Complexity in shared decision making: a qualitative analysis of clinical encounters and patient/physician interviews

[version 1; peer review: awaiting peer review]

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Abstract

Background: Shared decision making is a complex clinical activity, for which the most effective educational interventions are unclear. Cultural Historical Activity Theory (CHAT) can be utilized as a framework to help medical educators understand and teach shared decision making. The objective of this qualitative study was to utilize CHAT to explore, through analysis of clinical encounters and interviews, patient and provider perspectives of a medical decision-making process that included use of a decision aid mobile application (app).

Methods: Female patients from age 17 to 45, who sought care at a contraceptive clinic between April and June 2019, and physicians providing care in the clinic, were recruited for this study. Patients utilized the decision aid app prior to the visit. The clinical encounter and semi-structured interviews with each patient and physician were recorded. Template analysis was used to analyze the transcripts with themes including elements of activity systems within CHAT, tensions within and between activity systems, and agency.

Results: In total, 21 patients and eight providers participated in the study. Evidence of CHAT elements were identified for each patient-physician dyad. In analyzing occurrences of codes across transcripts, recurring contradictions and themes emerged, such as how the app is utilized as a mediating tool and the importance of patient and physician communities.

Conclusions: Through analysis of clinical encounters and focused interviews, patient and provider perspectives provided a unique understanding of the complex process of decision-making. These findings can assist educators in developing more effective teaching strategies that may lead to enhanced patient agency, effective relational agency, and successful shared decision making.
Keywords
shared decision making, cultural historical activity theory (CHAT), agency

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Introduction

Teaching complex topics in health professions education will fall short of its goals if medical educators fail to recognize or address a topic’s complexity. Shared decision making, an approach in which a patient and healthcare provider make a health decision together, considering a patient’s values and preferences in addition to the scientific evidence, is one such complex activity. In this article, we explore patient and physician perspectives of a clinical decision-making process to inform physicians and medical educators about the complex process of shared decision making.

The complexity of shared decision making arises from the requirement that the physician and patient co-create a decision, and the fact that the patient’s values and preferences grow from their sociocultural contexts, including their community and environment. Shared decision making requires an explicit discussion of these values and preferences, but patients may not mention this information in the clinical setting, especially if they are rarely asked about such things. Shared decision making relies to some extent on a patient’s agency—defined as an individual having intention and empowerment to act. However, if the patient is not forthcoming with their values, preferences, and cultural context, the physician may need to employ strategies to elicit the information and make sense of it, thus harnessing relational agency. But, like the patient, the health professional has their own professional identity, community, and preconceived notions of their role in the clinical encounter, which may not include facilitating the patient’s agency.

Developing effective teaching approaches for shared decision making first requires an understanding of its inherent complexity. Cultural Historical Activity Theory (CHAT) is one framework that has helped health professions educators close the gaps in understanding and achieving educational goals for other complex topics. In the CHAT framework, shared outcomes are dependent on interactions between activity systems, which are made up of a subject (person engaged in the activity), tools (symbolic or physical objects that facilitate accomplishment of a defined objective), and object (purpose of the activity), as well as rules, a community, and division of labor. According to Engeström, “the object-oriented and artifact-mediated collective activity system is the prime unit of analysis in cultural-historical studies of human conduct.”

Tensions (or contradictions) exist within and between elements of an activity system and it is the working through those tensions that can lead to learning. The events that take place within and across activity systems (e.g., a clinical encounter) are embedded within and shaped by the norms and values of the culture in which they occur. By analyzing clinical encounters with a CHAT lens and identifying contradictions that exist within activity systems and between a physician and patient, we may be able to develop effective educational strategies to teach behaviors that lead to enhanced patient agency and successful shared decision making.

The objective of this study was to explore, through CHAT-sensitized analysis of a clinical encounter and focused interviews, patient and physician perspectives of a decision-making process that included a decision aid mobile application (app), in order to inform physician understanding of the complexity of shared decision making and the design of future educational initiatives.

