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Group Trust: A Proposed Definition, Model, and Empirical Evidence from Competency Committee Decisions

by

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DEDICATION

To Melora, Nolan, Nyla, and Blake for their love and unwavering support

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ABSTRACT

Group Trust: A Proposed Definition, Model, and Empirical Evidence from Competency Committee Decisions:

Jason Sapp, Master of Health Professions Education, 2019

Thesis directed by: Steven Durning, MD, PhD, Director, Graduate Programs in Health Professions Education (HPE)

Problem: Trust is a critical component of competency committees given their high-stakes decisions. However, few studies have examined trust and group decisions.

Methods: We conducted a scoping review to synthesize a definition of "group trust" and develop a group trust model. Using this framework, the research team also conducted an investigation involving structured observations of competency committee meetings within the National Capital Consortium.

Results: We defined group trust as a group-directed willingness to accept vulnerability to actions of the members based on the expectation that members will perform a particular action important to the group, encompassing social exchange, collective perceptions, and interpersonal trust. The model served as a useful organizing framework for reporting findings, encompassing interpersonal interactions and individual, group, and environmental factors.

Conclusions: We propose a definition of group trust and a framework for making observations regarding group decisions and have collected preliminary empirical data to support its use.

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CHAPTER 1: INTRODUCTION

BACKGROUND

Competency-based medical education (CBME) was initially recommended for health professions training by a World Health Organization report in 1978, which defined the output of a CBME program as a professional who is able to perform at a defined level of proficiency to meet local needs (14, 15). CBME fosters progressive development of competence and measures progression using inherent knowledge, skills, and attitudes within specific competencies (14). For graduate medical education (GME) programs, an essential component of training residents and fellows includes developing a process to assess clinical competence. The Accreditation Council for Graduate Medical Education (ACGME) Next Accreditation System (NAS) and Milestones that were launched in 2013 are built upon the fundamentals of CBME (16). The overarching goal of the Milestone initiative is to help programs produce highly competent physicians to meet the health and healthcare needs of the public (13). Milestones also help programs determine which of their trainees are on appropriate paths towards independent clinical practice and which are not. While the ACGME delineates expectations for Milestone-specific levels of competence, programs are ultimately responsible for determining the best methods to assess the essential elements required of a competent physician, as well as synthesizing this information into trainee progress reports, and reporting the results to the ACGME twice a year.

Within a GME program, the clinical competency committee (CCC) forms a fundamental part of this effort. Individual member composition of CCCs varies based

upon different GME programs but ideally consists of faculty educators, a medical director or service chief, and chief residents who have completed a core residency program. One of the purposes of the CCC is to assess each trainee's progress in relation to the Milestones and his or her level of training. The CCC also makes recommendations to the program director regarding overall trainee progress, promotion, and potential remediation (18). Given the high-stakes decisions shouldered by the CCC, trust is an important foundational component of these committees.

In the context of individual trainee supervision, health professions education research has explored trust in decisions that supervisors make about the level of independence granted for different clinical responsibilities and the factors that influence those decisions (10). Entrustable professional activities (EPAs) address tasks that trainees are permitted to execute once they attain a sufficient level of competence. The level of supervision for each EPA depends upon how much a supervisor trusts a trainee to complete that specific task (2).

Our research, however, goes beyond the individual supervisor to focus on decisions made at the program level by the CCC. Several studies have looked at group decision making processes and how these concepts may be utilized by CCCs. A 2016 narrative review on group decision making as it relates to CCCs revealed which group aspects most influence their outcomes (i.e. individual member characteristics, effects of time pressures, information-sharing procedures, group leader role, and group size and understanding of its work) and delineated recommendations under the broad categories of group composition and group processes (11). An additional narrative review developed a theoretical approach consisting of three orientations (i.e. schema, constructivist, and

social influence) in the setting of moderators, which include guidelines, time pressures, and leadership to help explain how small groups make decisions (3). Finally, a 2017 report discusses the idea that conversation itself may hold the key to understanding how CCCs make decisions (12).

Scholars outside of medicine have explored trust at the individual level and at the group level (e.g. in work teams) (5, 9). Research on group trust has focused primarily on trust within a group (e.g. as an aggregate or combination of individual trust) as opposed to trust in group decisions from individuals either within or outside of the group. However, "group trust" in any of these contexts has also not been clearly defined. Additionally, although some recent studies describe data sources that CCCs use and how they weigh this information in their collective decisions (4, 20), health professions education research has not studied trust within these committees and trust in committee decisions from individuals either within or outside the group. Defining trust in group settings is important to informing and potentially improving how CCCs and other groups make collective decisions; proposing a model illustrating various components of group trust and empirically testing this model may also help such committees implement a more effective and meaningful decision process regarding trainee competence.

RESEARCH QUESTIONS

Based upon the gaps identified in both health professions education and the broader literature, we developed the following research questions.

1. How should "group trust" be defined in the context of group structure, process and decisions made by CCCs, and what factors may influence group trust?

2. (a) How does group trust operate within CCCs as they make Milestone-based decisions about trainee competence? (b) What do CCC faculty members think contributes to trust in these committee decisions?

THEORETICAL FRAMEWORK

Group components and processes have been evaluated as a framework for CCCs, and two narrative reviews utilized social decision scheme theory as part of their extraction and analysis of the literature (3, 11). The most commonly utilized theoretical frameworks from articles cited in our review of the broader literature are social exchange theory and social information processing theory (5). While these two theories are helpful to explain how trust develops, we have not found any evidence that they have been applied to decision making groups in the context of professional progress decisions (e.g. competence). One additional study explored factors important to CCCs as they make decisions regarding trainee supervisory roles and found that both trainee and environmental factors are important (19).

For decision making groups to reach a consensus, communication and interactions between and among people, objects (those items that extend human capabilities in a learning or task-oriented setting, such as learning management systems), and the environment are believed to be essential. Situated cognition, as a "macro theory," also provides a lens for understanding complex social situations in fields outside of medicine (7). We therefore chose situated cognition as our theoretical framework to support the development of a model and interpretation of the literature to help advance our understanding of group processes in the context of CCCs. Situated cognition contends that thinking is viewed as situated (or located) within the larger social and physical

context of the environment. This theory suggests that a group setting is highly complex with multiple components (i.e. social, cultural, and physical) and opportunities for multiple interactions between and among these components. It recognizes the complex interplay between participants, objects that augment individuals' cognitive capabilities (i.e. artifacts), and the environment. Situated cognition places emphasis on how these various interactions lead to thinking and decisions. The model we propose and test in this thesis is built upon all of these interactions.

OVERVIEW OF THE STUDIES

The work for this thesis began with a review of the literature on group trust to understand the origins of and perspectives on this complex topic. We conducted a scoping review presented in Chapter 2 with the following three aims. First, we examined the definition of trust in the context of group decisions. Second, we examined what factors may influence trust within a group and from the perspective of those who rely on CCCs to make collective decisions regarding trainee competence. Finally, given the complexity of multiple factors that influence trust, we proposed a model to illustrate the relationship between trust at the individual and group levels.

To offer validity evidence for our proposed model, Chapter 3 presents empirical findings from observations of CCC meetings. The purpose of this study was twofold. We tested our proposed model in the context of CCC collective decisions and assignment of the Milestones in primary care (i.e. internal medicine and pediatrics) and subspecialty settings. We also assessed what factors were important to individual faculty members regarding trust in the setting of CCC decisions. Taken together these two articles offer initial insight into how trust operates within a CCC.

CHAPTER 2: TRUST IN GROUP DECISIONS: A SCOPING REVIEW

SUBMITTED AS:

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ABSTRACT

Background: Trust is a critical component of competency committees given their high-stakes decisions. Research from outside of medicine on group trust has not focused on trust in group decisions, and "group trust" has not been clearly defined. The purpose was threefold: to examine the definition of trust in the context of group decisions; to explore what factors may influence trust from the perspective of those who rely on competency committees; and to propose a group trust model.

Methods: The authors conducted a literature search of four online databases, seeking articles published on trust in group settings. Reviewers extracted, coded, and analyzed key data including definitions of trust and factors pertaining to group trust.

Results: The authors selected 42 articles for full text review. Although reviewers found multiple general definitions of trust, they were unable to find a clear definition of group trust and propose the following: a group-directed willingness to accept vulnerability to actions of the members based on the expectation that members will perform a particular action important to the group, encompassing social exchange, collective perceptions, and interpersonal trust. Additionally, the authors propose a model

encompassing individual-level factors (trustor and trustee), interpersonal interactions, group-level factors (structure and processes), and environmental factors.

Conclusions: Higher degrees of trust at the individual and group levels have been associated with attitudinal and performance outcomes, such as quality of group decisions. Developing a deeper understanding of trust in competency committees may help these committees implement more effective and meaningful processes to make collective decisions.

BACKGROUND

Training competent physicians is, in many ways, a matter of trust. Patients trust providers to be able to competently address their ailments and assist in helping them achieve good health. Accreditation organizations trust that graduate medical education (GME) programs implement policies and procedures with a high level of skill to prepare graduates to provide highly competent medical care. GME programs trust their competency committees to make accurate decisions regarding trainee progress. Trust as a core concept is growing in prevalence in the broader education literature and more recently has been discussed in health professions education, but is the nature of trust in each of these contexts the same?

Scholars outside of medicine have explored trust at the individual level and at the group level (e.g. in work teams).[1,2] Research on group trust has focused primarily on trust within a group (e.g. as an aggregate or combination of individual trust) as opposed to trust in group decisions from individuals either within or outside of the group. However, "group trust" in any of these contexts has also not been clearly defined. Additionally, although some recent studies describe data sources that competency committees use and how they weigh this information in their collective decisions,[3,4] health professions education research has not studied trust within these committees and trust in committee decisions from individuals either within or outside the group. Defining trust in group settings is important to informing and potentially improving how competency committees and other groups make collective decisions; proposing a model illustrating various components of group trust may also help such committees implement a more effective and meaningful decision process regarding trainee competence.

In the context of individual trainee supervision, health professions education research has explored trust in decisions that supervisors make about the level of independence granted for different clinical responsibilities and the factors that influence those decisions.[5] Entrustable professional activities (EPAs) address tasks that trainees are permitted to execute once they attain a sufficient level of competence. The level of supervision for each EPA depends upon how much a supervisor trusts a trainee to complete that specific task.[6]

While such individual decisions of trust are important, group decisions regarding trainee competence are also critical. Competency committees determine which trainees are on appropriate paths towards unsupervised clinical practice and which are not. They assess each trainee's progress, and they make recommendations to program directors regarding trainee overall progress, promotion, and remediation.[7] Given the high-stakes decisions shouldered by competency committees, trust is a critical component of these group decisions.

Research from outside health professions education suggests that trust operates at the individual, group, and organizational levels of analysis.[1] Trust is believed to exist along a continuum and is often characterized as an emergent phenomenon that develops over time based upon interactions, context, and specific situations.[8] Even within a group, limited work outside of health professions education suggests that trust occurs at multiple levels encompassing both individual level and group level processes simultaneously.[2]

The purpose of this scoping review is threefold. First, we examine the definition of trust in the context of group decisions. Second, we examine what factors may influence trust within a group and from the perspective of those who rely on competency

committees to make collective decisions regarding trainee competence. Finally, given the complexity of multiple factors that influence trust, we propose a model to illustrate the relationship between trust at the individual and group levels.

Theoretical Framework

Group components and processes have been evaluated as a framework for competency committees, and two narrative reviews utilized social decision scheme theory as part of their extraction and analysis of the literature.[9,10] The most commonly utilized theoretical frameworks from the articles cited in this review are social exchange theory and social information processing theory.[2] While these two theories are helpful to explain how trust develops, we have not found any evidence that they have been applied to decision making groups in the context of professional progress decisions (e.g. competence). One additional study explored factors important to competency committees as they make decisions regarding trainee supervisory roles and found that both trainee and environmental factors are important.[11]

For decision making groups to reach a consensus, communication and interactions between and among people, objects (those items that extend human capabilities in a learning or task-oriented setting, such as learning management systems), and the environment are believed to be essential. Given that previous competency committee research has focused on social decision scheme theory, we instead chose situated cognition as our theoretical framework.[12] While situated cognition did not arise out of our literature review, we chose this theory to support the development of a model and interpretation of the literature to help advance our understanding of group processes in the context of competency committees. Situated cognition contends that thinking is

viewed as situated (or located) within the larger social and physical context of the environment. This theory suggests that a group setting is highly complex with multiple components (i.e. social, cultural, and physical) and opportunities for multiple interactions between and among these components. It recognizes the complex interplay between participants, objects that augment individuals' cognitive capabilities (i.e. artifacts), and the environment. We also contend that various group processes further explained in our results may influence interactions within a group and the environment. Situated cognition places emphasis on how these various interactions lead to thinking and decisions. The model we propose in this review is built upon all of these interactions.

METHODS

We chose a scoping review to understand how trust operates in groups making collective decisions and to support the development of a model using situated cognition that can be tested empirically in future studies. This scoping review was conducted based upon the methodology originally outlined by Arksey and O'Malley and expanded upon by Levac et al.[13,14] We initially reviewed the broad literature on trust at the individual, group, and organizational levels. During this initial review, we identified a multilevel model of trust in work teams from outside of health professions education that we used as a framework to guide our subsequent search and analysis.[2] Recognizing that the medical literature is narrow for this particular subject and the potential benefits of including what is known about trust in group settings from other fields, we chose to expand our search to include other disciplines that involve similar groups (e.g. committees and juries).

With the assistance of a medical librarian, we conducted a search in MEDLINE, ERIC, PsycINFO, and SCOPUS in April 2018 (our search strategy is shown in

Supplemental Digital Appendix 1). We did not limit the publication dates of our searches, but the results were limited to English-language articles.

The research team reviewed titles and abstracts using the following initial inclusion criteria: original research or review articles; "trust" referenced in the title; and articles that included information about a group, team, committee, or similar collection of individuals. Articles were excluded if they did not meet the inclusion criteria above. We also excluded articles for the following reasons: the word "trust" was used in a different context (e.g. trust fund); trust was a narrow focus of the article; no clear link to group processes or dynamics; the link between trust and a group was not clear; the article referenced only virtual groups; and articles from the computer science, information technology, and economics fields. The research team met regularly and came to complete consensus during this step of the process.

A data extraction sheet was modeled after a sensitizing framework in a recently published review of trust in teams outside of medicine and our initial review of the trust literature (See Supplemental Digital Appendix 2).[2] We extracted definitions of trust along with factors pertaining to trust at the group level and synthesized this information into our primary outcomes: a definition of group trust, factors that influence group trust, and a proposed model to illustrate the relationship between trust at the individual and group levels. Each article was independently coded by two members of the research team. Discrepancies in coding were resolved in regular in-person research team meetings. **Figure 1** outlines the review process.

Consistent with revised scoping review methodology recommendations,[14] we obtained consultation from two independent medical educators outside of our research

team who have experience with competency committees. We presented them our preliminary findings, and we incorporated their feedback in our final revision of the results.

RESULTS

We identified 406 publications and included 42 articles. The two main reasons for exclusion were that the articles demonstrated no clear link to group dynamics and/or trust was too narrow of a focus (**Figure 1**). A complete list of the 42 included publications is available in Supplemental Digital Appendix 3.

Publication Categories

Publications were written by 108 unique authors, with 103 (95.4%) contributing once. Twelve countries were represented, and six (14.2%) publications were multi-national collaborations. Five (11.9%) publications involved healthcare work teams. Thirteen (31%) involved undergraduate or graduate students, though none of the included publications focused on health professions education (**Table 1**).

