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Knowing and Throwing Mudballs, Hearts, Pies, and Flowers

A Connective Ethnography of Gaming Practices

Deborah A. Fields¹ and Yasmin B. Kafai²

Abstract

Little is known concerning how young players learn to participate in various activities in virtual worlds. We use a new integrative approach called connective ethnography that focuses on how a gaming practice spread across a network of youth at an after school club that simultaneously participated in a virtual world, Whyville.net. To trace youth participation in online and offline social contexts, we draw on multiple sources of information: observations, interviews, videos, online tracking and chat data, and hundreds of hours of play in Whyville ourselves. One gaming practice – the throwing of projectiles and its social uses and nuances – became the focal point of our analyses. The discussions address the methodological challenges underlying the synthesis of diverse types of data that allowed us to follow youth across multiple spaces as well as initial insights into how this practice was used to negotiate relationships in multiple spaces through play.

Keywords

ethnography, virtual worlds, insider knowledge, social practices, tracking data, tweens

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Introduction

Over two decades ago, Marjorie Goodwin (1985) argued in her paper, “The serious side of jump rope,” that even game play such as jump rope is not divorced from everyday experience but is, in fact, a continuation of it that allows participants to discover how social order works. In recent years, the idea of continuity between games and everyday experience has been expanded into the realm of online games and virtual worlds. Virtual playgrounds in the form of video games and virtual worlds have become the new play spaces for peer culture to develop as parents and society exert more control over the places that are considered “safe” for children’s play (Jenkins, 1998). Yet little of the growing research on gaming has been applied to how children learn to “legitimately” participate (Lave & Wenger, 1991) in virtual worlds, much less how they use play in these worlds to explore relationships and social order. It seems therefore that the study of play in virtual worlds can inform our understanding of learning in meaningful and substantive ways. How young players come to understand both the explicit and tacit ways through which to participate successfully in these virtual worlds is of interest not only to gaming researchers but also to learning scientists.

Our studies of an after school club where twenty 10–12-year-olds (or “twens”) came regularly to play in a virtual world called Whyville.net provided a window into how players helped each other to navigate the geographical intricacies of the site (Fields & Kafai, 2009) and how the participants subsequently appeared to become peer teachers and experts in their own right (Ching & Kafai, 2008). Knowledge important to being an insider in the virtual space that included both game mechanics and navigation of relationships unmistakably spread throughout the club but how it did so was difficult to discern. As a focal point for our study, we chose one particular type of gaming practice, throwing projectiles, a popular practice in Whyville and, as it turned out, connected with many different social purposes—thus a good prototype for other forms of gaming practices.

Although Gee (2004) has argued that specialized knowledge in these types of virtual gaming communities is developed and distributed among participants in the online space, it became clear in our case that learning took place in both online and off-line locations as well as between club members and within the virtual world of Whyville. Like others interested in the growing field of learning in gaming and online spaces, we began to realize that these spaces could not be studied separately (e.g., Leander, 2008; Stevens, Satwicz, & McCarthy, 2008). In previous work (Fields & Kafai, 2009), we developed an approach of connective ethnography (Hine, 2000; Leander & McKim, 2003) that used a gaming practice as the unit of analysis to integrate multiple data sources across online and off-line interactions. As we will argue in this article, this allows us to reestablish the continuity between the different spaces and extend the connection between game and everyday life deemed so important by Goodwin and others.

In this study, our goal is to conduct a connective ethnography that focuses on how the gaming practice of projectile throwing spread across a group of youth at an after

school club that simultaneously participated in a multiplayer virtual world. Our questions regard the tweens' learning and social navigation through play in the club and Whyville as well as methods for studying them. How did club members learn knowledge about projectiles important to socializing on Whyville and how did this spread throughout the club? Secondly, how could we trace this learning across both virtual and physical spaces and between the club community and the larger Whyville community? Finally, how did club members differ in their uses of projectile throwing and how could we trace this complexity with the available set of data? To answer our questions, we had to draw on methods that studied both online and off-line activity, inside and outside of club time. We draw on multiple sources of information: observations (field notes), interviews, video recordings, online tracking and chat data (logfiles), and hundreds of hours of play on Whyville ourselves. These different, complementary data sources embody the multimodal aspects of connective ethnography and allow us to trace players' activities and learning across physical and virtual spaces. Because this type of method is relatively new, we hope that this study will inform future efforts at researching and analyzing play and learning across blurred virtual and physical spaces.

Background

Children's Play and Positioning

Despite arguments concerning the importance of children's play for cognitive (Piaget & Inhelder, 1969) and social (Vygotsky, 1978) development, there is limited research on children's interactions in play spaces (e.g., Goodwin, 2006; Thorne, 1993). The play spaces studied have largely included playgrounds, which serve as a laboratory for understanding peer culture or the social worlds of children where adults are not present or maintain much less control than in other areas of children's lives. Among preadolescent peer cultures, children work through their desires for sharing and social culture as well as control over their lives through interaction with peers (Corsaro, 2005). To achieve these desires, children create alliances and rally an audience in their play by demonstrating an understanding of a game through producing variations of the game (Garvey, 1984), keying characteristic voices and speaking styles (Kyratzis, 2004), and excluding others through talk (Goodwin, 2002).