Methods

We conducted a qualitative study using template analysis guided by a constructivist approach to analyze recordings of clinical encounters and semi-structured patient and physician interviews. We obtained ethical approval from the Walter Reed National Military Medical Center (WRNMMC) Institutional Review Board (#WRNMMC-2019-0221). Per the regulations of this body, access to the interview and clinical session data is strictly controlled and limited to the core research team making it impossible for us to publicly deposit this data or make it available upon request.

Setting and participants

Recruitment and data collection occurred at the WRNMMC Complete Contraceptive Clinic between April-July 2019.

Our study included both patient and physician participants. Patient participants were active duty females in the United States military between the ages of 17 and 45 who were seen at the clinic and were interested in contraceptive services. Participants were excluded if they did not speak English, were infertile, currently pregnant, or desired to be pregnant within six months. Patient participants were recruited by two of the investigators (CW and EH) while they were waiting to be seen, and were informed about the purpose of the study and procedures for participation. For interested patients, informed consent included details about how the recordings of the encounter and subsequent interview would be transcribed and anonymized; they were informed that, when study results were published, there would be no identifying characteristics included in the manuscript. After informed consent, patient participants downloaded and completed a contraceptive decision aid mobile app, Decide + Be Ready, on their personal device. The app was designed by CW in collaboration with partners at University of California, San Francisco, and Nitid Bit LLC, and can be downloaded through the App Store (iOS) or Google Play (Android).

CW recruited physician participants during meetings with clinic staff. Upon recruitment, physician participants received basic information about navigating the app and had the opportunity to engage with it on their own device.

Data collection

Patient participants were seen in the clinic by a physician participant. The initial part of the clinical encounter (including history, discussion of contraceptive options, counseling, and decision about contraceptive method) was audio-recorded with the patient’s consent.

Immediately following the medical encounter, EH, a female civilian with master’s-level training in qualitative methods, conducted and audio-recorded a semi-structured interview with the patient. The semi-structured interview guide was designed to elicit the patient’s experience of the preceding visit (see
Extended data, Appendix A for patient interview guide\textsuperscript{15}). Questions elicited perceptions about empowerment to participate in decision-making, how the app impacted the decision-making process, factors that impacted the decision, and past experiences with similar types of health-care decisions. Following the medical encounter, within the same day, CW, a physician, conducted and audio-recorded a semi-structured interview with the physician, eliciting the physician’s perception of how the decision aid impacted a typical contraceptive counseling visit and if and how the decision aid facilitated or hindered the shared discussion about the patient’s options and preferences (see Extended data, Appendix B for physician interview guide\textsuperscript{15}). Prior to deployment, both interview guides were pilot tested with three females and several questions were revised based on their feedback. Additionally, both guides were iterated over the study period based on analysis of participants’ responses.

Recorded clinical encounters and interviews were transcribed and de-identified by CW.

Data analysis
We utilized template analysis\textsuperscript{12,13}, a form of thematic analysis, to help us make sense of the inherent complexity using CHAT. The \textit{a priori} overarching themes for the analysis were elements of activity systems within CHAT, including subject, object, tools, rules, community, and division of labor, as well as tensions within and between activity systems and individual and relational agency (See Table 1). These elements were defined early in the study based on the author team’s previous article on CHAT and Engeström’s descriptions\textsuperscript{9}. We utilized CHAT to analyze the patient and physician roles in clinical encounters in which the patient used a contraceptive decision aid app prior to the appointment.

To familiarize ourselves with the data, each author read a third of the transcripts, identifying and highlighting parts relevant to shared decision making, patient or relational agency and elements of CHAT. CW read and coded all the transcripts.

The initial template was designed in Excel after preliminary review of the transcripts and then operationalized as a table. The template contained elements of CHAT, and columns for tensions within and between activity systems of the patient and physician, and for data related to patient and relational agency.

Each co-author completed the table for each document, group-talked through the completed forms, and initial data were consolidated on a single document, with new themes noted during this process. Iterative changes to the data extraction tool occurred twice during initial data extraction, including slightly changing the structure of the template. New themes were defined, codes were established for themes and sub-themes, and codes added into the template. Data was transferred from Excel to Dedoose, where further coding and modeling of data was undertaken.

Analysis was iterative. While physician and patient transcripts were considered as groups for early analysis and general themes, we ultimately focused on each case—an encounter, patient interview and physician interview—as the unit for analysis. As a group we agreed that we reached “information power” to achieve the study objectives after interviewing 21 patients\textsuperscript{16}.