Publication Types

Thirty-four (81%) publications were empirical research studies, seven (16.7%) were literature reviews, and one (2.4%) was a meta-analysis. Of the empirical publications, all were prospective studies; 85.3% used quantitative methods (n=29: surveys=27, scenarios=2), while the remaining utilized qualitative (n=2) or mixed (n=3) methods.

Definitions of Trust

The most often cited general definition of trust by articles in this review (n=28, 66.7%; almost always referring to trust at the individual level) is the "willingness of a party to be *vulnerable* to the actions of another party based on the *[positive] expectation* that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party."[15] Other general definitions of trust cited by articles in this study are provided in **Table 2**. Positive expectations are beliefs that the actions of another will be beneficial, favorable, or at least not detrimental.[16] Vulnerability implies that there is something of importance to be lost and involves taking a risk; indeed, risk is also a commonly cited component of trust.[17-28] Thus, because trust in general can be defined as a willingness to be vulnerable to the actions of another party, trust at any level (e.g. individual, group, organization) can arguably be characterized as a measure of how much risk an individual is willing to incur in relationships.

Trust in general is also felt to have both cognitive and affective foundations.[24,29] Cognitive-based trust refers to available knowledge about another party's competence, reliability, and dependability, such that individuals choose who they will trust based upon calculative and rational characteristics.[2,30] Affect-based trust refers to the emotional elements of trust, which includes genuine care and concern for the welfare of others and the belief that trusting behaviors will be reciprocated by others.[2]

Within a group, trust has been proposed by fields outside of medicine (e.g. management, organizational and social psychology, and higher education) to exist at both the individual and group levels of analysis and that conceptualizations of group trust should include individual trust. However, we were unable to find in this review a clear definition of group trust. **Figure 2** outlines the relationship between individual trust and

various characterizations of group trust in the literature. At the individual level, interpersonal trust occurs in dyadic relationships between members in the group. At the group level, trust is thought to have many of the same characteristics outlined above, such as the willingness to accept vulnerability, positive expectations that the actions of another will be beneficial (or at least not detrimental), risk, and cognitive and affective foundations.[2,21,26] One important difference between individual and group trust is that instead of existing in dyadic relationships, group trust implies that these components of trust are shared *among* group members.[2] Scholars note that group trust involves each dyadic relationship within the group along with collective perceptions of trust about the group as a distinct unit.[31] Social exchange, which encompasses individual interactions and interdependent group tasks, is also thought to contribute to group trust and helps individuals develop shared perceptions, expectations, and behavioral norms with other group members.[32-34] Moreover, trust at the group level is also felt to be a matter of shared group membership where individuals may be willing to trust other group members to show that the group is important to them and a meaningful part of their identity.[35]

Although group trust may be illustrated as an aggregate or combination of individual trust, studies suggest group trust is not typically spread evenly amongst the group. *Trust asymmetry* is believed to emerge in a non-uniform manner as a function of the asymmetry that exists across all dyadic relationships within the group. Trust asymmetry is also believed to vary across groups and may influence group performance. Although trust between individuals usually enhances the level of exchange, trust asymmetry may hamper reciprocity in social exchange.[36]

Proposed Model

Given the lack of a clear definition of group trust in the literature we turned to exploring specific components of groups that may influence both the definition and how trust can be conceived to work in health professions education group settings, such as competency committees. We propose a preliminary model for various elements of trust pertaining to group decisions. We also acknowledge the coexistence of individual and group level trust within the model, as well as specific situational (contextual) factors that influence trust at both levels. Our model also emphasizes interpersonal interactions, which are a key element in situated cognition and have been cited as crucial for competency committees.[37] Below we outline some of the factors in our proposed model (See **Figure 3** and corresponding **Table 3** for a complete description of the factors, which includes potential implications for competency committees).

Individual-Level Factors

Trustor Factors

Trust between two group members requires looking at one individual as the "trustor" and the other as the "trustee," noting this relationship can be reciprocal with the roles shifting between members. Individual trustor factors include an individual's propensity to trust and vulnerability. Propensity to trust is believed to vary with people's different experiences, personality types, and cultures.[15] Showing vulnerability may also be crucial for building trusting group relationships as this demonstrates a willingness to trust other group members and the group itself.[38]

Trustee Factors

The three trustee characteristics most often cited in the literature are ability (a group of skills and competencies in a specific domain), benevolence (the extent to which

a trustee is believed to want to do good to the trustors on the giving end of a trusting relationship), and integrity (the trustor's perception that the trustee adheres to a set of principles that the trustor finds acceptable).[15] In a collective setting, perceived commitment to the group has also been cited as an important individual trait.[39]

Interpersonal Interactions

Interpersonal interactions are an important component of situated cognition, and effective interactions can lead to improved social exchange and cohesion, both of which have been shown to enhance the development of interpersonal trust, especially in new product development teams and technology-supported decision making groups.[24,30] For decision making groups and top management teams, a shared mental model is important and may be conceptualized as the shared knowledge and organized understanding of the information and resources used by the group, tasks and problems faced by the group, and individual group members' imported information (the preexisting knowledge, stereotypes, preconceptions, and experiences stored in group members' memories).[40,41] While trust between group members is usually felt to enhance information exchange and establish shared understanding, knowledge brought in by new members may adversely affect group collective beliefs and memory structures, especially in well-established groups.[30] Notably, trust can more easily be violated in relationships of shorter rather than longer duration because parties in newly formed relationships are less likely to have had the opportunity to develop mutual understanding and respect.[28] Additionally, a person's standing in the group, which refers to a person's inclusion or membership status within a group, may influence how more senior or experienced members interact with newer ones.[35]

Group-Level Factors

Group Structure

Regarding a group's composition, diversity amongst members can have multiple influences on trust within the group. Diversity in this context includes both cultural and skill diversity. Trust may be more likely to develop in a group, as demonstrated in a group of undergraduate psychology students, where members perceive each other to be similar in attitudes, personality, intellect, and other characteristics than in groups whose members perceive themselves to be dissimilar from one another.[20] Cultural diversity has also been shown in some contexts to negatively impact group performance and communication effectiveness.[41] In contrast to cultural diversity, skill diversity has been shown in an applied psychology meta-analysis to positively impact intrateam trust and team performance.[31]

Group member stability and group size are also believed to contribute to a group's structure. In general, group member stability tends to positively impact communication patterns, the social interaction of teams, and interpersonal trust.[30] From an external perspective, smaller groups (e.g. less than 10 individuals) have generally been shown to be more trustworthy than larger groups (e.g. 10 or more individuals) in undergraduate psychology students.[42]

Group Processes

Group Cooperation and Monitoring

Work outside of medicine suggests that cooperation and monitoring behaviors are commonly impacted by the level of trust within a group. Group members who experience high trust tend to cooperate more, share information, accept influences from

other members, and feel personally involved with the group. Monitoring usually occurs at the opposite end of the spectrum when trust between members is low. Monitoring behaviors manifest when members feel a need to be vigilant about the actions and intentions of others. Groups in which members perceive colleagues as trustworthy are likely to demonstrate fewer monitoring behaviors and more cooperative behaviors based upon psychology research on undergraduate students, teams from European social care institutions, and hospital employees.[17,19,43]

Group Conflict

Conflict amongst group members appears to have complex associations. Task (cognitive) conflict tends to arise from individual differences in viewpoints, ideas, or opinions when group members participate in a shared undertaking. Conversely, relationship (affective) conflict tends to arise from interpersonal tensions. Scholars argue that these two types of conflict lead to different outcomes and contend that task conflict can be constructive whereas relationship conflict is usually dysfunctional based upon research from strategic decision making teams and higher education faculty.[16,25] Higher levels of conflict (especially relationship conflict) in teams are usually associated with lower trust. In MBA graduate students, reductions in trust resulting from conflict may lead to more conflict as a result of blame for, and resentment about, ineffective group design or poor performance.[23] On the other hand, too much trust within a group may result in almost no conflict whatsoever regardless of type. Thus, the group may lose out on the positive effects of task conflict.[44]

In the management literature, even perceptions of conflict may lead to conflict within a group. How one perceives, defines, and interprets interpersonal discord may be more important than the nature of the conflict itself.[28] When one person distrusts another, that person may interpret ambiguous behaviors as threatening and convey distrust through his or her conduct. The person whose behavior is interpreted as threatening may reciprocate that distrust.

Group Procedural Fairness

Two aspects of decision making procedures have been shown to create perceptions of fairness: consideration of member input and influence over a decision. Consideration of input refers to the extent a group leader listens to and considers group member input during a decision making process. Influence refers to the extent group member input affects or is reflected in the final decision. Fair procedures have been associated with positive attitudes toward the group, leader, and organization, resulting in group harmony, trust in the leader, and organizational commitment. Individual members who perceive fair procedures within the group are believed to be more likely to commit to group decisions based upon research from Fortune 500 management teams and Netherlands undergraduate students.[45,46]

Group Task Interdependence

When task interdependence (the degree to which group members must interact and rely on one another to accomplish goals) is high, trust plays a more influential role because teamwork interactions become critical to achieving group goals.[2,31]

Group Climate

A group's climate has multiple components and can be defined as shared perceptions of the kinds of behaviors, practices, and procedures that are supported within a group.[47] Climate may include a group's identity, defined as the degree to which members view the group as "we" versus "I." A common group identity may help develop trust, especially in diverse work groups, decrease negative attitudes and increase more positive affective responses toward other group members, and reduce mutual tensions and uncertainty.[48] Related to group identity is group efficacy. Efficacy has been defined in undergraduate Canadian business students at either the individual or collective level, and refers to an entity's belief in its ability to succeed in specific situations or accomplish a task.[29]

Psychological safety, collectivism, and ownership are all distinct and also contribute to a group's climate. In graduate-level business students, psychologically safe group environments encourage authenticity and risk-taking among group members because there is no fear of reprisal, punishment, harassment, or ridicule from others.[33] Groups with higher levels of psychological safety tend to have higher levels of trust.[39] Psychological collectivism refers to a person's propensity to favor group affiliation and the collective effort of the group over independent and autonomous effort. Compared with members who have low levels of psychological collectivism, a highly collectivistic individual will likely experience greater satisfaction working in a low-trust group environment, be more willing to work with other members, and more readily identify with that group.[33] Finally, psychological ownership refers to a feeling of possessiveness

and attachment to a variety of objects within one's organization. These feelings of ownership lead one to value and take responsibility for those objects. In various industries, individuals who feel ownership may engage in territorial behaviors to communicate and defend their ownership claims, especially in lower trust environments.[49]

Group Leadership

Leaders are believed to play a critical role in the development and maintenance of trust within a group. In healthcare and bank employees, authentic and transformational leadership styles have been shown to improve trust amongst members of a group.[34,50] Legitimacy (e.g. honesty, fairness, respectfulness) of a group leader may also promote a climate of interpersonal trust in groups.[30] Additionally, prototypical leaders, which are leaders who share essential characteristics of their group, may foster employee trust in coworkers.[35]

Leader behaviors may also influence trust. Relational behaviors, those that encourage collaboration and open communication, have been shown to augment trust in top management teams.[40] Other leader behaviors that may foster trust include fairness, particularly for a prototypical group leader,[35] the ability to create a safe atmosphere,[38] establishing behavioral norms and climate of the group,[41] developing unique personal relationships with each group member,[48] managing conflict, and creating a superordinate mission for the group.[51]

Environmental Factors

Environmental factors also play an important role in situated cognition and may influence trust within a group. External reporting relationships can add complexity to shared tasks. Groups that experience large amounts of pressure and conflict caused by reporting relationships to outside entities may report role conflict, confusing expectations or role ambiguity, and excessive demands resulting in overload and competing priorities.[51] Task complexity and uncertainty can also influence trust amongst a group. The link between task uncertainty and trust has been studied in swift action starting teams, which are highly interdependent teams of skilled individuals in organizations that complete demanding, complex, time-pressured projects and are often formed quickly. High levels of task uncertainty may deplete cognitive resources, so members in these teams may become overly dependent on heuristic-based decision making and rely more heavily on predispositions than would groups in less uncertain situations.[41] Additionally, group members may value predictability within the group, especially with increasingly unpredictable events outside of the group. As a result, established members of a group might be reluctant to trust new members given the uncertainty that they bring to the group.[39] Additional external factors that may impact a group include individuals' memberships in other groups and social ties, threats (e.g. external dangers or conflict with another group), and staffing levels (e.g. if a group is understaffed, trust may develop more strongly than if the group were larger because members are forced to work more closely together).[39]

DISCUSSION

Although multiple definitions of general trust exist in the literature and scholars have explored trust within work teams, we were unable to find a clear definition of group

trust. Further, trust in group decisions has not been well studied within or outside of health professions education. We define group trust as a group-directed willingness to accept vulnerability to actions of the members based on the expectation that members will perform a particular action important to the group, encompassing social exchange, collective perceptions, and interpersonal trust (**Figure 2**).

In a group, we agree with the literature outside of health professions education that trust occurs at multiple levels encompassing both individual level and group level processes simultaneously. For example, in a competency committee, members must be able to reconcile differences of opinion and work with colleagues on the committee to make decisions that are in the best interests of not only their trainees, but ultimately the patients for whom their trainees provide care. Committee members must also be able to trust one another to pull their own weight on the committee, respect other individuals' opinions, provide constructive input, and make fair judgments.

Higher levels of interpersonal trust will likely lead to a higher degree of trust at the group level. Higher levels of trust at both levels have been associated with attitudinal outcomes, such as increased cooperation and satisfaction,[20,28,41] and performance outcomes, such as information sharing and quality of group decisions.[20,30,40,52] Moreover, developing a deeper understanding of our trust in competency committees may help these committees implement a more effective and meaningful process to make collective decisions regarding trainee competence.

Based upon a synthesis of the information uncovered in this scoping review, we propose a model (**Figure 3**) to better understand trust at the group level and the various factors that may influence the trust of group decisions. Our model uses situated cognition

to incorporate trust at both levels along with other group level factors, environmental factors, and most importantly, the interactions between all of these elements. We also include practical implications for group decision making, such as competency committees, in **Table 3**.

Future research should explore our model in group settings to determine the applicability of our proposed definition and factors that we contend influence group trust. We also suggest additional research looking at trust in group decisions from an external stakeholder perspective (e.g. a person who is not a competency committee member) and what, if any differences may exist between this and group trust. For competency committee decisions, this might involve examining how program directors and individual faculty members who are not on a competency committee define trust in this context. Observing competency committee meetings with our proposed group trust framework may provide additional insight about how group trust operates in health professions education settings.

Our research is limited by the fact that all of our data came from fields outside of health professions education, and trust in other occupational settings may not be the same as trust in health professions education settings. Similarly, some of the reviewed papers focused on undergraduate and graduate students, and characteristics of these learners may not be the same as trainees in health professions education. However, we attempted to tie together universal characteristics of trust across industries and populations studied to develop a model that may be applicable to health professions education groups and warrants further investigation. Indeed, we also provide specific examples of how the

model applies directly to competency committees and the collective decisions they make (**Table 3**).

CONCLUSIONS

This scoping review should allow program leaders to better understand what factors may contribute to trust in group settings (e.g. competency committees). As programs develop policies, procedures, and determine the membership of these committees, keeping in mind our definition and these factors may help improve the design and execution of groups like competency committees, enhancing the translation of evaluation data and individual opinions into competency decisions. Educators who understand these factors may also help create a collective environment of trust not only on a competency committee, but potentially within their organization as well. Trainees, patients, and other stakeholders trust competency committees to make carefully weighted decisions, and it is important to determine how these committees can demonstrate that this trust is not misplaced.

