and new themes were defined and codes added into the template.

**Results/Outcomes:** Twenty-one patients and 8 providers participated, creating 21 cases. Evidence of each CHAT element, including subject, object, tool, community, rules, and division of labor, were identified in at least 1 of the 3 transcripts for each patient–physician dyad. For example, “tools” that were used by patients to achieve the object of obtaining a contraceptive method included their knowledge, previous experience, and the app. We also observed the influence of a patient’s partner or occupation on decision making, which was represented by “community.” By comparing the findings of each element between different cases and by examining occurrences of codes across the transcripts, we identified recurring themes, such as how the app is used as a “tool” in facilitating agency or the impact of both the patient’s and the physician’s “community” on shared decision making.

**Discussion:** By analyzing clinical encounters with CHAT, we identified factors and tensions influencing behavior of individual patients and physicians when engaged in a clinical encounter about contraception. Analysis of interactions of the patient and physician activity systems revealed tensions that were resolved over the course of the encounter and allowed for an exploration of the impact of agency in the process. For example, in several cases, it was the role of “tools” and the physician’s awareness of factors such as their own and the patient’s “communities” that promoted successful shared decision making. Educational interventions that address the complexity of co-constructing decisions may result in more effective shared decision making.

**Significance:** By using CHAT to study shared decision making, we can identify important characteristics of educational interventions for health professionals that may lead to enhanced patient agency and successful shared decision making.

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**References**


**Influence of Emotion on Cognitive Load Experienced by Trainees While Performing Patient Handoffs**

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**Introduction:** Patient handoffs remain a significant patient safety challenge. Researchers have used cognitive load theory (CLT) to unpack the complexity of health professions workplace learning tasks including handoffs. When the cognitive load of a handoff exceeds the working memory capacity of the trainee, learning and performance suffer. CLT focuses on the development of instructional strategies that match intrinsic load (IL) to the developmental stage of the learner, decrease extraneous load (EL), and optimize germane load (GL). CLT strategies have traditionally focused on modifying the complexity of the task, the knowledge of the learner, and/or the design of the instruction. CLT researchers have given little attention to how the learner’s emotions influence cognitive load. Yet, we know that emotion modulates learning through numerous cognitive processes including motivation, attention, working memory, and long-term memory. To address this gap, this study explores how emotion influenced the IL, EL, and GL imposed upon the working memory of trainees performing patient handoffs.

**Methods:** From January to March 2019, we administered a cross-sectional survey to 1,807 residents and fellows from a large 24-hospital health system in the United States. Participants completed the survey after performing a handoff. The survey included questions about features of the learner, task, and instructional environment. IL, EL, and GL were measured with the 16-item Cognitive Load Inventory for Handoffs. Emotions were assessed with an 8-item scale based on the circumplex model of affect. The authors used factor analysis to identify the core dimensions of emotion and then explored the relationship between emotion and cognitive load with 3 types of analyses. First, bivariate correlational analyses examined the relationship between the emotion factors and learner, task, and environment features known to predict cognitive load. Second, we conducted univariate regression analyses to investigate whether emotion factor scores predicted IL, EL, and GL. Third, multivariate regression determined whether the addition of the emotion factors to models including these previously established predictors of cognitive load types increased the variance explained (Δ R²).

**Results:** Six hundred and ninety-three (38.7%) of 1,807 residents and fellows completed a survey. Exploratory and confirmatory factor analysis identified 2 dimensions of emotion representing positive activation (labeled invigoration) and positive deactivation (labeled tranquility). The correlational analyses revealed that higher invigoration was...
associated with higher levels of training and use of a standardized verbal protocol, while lower levels of invigoration were associated with interruptions, difficulty obtaining essential information, and fatigue. Higher tranquility was associated with higher levels of training and lower levels of tranquility with interruptions, difficulty obtaining information, fatigue, longer handoffs, and greater number of patients. In univariate regression analyses, higher levels of invigoration, tranquility, and their interaction were independently associated with lower intrinsic load and extraneous load. The interaction of invigoration and tranquility predicted lower germane load. Finally, in the multivariate models of predictors for each type of cognitive load, the addition of the emotion term increased the amount of variance explained from 0.10 to 0.16 for IL, 0.15 to 0.27 for EL, and 0.11 to 0.14 for GL.

Discussion: Emotion significantly influenced the cognitive load experienced by trainees while performing in vivo handoffs. Like studies in the simulation context, the structure of emotion during patient handoffs consisted of 2 factors. Higher invigoration/tranquility predicted lower IL, EL, and GL. Traditionally, CLT researchers assumed that emotion primarily affected EL. Our results suggest a much broader impact of emotion.

Significance: The study models how emotion and cognitive load can be measured during a workplace learning activity. These results suggest that enhancing invigoration and tranquility will reduce cognitive load and improve learning and performance. This highlights the importance of developing instructional strategies that help trainees regulate their emotions.

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References

The Incremental Influence of Course Leadership, Team Dynamics, and Psychological Safety on Personal Empathy and Burnout

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Purpose: Medical education traditionally focuses on clinical aspects of patient care, but recent curriculum development has integrated humanities education focused on areas such as empathy, communication, and wellness. Such curricula can be delivered in small group formats intended to improve student wellness through connections with others. However, not all groups share the same climate and may have varying experiences with the same curriculum. Group climate entails many factors, including how a course facilitator leads a discussion, how team members interact with one another (particularly when vulnerable), and whether team members feel they can speak freely. The purpose of this paper is to examine how small group climate (facilitator leadership, team dynamics based on benevolence and integrity, and psychological safety) impacts personal empathy and burnout.

Results/Outcomes: One path model revealed that facilitators’ behaviors influence psychological safety directly ($\beta = .50, P < .01$) and indirectly through team dynamics ($\beta = .10, P < .01$), with total explained variance of $R^2 = .50$. A separate model that includes empathy as an outcome variable reveals that psychological safety increases empathetic concern for others ($\beta = .23, P < .01$, $R^2 = .05$), but such an environment does not have as much influence on an individual’s perspective-taking ($\beta = .17, P = .06$, $R^2 = .03$). A third model using burnout as the outcome variable reveals that psychological safety does not reduce burnout on a statistically significant level ($\beta = -.14, P = .12$, $R^2 = .02$).

Discussion: This study showed that facilitators’ leadership skills play an important role in forming a team that carries benevolence and integrity and in creating a psychologically safe environment for students. Individuals’ empathic concerns are more subject to changes in the environment as compared to perspective-taking. The environment may not be the key cause for burnout in this sample, suggesting a need for research on the multiple factors.