Each case was designated by a number assigned to each patient participant. To identify a variety of voices, we captured quotations from all three artifacts (encounter, patient interview, physician interview) within a case. Verbatim extracts are denoted by case number, followed by E for encounter, PA for the patient interview, and PHY for the physician interview (e.g., 1-PA would refer to the patient interview from case 1).

We recognize that our backgrounds and experiences influenced our conduct of this study. CW is a retired military obstetrician/gynecologist who has been both physician and patient in clinical situations similar to those studied here. EH brought a perspective of having met the patients face-to-face. DT is a clinician and researcher, with experience in activity theory. LM has significant experience in qualitative analysis and both she and EH bring the additional perspectives of being recipients of women’s healthcare, outside of the military setting.

We used the SRQR (Standards for Reporting Qualitative Research) checklist\textsuperscript{17,18} to guide reporting.

**Results**
Twenty-one patients participated, including 3 Air Force, seven Army, and 11 Navy. Military ranks (which could be considered a proxy, albeit imperfect, for education level) included a combination of enlisted (n=16) and officers (n=5). The eight physician participants were both military and civilians. Sixty-three audio files were transcribed (21 encounters, 21 patient interviews, and 21 physician interviews).

Across the 21 cases, we identified the elements of CHAT which facilitated our understanding of the patients’ and physicians’ tensions and synergies within and between their activity systems (Figure 1). We also recognized the central role of the object of an activity system. According to CHAT, the object is the purpose of the activity, constructed from the interactions of all other parts of the system. Therefore, we frame our results in relation to each patient’s and physician’s own objects and that which each dyad potentially shares. We begin by reporting the patient’s and then the physician’s objects represented in the cases. We then describe the interaction of their activity systems at the point of intersection, which is at the object level, to explore if a shared object was present or evolved during the interaction. Following this, we examine object-related contradictions and interactions within and across activity systems.

**Shared object as co-constructed by interaction of patient and physician activity systems**
Upon entering the clinical encounter, each patient’s object was to obtain or change their contraceptive method; the object for each physician was to provide patients with a contraception method. Some physicians also noted goals of efficiency and/or educating patients about methods.
Table 1. Definition and representative quotes for each of the elements within Cultural Historical Activity Theory (CHAT) activity systems: selections from patient and physician participants in a contraceptive clinic, 2019.

| CHAT element | Definition | Patient quote | Physician quote |
|--------------|------------|---------------|-----------------|
| **Subject**  | The individual engaged in the activity who acts upon the purpose of the activity (the object). | Not applicable | Not applicable |
| **Object**   | Purpose of the activity that is constructed as a result of the interactions of all other parts of the system; the meaning of an activity system that is interpreted and changed by the subject’s actions. | I’m not trying to get pregnant right now (4-PA) | My job’s really to help you come up with what’s gonna work best for you (19-E) |
| **Tools**    | Symbolic or physical objects that facilitate the accomplishment of a defined objective and/or contribute to the construction of the object within the activity system. | I’ve learned that the longer I look into things beforehand, going into the doctor’s office with information makes it a lot easier to talk about things because then you’re not just taking whatever suggestion is thrown at you. . . the app is very helpful because then you know things when you go in there. (7-PA) | So now I can provide this sheet to them and say okay well from what you already saw, are there any that are interesting to you or you want more information about I’m happy to talk more about. . . so that by them being able to review beforehand really saves me from having to go through everything about every option. (20-PHY) |
| **Community**| A group of any size which shares an interest in and involvement with the object of an activity system. | . . if it was up to my husband, I would have like 10 children right now. So four is fine, you know what I mean? (9-PA) | responsibility to help military women select appropriate contraception: “this is extremely important” (16-PHY) |
| **Rules**    | Guidelines that reflect and regulate activities, may or may not be considered cultural norms, and may change as the activity system changes. | And so I kind of need something that I can just, you know, set it and forget it. (3-PA) | No intercourse in the past two weeks, that’s perfect, we’ll place the Mirena today. (5-E) |
| **Division of labor** | How activities are distributed among various members of an activity system or community (vertical, based on hierarchies; horizontal, based on proficiency or assignment of duties.) | . . it was good because I sort of knew what my concerns were specifically, and she addressed each of that and we came up with a plan together. (18-P) | [If primary care physicians] get more familiar with the app . . . they then will feel more comfortable with the counseling. . . And then if [patients] do get referred to us as gyn, then they’ve been counseled. . . (20-PHY) |