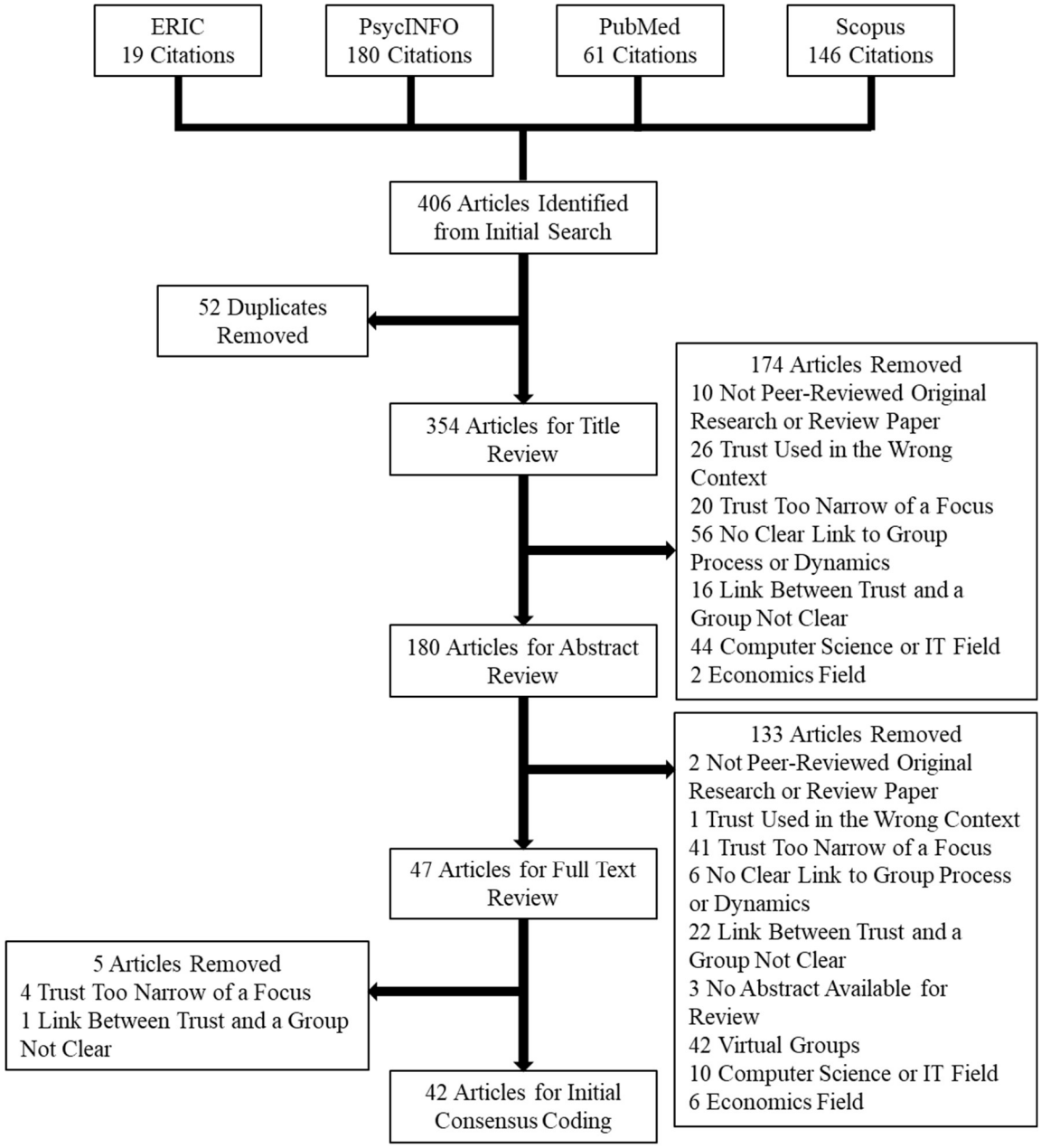

Figure 1. Flowchart of inclusion/exclusion determinations

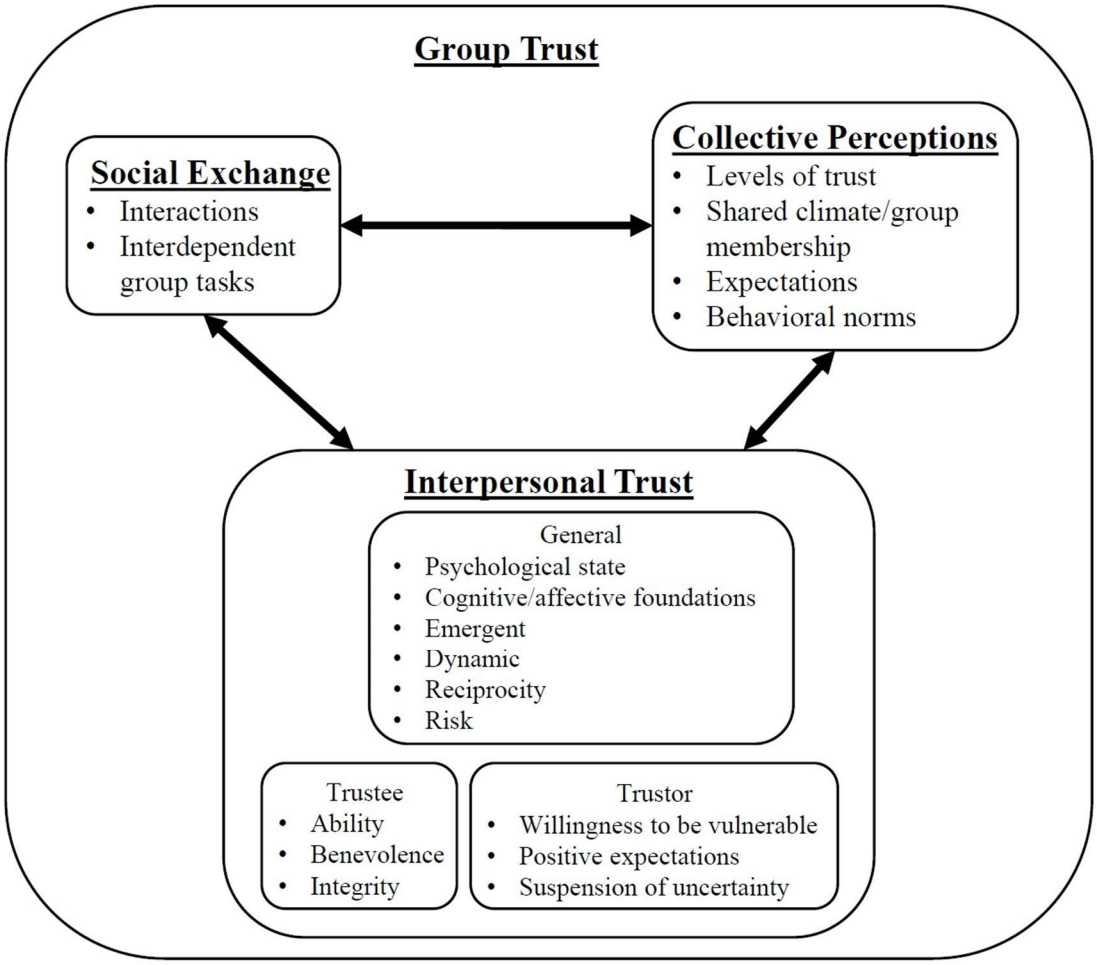

Figure 2. Definition of Group Trust

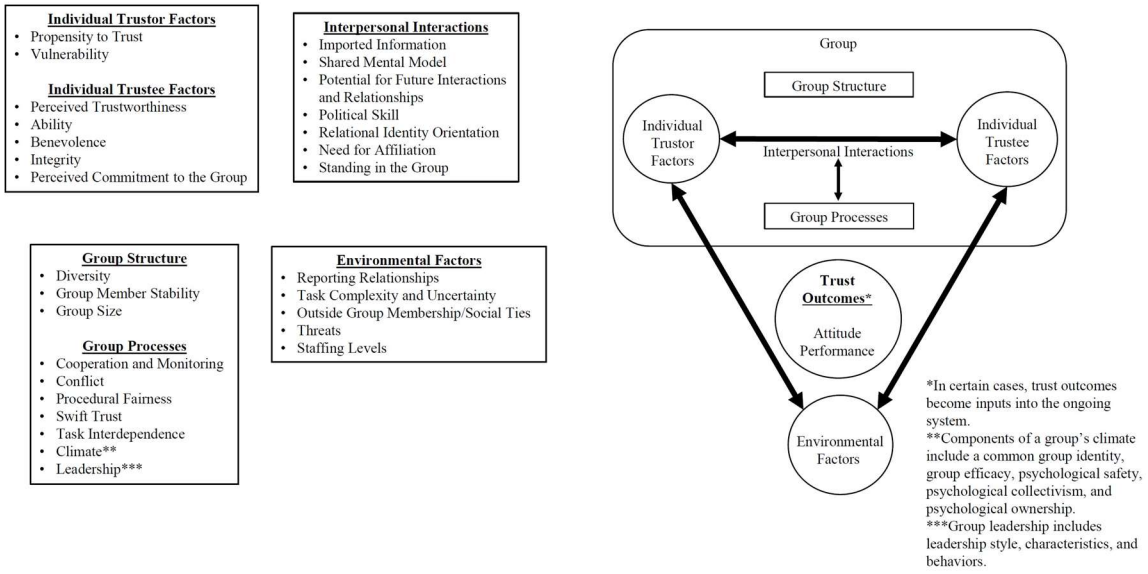

Figure 3. Proposed Group Trust Model

Table 1. Demographics of Manuscripts on Trust and Groups

Characteristic	**n (%)**
Country of Origin	
United States	17 (40.4%)
Netherlands	10 (23.8%)
Australia	3 (7.1%)
United Kingdom	2 (4.7%)
Canada	2 (4.7%)
Finland	2 (4.7%)
Denmark, France, Israel, Singapore, Spain, United Arab Emirates	1 each (2.4%)
Study Population	
Work Teams	19 (45.2%)
Multiple Industries	7 (16.7%)
Healthcare	3 (7.1%)
Education	2 (4.7%)
Finance	2 (4.7%)
Social Care	2 (4.7%)
Manufacturing	2 (4.7%)
Hospitality	1 (2.4%)
Not Specified	10 (23.8%)
Undergraduate Students	7 (16.7%)
Graduate Students	6 (14.2%)

Table 2. Definitions of Trust

"The willingness of a party to be vulnerable to the actions of another party based on the [positive] expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party."[15]
"The degree of confidence the members of a team have in the goodwill of its leader, specifically, the extent to which they believe that the leader is honest, sincere, and unbiased in taking their positions into account."[45]
"A psychological state that manifests itself in the behaviors towards others, is based on the expectations made upon behaviors of these others, and on the perceived motives and intentions in situations entailing risk for the relationship with those others."[17]
"Trust in individuals is an expectation or belief that actions from another party will be motivated by good intentions. Moreover, individuals take a risk in this belief because the other party may not act out of benevolence."[27]
"Expectations, assumptions, or beliefs about the likelihood that another's future actions will be beneficial, favorable, or at least not detrimental to one's interests."[53]
"A belief (held by an individual or a group) that another individual or group (a) makes good-faith efforts to behave in accordance with any commitments made both explicitly or implicitly, (b) is honest in whatever interactions preceded such commitments, and (c) would not take excessive advantage of another even when the opportunity became available."[54]
"The extent to which a person is confident in, and willing to act on the basis of, the words, actions, and decisions of another. Critically, trust requires the presence of uncertainty and risk."[24]
"One party's (the trustor) confident expectation that another party (the trustee), on whom the trustor must rely, will help the trustor reach his or her goals in an environment of risk and uncertainty."[20]
"The optimistic acceptance of a vulnerable situation in which the truster believes the trustee will care for the truster's interests through the bracketing out of uncertainty. Empirically, we therefore delineate trust in terms of the overlooking of uncertainty and possible negative outcomes based on considerations of the motives and/or competencies of others."[38]
"A resolve to bear an experienced risk by confiding in the new and unknown. It goes beyond the blind, unquestioning faith that an infant may have of a parent because there is an acknowledgement of past experience that denotes trust as a risk, especially where there are unknown elements. It is a decision to act in concert with others in anticipation of a return. By placing trust in others, we place ourselves in a position of vulnerability, ceding power. Trust given in the anticipation of reciprocity creates a sense of mutual obligation."[26]
"The generalized expectation of predictable and benevolent motives and/or behavior from others."[42]

*Definitions of trust are limited to papers in this scoping review.

Table 3. Scoping Review Results

Theme	Sub-Theme	Definition/ Implications for Trust Model	Implication for Competency Committees
Individual-Level Factors: Trustor Factors	Propensity to Trust[15,17,19,27,28,41]	A general willingness to trust others that varies with people's different experiences, personality types, and cultures	Committee members have different propensities to trust other members and the process that the committee uses to make collective decisions. A large degree of propensity to trust asymmetry may adversely affect group-level trust.
	Vulnerability[15,38]	Exposure to the possibility of being harmed, either physically or emotionally	Committee members with higher levels of trust toward other individuals or the group are willing to accept more personal vulnerability than less trusting individuals.
Individual-Level Factors: Trustee Factors	Perceived Trustworthiness[15]	Characteristics and actions of an individual or group that help explain why some parties are more trusted than others	At the individual level, a committee member's ability, benevolence, and integrity contribute to his/her perceived trustworthiness by other members, which determines how much he/she will be trusted within the group. Collectively at the group level one may also judge these factors from an external perspective (e.g. the training program, patients, etc) to determine the perceived trustworthiness of competency committee decisions and the group itself.
	Ability[15,39]	A group of skills and competencies that enable an individual to have influence within some specific domain	
	Benevolence[15]	The extent to which a trustee is believed to want to do good to those individuals on the giving end of a trusting relationship (i.e. trustors)	
	Integrity[15]	The trustor's perception that the trustee adheres to a set of principles that the trustor finds acceptable	
	Perceived Commitment to the Group[39]	Established group members are more likely to trust new members who seem more committed to the group	A committee member's commitment to the group and how that commitment is perceived within the group may influence how much

			that individual is trusted by other members.
Individual-Level Factors: Interpersonal Interactions	Imported Information[41]	Preexisting knowledge, stereotypes, and preconceptions stored in group members' memories	Committee members bring their own personal experiences regarding individual trainees to the committee. This information forms the basis for discussions regarding trainee competence and attainment of specific educational milestones.
	Shared Mental Model[30,40]	The shared knowledge and organized understanding of the information and resources used by the group, tasks and problems faced by the group, and individual group members' imported information	Developing a shared model of trainee competence is critical for these committee decisions. Sources of shared information include written evaluations, results of knowledge exams, conversations amongst faculty members with their own experiences with the trainees, etc.
	Potential for Future Interactions and Relationships[28]	A person's early feelings about group members can create a sense of optimism about the potential of the relationship	New committee members may be more willing to cooperate with other members given the potential of building stronger future relationships.
	Political Skill[29]	A social effectiveness construct defined as the ability to effectively understand others at work and to use such knowledge to influence others to act in ways that enhance one's personal and/or organizational objectives	A committee member who has particularly strong opinions about a trainee may be more persuasive (and potentially trusted as well) based upon his or her degree of political skill.
	Relational Identity Orientation[48]	One's conception of his/her relatedness to other individuals	Committee members with a high relational identity orientation may take great steps to build relationships within the group and will likely be more trusted as well.
	Need for Affiliation[28]	An overlapping common factor among group members that motivates	This collective need helps a committee build a shared level of trust amongst