In particular, Goodwin (1985) has argued that participation in play needs to be seen as continuation of everyday practices that let children position themselves within a group. Video games and virtual worlds have extended children's play spaces and take on significant portions of their leisure time (Kaiser Family Foundation, 2005; Lenhardt & Madden, 2005). It is only recently that our attention has turned to them as spaces valuable for learning, recapturing the earlier arguments made about children's play. Researchers here have illustrated the complexities of learning how to play these games and their collaborative nature—indicative of rich learning environments (Gee, 2003). For the moment, most of the research has

focused on interactions in the virtual space paying little attention to the intricate connections between online and off-line interactions situating most play, in particular, within groups of children.

Studying Play Across Worlds: Connective Ethnography

Our research on insider gaming practices draws from two distinct bodies of work that illustrate very different approaches of what is involved in becoming a member of a virtual world. A common denominator in all of these accounts is that learning how to play in virtual worlds is seen as a complex, challenging, and time-consuming activity. Beyond this, one thread of studies has focused largely on online play, most prevalent perhaps the first person accounts in which researchers use their own learning experiences and reflections in conjunction with ethnographic studies (e.g., Boellstorff, 2008; Castronova, 2005; Steinkuehler, 2006; Taylor, 2006) to document various social, economic, and cultural practices in virtual worlds. Others have launched large-scale surveys inviting thousands of players to respond to various aspects of their gaming experiences (Williams, Yee, & Caplan, 2008; Yee, 2008). A few studies have used tracking data to capture players' movements across multiple spaces and time zones such as Duchenaut, Yee, Nickell, and Moore (2006), who studied guild and social networks in the online game *World of Warcraft* or Nardi, Ly, and Harris (2007) who analyzed chat to understand how players learned from each other in spontaneous, contextual conversations "driven by small events."

A second group of researchers have turned their attention to the physical spaces in which game play is situated and here studies have focused mostly on gaming clubs or Internet cafés (e.g., Beavis, Nixon, & Atkinson, 2005; Jansz & Martens, 2005; Lindtner et al., 2008; Swalwell, 2003) and to a lesser extent on homes and dormitories (e.g., Leander & Lovvorn, 2006; Lin, 2008; Stevens et al., 2008). In these studies, researchers try to capture how the configurations and dynamics in the physical space situate access and participation to game play. This applies also to the more intimate settings of homes or dormitories where players are often alone but in contact with others. Researchers here have used mostly observational methods, often supported by video recording and ethnographic notes, to capture the comings and goings, interactions and conversations among participants while involved in online gaming.

Each of these approaches has informed us a great deal on what players have to learn to master the complexities of the game. But at the same time, the research focus and choice of methods have led to an artificial separation between online and off-line (real or virtual). Many now argue that we need different approaches to capture the complexities of participation. Proposals such as connective or multisite ethnography (Hine, 2000; Leander, 2008; Leander & McKim, 2003) have started to map out new strategies for researching learning across multiple spaces and times.

Most connective ethnographies have accomplished an integrative study across spaces by following individuals as the unit of analysis—looking at their activities

in different spaces. For instance, Lam (2000, 2004) followed several high school immigrant youth in their activities in online spaces (chat rooms, anime multimedia sites) and studied the ways that they constructed new representations of themselves as competent in comparison to how they were identified at school. Similarly, Jacobs (2004) studied one girl and six of her friends' instant messaging (IM) and how changing contexts affected the language they used in their messaging. Leander and Lovvorn (2006) looked at one boy's literacy practices in his English and Social Studies' classrooms and in a massively multiplayer online game. Perhaps the most ambitious of these studies, at least in the number of participants and comprehensiveness of data collection, comes from Jones (2004), whose team studied youth's online and school social practices, particularly focusing on the interconnectedness of friendships with events across multiple spaces, including IM and other cyberspaces as well as hangout spaces like malls, restaurants, and school (see also Leander, 2008 for a description).

In contrast to following individuals, our use of connective ethnography has meant tracing practices across a group of tweens. In our first study of the spread of a practice, we traced the sharing and diffusion of the practice of teleporting across the primarily unstructured, informal settings of the after school club and the virtual world of Whyville (Fields & Kafai, 2009). By following the practice of teleporting as it was used and discussed in multiple spaces (including those we could only indirectly observe by analyzing logfiles that collected mouse-clicks and chat words), we found that most of the tweens traversed multiple social spaces in their learning to teleport, including not only the club and a classroom but also school friends on Whyville and Whyvillians at large, though they expressed a preference for getting help in the context of the club. They also contributed to the spread of teleporting on Whyville itself through their social interactions and conversations with Whyvillians.

While others have integrated more traditional ethnographic data (interviews, field notes, videos) with logfile analysis, our approach remains unique for a two reasons. First, the logfiles we use are more comprehensive than most companies are willing to share, excepting some educational virtual worlds where researchers can collect their own logfiles such as Quest Atlantis (Barab, Thomas, Dodge, Carteaux, & Tuzun, 2005), River City (Dede, Nelson, Ketelhut, Clarke, & Bowman, 2004), and Moose Crossing (Bruckman, 2000, 2006). For instance, Nardi et al. (2007) used a tool within the online game World of Warcraft to collect chat data—but only where the researchers were virtually present. Second, our approach is more extensive in the number of people we follow—20 tween members of an after school club versus two (Bruckman, 2000) or four (Clarke & Dede, 2007) youth—and in the duration of time that we studied them (over 2 months). To trace so many tweens' activities over a relatively large amount of time, we limited our study to a practice. Although our prior study focused on a very limited practice that could only be learned from other people, in this study, we deepened our exploration by choosing a more complex practice that could be learned and used in multiple ways.