Patient and physician quotes denoted by case number, followed by PA for patient interview, PHY for physician interview, E for encounter.
The interaction of the patient and physician activity systems frequently resulted in a shared object, which was constructed from elements from within both the patient and physician’s activity systems. For example, in Case 21, the patient’s initial object was to obtain a reliable contraceptive method that could also help with acne. The physician’s object was to provide counseling about the variety of methods and provide the patient with a method. The shared object of the patient and physician was ultimately constructed from an evolution of each of their individual objects, as mediated by tools such as the app, which empowered the patient to be more active in the decision-making process. She said the app helped her feel “more confident when I brought things up to the provider” (21-PA), as exemplified by her stating during the encounter that she was a shift worker and therefore timing of the method was a concern. The shared decision was evidence of a shared object as co-constructed by the patient and physician activity systems. Patient 21 said that the physician “helped a lot with the decision.” (21-PA)

Role of tools in construction of a shared object
Tools for the patient included both the app (physical tool) and knowledge and experience that the patient brought to the encounter (symbolic tool). In several cases, we observed the concept of information leading to knowledge and resulting empowerment of the patient (subject) to accomplish the object. For example, patient 17 stated “I can go home and actually sit down and actually think and do my own research . . . instead of going in and the doctor saying okay, no, you have to do this type of thing. So, yes . . . it’s more empowering.” (17-PA)

For the physicians, tools included their personal knowledge (symbolic tool) about contraceptives as well as the app and at least one other visual aid (physical tools). There was evidence of the app as a tool to achieve efficient decision making in several cases, such as the physician speaking about Patient 1: “I didn’t have to go in detail as much as I normally do because she already knew a lot . . . of the answers already, so it made my encounter shorter.” (1-PHY)

Tools also contributed to the construction of a shared object. For example, the physician speaking about Patient 14: “I really think [the app] gave her a good baseline and allowed her to think through things several steps beyond just ‘what’s available to me?’ And I think it guided the conversation quite a bit, because we weren’t just starting from ground zero, we were already at the second or third step” (14-PHY). The app facilitated a conversation between the physician and the patient that led to a shared object—a shared decision about the contraceptive method that would best suit the patient’s needs.

Role of community in construction of a shared object
Community was represented in the patient activity system through references to partners, family, the military, and peers. Sometimes the community was noted as creating a tension for the patient’s object, but in other cases, the community was represented as supportive of the patient’s object. For example, a patient who needed a method to treat a gynecologic condition remarked “. . . me and my husband, we sat and had a discussion. . . .” (17-PA)

Community was represented in the physician activity systems in the form of professional identity as a member of medical and military communities. Several physicians reflected on their responsibilities as physicians and as military officers, which contributed to their objects. For example, “it’s really important
for patients to make their own choice with the caveat that they fully understand the risks and benefits, the efficacy of different options” (2-PHY) and “. . . counseling her about the benefits of different types of contraception for her life and for her military life . . . especially were she to deploy.” (1-PHY)

Community in some cases also contributed to the co-construction of the shared object. For example, a number of patients and physicians intimated that being part of the military community was important. From the patient’s perspective: “I want to put my career first” (8-PA) and “I needed to have something that was low maintenance because you never know when you’re gonna . . . deploy or have a shift schedule . . .” (21-PA). The physicians’ responsibility to the patient as a military member aligned in several cases with the patient’s object and a shared object emerged. For example, in Case S: “The particular aspects of military medicine . . . that’s where as a physician in this setting I can give them some guidance if they were going to be deployed as the access to the contraception they chose or those considerations.” (19-PHY)

Role of rules in construction of a shared object
Self-imposed rules about tolerable side effects or how the method is used also helped shape the patient’s object and subsequently the shared object. For example, Patient 1 stated the app and the encounter “definitely highlighted which ones weren’t for me based on what I didn’t want from the side effects like weight gain.” (1-PA)

Physician’s rules were generally related to following clinical guidelines, such as the requirement that the patient not be pregnant at the time of a procedure. This rule sometimes created tension with the patient’s object of having a method started on the same day as the visit.