		them to view each other as trustworthy	members and within the group.
	Standing in the Group[35]	A person's inclusion or membership in a group (e.g. power or hierarchy differentials)	An individual's position, whether specified (e.g. the committee chair) or unspecified (e.g. based upon seniority, rank, job title outside the committee, etc.) may affect how other members interact with this person. Large perceived differences in this category may adversely affect interactions and therefore trust.
Group Level Factors: Group Structure	Diversity[20,24,30,31,41,48]	While cultural diversity has positive and negative influences on group trust, skill diversity has been shown to positively impact intragroup trust and group performance	Members of the committee should have a number of shared traits given that they are associated with the healthcare field and educating trainees, thus cultural diversity should have a smaller influence on these committee decisions. Diversity of opinions and skill diversity are likely beneficial to committee decisions, leading to higher levels of trust.
	Group Member Stability[30]	Positively impacts communication patterns, the social interaction of teams, and interpersonal trust	Committee member stability is important, especially if faculty members are assigned specific trainees to follow longitudinally.
	Group Size[42]	Smaller groups have been shown to be more trustworthy than larger groups	While small groups are perceived to be more trustworthy from an external perspective, training programs need to weigh factors such as the number of trainees and faculty availability when deciding the optimal size of their competency committee(s).
Group Level Factors: Group Processes	Cooperation and Monitoring[2,17,19,28,43]	Group members who experience high trust tend to cooperate, share information, accept influences from others, and feel personally	Trust between committee members will most likely lead to increased cooperation. If trust is low, committee members may increase their monitoring

		involved with the group. Monitoring behaviors usually occur when trust between members is low and manifest when members feel a need to be vigilant about the actions and intentions of others.	behaviors, which detracts from the collective decision making process and likely affects the quality of these committee decisions.
	Conflict[16,23,25,28,40,44,55]	One of the most important factors influencing group trust. Task conflict is generally felt to be functional while relationship conflict may be dysfunctional. Higher levels of either type of conflict usually lead to diminished group trust	To a certain extent, task conflict in a competency committee may lead to better decisions. When faculty members have different opinions about trainees, the discussion may be livelier. As long as the discussion doesn't get hijacked by those with strong opinions or degenerate into relationship conflict, variable faculty member opinions and experiences with trainees likely leads to better group decisions.
	Procedural Fairness[30,45,46,56]	For decision making groups, this includes consideration of member input and influence over a decision. Fairness of procedures used by a group has been associated with increased levels of trust and commitment to group decisions.	Committee decisions are likely to be more trustworthy when the group follows procedures that are judged as fair by faculty members and trainees.
	Swift Trust[28,41]	Occurs when individuals decide to trust others prior to developing longer term relationships. Swift trust develops as a function of members' own dispositional tendencies, quickly discernable surface-level cues of others, and imported trust-related information.	Initial/swift trust usually occurs in newly formed committees or with new members (especially if they don't work with more established members in other contexts). These individuals will have to decide if they are going to trust other members of the group and the committee itself before developing deeper relationships.

	Task Interdependence[2,31]	The degree to which group members rely on one another and interact in order for the group to accomplish its goals, which may have an effect on group trust and trust between group members	Making collective decisions about trainee competence relies on the "wisdom of the group." Each faculty member only has a portion of the data based upon their own experiences. The group must compile performance data and members' experiences to build a collective picture of individual trainee competence.
	Climate[29,30,33,36,39,40,48,49]	Components include a common group identity, group efficacy, psychological safety, psychological collectivism, and psychological ownership	The internal climate of a committee may be influenced by each of these factors. A common group identity, group efficacy, and psychological safety are probably most important for competency committees.
	Leadership[30,34,35,38,40,41,48,50,51]	Components include leadership style, characteristics, and behaviors	The committee chair is responsible for implementing the training program's policies and procedures related to this committee. Committee chairs may be more effective at building individual and collective trust if they are prototypical of the group, utilize an authentic or transformational leadership style, create a safe atmosphere, manage conflict/discussions, and demonstrate relational behaviors.
Environmental Factors	Reporting Relationships[51]	In settings where groups report to diverse outside entities, these reporting relationships can be associated with role conflict, confusing expectations or role ambiguity, excessive demands, and competing priorities	The committee reports to their respective training program, which in turn reports information about resident performance to various accreditation agencies. If a committee is required to report to another entity outside of this chain, it may decrease trust amongst members of the group, especially given the sensitive

			nature of trainee performance information.
	Task Complexity and Uncertainty[39,41]	Associated with decreased levels of trust within a group, especially if the group is newly formed	For a competency committee, it may be challenging to determine the attainment of various clinical competence domains for all trainees, especially with gaps in evaluation data or for large training programs. Increasing complexity and uncertainty may adversely affect trust by members in the committee's processes and decisions.
	Outside Group Membership/ Social Ties[39]	Group members may be worried that membership in other groups can lead new members to act in ways that harm their own group.	Committee members who serve on other hospital committees (e.g. credentials, risk management, etc.) may be perceived as more or less trustworthy from other members. However, this is probably a small contributor to trust within these committees.
	Threats[39]	External dangers or conflict with another group	Time pressures and faculty availability (either for individual meetings or to serve longitudinally on the committee) are potential threats to group level trust within a competency committee. However, an understaffed committee may lead to higher trust between group members.
	Staffing Levels[39]	Understaffed groups may develop stronger trust amongst members than larger groups	
Trust Outcomes	Attitudes[18,20,26,28,33,38,41]	May include confidence, resiliency, creativity, group satisfaction and identity, cooperation, and commitment	Individual and group level trust within competency committees may lead to greater cooperation, commitment to the group, satisfaction, and confidence in group decisions.
	Performance[20,30,40,41,52]	May include group performance, group learning, information sharing, and decision quality	Individual and group level trust within competency committees may lead to better sharing of information, group learning, and quality of decisions.

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CHAPTER 3: GROUP TRUST IN THE SETTING OF COMPETENCY COMMITTEE DECISIONS: A QUALITATIVE OBSERVATIONAL STUDY

SUBMITTED AS:

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ABSTRACT

Introduction: Trust is an important foundational component of a competency committee. Little work has been done in health professions education to look at trust and group decisions. A recent scoping review defined "group trust," examined factors that may influence group trust, and proposed a model to illustrate the relationship between trust at the individual and group levels. The purpose of this study was to test this model in the context of competency committee decisions and assignment of the ACGME Milestones.

Methods: The authors conducted structured observations of competency committee meetings in internal medicine and pediatrics residency and subspecialty programs within the National Capital Consortium. Data were analyzed using a constant comparison method.

Results: The authors observed six meetings from May to June 2018 (15 hours) reaching thematic saturation by the final meeting. The proposed model served as an organizing framework for reporting findings into the following categories: individual and

group level factors, interpersonal interactions, and environmental factors. Results suggest that diversity of opinion promotes a more complete understanding of trainee competence. Varied faculty experiences, interactions, and actions by committee chairs helped to build a shared group mental model, which was identified as one of the most important aspects of making collective decisions and assigning Milestones. Meetings generally had similar structure based upon the size of the training program, and groupthink was more of a risk for larger training programs, especially when assigning individual Milestones. An important environmental factor identified was decision making fatigue, which was most prevalent towards the end of committee meetings.

Conclusions: As training programs develop policies, procedures, and determine the membership of competency committees, utilizing these findings may help improve the design and execution of these groups, enhancing the translation of evaluation data and individual opinions into Milestone and competency decisions.

INTRODUCTION

Developing a process to assess clinical competence is an essential component of all graduate medical education (GME) programs. Built upon the fundamentals of competency-based medical education, the Accreditation Council for Graduate Medical Education (ACGME) Milestones help GME programs determine which of their trainees are on appropriate paths towards unsupervised clinical practice and which are not. Within a GME program, the clinical competency committee (CCC) forms a fundamental part of determining trainees' progress in the context of the Milestones, and some recent studies describe data sources that CCCs use and how they weigh this information in their collective decisions (Choe *et al*., 2016; Shumway *et al*., 2015). Several other studies have also looked at group decision making processes and how these concepts may be utilized by CCCs (Chahine *et al*., 2017; Hauer *et al*., 2016; Hemmer and Kelly, 2017).

Given the important decisions shouldered by the CCC (e.g. overall progress, trainee promotion, and remediation), trust is an important foundational component of these committees, enabling open and collaborative discussions of strengths and areas of improvement, to include recommendations of remediation and dismissal. In the context of individual trainee-supervisor relationships, health professions education research has explored trust in decisions that faculty make about the level of supervision granted for different clinical responsibilities and the factors that influence those decisions (Damodaran, Shulruf, and Jones, 2017; Hauer, 2015; Cate *et al*., 2016). Entrustable Professional Activities (EPAs) are an example of these decisions and address tasks that trainees are permitted to execute once they attain a sufficient level of competence; the level of supervision for each EPA depends upon how much a supervisor trusts a trainee to

complete that specific task (Cate, 2013). While individual decisions of trust are important, little work has been done in health professions education to look at trust as it relates to *group decisions*, such as trust within a CCC, trust in the context of how characteristics and processes of these committees might impact collective decisions, and group member trust in these decisions.

In a recent scoping review, we defined group trust (which encompasses both trust within a group as an aggregate or combination of individual trust and trust in the context of group decisions) as a group-directed willingness to accept vulnerability to actions of the members based on the expectation that members will perform a particular action important to the group, encompassing social exchange, collective perceptions, and interpersonal trust. We also examined literature outside of health professions education to determine what factors may influence trust from the perspective of those who rely on decision making groups and proposed a model (**Chapter 2, Figure 3**) to illustrate the relationship between trust at the individual and group levels (Sapp *et al*., 2019). In this model, we delineate individual level factors, group level factors (i.e. group structure and processes), interpersonal interactions, and environmental factors. As empirical data in a health professions education context has not been collected for this literature-informed model, we conducted the current study with two primary purposes: a) test our proposed model in the context of CCC collective decisions and assignment of the Milestones in primary care (i.e. internal medicine and pediatrics) and subspecialty settings and b) assess what factors are important to individual faculty members regarding trust in the setting of CCC decisions.

Theoretical Framework

For decision making groups to reach a consensus, communication and interactions between and among people, objects (those items that extend human capabilities in a learning or task-oriented setting, such as learning management systems), and the environment are believed to be essential. We therefore used situated cognition as the underlying theoretical framework for our model (Sapp *et al*., 2019). Situated cognition contends that thinking is viewed as situated (or located) within the larger social and physical context of the environment (Durning and Artino, 2011). This theory suggests that a group setting is highly complex with multiple components (i.e. social, cultural, and physical) and opportunities for interactions between these components. It recognizes the complex interplay between participants, objects that augment individuals' cognitive capabilities (i.e. artifacts), and the environment. Situated cognition places emphasis on how these various interactions lead to thinking and decisions, and this framework informed our model.

METHODS

We conducted a qualitative observational study involving GME program CCCs at our institution to determine how collective decisions about trainee progress within these programs are made in the context of the Milestones. We focused on internal medicine and pediatrics residency and subspecialty fellowship programs within the National Capital Consortium because they represent the largest population of GME trainees within our institution.

Given the social and group dynamics underpinning CCCs and their decisions, along with the multiple inputs to our model, we believe that a qualitative approach was

optimal for this study. Our qualitative approach also allows for iterative construction of the results based upon the emergence of conceptual categories and descriptive themes.

Data Collection

Before collecting data we developed a structured observation guide (Supplemental Appendix 4) based on our literature review and proposed model (**Chapter 2, Figure 3**) to measure various components of trust and to focus data collection on a CCC's structure and processes. We also held conversations with subject matter experts who informed revisions to the guide. The structured guide included the following headings along with a sample of items within those sensitizing concepts: individual-level factors (i.e. observed behaviors that may affect interactions amongst group members, group decisions, etc.), group structure (e.g. group size and diversity), group processes (e.g. group conflict, procedures utilized by the CCC, overall climate of the group, and leadership), information sharing/interpersonal interactions, and environmental factors (e.g. task complexity, uncertainty, and threats). Next we pilot tested the guide by observing four CCC meetings in internal medicine and adult endocrinology (amounting to 10.5 hours of observation) from September 2017 to May 2018 and made revisions based upon observations in these meetings. Observers were part of the research team, had the opportunity to practice observing during these four CCC meetings, and helped to revise the observation guide.

We sent out requests to a purposive sample of programs to observe their CCC meetings during the June 2018 end-of-year Milestone reporting period. For programs that elected to participate, we conducted structured observations of the CCC meetings using the revised observation guide. We had two observers in the room, and they

observed as spectators (as opposed to a participant observer). To minimize interference in the CCC meeting, observers sat outside the group circle along the perimeter of the room. Observations were from an outside perspective, and the inquiry of the observation was directed entirely by the observers (i.e. there was no collaboration with those being studied). Observers provided full disclosure of their role to those being observed and independently recorded field notes utilizing the structured observation guide. At the end of each CCC, the lead observer asked the committee, "what do you think contributes to trust in CCC decisions?" Observers collected information provided by individual committee members on their field notes.

Data Analysis

Field notes were independently read and coded by the two CCC meeting observers (JS, KL). To code and analyze the data, we used a constant comparison method (Fram, 2013) to identify and confirm themes and/or topics that emerged from the observations and discussions. We looked at published approaches to group decision making (i.e. individual and group level factors, environmental factors, the interactions between all of these elements, and measurable components of trust), how CCCs operationalize this information, components of trust in the setting of decisions made by these groups, and the emergence of new concepts or themes. We sought counter-examples to determine how new concepts or categories may vary from the published literature and how this impacts the process of group decision making. Data analysis occurred simultaneously with the collection of data in order to monitor for thematic saturation and the need for any new directions in data collection. The research team (JS, KL, DT, SD) met regularly to discuss coding and resolve all differences. During

analysis, memoranda and diagrams were used to keep written records of the process. Techniques to enhance trustworthiness of the qualitative analysis process per the Standards of Reporting Qualitative Research included member checking, maintaining an audit trail, and collection techniques to allow triangulation of the data (O'Brien et al., 2014).

Ethics

Our research was approved by the Walter Reed National Military Medical Center Institutional Review Board (IRB; WRNMMC-2018-0137). All participating training program directors and individual CCC faculty members provided written consent prior to their participation in the study.

RESULTS

We observed six CCC meetings in the following specialties from May to June 2018: general pediatrics, pediatric endocrinology, neonatal-perinatal medicine, internal medicine, and adult cardiology and hematology-oncology. During this time, we observed a total of 15 hours' worth of meetings amounting to 36 pages of data, and we reached thematic saturation before the sixth CCC meeting. Our proposed model served as an organizing framework for reporting our findings. See **Table 4** for themes that were observed during these meetings, with representative quotes, which are organized under various components of the model (**Chapter 2, Figure 3**) and discussed below. We aggregated data from the observations and the debrief discussions into the sections below and contend that the different components of the model may affect group trust.

Group Level Factors

Group Structure

The size of the committees varied from 5 to 11 individuals (average 8, standard deviation 2.8). All assigned faculty members were present for the meeting with two exceptions. An absent faculty member on one CCC provided her scoring sheet to the CCC chair in advance of the meeting. On another CCC, the committee had to table the discussion of an absent faculty member's trainees because he had not provided recommendations about the updated Milestone levels for these individuals. Besides physician faculty members, some of the CCCs also included a diabetic nurse educator, nurse practitioner, chief residents who had completed a core residency program, and training program administrative personnel. CCC members commonly reported that a diversity of opinions from different faculty members contributes to a more complete collective understanding/picture of competence for each trainee.

Group Processes

Group Conflict

In all of our observations, we did not witness any instances of affective (relationship) conflict. Rather, during each meeting we observed at least one episode of task (cognitive) conflict, which tends to arise from individual differences in viewpoints, ideas, or opinions when group members participate in a shared undertaking. Observers did not specify how frequently these episodes occurred during a single meeting, and CCC faculty members in general seemed to offer personal experiences that were largely confirmatory and agreeable relative to points about learners raised by the CCC chair or other members. However, "individuals at times volunteered differing comments, but [these experiences] were usually treated as apples-and-oranges differences rather than

conflicting experiences (KL)." When assigning individual Milestones, some differences of opinion occurred. "Occasionally, after committee members suggested scores, other committee members would inquire how they saw the [trainee] as satisfying that score; the majority of inquiries were collegial, open-ended, and were interpreted as clarifications rather than challenges (KL)."

