zutreffen**. Hierzu steht Ihnen eine Skala mit 5 Stufen zur Verfügung, von „- - = **stimme gar nicht zu**“ bis „++ = **stimme völlig zu**“.

Manche Fragen sind eventuell schwerer zu beantworten, lassen Sie sich mit der Beantwortung ruhig etwas Zeit. Bitte entscheiden Sie sich für eine Antwort und **kreuzen Sie nicht zwischen den Kästchen an**.

		stimme gar nicht zu	stimme wenig zu	stimme mittelmäßig zu	stimme überwiegend zu	stimme völlig zu
3	Die Teammitglieder vertrauen ihren Kollegen.	--	-	±	+	++
4	Meinem Team fällt es schwer, von Routine abzuweichen.	--	-	±	+	++
5	Wir erinnern uns gegenseitig daran, auch mal eine Pause zu nehmen.	--	-	±	+	++
6	Im Team können Probleme offen angesprochen werden.	--	-	±	+	++
7	Neue Ideen werden im Team berücksichtigt.	--	-	±	+	++
8	Professionell zu sein heißt bei uns im Team, mit jeder Belastung zurecht zu kommen, egal wie hoch diese ausfällt.	--	-	±	+	++
9	In unserem Team wird nur selten schlecht über Kollegen & Kolleginnen hinter deren Rücken gesprochen.	--	-	±	+	++
10	Neue Ideen in unser Team einzubringen ist schwer.	--	-	±	+	++
11	In Gesprächen untereinander äußern wir uns nur sehr selten negativ über Patienten.	--	-	±	+	++
12	Fehler werden in unserem Team offen und ehrlich diskutiert.	--	-	±	+	++
13	Das Team ist Veränderungen gegenüber aufgeschlossen.	--	-	±	+	++
14	Beim Gespräch mit Patienten oder Angehörigen sprechen wir auch über deren Gefühle und Bedürfnisse.	--	-	±	+	++
15	In unserem Team fragt man sich gegenseitig um Rat.	--	-	±	+	++
16	Im Team unterstützen wir uns gegenseitig bei der Umsetzung neuer Ideen.	--	-	±	+	++
17	Uns gemeinsam über die Arbeit aufzuregen, gehört bei uns zum guten Ton.	--	-	±	+	++
18	Im Team kann jeder Fehler offen ansprechen.	--	-	±	+	++

19	In unserem Team herrscht eine hohe Bereitschaft, Arbeitsabläufe zu überdenken.	--	-	±	+	++
20	In Übergabesituationen wird oft negativ über Patienten gesprochen.	--	-	±	+	++
21	Im Team werden auch persönliche Dinge besprochen.	--	-	±	+	++
22	In unserem Team herrscht eine „das haben wir schon immer so gemacht“ - Haltung.	--	-	±	+	++
23	Bei uns im Team spielt der emotionale Zustand von Patienten als Teil des Aufnahmegesprächs eine wichtige Rolle.	--	-	±	+	++
24	Im Team haben wir eine „Wir sitzen in einem Boot“ – Einstellung.	--	-	±	+	++
25	Veränderungen von Arbeitsabläufen werden in unserem Team blockiert.	--	-	±	+	++
26	Wir haben im Team in der Regel sehr schnell eine klare Meinung zu Patienten.	--	-	±	+	++
27	Wir halten als Team zusammen.	--	-	±	+	++
28	Vorschläge für neue Arbeitsweisen können in unserem Team gut angebracht werden.	--	-	±	+	++
29	Besucher behindern uns oft bei unseren Arbeiten.	--	-	±	+	++
30	Jede Ansicht wird angehört, auch wenn es die Meinung einer Minderheit ist.	--	-	±	+	++
31	Bei der grundpflegerischen Versorgung morgens können wir leider keine Rücksicht auf die Wünsche der Patienten nehmen.	--	-	±	+	++
32	In unserem Team fühlt sich niemand ausgeschlossen.	--	-	±	+	++

Bitte beschreiben Sie kurz, wie in Ihrem Team normalerweise neue Informationen wie zum Beispiel Fortbildungsinhalte weitergegeben werden. (Einige Teams haben zum Beispiel alle 2 Wochen Zeit für Besprechungen mit dem ganzen Team eingeplant, in denen solche Informationen an alle Teammitglieder weitergegeben werden.)

Bitte beantworten Sie abschließend einige Fragen für die Statistik:

1. Alter _____

2. Geschlecht

- männlich weiblich unbestimmt

3. Deutschkenntnisse

Da diese Umfrage auf sprachlichem Material basiert, möchten wir Sie bitten, Ihre Deutschkenntnisse anzugeben.

- Muttersprache
 wie Muttersprache / sehr gut
 gut
 ausreichend

4. Falls Sie zu einem späteren Zeitpunkt erneut an einer unserer Befragungen teilnehmen, würden wir die Daten gern einander zuordnen können. Damit dies anonym erfolgen kann, erstellen Sie sich bitte einen Teilnahme – Code:

1. und 3. Buchstabe Vorname Vater, z.B. Peter -> PT

Geburtsdatum der Mutter (TTMM), z.B. 3. Januar -> 0301

1. und 3. Buchstabe Vorname Mutter, z.B. Aнна -> AN

Im Beispiel wäre der Code PT0301A

Ihr Teilnahme - Code:

--	--	--	--	--	--	--	--

Sollten Ihre Eltern mehrere Vornamen haben, merken Sie sich bitte, welchen Sie verwendet haben. Bitte merken Sie sich ggf. auch, ob Sie die Angaben Ihrer Eltern oder Stiefeltern gewählt haben.

Zum Abschluss: Haben Sie ernsthaft an der Befragung teilgenommen?

Wir wissen, dass Befragungen oft lang sind und man möglicherweise irgendwann nur noch "irgendwas ankreuzt". In diesem Fall können wir Ihre Daten nicht verwenden. Sie erleichtern uns die Auswertung erheblich, wenn Sie dies bitte hier ehrlich angeben.

- Ja, ich habe ernsthaft an der Befragung teilgenommen
 Nein, ich habe nicht ernsthaft teilgenommen

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