Rules also played a role in contributing to the co-construction of the shared object. For example, in applying the physician’s rules pertaining to medical contraindications and the patient’s personal rules about acceptable side effects, the patient and physician were able to identify a method that met both criteria. An object of completing the procedure on the day of the visit was not always accomplished because of the rules about not placing an intrauterine device (IUD) or implant until the physician can ensure the patient is not pregnant, but when the physician shared the explanation for this rule, the tension was resolved and the patient agreed to return at a future date: “We could set you up to just have it put in next week when you have the best of all worlds with regards to that, when we have the reassurance that you’re not pregnant . . . “ (19-E)

Role of division of labor in construction of shared object
Division of labor is represented in the activity systems of the patients with statements about the differing roles of patient and physician. Patient 18 stated about the physician: “I think patients are the only important role in decisions. . . . I don’t think doctors really decide anything for patients, especially when it comes to contraceptive use . . . but I really liked that she had acknowledged that I had concerns about it and addressed those and had a plan to sort of prevent and sort of side effects I was worried about . . . “ (18-PA) A few physicians commented on their role and that of other physicians. For example, one physician said that the app could be used as a tool by primary care physicians to “maybe help tailor their counseling, so they don’t feel like, oh my gosh, I have to do everything. . . . I think it would really help them. And then even if they do get referred to us as gyn, then they’ve been counseled on the IUDs . . . .” (20-PHY)

However, even with differing views of the division of labor from the patient’s or physician’s perspectives, the result was generally a shared decision with contributions from both.

Discussion
Through analyses of clinical encounters and interviews, we explored patient and physician perspectives of the clinical decision-making process to provide a unique understanding of the complex process of shared decision making. We contend that our identification of the patient’s and physician’s evolving individual objects, and our analyses of contradictions which, upon resolution, led to a shared object, may facilitate a richer understanding of the activity that is shared decision making. More specifically we consider our findings in relation to the recognition of a patient’s community, use of tools, and expansive learning, and discuss the implications for teaching strategies that facilitate enhanced patient agency, effective relational agency, and successful shared decision making.

In shared decision making, physicians must recognize that multiple perspectives and voices contribute to the interaction and ultimately the health decision, including the patient’s community (e.g., family, friends, and sociocultural groups). Although patient agency is critical to shared decision making, the self is “embedded within sociocultural contexts and intrinsically interwoven with them”19. Each of these perspectives may create contradictions that the physician needs to address. The finding that community plays an important role in the development of the shared object refocuses our efforts on educating physicians to consider not only the individual person, but also their social and community context. Educational interventions about shared decision making, therefore, should include social determinants of health as well, including economic stability, educational background, healthcare access, and the patient’s environment19. Further, for physicians to be effective in this realm, cultural humility is required, which emphasizes lifelong learning and self-reflection in understanding others, their socio-cultural circumstances, and the power imbalances that often exist1.

We also observed the important role of tools in shared decision making. Whether material (e.g., the app) or conceptual (e.g., knowledge, conversation), many of the tools identified in this study enabled pursuit of the object in the activity system. Educational interventions should, and mostly do, include the discussion of and practice with tools to facilitate shared decision making19. However, with a recent proliferation of digital tools for patients, health professionals need to be cognizant of not only the content of the apps, online tools, and other resources, but even more importantly, how these tools influence patient behavior. Our findings support the notion that, with tools such as decision aids, patients may come to the visit with enhanced agency and an expectation that their values and preferences are important to the decision-making process. How a
physician responds to that, and whether a shared decision is achieved during the visit, impacts not only that visit but future encounters as well. Tools can help the patient and physician deal with the tensions and contradictions in a clinical encounter and may assist with the sense-making and evolution of a shared object. The field of interactive design has utilized CHAT to guide an understanding of how “people act with technology” and the important roles tools play in our lives and in healthcare. We can envision how these mediating artifacts can facilitate the collective transformation of multiple activity systems over time—leading to expansive learning.