Some faculty members felt that dominant voices/personalities may negatively impact a CCC. One member remarked, "It is difficult to achieve a confident consensus when there is a forceful personality in the group, especially if other members of the committee may be more conflict averse." In one CCC, however, a faculty member consistently emerged as a dominant personality in both volume and quantity of commentary. Unless other CCC members were specifically addressed, this individual volunteered, and at times interrupted, conversation an average of four times per each trainee discussion (a contrast to other members generally volunteering thoughts zero to two times per trainee). These comments consisted of generally confirming/restating the point of others, injected with personal experiences from working with various trainees. The other CCC members never attempted to prevent this individual from speaking, nor did they give any indication of annoyance or frustration (rather, there was an indication that they simply were comfortable and did not mind having the forceful personality present).

Group Procedural Fairness

Regarding the assignment of individual Milestones, procedures varied with each training program observed. For smaller programs, such as pediatric endocrinology (3 trainees), the group generally went through each individual Milestone in greater detail

with each trainee, and individual trainees were not assigned to faculty members. In cases where trainees had previously achieved high scores on their prior Milestone assignments, committee members would both implicitly assume that those Milestones did not need to be considered ("let's talk globally… I don't want to go line by line…") and at times would explicitly state that those Milestones did not need to be considered ("if it's mostly 4's then we don't really have to do it [as in depth as for others]"). However, this was not universally true; on another CCC, several trainees had their Milestone levels decreased given some faculty concerns about professionalism and completing administrative tasks on time.

For training programs with a larger number of trainees (i.e. internal medicine and pediatrics with 74 and 29 trainees respectively), faculty members were assigned individual trainees and utilized a standardized CCC data collection form that they filled out in advance of the meeting, which included proposing updated Milestone levels for each trainee. During the meeting, faculty members took turns presenting the information off of these forms, which seemed to help standardize the process of discussing trainees and assigning Milestones. Faculty presentations were followed by varying degrees of discussion. In some circumstances, "the group seemed reluctant to make changes to the assigned faculty recommendations (JS)," and the discussion was more likely to involve groupthink (i.e. group members refrained from expressing doubts and judgments or disagreeing with the consensus).

In other CCCs, there also seemed to be less discussion for certain Milestones, especially in areas where the faculty members may not have any observational experience or evaluation data for specific trainees. In some committees, "very rarely were specific

Milestone numbers discussed; rather the discussions focused almost entirely on [trainee] skill-sets and general scoring (KL)." Multiple CCC members also indicated that they felt they should not progress trainees in the context of the Milestones just for the sake of progression. Members stated that they should be comfortable keeping trainees at their same level if no clear evidence exists to suggest that the learner has progressed in that specific Milestone.

Group Climate

The atmosphere of the meetings was "collegial and positive (KL)" and "comfortable (JS)." Each meeting seemed to be a safe environment where all opinions were welcome and openly discussed. One member stated that "respect for each other is important to build trust, which includes listening to other members when they are talking and sharing." In one CCC, the discussion repeatedly made use of the term "we" and referenced what the team could do as a collective to improve the trainees' performance, which is the hallmark of a common group identity. Further, the cardiology CCC chair stated that consensus in this setting helped to support "[cardiology] community standards." The group agreed that determining when fellows are ready for independent practice provides reassurance to society that these trainees graduate with a basic level of skills to practice cardiology in any setting. Finally, it was clear during some of the group discussions (especially in smaller programs with fewer than 15 trainees) that all of the faculty members knew the trainees well and had worked with them frequently.

Group Leadership

The two most important leader behaviors that we observed were the abilities of the CCC chair to conduct the meeting and to facilitate a shared mental model. In most of

the meetings we observed, the chair provided an overview of the Milestones to the group and the structure of the session. "The pace was immediately established by the chair as quick; he explicitly stated the order in which [trainees] would be evaluated (third years first, 'anticipat[ing] it will go quickly'); the pertinent information (timeline details, when Milestones are due, etc), and a brief reminder of the core of the Milestones' meaning (deficiencies, ongoing progress, and aspirations) (KL)."

Two different meeting formats emerged during our observations. Some CCCs went through all of the trainees in order (e.g. by post-graduate year, alphabetically, or based upon other external factors) discussing the trainee in general terms and assigning the Milestones at the same time. "It seemed like the faculty who had other competing schedule requirements were given priority to present their [trainees] early (JS)." For other CCCs, meetings generally had two distinct phases. In phase 1 the chair led a discussion to generate formative comments for each trainee, and in phase 2 the group assigned the Milestones for each trainee.

Generating a shared mental model seemed to be one of the most important parts of making group decisions and assigning Milestones, and the CCC chair appeared critical in facilitating this. In CCCs of smaller programs (i.e. fewer than 15 trainees), the chair usually introduced and provided some information about each trainee. "[The CCC chair] began by summarizing the past activities and future plans of each of the [trainees], in addition to comments about exam performances and most recent one-on-one experiences with the [trainee] (KL)." In larger programs, assigned faculty members generally provided this information as discussed above. In all of the meetings, group members tended to freely share their opinions; for instance, in one meeting "the CCC chair did not

need to engage individual faculty members because all freely participated when it seemed like they had something to contribute to the discussion (JS)." When one of the members commented about a trainee's performance, other members tended to jump into the conversation to provide their individual experience with the trainee.

Individual Level Factors

Several faculty members felt that individuals on a CCC should have some baseline knowledge and experience in medical education. One CCC member noted that "individuals who serve on the committee should have a basic level of competence as a physician within their specialty and a basic understanding of evaluating and discussing trainee performance." Additional areas identified by the observers include buy in ("faculty should recognize that they bought into training these residents/fellows, and the overall agenda of the group should be to make the learners successful, to the maximum extent possible"); having an open mind ("members should come to the meeting with no preconceived notions or 'labels' for specific trainees"); and advocacy for the trainees ("the group felt that they were advocates for the trainees, and the group setting allowed them to identify mentors for individual trainees who may be struggling (JS)"). We did not observe any specific comments related to patient advocacy and if any tension may result from advocacy for patients versus trainees.

Interpersonal Interactions

Imported Information

Information brought to the meeting by individual faculty members is important to helping build a shared mental model. Two main themes that emerged from the observations include information obtained from faculty pre-work assignments and

individual experiences with trainees. For CCC decisions, the latter seemed to be the most frequently relied upon source of information. Especially for smaller programs, CCCs frequently used specific individual stories and/or experiences with trainees as a means of evaluation. During the general discussion of each trainee, CCC members would most frequently offer specific experiential anecdotes to illustrate their opinions, both to offer positive and negative evidence regarding trainee performance.

Shared Mental Model

During our observations we noted three general themes whereby CCCs build a shared mental model: assignment of the Milestones, perceptions regarding the developmental level and overall clinical competence of various trainees, and the work and processes of the CCC. When building a shared mental model, CCCs discussed a number of different topics to include trainee global strengths/weaknesses (e.g. praises of bedside manner, maturity and concerns of professionalism, and personality issues), instances in which feedback was given to trainees (and whether they did/did not respond to it), and general discussions of what the CCC members could do and actions they could take in the future in order to aid the trainees and foster additional growth. Indeed, when discussing solutions for questions and/or concerns about certain trainees, CCC members either described specific instances in which they attempted to correct behavior one-on-one or discussed team actions in abstract terms (e.g., "we have to somehow make it clear to [the trainee]…" or "we might need to consider program-level remediation…"). A sample of other topics discussed are listed in **Table 4**.

When there was quick group consensus regarding the Milestones, CCC chairs would generally move the discussion forward to the next trainee. In instances when a

member disagreed with any of the proposed numbers, he or she would usually either implicitly ask the CCC member who offered the number why ("really?") or offer a contradictory opinion ("I'd say [the trainee] is still probably at a x…"), at which point CCC members would offer specific examples, explanations, or evaluations that explain their points. Additionally, there was an occasional voiced reluctance to offer "perfect" scores, as the committee generally agreed that trainees may never achieve some aspirational competencies.

Conversations seemed to be key to the process of discussing trainee competence and building a shared mental model. Members used the analogy of a puzzle in which each faculty member had pieces of data about experience with trainees, and together through discussion and information sharing a more complete picture of trainee competence emerged during the meeting. It was generally felt that members should share concrete, specific examples that can be interpreted by the group in a relevant context. Individual participation is important for this to occur, and discussion amongst the faculty members led to additional insights and comments about each trainee. The discussion uncovered information not written on global or other evaluation forms. One faculty member noted that written evaluations are most useful for the highest and lowest performing trainees. He stated that "97% of the time my evaluation is the same for trainees in between those two extremes and in the middle of the competency spectrum." He also felt that Likert scales are not useful and that group discussion is a much more effective way to share information about group members' experiences with individual trainees. Some members reported feeling that it was easier to identify troubling trends with trainees based upon conversations with faculty members who have worked with

these individuals. Oftentimes they said that it is hard to write negative comments on an evaluation form, especially if that form goes back to the trainee. As a result, these "neutral" evaluations may not identify trends in a way that conversation does. For example, if more concerning faculty observations arise with trainees and there has been no record of borderline performance or other concerns, it may be harder to justify things like program level remediation, etc.

To facilitate a shared mental model, some CCCs had additional resources available to the group. In most meetings, the group had access to a copy of the Milestones. In others the CCC chair had complete evaluation packets for each faculty member and asked the group to read the entire packet prior to discussing trainees. The latter led to notable periods of silence as committee members read the evaluation summaries, as well as specific Milestone criteria.

Standing in a Group

In all of the CCCs, participation in the meeting did not seem to be influenced by military rank, seniority, specialty, or whether one was a voting member of the group. In two CCCs chief residents attended as non-voting members of the committee, and they freely provided input from a near peer perspective about their experiences with most of the residents. These individuals had unique insight into most of the trainees that other faculty members may not be in a position to observe, and their input on the CCC provided information the committees considered very valuable. One CCC also solicited input from two program administrators, and their comments were valuable regarding trainee accomplishment of administrative tasks.

Environmental Factors

Task Complexity/Uncertainty

We identified the following themes under this heading: specific role of the CCC (e.g. two members in one meeting actively debated what regulative power the committee had when a trainee may need additional supervision); faculty member roles (e.g. should the members be more of a coach/mentor versus an evaluator or should trainees be assigned to faculty members based upon aligned interests?); developing remediation plans; lack of faculty member experience with certain trainees; and the Milestones themselves. In regards to the Milestones, members at times expressed frustration with the Milestone definitions, especially those with lengthier anchors and what the milestones don't capture (e.g., burnout). In several instances groups noted the difficulty in determining numerical milestone assignments given how the Milestones were written/phrased and commented on the difficulty in fitting individuals into the specifically defined categories. Some groups acknowledged the difficulty and/or worry in selecting only one demonstrative experience as a justification for a number assignment. For programs with a larger number of trainees (i.e. greater than 15 individuals), information and evaluation gaps complicated the ability of the CCC to make informed assignments of some individual trainees' Milestone levels. Additionally, a large number of trainees coupled with the number of Milestones typically led to longer meetings, which seemed to truncate the discussion and the competency evaluation process compared to CCCs with fewer trainees.

Threats

One of the biggest environmental threats identified was decision making fatigue. While members of one CCC admitted that they come to the meeting knowing

what needs to be accomplished, almost all acknowledged that they get more fatigued as the meeting continues and tend to make more brusque decisions. Observations near the end of the meetings included members increasingly stepping out for short intermittent periods, multiple members checking their cell phones and fidgeting, group members openly asking how many trainees they had left to evaluate, and/or comments such as "I'm fading," "homestretch for milestones!" and "last one!," to CCC cheers. Other threats identified during the observations included scheduling conflicts, technical difficulties, and institutional structures/policies (e.g. on several occasions one CCC considered not just how the trainee did/did not perform, but how the institutional structures may/may not be at fault).

DISCUSSION

Based upon a synthesis of the information uncovered in our previous scoping review, we proposed a model (**Chapter 2, Figure 3**) utilizing situated cognition to help better understand trust within a group and the various factors that may influence trust in group decisions from individuals either within or outside of the group. In our current study, we observed 15 hours of CCC meetings from multiple different GME training programs using a structured observation guide developed from a review of the literature and this proposed model. We explored how members characterize trust in the setting of a CCC and observed how these committees make decisions about trainee clinical competence and Milestone-based performance in the context of previously identified group trust elements: individual and group level factors, environmental factors, and the interactions between all of these elements. Our proposed model captured the themes that emerged at the observed CCC meetings.

Our results suggest that diversity of opinion promotes a more complete collective understanding of competence for each trainee. Varied faculty experiences provide a diversity of information available to the CCC, and interactions among faculty members help to build a shared group mental model, which was identified as one of the most important aspects of making collective decisions and assigning Milestones. Further, CCC chairs were instrumental in facilitating a shared mental model by communicating an agenda, determining a process to assign the Milestones, moving along the conversation, engaging individual faculty members as needed, etc. These findings were consistent with our expectations based on the proposed model.

Additionally, CCC meetings generally had similar structure and agendas based upon the size of the training program. Faculty in smaller training programs tended to have more familiarity with all of the trainees and discussed them in more detail compared to larger programs. Larger programs also assigned faculty members to individual trainees, and it was their responsibility to complete standardized pre-work on their trainees prior to the meeting. Groupthink was more of a risk for larger training programs, especially when faculty members did not know their individual trainees well and when assigning individual Milestones.

Finally, environmental factors we identified that can compromise trust were task complexity, uncertainty, and threats to the process of group decision making. One of the most important threats was decision making fatigue. Almost universally, increasing distractions and observed lapses of concentration seemed to occur the longer the meetings ran.

Our research was limited to CCC meeting observations and brief group question sessions at the end of the meetings. While we were able to collect data about easily observable components of our proposed model such as group size, diversity, and communication patterns, we were unable to obtain data on individual faculty member thoughts and feelings. As a result, we were unable to test all components of the model, such as an individual's propensity to trust, vulnerability, relational identity orientation, need for affiliation, etc. We also did not collect data about what types of assessments each CCC used and had access to. Given that observers were present in the same room as CCCs, the results may have been influenced by the Hawthorne effect (i.e. CCC members knew they were being watched, which may have impacted their behavior and/or group discussions). Observations were also limited to meetings occurring during one Milestone reporting cycle at the end of the academic year at one institution.

Future research might gather more validity evidence and explore faculty member thoughts and feelings regarding trust in a group setting. We also suggest additional research looking at trust in group decisions from a non-CCC member stakeholder perspective. This might involve examining how department leaders, program directors, and individual faculty members who are not on a CCC define trust in this context.

Developing a deeper understanding of our trust in CCCs may help these committees implement a more effective and meaningful process to make collective decisions. Our model attempts to provide leaders within GME training programs a way to view and attend to the various factors that may impact trust. The model might also serve as a way to "diagnose" why a CCC goes awry by looking at the CCC discussions

through various components of the model (e.g. if environmental or leadership factors may be perceived as "ineffective," what can be done to change or correct this?).

CONCLUSION

This observational study should allow program leaders and educators to better understand what factors may contribute to trust in group settings (e.g. CCCs). As programs develop policies, procedures, and determine the membership of these committees, utilizing our findings may help improve the design and execution of groups like CCCs, enhancing the translation of evaluation data and individual opinions into Milestone and competency decisions.

