

# Small Groups, Big Mistakes: The Emergence of Faulty Rules During a Collaborative Board Game

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**Abstract:** Recent research using games as learning environments has provided us with examples of situated learning processes (e.g., Gee, 2007). Board games, in particular, foster rich think-aloud cognition and small group reasoning (Smith, 2007). This study uses a collaborative board game as a site for understanding sense-making in small groups. We investigate how groups ‘reconstruct’ rules, and unpack how and when they coordinate an understanding of goals. We suggest this is done with the aid of *handles*: concrete signifiers, such as physical objects, words, or gestures that players use as substitutes for complex rules.

## Introduction

Recent research using games as learning environments has provided educational researchers with new examples of situated learning processes (e.g., Gee, 2007). Many of the most recent studies have focused on computationally based games, but we maintain the position that the affordances of game environments, both for observing and orchestrating learning, are not restricted to the computational medium. Board games, a similarly rule-based and interactive game environment, constitute an especially promising class of games for study because foster the kinds of think-aloud cognition and small group reasoning that is the target of empirical research and educational reform efforts (Smith, 2007). In this study, we use a collaborative board game as a site for understanding sense-making in small group collaboration. We examine a situation where players are provided with all the materials packaged with a collaborative board game and unpack how and when they coordinate an understanding of their individual and group goals. In our pursuit of this endeavor, we have noticed a phenomenon across our samples thus far in which rule reconstruction goes awry. Essentially, players make up their own rules without realizing they are creating something new that deviates from what is prescribed by the rulebook. Upon iterative review, and as we will describe in this paper, these faulty rules are seeded by players grasping at what we describe as a “*bad handle*”.

As will be illustrated by our case, handles serve in these social sense-making situations as material anchors (Hutchins, 2005) around which players share and build knowledge. Handles are concrete signifiers, such as physical objects, words, or gestures, which players repeatedly use or reference as stand-ins for more complex concepts and rules. Problems arise when the group’s understanding of a complex rule is shaped by a handle that they have (perhaps unwittingly) chosen. The original referenced meaning is lost or converted into something new.

The interest of this work to the Learning Sciences community is two-fold. First, it is an expansion of the recent interest in research related to learning that takes place in and around games and gaming practices (e.g., Squire & Barab, 2004). The second point of interest in this work is in small group collaboration. Collaborative discourse has long been an interest in the Learning Sciences (e.g., Barron, 2003; Engle & Conant, 2002). What we intend to do is carefully consider how the signifiers that we describe as “handles” are instrumental to the sense-making and discourse that takes place.

## Handles and Material Anchors

Our term *handle* is a targeted extension of Hutchins’ (2005) definition of material anchor to this context. Hutchins uses the term material anchor to describe how physical objects (or signifiers thereof) solidify group understanding of a particular metaphor. An example he provides is that subjects will be more successful in identifying the correct answer in statement 2 than statement 1:

1. If x is true, then y is true. We know that y is not true. Is x true?
2. If this is a garnet, then it is a semi-precious stone. We know that this isn’t a semi-precious stone. Is it a garnet?

Statement 2 is easier to understand, because subjects can use outside information (D’Andrade, 1989).

Groups do not have a facility for sharing the same understanding of the rules other than through concrete signifiers in the world. Thus, material anchors are a necessary mediator of group understanding – they form one of only a few anchors around which groups can share understandings of an abstract concept (Kripke, 1982). However, the outside information that individuals unconsciously use to understand these material handles colors how they process the problem. Fauconnier & Turner (2002) describe this mix of unconscious understanding and target content as involving *conceptual blending*. A *bad handle* can be understood as an anchor that results in conceptual blending that, as it is taken up by the group, nudges groups away from correct interpretations of shared information toward jointly agreed-upon misunderstandings.

## Example: Role Handle

For this work, we collected multiple video-recorded observations of four groups as they were provided with a collaborative board game about disease spread, *Pandemic*, to learn and play. The participants gathered for up to three two-hour game play sessions. Twelve of the sixteen participants were undergraduate students at a large university in the American West. The other four were a group of adults from the same regional area. Participants were told at the beginning of the game sessions that the researcher would not participate nor answer any questions related to the game, and as much as possible, the players should act as if the researcher and camera were not there. Transcripts were generated of the initial game sessions for all four groups.

We present a short example to illustrate how a handle can be taken up and seed bad information. The group from the excerpt below used a bad handle to misunderstand the word ‘role’ in relation to the game. At the beginning of each game of *Pandemic*, each player is randomly assigned a permanent game role through distribution of ‘role cards’. Each role has unique capabilities that allow that player to take different “special” actions throughout in the game. The error that the group made was to overlook an entire phase of the game because of how they handled of the word ‘role’. Only when their game was entirely finished did they begin to notice where the problem had been:

Andi: [reading from the instructions] Special event: the next player to play the infector phase can skip their turn entirely.

Jesse: How come we haven’t had any outbreaks [i.e., difficulty increases in the game]?

...

Elena: [in reference to Andi’s reading] What’s the infector phase? The infector example, lets see: [she reads from instructions] “Brandon’s playing the infector. To finish his turn the infector marker is on three to end the infector rate.” Oh... whose, is anyone’s role card the infector?

Jesse: This [an unused role card, face down, located to the side of the board] is the infector right here.

Throughout the game, the group had conflated the existence of the “infector phase” with a role one must play and, in turn, with the “role card.” They substituted the “role card” concept in every situation in which the “infector phase” should have been played the game. This substitution provided a convenient ‘handle’ with which to incorrectly interpret large chunks of the game.

## Conclusions

Small, self-directed groups can make big mistakes when building rules. Sometimes this can occur when ideas are not heard or built upon (e.g., Barron, 2003). However, we have seen instances here where listening to others and building up on ideas leads to errors. Individuals were all attempting to coordinate understandings through physical and verbal externalizations their individual rules, and, as such, the group ultimately changed the content of the rules for the game as a whole. Our work thus serves to add to our understanding of how interacting with signifiers might change collaborative rule construction. Through this poster, we demonstrate some of the potential for Learning Sciences games research can involve board games, and in particular how some of the observable interactional phenomena can be traced to group interactions and handles. Although still preliminary, we conjecture from these observations that small design changes to target bad handles could manifest in significant learning gains in the domain of a complex gaming activity. A future paper will outline the effect of specific design implications for collaborative rule-building.

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