Figure 1. Club members clustered around computers.

Research Settings and Approach

Whyville.net is a virtual world with over 1.2 million registered players at the time of our study that encourages youth ages 8–16 to play casual science games to earn a virtual salary (in “clams”), which youth can then spend on buying and designing parts for their avatars (virtual characters), projectiles to throw at other players, and other goods. The general consensus among Whyvillians (the citizens of the virtual community of Whyville) is that earning a good salary and thus procuring a large number of clams to spend on face parts or other goods is essential for fully participating in the Whyville community (Kafai & Giang, 2008). Social interactions with others are the highlight for most Whyvillians and consist primarily of ymailing (the Whyville version of email) and chatting on the site where users are visible to each other on the screen. A pull down menu offers a listing of over 30 different places to visit and hang out together on Whyville.

In early 2005, we set up an after school club where 20 youth¹ aged 9–12 (fourth to sixth grade) came to play on Whyville for an hour most days after school. Most tweens were new to Whyville, though one had played for the year before the club started. They distributed themselves among 10 computers laid out around the classroom, often sharing a computer or wandering around the room talking to others. Although the club began as a quiet place, it quickly became loud and lively as participants learned the site and began to shout advice to each other, arrange parties on Whyville, chat, throw virtual projectiles at one another, and critique each other’s avatars (Kafai, 2008). Often clusters of youth would form around one computer when something interesting happened on Whyville (see Figure 1).

In addition, six members of the after school club were sixth graders (11–12 years old) who also played on Whyville during science class as part of a unit on studying viruses and epidemics (see Kafai, Feldon, Fields, Giang, & Quintero, 2007). The choices of activities on Whyville during the class were more directed than the open-ended play in the club, but we could not ignore relationships among class

<p>Wink  Price: 2 clams Quantity: <input type="text"/></p>	<p>Yuck  Price: 2 clams Quantity: <input type="text"/></p>	<p>Snowball  Price: 2 clams Quantity: <input type="text"/></p>
<p>Blue Balloon  Price: 3 clams Quantity: <input type="text"/></p>	<p>Red Paintball  Price: 5 clams Quantity: <input type="text"/></p>	<p>Green Paintball  Price: 5 clams Quantity: <input type="text"/></p>
<p>Purple Paintball  Price: 5 clams Quantity: <input type="text"/></p>	<p>Mudball  Price: 2 clams Quantity: <input type="text"/></p>	<p>Stink  Price: 8 clams Quantity: <input type="text"/></p>

Figure 2. Projectiles available for purchase, Copyright by Numedeon, Inc.

members as a social context of learning in Whyville, as will become apparent in the findings.

On Throwing Projectiles

In choosing a practice to study (a process that involved significant immersion in the data and represents the first step of our analysis), we searched for something that was important for playfully engaging with others in Whyville and traceable in chat. Beyond chatting and ymailing, one key way to socialize on Whyville is by throwing projectiles. Throwing projectiles is a common form of play on Whyville and allows Whyvillians to “reach out and touch someone,” so to speak, in a virtual setting. Projectiles and face parts (with which one can assemble one’s avatar or online representation) form the two main types of products for sale on Whyville at the time of the study. The Projectile Shoppe offers more than 45 types of projectiles for sale—from mudballs to hearts to Frisbees—all of which can be thrown at other avatars on Whyville (see Figure 2). Projectiles range in price from 1 clam (sad faces, smileys, winks) to 2 clams (mudballs, snowballs) and on up to 15 clams (maggots, spiders).

Throwing projectiles involves knowledge of the mechanics of throwing as well as how to use throwing to achieve certain social goals. Some of the mechanics of throwing include typing the actual command to throw. Players can throw to a person by name as in “throw mudball oriahsiri” (or “throw [projectile] [username]”) or players can throw in a direction designated by degrees in a circle as in “throw heart 90” (or “throw [projectile] [degree]”). Throwing by degree is in general more efficient (it takes less time to type “0” than “oriahsiri”) and is important for the Zero Gravity Game, where players throw a projectile in one direction to move in another direction (for more on this game, see the paper on cheating by Fields & Kafai, 2010). The pictures in Figure 3 show one of the authors (on the right) making two red paintball throws at another Whyvillian on Saturn.

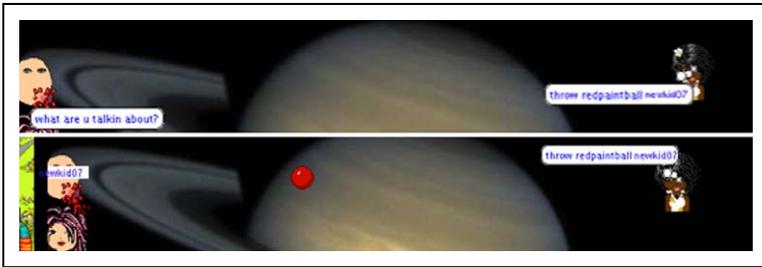


Figure 3. Throwing a red paintball on Whyville, Copyright by Numedeon, Inc.



Figure 4. Whyvillians hit with a blue balloon (left), garlic (middle), and a heart (right), Copyright by Numedeon, Inc.

In the top picture of Figure 3, the projectile has already hit its target (given the pseudonym “newkid07”), whereas the lower picture shows the second projectile on its way (a few seconds from one end of the screen to the other). In both pictures, the command to throw is shown in the author’s chat bubble.