Table 4. Themes Observed During CCC Meetings

	Model Component	Themes	Evidence
Individual Trustor Factors	Propensity to Trust	N/A	Not observed
	Vulnerability	N/A	Not observed
Individual Trustee Factors	Ability	Faculty member experience with trainees	"P10 and P11 consistently volunteered specific, one-on-one examples of experiences with specific trainees along with guidance/recommendations to [trainees]." (KL) "At other times, individuals explicitly acknowledge that they did not have experience with a specific [trainee] and did not feel they had the capacity to make an assessment (P18: 'I haven't been here so I don't think I have that much to add'.)" (KL) "On the whole, the CCC relied frequently upon specific individual stories/experiences with [trainees] as a means of evaluation, with members typically describing one specific personal interaction for one or more [trainees]." (KL) "It was clear that one CCC member (P13) was relied upon to volunteer/respond with commentary specific to the [trainees'] 'personal style,' offering input on the relationships between [trainees] and patients." (KL)
		Faculty knowledge requirements	CCC faculty member comment: "Members need to have a basic level of competence as a physician within their specialty and a basic understanding of evaluating and discussing trainee performance." (JS) "Prior to the start of the meeting, the Chair (P32) explicitly indicated that it was his/her first time chairing the CCC meeting and that he/she was unsure how long it would go (or how best to execute the meeting)." (KL)

			"[The Chair] described prior meetings' procedural organization, noting that in the past the CCC possibly 'arbitrarily threw out numbers' and that P32 wanted this specific CCC meeting to be 'thoughtful.'" (KL) "There seemed some hesitancy or confusion about next steps (e.g., P44: 'how do we do this?' and P46 restating the goals of the CCC)." (KL)
	Benevolence	Open mind	CCC faculty member comment: "Members should come to the meeting with no preconceived notions or 'labels' for specific trainees. They should keep an open mind when discussing trainee performance." (JS) "Other committee members consistently interjected the [trainee] evaluation discussions with questions for other committee members, either about (a) the [trainees'] performance or (b) the CCC process. As typical examples of (a), members would often follow-up with clarifying questions regarding a specific member's experience with any [trainee] (e.g., when P35 said he/she thinks a [trainee] gets frustrated at times, P32 immediately inquired 'how so?')." (KL)
		Advocacy	CCC faculty member comments: "The group felt that they were advocates for the [trainees] and the group setting allowed them to identify mentors for individual [trainees] who may be struggling in one area or another." (JS) CCC faculty member comment: "One member brought up the idea of CCC faculty serving as advocates for their trainees on the CCC. If trainees have a bad experience or interaction, they should feel comfortable approaching their assigned CCC faculty member to get ahead of this prior to the CCC meeting." (JS)
	Integrity	Buy-in	CCC faculty member comment: "Faculty should recognize that they bought into training these residents/fellows, and the overall agenda of the group should be to make the learners successful." (JS)

	Perceived Commitment to the Group	N/A	Not observed
Group Structure	Diversity	Composition	33.3% to 100% female; 36.4% to 83.3% active duty military
		Additional members present (non-physicians)	Diabetic nurse educator, nurse practitioner, 1-2 chief residents, 1-2 administrative personnel
		Diversity of opinion	"The committee's different perspectives mean there is a well-rounded portrait of the [trainee] being painted; the group agreed and described it as a cascade of references for the [trainee's] performance." (KL) CCC faculty member comments: "The group felt that a variety of opinions from different faculty levels was important in the process (i.e. including the chief residents, administrators, and program director)." (JS)
	Group Member Stability	New faculty selections	"[The Chair] didn't think that many faculty members would be good additions, specifically because she didn't think they understood the mMlestones and the [trainee] education process." (KL)
		Turnover	"Due to turnover of two staff members and the deployment of another, some [trainees] had to be picked up by a new faculty member to complete their end-of-year evaluation and Milestones." (JS)
	Group Size		5 to 11 members
Group Processes	Cooperation/ Monitoring	Familiarity	"P41 added that the degree of familiarity/comfort with each other ('we know each other really well') between both the CCC members and the [trainees] was essential." (KL) "The CCC included a chief resident. [His/her] input on the CCC provided valuable information about each trainee." (JS)
		Help trainees	"Even in the case of a trainee described as the 'lowest [first-year trainee] scores we've ever had,' the full group conversation turned to what would be offered in the future in order to aide his/her progress (e.g. P01 stated 'we

			could do X to make [the trainee] aware.’).” (KL) “It seemed like the group wanted to generate summative feedback comments (recorded by the Chair) to be provided at a later counseling date with the trainees.” (JS)
	Conflict	Task conflict	“Occasionally, after committee members suggested scores, other committee members would inquire how they saw the [trainee] as satisfying that score; inquiries were collegial, open-ended, and seemed to be interpreted as clarifications rather than challenges.” (KL) “No one clearly seemed to disagree with other CCC faculty members, and the group discussion seemed to focus more on brainstorming ideas for how best to support the trainees.” (JS)
		Dominant voice/ personality	“P06 volunteered that it is difficult to achieve a confident consensus when there is a forceful personality in the group; other members agreed, and all commented on an example of a colleague with a forceful personality with whom they would not want to serve on such a committee.” (KL) “At this point, P16 would consistently emerge as a dominant personality in both volume and quantity of commentary; unless other CCC members were specifically addressed, P16 volunteered—and at times interrupted—conversation on average four times per each [trainee] discussion (a contrast to other members generally volunteering thoughts zero to two times per [trainee]).” (KL) “At times, P15 would ask general questions about changing the Milestones (e.g., “has the [trainee] moved up to a 3.5?”) and would get no responses at all, to which P15 would point out (e.g., say “Crickets”) and members (most often P16) would volunteer thoughts.” (KL)
		Groupthink	“Other CCC faculty members either concurred with the assigned faculty

			member [Milestone] recommendations (most of the time) or they didn't (rarely). There was often minimal group discussion/disagreement on the Milestones as the group seemed reluctant to make changes to assigned faculty recommendations. Only on a handful of occasions did the discussion about an individual [trainee] spark a discussion about adjusting respective Milestones from the faculty member recommendations" (JS) "If faculty members had no evaluation data to change the existing Milestone level, they left the level from earlier in the year alone." (JS) "For certain Milestones, there seemed to be less discussion, especially for areas where the faculty members may not have any observational experience with the trainees." (JS)
	Procedural Fairness	Voting	"Though it was clear that P39 was in charge of the group, over time P46 kept formally requesting a vote and appeared to try to institute more formal order to the process." (KL) "The group followed with a procedural hand-raise vote, with all except P31 voting in favor of 'graduation with reservations.'" (KL) "At several points CCC members successfully altered the initial numerical assessment and/or P32 would casually ask for a vote from the group." (KL)
		Length of discussion	"During the meeting there was an obvious difference in the amount of time that some [trainees] were discussed as opposed to others. Struggling [trainees] received significantly more committee discussion than highly performing [trainees] or those with average performance." (JS) During the CCC meetings observed, the average length of discussion for each trainee varied from 1-3 minutes all the

			way up to 24 minutes with discussion about one trainee lasting 56 minutes.
		Meeting structure	"As the meeting continued a clear structure emerged, divided according to (Phase 1) a general recounting and discussing of [trainees'] performance and (Phase 2) a specific Milestone assessment of each [trainee]." (KL) "P02 began by assessing each [trainee] according to specific evaluation data, including numerical rankings and formally reading evaluation comments (word-for-word, even when lengthy) while other participants attentively listened." (KL) "In order of years (second year [trainees], then first year [trainees]), the following pattern was generally employed: P15 would summarize the [trainee's] schedule, test scores, and evaluation scores (very detailed summaries, but only rarely involving word-for-word reading of specific comments), offer some personal opinions on the strengths/weaknesses of the [trainee], open the discussion to commentary from the CCC members, and then most often end discussion with a summary consensus question (e.g., 'do we agree?' 'other comments?')." (KL) "After the CCC faculty presented one of their individual interns, a group discussion followed. During this discussion, the end-of-year Milestones spreadsheet was populated." (JS) "The order in which each CCC member introduced their [trainees] to the room was determined according to two central criteria: personal time constraints of the member, and whether certain [trainees] had particularly pressing/significant issues to address (indeed P44 began the discussion in respect of personal time constraints). Such cases were introduced earlier in the meeting, whereas satisfactory/typical [trainees] were introduced later in the meeting." (KL)

		Ability to make decisions	"P38 wondered 'if our only options are to graduate or not…' and shared that 'I think we're at least obligated to share this information' and 'I don't think we have enough information to not graduate [the trainee].'" (KL) "There seemed to be an explicit recognition that the program would be under increased scrutiny for failing to promote someone (e.g. P44 indicated it would look bad for the program, and P46 noted 'this is going to draw attention when the [trainee] has never failed a rotation')." (KL)
		Milestone assignment	"P02 began each Milestone by explicitly stating the past scores of each of the [trainees], followed by silence while the committee members read the qualifications. Often, the first comment volunteered from any of the committee members would be a 'new' score, either the same or marginally higher than prior scores, at which point the group would consider whether they found that suggested score appropriate (e.g. for one Milestone P02 offered 'I think the [trainee] has reached a 3.' P03 specifically noted the importance that they all have the same 'outlook'—an implicit understanding that they don't want to progress a [trainee] just for the sake of progressing them and that each CCC member buys into that mentality." (KL) "At this stage there was little to no explicit discussion of numerical Milestone assignments; nearly all the discussion was general about [trainees'] behavior and test performance (with a seemingly implicit assumption that P32 would take those comments and independently assign Milestones as appropriate). In cases where [trainees] had previously achieved high scores (e.g., 4) on their prior Milestone assignments, committee members would both implicitly assume that those Milestones did not need to be considered (P32: 'let's talk globally… I don't want

			to go line by line…') and at times would explicitly state that those Milestones did not need to be considered (P33: 'If it's mostly 4's then we don't really have to do it [as in depth as for others]')." (KL) "In regards to the Milestones (the latter part of the meeting), the group went through each individual Milestone with each individual [trainee]. Each Milestone was projected on the screen (which included the title of the Milestone and anchors)." (JS) "Updating the spreadsheet was done in real-time for the first few [trainees] and then was more inconsistent for the duration of the meeting. Most individual Milestone levels for each [trainee] received very little to no discussion. Individual faculty members recommended new/updated Milestones based upon their experience with the [trainee], evaluations they reviewed on the [trainee], and the automated average for each Milestone provided by the electronic evaluation system." (JS)
	Swift Trust	N/A	Not observed
	Task Interdependence	N/A	Not observed
	Climate	General	"The atmosphere was collegial and positive, and members dove into the discussion quickly." (KL) "The setting felt laid back and comfortable." (JS)
		Group efficacy	"The group came prepared for a lengthy CCC process; in addition to warning the study team that this would be an open-ended meeting, they brought significant amounts of food for the group to consume throughout the meeting period." (KL) "It was clear during the group discussion that all of the faculty members knew the [trainees] well and had worked with them frequently." (JS)

			"The CCC faculty members knew all of the [trainees] well, so it was easy for them to articulate their opinions about each Milestone without any specific evaluation data." (JS) "Based on his/her presentation, it seemed clear that this new CCC faculty member does not know or has not worked closely with his/her assigned trainee." (JS)
		Common group identity	"Throughout, the discussion repeatedly made use of the term 'we' and referenced what the team could do as a collective to improve the [trainees'] performance." (KL) "The group felt that redundancy of opinion was useful, especially when making decisions about whether [trainees] are ready for independent practice. They felt that group consensus in this setting helped to support "[specialty] community standards." The group felt that weighing in on when [trainees] are ready for independent practice provides reassurance to society that this group is ensuring that [trainees] graduate with a basic level of skills to practice [specialty] in any setting." (JS)
		Psychological safety	CCC faculty member comment: "Respect for each other is important to build trust, which includes listening to other members when they are talking and sharing. A collegial atmosphere is important to build trust." (JS) "P01 referenced the collegial atmosphere and basic competence (with a clear agenda) that makes the CCC a success." (KL)
		Psychological ownership	CCC faculty member comment: "Most of the [trainees] have a longitudinal relationship with their CCC faculty members." (JS)
	Leadership	Conduct of meeting agenda	"The pace was immediately established by the Chair as quick; he/she explicitly stated the order in which [trainees] would be evaluated (third years first, 'anticipat[ing] it will go quickly'); the pertinent information (timeline details,

			when Milestones are due, etc), and a brief reminder of the core of the Milestones' meaning (deficiencies, ongoing progress, and aspirational targets." (KL) "As members showed up and there was a quorum, P32 began by discussing the guidelines and aims of the meeting, emphasizing that he/she would discuss the [trainees] according to their Milestones and overall progress. P32 distributed information packets on each of the Milestones at the start of the meeting and laid out the organization of the meeting (intending to start from 3rd year [trainees] and progress to 1st year [trainees]." (KL)
		Agility	"While the first few [trainees] were initially being evaluated, the Chair was actively entering specific information into the digital Milestone spreadsheet; however, over time he/she appeared to recognize that it was not an effective use of time and that CCC members could simply contact him/her directly with the data to be entered." (KL)
		Facilitating a shared mental model	"As the Chair would transition from his/her own introduction to the discussion, he/she would typically open the conversation by asking, 'anyone have specific concerns?' He/she summarized the process of 'how we do Milestones,' telling the group the plan to progress according to each individual Milestone and assess all [trainees] within that Milestone at that time (at which point he/she asked for, and received, the group's consensus agreement on this plan). At times, he/she also directly asked specific CCC members for their own evaluations/experiences with certain [trainees]." (KL) "For the first part of the meeting, the Chair let the group discussion play out without much intervention, and all CCC faculty members seemed to be involved equally in the discussion. He/she did not really need to engage individual faculty members because all freely participated

			when it seemed like they had something to contribute to the discussion." (JS)
Interpersonal Interactions	Imported Information	Pre-work assignments	"The discussion centered around the CCC Evaluation Form that was supposed to be filled out by assigned faculty members in advance of the meeting." (JS) "For each [trainee], faculty members gave some brief comments from the evaluations that they reviewed prior to the meeting along with a general synopsis of the electronically generated numerical values from the evaluation system that was prepopulated on the middle column of the CCC Evaluation Form." (JS) "There was no set format for how CCC faculty members presented his/her interns. Some utilized the program's CCC data collection sheet and some had information on other documents. However, all of the faculty members covered mostly the same information." (JS)
		Experiences with trainees	"During the general discussion of each [trainee], CCC members would most frequently use specific experiential anecdotes to illustrate their opinions, both to offer positive and negative evidence regarding [trainee] performance." (KL) "Each time P12 raised concerns over the course of this specific conversation, other members (P07, P08, P10, P11) volunteered small, specific instances of praise of the same [trainee], and in some instances (P10) explicitly disagreed with P12's critique. For another [trainee], P08 raised a personality-related critique; other CCC members (P07, P10, P11) offered specific experiences and praise for the [trainee's] growth." (KL) "Members also noted that they sometimes could not think of multiple examples to invoke beyond singular memories, with P32 at one point noting

			'I should have taken more notes during cases I staffed with the [trainee].'" (KL) "P16 added that it was the level of interaction with each of the [trainees] that mattered most in building an effective CCC." (KL)
	Shared Mental Model	Discussion patterns	"Most of the information shared at the meeting was via informal group discussion. Faculty members discussed areas such as medical knowledge, in-training exam scores, procedural competence, mentorship ability (for more senior [trainees]), ability to complete administrative tasks, teaching skills, scholarly activity, medical decision making, patient care, response to feedback, intrinsic motivation, patient presentation skills, and interpersonal communication skills and ability to interact with other [trainees], staff, patients, etc." (JS) "These discussion patterns largely considered the [trainee] according to global skills/traits (e.g., professionalism) the [trainee] currently exhibits that were then supported with singular experiences of interaction the CCC members had with the [trainees]." (KL) "As the meeting progressed, P33 began to assert a more dominant and organized tone in the meeting, at times ending the initial reading silence faster by offering opening comments (e.g. 'I can speak to clinic experience with the [trainee]…') and by explicitly wrapping up conversations (e.g. 'Who's next?' when discussions had devolved into unrelated chatter)." (KL)
		Development of a shared mental model	CCC faculty member comments: "Members felt that group input from a personal perspective and discussion is a very important part of this process. They felt that written evaluations don't provide nearly the information about an individual [trainee's] performance than conversation with someone who has worked with them and has a personal opinion about their performance." (JS)