Application of Engeström’s concept of expansive learning can guide educators in designing educational interventions for shared decision making. “Expansive learning is a historically new type of learning which emerges as practitioners struggle through developmental transformations in their activity systems, moving across collective zones of proximal development.” Learning involves a process of adaptation, which is a key feature of complex adaptive systems. Each encounter in which the physician achieves a shared object with a patient, evolved by working through contradictions, shapes that physician’s awareness of the importance of patient context, culture, values, and beliefs. An expansive cycle is, according to Engeström, one in which we see “construction and resolution of successively evolving tensions or contradictions in a complex system”.

Contradictions are not “problems”. Rather, in the case of our patient-physician dyads, they allowed discourse and consideration of factors that the physician may not have otherwise considered—and the shared object emerges from resolving the contradiction. No longer is the decision made in isolation, based only on the physician’s assessment of the medical issue, but instead it becomes one component of an interconnected, multidimensional, and evolving network of activity systems. With authentic practice and reflection on the effects of their behaviors, physicians can evolve and transform their practice. Some have identified the need for culture change for successful implementation of shared decision making. We propose that, as multiple activity systems interact, further expansive cycles may lead to a culture shift of professional communities and/or communities of practice of which the physician is part—with the goal of achieving shared objects with patients, regardless of the clinical context.

Our study benefited from the analysis of actual clinical encounters, followed by interviews with both patients and physicians. The 21 patient-physician dyads allowed for adequate “information power”. Our study’s chief limitation is that all encounters were from a single setting, which was a contraceptive clinic in a military hospital, with all physicians. This allowed analysis of a complex activity by limiting the variability of the setting, types of health professionals, and kinds of clinical decisions and the military setting allowed for a richer analysis of the influence of a specific community on both patients and physicians. However, the single setting and type of clinical decision may limit the generalizability of our findings.

Furthermore, we do not report in detail tensions between all elements of the CHAT framework (e.g., between tools and community, between community and rules, or between division of labor and tools). We focused on the tensions between each of the elements and the object of the individual activity systems and how resolution of the contradictions led to evolution of a shared object.

By analyzing clinical encounters with CHAT, we identified factors and tensions influencing behavior of individual patients and physicians when engaged in a clinical encounter. By using CHAT to study the complexity of co-constructing decisions, we can identify important characteristics of educational interventions for health professionals that may lead to successful shared decision making in all areas of healthcare.

**Prior presentations**

Findings from this study were presented at the American Association of Medical Colleges (AAMC) annual meeting, Learn Serve Lead 2021: The Virtual Experience, during the Quick Takes: Med Ed Abstract Presentations (LIVE), on 8 Nov 2021. Because of its selection for the Med Ed Abstract Presentations, the associated abstract was published in the *Academic Medicine* November 2021 RIME supplement.

**Disclaimer**

The contents of this publication are the sole responsibility of the authors and do not necessarily reflect the views, assertions, opinions, or policies of the Uniformed Services University of the Health Sciences (USUHS), the Henry M. Jackson Foundation, the Department of Defense (DoD), or the Departments of the Army, Navy, or Air Force.

**Data availability**

**Underlying data**

Per the regulations of the WRNMMC, access to the interview and clinical session data is strictly controlled and limited to the core research team making it impossible for us to publicly deposit this data or make it available upon request. Moreover, the size and nature of our sample makes it possible that participants could be potentially identified despite anonymization of transcripts.

**Extended data**

Zenodo: Complexity in shared decision making: a qualitative analysis of clinical encounters and patient/physician interviews. [https://doi.org/10.5281/zenodo.630163](https://doi.org/10.5281/zenodo.630163)

This project contains the following extended data:

- Appendix A_Patient Interview Guide.pdf
- Appendix B_Physician interview guide.pdf

**Reporting guidelines**

Zenodo: SRQR checklist for ‘Complexity in shared decision making: a qualitative analysis of clinical encounters and patient/physician interviews’ [https://doi.org/10.5281/zenodo.630163](https://doi.org/10.5281/zenodo.630163)

Data are available under the terms of the Creative Commons Attribution 4.0 International license (CC-BY 4.0).
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