Besides the command to throw, there are several other nuances to throwing that are helpful to know. For instance, money will stretch farther if one spends it on less expensive smileys (sads, frowns, winks) and mudballs than on more expensive items such as rainbows, flowers, turkeys, or spiders. Furthermore, it is useful to know that some projectiles explode (such as the red paintball in Figure 3 or the explosions of a blue water balloon and garlic in the first two pictures of Figure 4) and others stay intact (such as the heart in Figure 4). Projectiles that stay intact (footballs, Frisbees, flowers) land as a whole and become a part of the target’s inventory, enabling the throwing back and forth of one projectile. Of course throwing also involves the ability to aim correctly. Even if one types the command correctly, “throw redpaintball oriahsiri,” if another avatar is in between the thrower and the target, the projectile will hit the avatar directly in its line of fire.

There are also social nuances to throwing. One of the most obvious is that different projectiles might be interpreted differently. Throwing a piece of garlic at someone might result in a different reaction than throwing a Frisbee. And throwing a heart from a boy to a girl will probably be construed differently than from a boy to a boy (in the club, this usually resulted in convulsive giggling).

Throwing projectiles is not solely learnable from other people. Whyvillians can also learn to throw projectiles from observing others' chat because the command to throw is visible in the thrower's chat bubble until new chat has been typed. Furthermore, Whyvillians can learn to throw by degrees by reading instructions for the Zero Gravity game. Still, in our observations of the after school club, only one member (Briana) played the Zero Gravity Game and even while she was there she requested help with throwing from Whyvillians who were lingering there, soliciting other people for help rather than relying on the written instructions.

Data and Analytical Methods

To study the tween's activities in the "multiple, simultaneous space-time contexts" (Leander & McKim, 2003) of the club and Whyville, we gathered and analyzed numerous types of data aimed to track the youth in the club over multiple spaces (physically in the club as well as virtually over multiple spaces on Whyville). Ethnographic field notes were recorded daily to capture the overall activity of the club while videotapes focused on small groups of youth clustered at tables with 2–3 computers throughout the 9 weeks the club took place in the winter of 2005. Numedeon, the owner and creator company of Whyville, gathered click-level and chat data on each club participant. This means that every time a club member clicked to go to a new space on Whyville, it was recorded, in addition to every word they typed in chat or whisper bubbles in chat spaces. In addition, participants were interviewed individually at the end of the club about their learning preferences (e.g., "When you want to learn something on Whyville what do you do?"). While we report on our analytical methods in this section, we wish to note that these methods are really part of our findings.

After determining that projectile throwing was a type of play important to being a part of Whyville and traceable in chat, we set out first to understand how it developed as a type of play within the club and what we could understand about how kids learned it within the club, coding field notes, video, and interviews in traditional grounded theory analysis (e.g., Charmaz, 2000; Glaser & Strauss, 1967). To extend our analyses into the online space occupied both during and beyond club times, we began by searching the logfiles for the first time club members correctly threw a projectile and identified their physical locations based on time stamps and knowledge of attendance and schedules at the club and in the classrooms. This was done in part by filtering the chat data for times when the word "throw" was used and then manually determining when a correct throw was made based on spelling and syntax. We also calculated the total numbers of times that each club member threw projectiles and the first time that they visited the Projectile Shoppe (see Table 1). Building on our prior analyses of projectile throwing in the club and Whyville, we then sought to understand any differences between club members' use of projectile throwing, determining whether they threw to another school member, Whyvillians in general (by name), or by degree, and calculating percentages of each kind of throw for every member. We also noted whether they ever threw projectiles with romantic

Table 1. Frequency of Typing “Throw” by Week

Username	Name	First correct throw			First Projectile Shoppe Visit		
		Day	Time	Place	Day	Time	Place
fairi60	Kaitlyn		Preclub	Home		Preclub	Home
whskr29	Briana	Jan. 5	6:58:15	Home	Jan. 10	13:06:54	School
bluwave	Zoe	Jan. 13	15:05:32	Home	Jan. 11	14:22:00	School
raybeams	Blake	Jan. 14	15:35:22	Club	Jan. 11	15:47:11	Club
leo95	Cole	Jan. 20	15:40:04	Club	Jan. 13	16:06:53	Club
zink	Bryce	Jan. 20	15:46:42	Club	Jan. 20	15:23:47	Club
funster	Paul	Jan. 20	15:38:58	Club	Jan. 20	15:34:30	Club
sirius	Scott	Jan. 20	17:38:08	Home	Jan. 19	19:52:34	Home
sharky404	Kyle	Jan. 20	19:01:49 ^a	Home	Feb. 1	15:51:46	Club
stngray09	Trevor	Jan. 24	15:53:52	Club	Jan. 10	13:21:50	School
WOW4	Gabe	Jan. 24	16:12:42	Club	Jan. 11	07:46:29	Home
ivy06	Isabel	Jan. 28	15:04:24 ^a	Home	Jan. 26	15:57:15	Club
masher47	Aiden	Feb. 1	16:05:59 ^a	Club	Jan. 11	16:09:59	Club
betelguice	Paolo	Feb. 1	15:37:29	Club	Feb. 1	15:51:46	Club
vulcan61	Brad	Feb. 2	15:41:31	Club	Jan. 21	18:18:19	Home
Peachy5	Leslie	Feb. 10	15:32:15	Club	Jan. 14	17:36:38	Home
amarylys	Jill	Feb. 18	16:09:23 ^a	Club	Feb. 18	16:05:55	Club
Violet5	Ulani	Feb. 18	16:07:55 ^a	Club	Feb. 15	15:35:12	Club
lucky7	Marissa	Feb. 18	19:37:24 ^a	Home	Never		
bluswirls93	Molly	Never			Feb. 24	11:41:07	Home
bloofer	Paige	Never					

NOTE: Jan. = January; Feb. = February.