			"It was clear that P32 was the final arbiter of the number chosen—per the use of numerous "I" statements ('I'm fine with 3 or 4;' 'I say leave the [trainee] at 3.5,' etc.)." (KL)
		Resources available to the group	"When formally beginning the evaluation of [trainees], P32 asked that all members of the CCC read the entire evaluation packets and comments. This consistently led to notable periods of silence as committee members read the evaluation summaries, as well as when committee members read each individual Milestone criteria silently to themselves during the Milestone assignments." (KL)
		Disparate opinions	"Disparate opinions seemed to be constructive and productive although the degree of disagreement or dissention in the group was low. Different CCC faculty members brought up additional/supplementary information, and for the most part consensus occurred fairly easily within the group." (JS) "After generally agreeing with a hybrid solution—graduating the [trainee] with noted reservations—P31 asked if they could formally record P31's dissent from that decision (with P31 explaining that they recommended graduation without reservations, noting the number of cases the [trainee] had been a part of and emphasizing that 'if the [trainee] has made it this far without remediation, the CCC's role should be to graduate the [trainee].'" (KL)
	Potential for Future Interactions and Relationships	N/A	Not observed
	Political Skill	N/A	Not observed
	Relational Identity Orientation	N/A	Not observed
	Need for Affiliation	N/A	Not observed
	Standing in a Group	Non-voting members	"The chief residents freely provided input about their experiences with most of the [trainees]. They were included in

			the discussion to provide input from the near peer perspective. These two faculty members seemed to have a unique perspective and insight into most of the trainees that other faculty members may not in a position to observe." (JS)
		Seniority	"P40 seemed like the most junior faculty member on the CCC, but she freely participated in the discussion for multiple [trainees] and had specific examples of patient care and faculty member interactions with a number of [trainees] from the clinic." (JS)
Environmental Factors	Reporting Relationships	N/A	Not observed
	Task Complexity/ Uncertainty	CCC role	"During the CCC discussion it became clear that group members were unsure of what the process was should they not want to recommend the [trainee] for independent practice; P36: 'the alternative is what?'" (KL) "There seemed some hesitancy or confusion about next steps (e.g., P44: 'how do we do this?' and P46 restating the goals of the CCC)." (KL) "At this point, P33 and P36 actively debated how the CCC assessment information would be shared and what regulative power the committee actually had in an instance in which the [trainee] may need additional supervision." (KL) "During the meeting, it was unclear from an observer standpoint exactly what decisions the group was making." (JS)
		CCC faculty member role	"Various members discussed the role of the individual CCC faculty member. Should members be more of a coach/mentor versus an evaluator? Should trainees be aligned to faculty members based upon aligned interests, specialties, etc.?" (JS)
		Milestones	"On several occasions, the group noted difficulty in determining numerical Milestone assignments given how the Milestones were written/phrased, and commented on the difficulty in fitting individuals into the specifically defined

			categories (e.g., at one point P16 noted the 'insanity' of anyone being able to achieve the highest ranking for one specific Milestone)." (KL) "At times, the CCC members expressed frustration with the Milestone definitions, specifically to what the Milestones are unable to capture (e.g., burnout)." (KL) "It seemed to me that there are so many Milestones and so many [trainees] that there were a number of gaps in information to make informed changes to the existing Milestone levels, and faculty members were comfortable leaving Milestones alone in these circumstances or going along with the assigned faculty member recommendations when there was no data to change the Milestone level." (JS)
		Developing remediation plans	"Rarely, comments were made to the effect of not knowing what to do (e.g., P02 stated for one [trainee] that they 'don't know how to help.'" (KL)
	Outside Group Memberships/ Social Ties	N/A	Not observed
	Threats	Decision making fatigue	"The meeting ran several minutes past its scheduled time, and there was some small indication that time pressure and decision making fatigue were setting in among the group—for instance, the group was quicker to both deliver evaluations and come to consensus on those evaluations over time." (KL) "[Faculty members] nearly unanimously acknowledged that they get more fatigued as the meeting continued and often end up brusquely assessing [trainees] on the final Milestones." (KL)
		Schedule conflicts	"At one point P08 took a phone call and left the room, and by 8:30 P07 had to leave to attend another meeting." (KL) "In one instance a CCC member (P36) needed to complete outside grading work—but rather than leave the CCC

			meeting, he/she simply asked the committee if it was ok for him/her to focus on the computer and submitting grades while the committee continued its discussion and that P36 would chime in when necessary (the group agreed; P36 did redirect focus away from the meeting but occasionally volunteered comments in line with [trainee] discussions).” (KL)
		Institutional structures/ policies	“Several times the CCC considered not just how the [trainee] did/did not perform, but how the institutional structures were/were not at fault.” (KL)
		Technical difficulties	“At one point, P02 sought to locate additional electronic materials to show the group using the available screen, but due to technical difficulties he/she was unable to have the materials at their disposal.” (KL)
	Staffing Levels	N/A	Not observed

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CHAPTER 4: DISCUSSION

DISCUSSION

Although multiple definitions of general trust exist in the literature and scholars have explored trust within work teams, the definition of "group trust" remains unclear. Further, we found that trust in group decisions has not been well studied within or outside of health professions education. Trust is a complex concept, and we contend that defining trust in group settings is important to informing how CCCs and other groups make collective decisions. In our scoping review (Chapter 2), we defined group trust as a group-directed willingness to accept vulnerability to actions of the members based on the expectation that members will perform a particular action important to the group, encompassing social exchange, collective perceptions, and interpersonal trust (**Figure 2**).

In a group, we agree with the literature outside of health professions education that trust occurs at multiple levels encompassing both individual level and group level processes simultaneously. For example, in a CCC, members must be able to reconcile differences of opinion and work with colleagues on the committee to make decisions that are in the best interests of not only their trainees, but ultimately the patients for whom their trainees provide care. Committee members must also be able to trust one another to pull their own weight on the committee, respect other individuals' opinions, provide constructive input, and make fair judgments.

Higher degrees of interpersonal trust will likely lead to a higher degree of group trust. Trust at both the individual and group levels have been associated with attitudinal outcomes, such as increased cooperation and satisfaction (8, 21, 22), and performance

outcomes, such as information sharing and quality of group decisions (1, 6, 8, 17). Moreover, developing a deeper understanding of our trust in CCCs may help these committees implement a more effective and meaningful process to make collective decisions regarding trainee competence. We include practical implications for group decision making, such as CCCs, in **Table 3**.

Based upon a synthesis of the information uncovered in our scoping review, we proposed and examined a model (**Figure 3**) utilizing situated cognition to help better understand trust within a group and the various factors that may influence trust in group decisions from individuals either within or outside of the group. As summarized in Chapter 3, we observed 15 hours of CCC meetings from multiple different GME training programs using a structured observation guide developed from a review of the literature and this proposed model. We explored how members characterize trust in the setting of a CCC and observed how these committees make decisions about trainee clinical competence and Milestone-based performance in the context of previously identified group trust elements: individual and group level factors, environmental factors, and the interactions between all of these elements.

Our model that emerged from the scoping review provided scaffolding for the subsequent study (Chapter 3) and captured multiple themes that emerged at the observed CCC meetings. Results suggest that diversity of opinion promotes a more complete collective understanding of competence for each trainee. Varied faculty experiences provide a diversity of information available to the CCC, and interactions among faculty members help to build a shared group mental model, which was identified as one of the most important aspects of making collective decisions and assigning Milestones. Further,

CCC chairs were instrumental in facilitating a shared mental model by communicating an agenda, determining a process to assign the Milestones, moving along the conversation, engaging individual faculty members as needed, etc. While not every chair facilitated a shared mental model to the same degree, its presence was clearly the key to success. These findings were consistent with our expectations based on the proposed model.

Additionally, CCC meetings generally had similar structure and agendas based upon the size of the training program. Faculty in smaller training programs tended to have more familiarity with all of the trainees and discussed them in more detail compared to larger programs. Larger programs also assigned faculty members to individual trainees, and it was their responsibility to complete standardized pre-work on their trainees prior to the meeting. Groupthink, which may occur when individual members refrain from expressing doubts and judgments or disagreeing with the group consensus, was more of a risk for larger training programs, especially when faculty members did not know their individual trainees well and were assigning individual Milestones.

Among environmental factors that impact trust, we found several that can compromise it, namely task complexity, uncertainty, and threats to the process of group decision making. One of the most important threats was decision making fatigue. Almost universally, increasing distractions and observed lapses of concentration seemed to occur the longer the meetings ran.

Our model attempts to provide leaders within GME training programs a way to view and attend to the various factors that may impact trust. The model might also serve as a way to "diagnose" why a CCC goes awry by looking at the CCC discussions through

various components of the model (e.g. if environmental or leadership factors may be perceived as "ineffective," what can be done to change or correct this?).

Military Relevance

In regards to readiness, military GME training programs are responsible for determining the best methods to assess the essential elements required of a competent physician and graduate trainees who can provide high-quality care within their respective specialty and the Department of Defense. Exploring trust in the context of decisions made by CCCs marks a significant step forward towards ensuring that military GME training programs are graduating competent physicians ready for unsupervised practice. Beyond CCCs, our group trust definition and model may also apply to decision making groups in other military healthcare settings, such as interprofessional patient care teams, hospital committees, and strategic management groups. In a larger military context, our research may also be relevant (e.g. operational planning). While a commander is ultimately responsible for decisions made about his/her unit, he/she typically has a staff to advise and help plan in various operational contexts. Group trust applied to operational military planning may also help the unit make better collective decisions and potentially help to establish a climate of trust within the organization.

Limitations

Data from our scoping review (Chapter 2) was limited to non-military populations and fields outside of health professions education; trust in other occupational settings may not be the same as trust in health professions education and/or military settings. Similarly, some of the reviewed papers focused on undergraduate and graduate students, and characteristics of these learners may not be the same as trainees in health professions

education. However, we attempted to tie together universal characteristics of trust across industries and populations studied to develop a model that may be applicable to health professions education groups. Indeed, we also provided specific examples of how the model applies directly to CCCs and the collective decisions they make (**Table 3**).

Our empirical research (Chapter 3) was limited to CCC meeting observations and brief group question sessions at the end of the meetings. While we were able to collect data about easily observable components of our proposed model such as group size, diversity, and communication patterns, we were unable to obtain data on individual faculty member thoughts and feelings. As a result, we were unable to test all components of the model, such as an individual's propensity to trust, vulnerability, relational identity orientation, need for affiliation, etc. We also did not collect data about what types of assessments each CCC used and had access to. Given that observers were present in the same room as CCCs, the results may have been influenced by the Hawthorne effect (i.e. CCC members knew they were being watched, which may have impacted their behavior and/or group discussions). Observations were also limited to meetings occurring during one Milestone reporting cycle at the end of the academic year at one institution.

FUTURE DIRECTIONS

Because our empirical research only focused on the observable components of our model, further research may explore faculty members' thoughts and feelings regarding trust in a group setting, which may help to validate other components of the model that are not easily observable. We also suggest looking at trust in group decisions from a non-CCC member stakeholder perspective. This might involve examining how department leaders, program directors, and individual faculty members who are not on a

CCC define trust in this context. Trust from a stakeholder perspective is important because these individuals are ultimately the ones entrusting the CCC to make "valid" decisions about individual trainees. These individuals may also have unique insights into our model and/or interpret components of the model that may be "critical" to trust from an outsider perspective. Exploring CCC group trust from a trainee perspective may also yield additional insights into our model. Trainees are another type of stakeholder, and they trust their programs to make informed and reasonable decisions about their own levels of competence. Observing additional competency committee meetings in other contexts (e.g. undergraduate medical education) with our proposed framework may provide additional insight about how group trust operates in other health professions education settings.

Future research might also gather additional validity evidence and further test the model in additional educational settings and other types of decision making groups (e.g. interprofessional patient care teams, hospital committees, and healthcare strategic management groups). Additionally, our framework may be useful to consider in military-specific contexts, such as the joint operational planning process; decision making at the level of a battalion, brigade, or division staff; or on a promotions board. Considering the stakeholder perspective in these group settings may help to provide inferences about trust within the respective organization as well.

CONCLUSIONS

Our research should allow educators and program leaders to better understand what factors may contribute to trust in group settings. As programs develop policies, procedures, and determine the membership of these committees, keeping in mind our

definition of group trust and factors that we contend contribute to group trust may help improve the design and implementation of CCCs or other decision making groups, enhancing the translation of evaluation data and individual opinions into competency decisions. Educators who understand these factors may also help create a collective environment of trust not only on a CCC, but potentially within their organization as well. Trainees, patients, and other stakeholders trust CCCs to make carefully weighted decisions, and it is important to determine how these committees can demonstrate that this trust is not misplaced.

APPENDIX 1: SCOPING REVIEW SEARCH STRATEGY

ERIC Search strategy: title:(trust OR trustworthy OR trustworthiness) AND title:(group OR groups OR team OR terms OR committee OR committee OR july OR judges) AND (decision OR decisions OR success OR success OR outcome OR outcomes)

PsychINFO Search strategy: ((trust or trustworth*) and (group or groups or team or teams or committee or committees or jury or juries)).ti. and (decision or decisions or success or successes or outcome or outcomes).af.