^a Signifies first throw was to a school friend (from club or class).

(hearts/kisses) or sports connotations (footballs/Frisbees/soccer balls; see Table 2), choosing these to further determine whether club members ever explored the two kinds of throwing they represent (flirtatious or toss-and-catch). Based on analyses of throwing in the club and in Whyville, we ascertained that while other objects could also be used in flirting or toss-and-catch, these objects generally had unquestioned meanings. Finally, using the time stamps of members’ first accomplished throws as starting points, we pieced together information across all of our data (log-files, field notes, videos, and interviews) to determine the process and contexts of learning for a few case studies. Because this was a very time-intensive process, we chose a few individuals who we thought had different pathways to throwing projectiles, based on the earlier described analyses.

Although we have described our analyses in a particular “order,” from traditional qualitative coding to filtering and counting types of throws in logfiles to putting together larger individual trajectories of throwing projectiles, the entire process was iterative and each aspect built on the others. Based on findings from the filtering of “throw” from chat data, we went back to the video and field notes to more fully

Table 2. Possible Interpretations of Throws

Name	Total throws	To school friends	To nonschool	By degrees (180, 90)	Hearts or kisses	Sports (Frisbee, football)
Kaitlyn	25	0	8%	92%	-	Y
Briana	263	<1%	26%	73%	Y	Y
Zoe	49	41%	49%	10%	Y ^a	Y
Blake	184	26%	54%	20%	Y	Y
Cole	88	83%	11%	6%	Y	Y
Bryce	34	21%	79%	-	-	Y
Paul	191	15%	10%	75%	Y ^a	-
Scott	205	7%	53%	40%	Y	-
Kyle	44	91%	9%	-	Y	Y
Trevor	62	37%	63%	-	Y	Y
Gabe	13	69%	31%	-	-	-
Isabel	50	28%	44%	28%	Y	-
Aiden	79	45%	54%	-	Y	Y
Paolo	209	29%	70%	<1%	Y	Y
Brad	105	8%	50%	42%	Y	Y
Leslie	8	62%	38%	-	-	Y
Jill	1	100%	-	-	-	-
Ulani	1	100%	-	-	-	-
Marissa	2	100%	-	-	-	Y
Molly	-	-	-	-	-	-
Paige	-	-	-	-	-	-

^a Threw a heart or kiss *after* the club ended.

understand projectile throwing during the club and vice versa. In other words, though we did this most explicitly in the case studies, we continually moved back and forth between our data and analyses to flesh out a fuller picture of throwing in the club as a whole and in individuals—across time and spaces. Through the whole analysis, we focused on the practice of throwing projectiles with all its social nuances and purposes.

Findings

We begin the findings with a description of projectile throwing in the club—how it became a regular part of activities in the club, how members used it in play, and what we know about how members learned it in the club. Then we move to a quantitative analysis of projectile throwing from the logfiles, illuminating the online activities of club members and how those contrasted with our initial interpretation of the club. Finally, we end with a case study of how they learned projectile throwing—drawing all of our data together to trace them across multiple social spaces in their learning how to throw and their styles of throwing.

Projectile Throwing in the Club

The first mentions of projectile throwing at the club occurred during the 2nd week and consisted of quiet exchanges between club members at neighboring computers. On Wednesday of the 2nd week (January 12), Briana mentioned to Gabe at an adjacent computer that she had sent clams as a prize to the first person who had thrown a projectile at her. Later when they were both on the Moon, Gabe tried to throw a projectile at someone and asked Briana, “Wait, how do you throw project projectiles?” Briana responded with the brief instruction “Oh, just write throw and whoever you want to throw it at,” then later corrected Gabe on his syntax, “No you don’t write ‘at,’ you just write throw.” Presumably she had seen his incorrectly written command to throw “at” someone because she never looked away from her screen as she coached him. Two days later on Friday (January 14), Blake spoke softly to himself as he typed out a command to throw a pie at a Whyville girl, “Throw, throw pie, throw pie, throw pie,” and when he was finally ready to press enter, he said to Scott sitting next to him, “Wanna see it? Wanna see it?” Both however were slightly disappointed because the pie did not appear to hit its mark, though Blake continued to try. These were the first and only mentions of throwing projectiles by the end of the 2nd week—quiet and between neighbors, though Blake’s bid for an audience for throwing foreshadowed the future liveliness of the practice in the club.

From the beginning of the 3rd week of the club, projectile throwing became a loud and rowdy occupation among many of the boys. This social dynamic really started on Monday of the 3rd week (January 19), Blake threw pies at several people with Scott at his side, telling him who to throw at and pointing at potential targets, “Hey, throw one at that ugly chick. No, throw it at him.” Quickly Blake moved from throwing at various Whyvillians who stood out for some reason, whether girls or boys, and began to take aim at fellow club members, saying with suspense in his voice, “I wanna throw at Gabe, at Gabe.” When Blake’s pie missed Gabe and hit a girl, Scott jumped up from his computer to tell Gabe, “He threw it at you but he missed, he missed.” This kind of play increased the following day (January 20) when other members besides Blake began to throw projectiles, or at least try. Bryce, who sat at the computer next to Blake’s for the afternoon, tried to get in on the action:

Bryce: Ok tell me if I’m doing it right, okay? (touching Blake on the shoulder to get his attention)

Bryce: I throw it at whatever it is-

Blake: Him him him (looking over and pointing at someone on Bryce’s screen)

Blake: Oh, go to the mall go to the mall. Let’s go to the mall.

Bryce: No I want to check out her. Rosey7.

Blake: You have to go to the mall.

Bryce: Let’s go in.

Blake: It says french. Okay throw at the girl that says french.

Bryce: No I’ll do chewy1. Do I have to write chewy1 then colon?

In the above scene, Bryce tried twice to get Blake to look at his screen and tell him how to throw, but instead of helping him learn the command, Blake eagerly pointed at various Whyvillians to hit. Bryce and Scott regularly looked over Blake's shoulder as he threw projectiles, Bryce continued to seek advice from Blake, Cole called to Scott (and later Blake and Briana) from across the room to get help on how to throw projectiles, and other male club members became targets for throwing. It was quite an interactive social event.

From Week 3 to Week 7, projectile throwing in the club continued to be a largely male activity with few exceptions. The boys threw projectiles at each other, at Whyville girls as part of flirting ("I threw a heart at my girlfriend"), and at various Whyvillians for any number of reasons that seemed to set them apart ("Throw it at that guy, since he thinks he's so cool," "Let's get the carrot dude," "Hey, Goth is ugly"). When asked by one of the researchers, "Why do you throw a projectile at someone?" Aidan replied, "Cause you don't like them." The researcher pressed further, "Would you throw it at a friend for fun?" and Aidan responded, "Yeah, that's what I do to Blake all the time." So there were multiple reasons for throwing projectiles—as part of collaborative play with friends (akin to a snowball fight), to set people apart (as members of the opposite sex, ugly, or just different), and even to flirt (both to express interest in someone new or to continue an existing "dating" relationship). Occasionally, a boy would tell someone not to throw anything at him, but more often they vied for each other's attention when they hit others with various projectiles ("Guys go to the pool party, I threw a spider at her!"). A particularly successful way of getting attention was to throw a heart at another boy in the club, drawing on gendered and romantic connotations of the hearts and generally breaking down in giggles as a result. Already we have ample evidence that club members used projectile throwing to rally an audience to their side and demonstrate their knowledge of the social play by creating variations on the play such as throwing a heart at a boy (Garvey, 1984) as well as excluding others (Goodwin, 2002) through projectile throwing.

Girls rarely participated in throwing projectiles at the club or at all during this time based on our knowledge of field notes and videos. Zoe occasionally participated in throwing during the club, but this was rare. Briana never mentioned projectiles in the club after Cole sought her for help on January 20. Isabel and Leslie both asked how to throw projectiles while sitting next to boys who were throwing though they did not appear to join in the boys' play—Isabel on January 26 and Leslie on February 10 (for a description of Isabel's learning to throw, see the case study described later).

Projectile throwing shifted from being primarily a boys' play activity to being mixed-gender on February 16, during the 7th week of the club. While four girls were hanging out on Saturn, a Whyvillian insulted one of the girls, Ulani, who broadcasted his insult to the club. Within seconds, most of the club members present made their way to Saturn and started throwing projectiles at the offender until he left the planet. Girls and boys together gathered and watched the projectile fight—Isabel was specifically called out to help. Several club members were so incensed that they organized a

search party to go from space to space on Whyville so that they could continue to pursue the offender. We see evidence for the strong influence of this club-wide incident in conversations about it that occurred for the next few days and girls' increased participation in throwing wars in the club (for more on this, see Kafai, 2008). For example, just 2 days later on February 18, some club members noticed school friends (who did not participate in the club) on Mars and called for help in throwing projectiles. During this high-energy event, there was a great sense of urgency to hit the nonclub members with projectiles—notably, Jill and Ulani were directed to buy projectiles and help “get” their school friends. Below is a section of transcript that shows the girls' involvement in what had previously been a primarily boys' activity:

Ulani: How do you throw something at someone?

Cole: You type throw and you type in the thing you want to throw and then you type in whoever you want to throw it at.

....

Cole: Keep him all occupied while I get some more- things okay?

....

Paolo: A::h I threw a frown at him Cole!

Cole: Good I just bought 40 things.

Paolo: Forty things?

Cole: Yeah but. I bought 20 pies and um- 20 pies, 10 mudballs and 10 snowballs. And I bought maggots, they're so awesome.

....

Paolo: Ah ha ha!

Paolo: I threw something at Jill! I threw something at Jill!

So during the projectile war on Mars between club members and school friends, Ulani learned how to throw something, and Jill became a target of throwing as the war progressed from attacking the school friends to attacking anyone who was on Mars. This is what we gathered from our field notes and videos about club members' learning about projectile throwing using a fairly typical ethnographic approach of identifying practices at a particular location in our data. When we included the logfiles in our analyses, we were able to develop a more nuanced view of when and how projectile throwing was adopted by club members.

The above summary represents what we knew of play through projectile throwing from a fairly typical ethnographic approach to identifying practices among a group of people in a space-based location. What we found when we studied the logfiles both supported and challenged our prior understanding of throwing projectiles as a form of play.