Limit: (english language and ("0100 journal" or "0110 peer-reviewed journal" or "0120 non-peer-reviewed journal" or "0130 peer-reviewed status unknown"))

PUBMED Search strategy: ("Trust"[Majr] OR trust[ti] OR trustworth*[ti]) AND ("Group Processes"[Majr] OR group[ti] OR groups[ti] OR team[ti] OR teams[ti] OR committee[ti] OR committees[ti] OR jury[ti] OR juries[ti]) AND ("Decision Making"[Mesh] OR decision*[tiab] OR success[tiab] OR outcome*[tiab]) AND English[lang]

SCOPUS Search strategy: (TITLE(trust OR trustworth*) AND TITLE(group OR groups OR team OR teams OR committee OR committees OR jury OR juries) AND TITLE-ABS-KEY(decision OR decisions OR success OR successes OR outcome OR outcomes)):

Limit: “English (language),” “article” (including “article in press”) and “review” (excludes “conference paper,” “book chapter,” “note,” “letter,” “short survey”):

APPENDIX 2: SCOPING REVIEW EXTRACTION TOOL HEADINGS

General Article Characteristics					
Reviewer	Year	Author(s)	Who are the authors? (medical; organizational psychologists; business; social scientists; other (please list))	Title of article	Title of journal
Citation information (issues, page number(s))	Citation type (commentary/editorial; original research paper - peer reviewed; original research paper - not peer reviewed; review paper; other (please list))	Type of review (narrative; scoping; structured; systematic; systematic with meta-analysis; not stated but I infer the type of review was (please indicate); Other (please indicate))	Geographic location of the study. If the location of the study (i.e. study population) is not possible or not relevant, select the location of the majority of the authors (Asia; Europe; North America; Oceania; South America; More than one location (please list))	What type of individuals and/or groups are being studied/cited? (e.g. medical professionals; business professionals; educators; students; jurors, etc). If the individual type is different than the group type, please list both	If the article relates to medical individuals and/or groups, does it mention any specific areas or specialties? If so, please list
Is the paper presenting data from an original research study?	Please summarize the main purpose of the study. Direct quotations are preferred over using your own words. If you are quoting, please use quotation marks and indicate the page from which you are quoting	Approach to Data Collection			
[redacted]	[redacted]	Qualitative (Please summarize what kind of	Quantitative (Please summarize what kind of	Mixed Methods (Please summarize what kind of	Other (Please describe)

		data was collected e.g. field notes of observations, interviews, focus groups, etc.)	data was collected)	data was collected in each study arm)	
Definitions of Trust					
Is an explicit definition of trust included? An example could be: "For the purpose of this study, we define trust as…" (please copy and paste the definition(s) of trust present in the paper using quotation marks and indicating page numbers for source quotes as appropriate)	Does the paper provide an explicit or implicit definition of individual trust? An example could be: "For the purpose of this study, we define individual trust as…" (please copy and paste the definition(s) of trust present in the paper using quotation marks and indicating page numbers for source quotes as appropriate)	Does the paper specify a group or team (which consists of more than two individuals) as a unit or level of analysis? If so, please provide quotes (and page numbers) regarding how the paper defines a group or team. If the paper refers to a collection of individuals other than a group or team, please indicate this as well	Does the paper provide information about a group or team making decisions about an individual? If so, please provide quotes (and page numbers) regarding how the paper discusses this	Does the article provide an explicit or implicit definition of group trust? An example could be: "For the purpose of this study, we define group trust as…" (please copy and paste definition(s) of the above mentioned word(s) present in this paper using quotation marks and indicating page numbers for source quotes as appropriate). If the paper refers to group trust as something different (e.g. collective trust, trust at the team/group level, trustworthiness of group decisions, etc), please provide this term as well	
Are any theories or models mentioned in the article? If so, please list and provide specific references cited in the paper for each theory listed					
Does the article list individual factors that contribute to trust at the individual level? If so, please provide the term(s) under the category specified by the article					

Trustor characteristics (e.g. propensity to trust)	Trustee characteristics (e.g. ability/ competence, benevolence, integrity)	Interpersonal relationships (e.g. types and duration of relationships, community or geographic similarities)	Other (please also provide a category if this is listed in the article)	Comments	
Does the article list group factors that contribute to trust at the group level? If so, please provide the term(s) under the category specified by the article					
Composition (e.g. demographics, diversity, degree of individualism)	Relationship structure (i.e. strength of ties in the group)	Leadership (e.g. leader characteristics, type of leader-member exchanges)	Climate (e.g. degree of psychological comfort within the group environment)	Task interdependence (i.e. the degree to which group members rely on one another and must interact in order for the group to accomplish its goals)	Other (please also provide a category if this is listed in the article)
Comments					
Does the article list any team interaction or group process factors that contribute to trust at the group level (examples may include procedural fairness, transparency, inclusion, group/shared mental model, information sharing/distribution of knowledge, time pressures, groupthink, task/cognitive vs relational/affective conflict, cognitive vs affective trust, communication, etc)					Comments
Does the article list contextual/situational factors that contribute to trust at the group level? If so, please provide the term(s) under the category specified by the article					Comments
Does the article list individual level outcomes that result from trust at the group level? If so, please provide the term(s) under the category specified by the article					
Attitudes (e.g. job satisfaction/ stress, loyalty/ commitment to the organization, satisfaction with the group)	Performance (e.g. open communication, knowledge sharing, proactive idea implementation/ problem solving, cooperation)	Other (please also provide a category if this is listed in the article)	Comments		
Does the article list group level outcomes that result from group at the team level? If so, please provide the term(s) under the category specified by the article					
Attitudes (e.g. group-level satisfaction, commitment, cohesiveness)	Performance (e.g. innovation, knowledge sharing, group learning/ information processing and organizational citizenship behaviors)	Other (please also provide a category if this is listed in the article)	Comments		

Please summarize the main findings of the paper. Direct quotations are preferred over using your own words. If you are quoting, please use quotation marks and indicate the from which page you are quoting
Does the article provide any practical implications of defining trust at the group level of analysis? If so, please describe
Does the article provide implications for future research? If so, please list
General comments/notes (anything you think wasn't captured)

APPENDIX 3: SCOPING REVIEW INCLUDED PUBLICATIONS

Citation	Type of Article	Geographic Origin of the Study	Study Population	Approach to Data Collection
Bianchi EC, Brockner J, van den Bos K et al. Trust in decision making authorities dictates the form of the interactive relationship between outcome fairness and procedural fairness. Pers Soc Psychol B. 2015;41:19–34.	Original research	United States	New employees in a large global shipping company and community sample	Quantitative – survey
Brown G, Crossley C, Robinson S. Psychological ownership, territorial behavior, and being perceived as a team contributor: the critical role of trust in the work environment. Pers Psychol. 2014;67:463-85.	Original research	Singapore	Employees in a variety of occupations	Quantitative – survey
Carmeli A, Tishler A, Edmondson A. CEO relational leadership and strategic decision quality in top management teams: the role of team trust and learning from failure. Strateg Organ. 2011;10:31-54.	Original research	Israel	CEOs and employees on top management teams (TMTs) from firms in a variety of industries	Mixed Methods – survey and in-depth qualitative analysis of two TMTs
Costa A, Roe R, Taillieu T. Trust within teams: the relation with performance effectiveness. Eur J Work Organ Psy. 2001;10:225-44.	Original research	Netherlands	Teams from three social care institutions	Quantitative – survey
Costa A. Work team trust and effectiveness. Pers Rev. 2003;32:605-22.	Original research	Netherlands	Employees of three social care institutions	Quantitative – survey
Costa A, Anderson N. Measuring trust in teams: development and validation of a multifaceted measure of formative and reflective indicators of team trust. Eur J Work Organ Psy. 2011;20:119-54.	Original research	Netherlands	Employees of a hospital and three social care organizations	Quantitative – survey
Costa A, Fulmer C, Anderson N. Trust in work	Review paper	United Kingdom	N/A	Review paper

teams: an integrative review, multilevel model, and future directions. J Organ Behav. 2017;1-16.				
Curseu P, Schruijer S. Does conflict shatter trust or does trust obliterate conflict? Revisiting the relationships between team diversity, conflict, and trust. Group Dyn-Theor Res. 2010;14:66-79.	Original research	Netherlands	Undergraduate students	Quantitative – survey
Dayan M, Benedetto CA. The impact of structural and contextual factors on trust formation in product development teams. Ind Market Manag. 2010;39:691-703.	Original research	United Arab Emirates	New product development teams	Quantitative – survey
De Jong B, Dirks K. Beyond shared perceptions of trust and monitoring in teams: implications of asymmetry and dissensus. J Appl Psychol. 2012;97:391-406.	Original research	Netherlands	Board members of various Dutch student associations and employees of a healthcare organization	Quantitative – survey
De Jong B, Dirks K, Gillespie N. Trust and team performance: a meta-analysis of main effects, moderators, and covariates. J Appl Psychol. 2016;101:1134-50.	Systematic review and meta-analysis	Netherlands	N/A	Systematic review and meta-analysis
DeOrtentiis P, Summers, J, Ammeter A, Douglas C, Ferris G. Cohesion and satisfaction as mediators of the team trust – team effectiveness relationship: an interdependence theory perspective. Career Dev Int. 2013;18:521-43.	Original research	United States	MBA graduate students	Quantitative – survey
Ennen NL, Stark E, Lassiter A. The importance of trust for satisfaction, motivation, and academic performance in student learning groups. Soc Psychol Educ. 2015;18:615–33.	Original research	United States	Undergraduate students	Quantitative – survey

Ferguson A, Peterson R. Sinking slowly: diversity in propensity to trust predicts downward trust spirals in small groups. J Appl Psychol. 2015;100(4):1012-24.	Original research	United Kingdom	Graduate MBA students	Quantitative – survey
Hakanen M, Hakkinen M, Soudunsaari A. Trust in building high-performing teams – conceptual approach. Electron J Bus Ethics Organ Stud. 2015;20:43-53.	Review paper	Finland	N/A	Review paper
Han G, Harms P. Team identification, trust, and conflict: A mediation model. Int J Confl Manage. 2010;21:20-43.	Original research	United States	Employees of a Fortune 500 company	Quantitative – survey
Korsgaard M, Schweiger D, Sapienza H. Building commitment, attachment, and trust in strategic decision making teams: the role of procedural justice. Acad Manage J. 1995;38:60-84.	Original research	United States	Management teams of a Fortune 500 company	Quantitative – survey
Kweekel L, Gerrits T, Rijnders M, Brown P. The role of trust in CenteringPregnancy (CP): building interpersonal trust relationships in group-based prenatal care in the Netherlands. Birth. 2017;44:41-7.	Original research	Netherlands	Former participants in Centering-Pregnancy (CP) who received prenatal care at one of four midwifery practices	Qualitative – semi-structured interviews and structured observations
LaMacchia ST, Louis WR, Hornsey MJ, Leonardelli GJ. In small we trust: lay theories about small and large groups. Pers Soc Psychol B. 2016;42:1321–34.	Original research	Australia	Undergraduate students and community samples	Mixed Methods – quantitative and qualitative surveys
Langfred C. The downside of self-management: a longitudinal study of the effects of conflict on trust, autonomy, and task interdependence in self-	Original research	United States	MBA graduate students	Quantitative – survey

managing teams. Acad Manage J. 2007;50:885-900.				
Lowry P, Zhang D, Zhou L, Fu X. Effects of culture, social presence, and group composition on trust in technology-supported decision making groups. Inform Syst J. 2010;20:297-315.	Original research	United States	Undergraduate students	Quantitative – scenario
Lvina E, Maher L, Harris J. Political skill, trust, and efficacy in Teams. J Leadersh Org Stud. 2017;24:95-105	Original research	Canada	Undergraduate students	Quantitative – survey
Mayfield C, Tombaugh J, Lee M. Psychological collectivism and team effectiveness: moderating effects of trust and psychological safety. J Organ Cult Comm Conflict. 2016;20:78-94.	Original research	United States	Graduate and upper-division undergraduate students enrolled in business and education courses	Quantitative – survey
Moreland R, Levine J. Socialization and trust in work groups. Group Process Intergr. 2002;5:185-201.	Review paper	United States	N/A	Review paper
Naquin C, Kurtzberg T. Team Negotiation and perceptions of trustworthiness: the whole versus the sum of the parts. Group Dyn-Theor Res. 2009;13:133-50.	Original research	United States	Graduate-level business students	Quantitative – survey
Olvera J, Llorens S, Acosta H, Salanova M. Transformational leadership and horizontal trust as antecedents of team performance in the healthcare context. Ann Psychol. 2017;33:365-75.	Original research	Spain	Employees from work teams and supervisors of these teams from four healthcare centers	Quantitative – survey
Parayitam S, Dooley R. The relationship between conflict and decision outcomes: moderating effects of cognitive- and affect-based trust in strategic decision making	Original research	United States	Hospital employees on strategic decision making teams	Quantitative – survey

teams. Int J Confl Manage. 2007;18:42-73.				
Peterson R, Behfar K. The dynamic relationship between performance feedback, trust, and conflict in groups: A longitudinal study. Organ Behav Hum Dec. 2003; 92:102-112.	Original research	United States	Graduate MBA students	Quantitative – survey
Poltis J. The connection between trust and knowledge management: what are its implications for team performance. J Knowl Manag. 2003;7:55-66.	Original research	Australia	Members of self-managing teams from a large high-technology, aerospace, manufacturing organization	Quantitative – survey
Rau D. The influence of relationship conflict and trust on the transactive memory: performance relation in top management teams. Small Gr Res. 2005;36:746-71.	Original research	United States	Members of commercial bank top management teams	Quantitative – survey
Robertson M. Trust: the power that binds in team supervision of doctoral students. High Educ Res Dev. 2017;36:1463-75.	Original research	Australia	Late-stage doctoral students and doctoral supervisors	Qualitative – in-depth, semi-structured interviews
Selmer J, Jonasson C, Lauring J. Group conflict and faculty engagement: is there a moderating effect of group trust? J High Educ Pol Manage. 2013;35:95-109.	Original research	Denmark	Academic staff members in three large universities	Quantitative – survey
Seppala T, Lipponen J, Pirttila-Backman A. Leader fairness and employees' trust in coworkers: the moderating role of leader group prototypicality. Group Dyn-Theor Res. 2012;16:35-49.	Original research	Finland	Employees in work groups in two different organizations	Quantitative – survey
Simons TL, Peterson RS. Task conflict and relationship conflict in top management teams: the pivotal role of intragroup	Original research	United States	CEOs and management teams of hotel companies	Mixed Methods – surveys and interviews

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Spector M, Jones G. Trust in the workplace: factors affecting trust formation between team members. J Soc Psychol. 2004; 144: 311-21.	Original research	United States	Professional employees working regularly in an office environment of 19 major corporations	Quantitative – survey
Tanghe J, Wisse B, van der Flier H. The role of group member affect in the relationship between trust and cooperation. Brit J Manage. 2010;21:359-74.	Original research	Netherlands	Undergraduate students	Quantitative – survey
Terwel BW, Harinck F, Ellemers N, Daamen D. Voice in political decision making: the effect of group voice on perceived trustworthiness of decision makers and subsequent acceptance of decisions. J Exp Psychol-Appl. 2010;16:173-86.	Original research	Netherlands	Undergraduate students	Quantitative – scenario
van der Zee K, Vos M, Luijters K. Social identity patterns and trust in demographically diverse work teams. Soc Sc Inform. 2009;48:175-98.	Review paper	Netherlands	N/A	Review paper
Walumba F, Luthans F, Avey J, Oke A. Authentically leading groups: the mediating role of collective psychological capital and trust. J Organ Behav. 2011;32:4-24.	Original research	United States	Employees and their immediate supervisors of a large bank	Quantitative – survey
Webber S. Leadership and trust facilitating cross-functional team success. J Manage Dev. 2002;21:201-14.	Review paper	Canada	N/A	Review paper
Wildman J, Shuffler M, Lazzara E, Fiore S, Burke C, Salas E, Garven S. Trust development in swift starting action teams: a multilevel framework.	Review paper	United States	N/A	Review paper

Group Organ Manage. 2012;37:137–70.				
Yang I. What makes an effective team? The role of trust (dis)confirmation in team development. Eur Manage J. 2014;32:858-69.	Review paper	France	N/A	Review paper

APPENDIX 4: CCC OBSERVATION GUIDE

Individual Level Factors

Description	Reflection
Observed behaviors that may affect interactions amongst group members, group decisions, individual and/or group trust etc.	

Group Structure

Description	Reflection
How many individuals are present for the CCC meeting?	
What individuals are present for the CCC (e.g. professional titles/specialties)	

Group Processes

Description	Reflection
Do you perceive any conflict during the meeting? If so, how does this affect the group decision making process?	

Are some members of the group more vocal than others? If so, how does this affect the group?	
Do you notice any disparate opinions? If so, how are these handled?	
What procedures are utilized by the CCC to make decisions?	

What was the overall climate of the CCC?	
What is the role of the group leader?	
Do you notice any instances of groupthink?	

Information Sharing/Interpersonal Interactions

Description	Reflection
What is the agenda for the meeting? How well was this communicated?	
How are individual residents discussed?	
How are group decisions reached?	

Does the CCC recognize any limitations regarding its ability to make decisions for specific residents?	
Does military rank and/or standing/influence within a program appear to play a role in the decision making process?	
Do you notice any differences in the way new or relatively inexperienced members act compared to more experienced members?	

Environmental Factors

Do you notice any environmental factors that may influence the ability of the CCC to make decisions (e.g. task complexity, uncertainty, etc.)?	

Do you notice any potential threats to group trust?	

Meeting Conclusion

Do all relevant concerns seem to be addressed in the meeting?	
Is a plan discussed to follow-up on any unresolved issues identified during the meeting?	

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