Who Threw First and How Often?

A look at some of the online data about throwing projectiles provides several new insights into projectile throwing among club members. Studying projectile throwing

was a strategic choice because we could trace at the practice in chat. By filtering the logfiles and searching for the word “throw,” we were able to determine the first time each member correctly threw a projectile² and when they first visited the Projectile Shoppe (see Table 1). We also determined (marked with an “*”) if the first throw was to a school friend—either from the club or from the sixth grade classes.

One of the most obvious trends in this table is confirmation of the strong influence of Blake’s loudly broadcasted throwing on January 19–20. Five club members threw for the first time on January 20—either during club or afterward when logged into Whyville at home. In fact, though the video demonstrated the involvement of Blake, Bryce, and Scott in the projectile throwing that day, the logfiles show that Paul and Kyle also threw projectiles. Although Paul was mentioned as a target in the video, to our prior knowledge, he was not a participant in throwing at the club that day. Furthermore, Kyle was not mentioned at all in our field notes or videos in regard to throwing projectiles that day, though he was present at the club. Although we cannot be sure, it seems likely that he was influenced by the loud play of the other boys. The table also confirms that Jill and Ulani did learn to throw projectiles on Mars on February 18—before analysis of the logs, we could not tell whether they had actually thrown anything that day based on the video and field notes. So at a first glance, analysis of the logfiles supports our prior findings on the influence of certain club events on members’ learning to throw and even reveals that more members learned during those events than we had realized.

A second insight from Table 1 is the strong influence of a shared physical place on the first time members threw projectiles. Twelve members threw for the first time while in the club. Four more (Briana, Zoe, Kyle, and Isabel) first visited the Projectile Shoppe while in class or the club even though they threw projectiles later. So 16 of the 21 club members began their throwing or their visits to the Projectile Shoppe (a necessary precursor to throwing) while with school friends in a physically shared space. Although it is impossible to tell based only on the logfiles what kinds of influences might have occurred in these shared spaces with school friends, the trend is striking. One more member (Marissa) threw first to a school friend while in a shared virtual space in Whyville. Of the four remaining club members, we know from the video data that Scott was highly involved in projectile throwing play at the club on January 14, 19, and 20 before he threw something on the evening of January 20. This leaves only three members (including Kaitlyn who began to throw before the club began) for whom there is no logfile evidence of school friends potentially influencing the start of their throwing activities.

A third insight regarding gender is rather surprising—despite the boisterous projectile throwing activity of many of the boys in the club, three girls (Kaitlyn, Briana, and Zoe) were the first members to actually throw things. A look at when club members first visited the Projectile Shoppe also demonstrates that there were six other members who took an interest in throwing projectiles before it became a prevalent club activity: Leslie, Cole, Blake, Trevor, Aiden, and of course Gabe, the only person whose prior interest/knowledge we knew about from video and field notes. How

did this tangible interest in throwing projectiles begin for these eight individuals? Perhaps they were browsing through Whyville locations and came across the Projectile Shoppe on the Destination Menu; perhaps they saw Whyvillians throwing projectiles and became interested; or perhaps one of the three girls who threw projectiles earliest had some sort of influence that we could not see on our limited video and field notes. Because Blake, Cole, Trevor, and Aiden all went to the Projectile Shoppe during club time, some sort of influence during the club seems likely. Regardless, we now know that projectile throwing was not solely a boys' activity in Whyville.

Finally, though in general, most kids visited the Projectile Shoppe before they first threw a projectile, there are a few interesting exceptions. Molly never threw a projectile but did visit the Projectile Shoppe, perhaps showing some interest in the site. Briana and Kyle both threw their first projectiles several days before visiting the Shoppe. How is this possible? Closer analysis of the logs reveals that Briana's first throw was a football—an object that someone could have thrown at her and that she could have thrown back. Kyle's first throw was a mudball, the kind that explodes on contact. Because his first throw was to a school friend, perhaps one of his school friends bought projectiles for him that went directly to his ownership (it is possible to purchase both face parts and projectiles directly for someone else). In another exception, Marissa never visited the Projectile Shoppe—closer analysis of her logfiles shows that her first throw was a Frisbee thrown to her by fellow club member, Leslie (Peachy5). Below is a simplified transcript of Marissa's (lucky7) first throw based on the logfiles from February 18.

Peachy5	19:34:13	Throw Pfrisbee lucky7
lucky7	19:34:22	Y do u want 2 throw a frisby at me?
Peachy5	19:34:37	So u can trow it back
lucky7	19:35:11	Achooy
Peachy5	19:35:18	Say "trow Pfrisbee Peachy5"
Peachy5	19:35:46	Hello r u there
lucky7	19:35:52	Yea
lucky7	19:36:07	I just keep on sneazing
Peachy5	19:36:33	Say "throw Pfrisbee Peachy5"
Peachy5	19:37:13	O well
lucky7	19:37:24	Throw pfrisbee Peachy5
Peachy5	19:37:37	Yay!!!!!!

In the evening when Leslie and Marissa met on Saturn, Leslie threw a purple frisbee ("Pfrisbee") to her friend. Puzzled by this, Marissa asked, "y do u want 2 throw a frisby [sic] at me?" Leslie coached Marissa to throw it back, which took a bit of encouragement. She even rewrote her instructions on how to throw, spelling throw correctly in the second instructions, "say 'throw Pfrisbee Peachy5.'" The whole back and forth of one frisbee throw took 3 min to accomplish and also demonstrates a different kind of projectile throwing than we observed in the club—throwing objects back and forth like a game of toss.

To Whom Did Members Throw and What?

A further look at the logfiles of projectile throws allows us to delve a little into the differences between club members' throwing. Table 2 shows how many times each club member correctly threw projectiles during the weeks that the club met; how many times they threw to a fellow school member, another Whyvillian, and by degree; and whether they ever threw hearts and kisses or sports objects. There are differences in how many times members threw projectiles, at whom they threw, and to what degree they engaged in throwing different types of objects. Certainly, there are other things that we could study in regard to projectiles and targets, but these are what we determined could be clarified from logfiles of throws without the surrounding context of play. Throwing to club members versus Whyvillians is a simple measure of what kind of people members engaged with in play. Did they mostly throw to friends they knew in "real" life or to Whyvillians with whom they may or may not have had previously existing relationships? Did they ever take advantage of throwing by degrees, which involves less typing and has less potential for spelling errors? Did they ever engage in flirting by throwing hearts or kisses, objects that based on analysis of the club and Whyville have strong romantic and gendered meanings? And did they ever engage in a toss-and-catch game of throwing that is different from the throwing of mudballs, pies, and smileys that we observed as the predominant practice in the club?

Based on Table 2, we can see that club members did differ in the degree to which they took up the practice of throwing projectiles. The most obvious difference is the frequency with which several members threw. Briana, Blake, Scott, Paul, and Paolo all threw more than 180 times over the 9 weeks of the club. Of these most frequent throwers, all learned to throw by degrees (a less common practice overall), though Paolo never pursued it much. In contrast, Leslie, Jill, Ulani, and Marissa threw very few times. In fact, Jill and Ulani never threw anything after February 18, when they were engaged with others in throwing projectiles at fellow school members on Mars. For whatever reason, they did not become interested in throwing projectiles as a style of play on Whyville despite the apparent change in the club after the incident where Ulani was insulted and members came to her "rescue." Aside from these girls, the time of accomplishing a first throw seems to have little relation to the frequency of throwing projectiles. However, frequency of throwing does seem to relate to throwing more projectiles at Whyvillians or by degree than directly to club members. Club members who threw more often to school friends generally threw fewer projectiles. Perhaps this is because throwing at club members on Whyville provided fewer occasions for throwing than if a wider audience was included.

In regard to throwing objects related to different purposes, both romantic and sports (toss-and-catch) objects were thrown by approximately the same number of club members (12 and 13, respectively). In general, we can simply note the diversity among club members in terms of adopting various aspects of throwing projectiles—by degrees, with hearts/kisses, or with sports objects. Interestingly, all of the more

frequent throwers, girls and boys alike, eventually threw hearts or kisses—in other words, they engaged in flirting by throwing romantic objects (note that Zoe and Paul threw hearts/kisses after the club ended). This contrasts with our previous perception of the club that girls did not engage in flirting at all (see Kafai, 2008), particularly not with projectiles (for a deeper study of flirting on Whyville, see Kafai, Fields, & Searle, in press). In contrast, some of the more frequent throwers never threw sports objects, including Paul and Scott who were among the most frequent throwers as well as Isabel, whereas three of the least frequent throwers (Kaitlyn, Leslie, and Marissa, all girls) did engage in toss-and-catch throwing.³ Beyond the diversity of club members' throwing different objects with different frequencies, it is difficult to say much more with any certainty about their styles or social purposes of play without delving deeper into the contexts of their throwing. This is the object of the next section of findings.

Individual Learning: Isabel Learns to Throw

Beyond looking at trends in the whole club, we also analyzed individuals' learning how to throw projectiles. Granted, while we know from chat records when each club member first threw a projectile, the connection to how they learned was not always obvious. Sometimes it was clear from the chat records surrounding club members' first throws that they learned by repeatedly asking Whyvillians for help online, and sometimes we found peer-to-peer mentoring encounters in our video and field notes or were able to combine online and off-line data to put together the picture of how youth learned this insider knowledge across spaces and people (Fields & Kafai, in press). In a few cases, our data were not sufficient to answer the question of how, where, and from whom youth learned.

However, there are a few instances where we have extended details that demonstrate the process by which some club members learned to throw projectiles. One of these is the case of Isabel, who learned during the 4th week of the club. In the following excerpts from the transcript of video, we can see how she learned some of the mechanics and social nuances of throwing projectiles while interacting with club members. She then followed up with this knowledge by asking questions in Whyville where she solidified her understanding of the mechanics of throwing and proceeded to apply them back in the club.

On the day of the transcript, Isabel and Cole were sitting next to each other at neighboring computers. Cole yelled in a loud voice, "Okay you guys, meet me at the Beach, no, at the Pool Party!" Having issued his invitation to meet at a specific place in Whyville (the Pool Party), he then went to the Projectile Shoppe to stock up on projectiles to throw at any club members who met him at the Pool Party (see Table 3).

From the very beginning, Isabel showed interest in his club-wide invitation, but while Cole was shopping her curiosity peaked as she began making suggestions for what he should buy as well as expressing wonderment about the various types of

projectiles for sale: “Mudball, Red Paintball, Chocolate?” Obviously, one cannot throw projectiles without buying them, and her observation and semiparticipation in Cole’s shopping spree appear to have both peaked her curiosity and provided her with the needed exposure to the Projectile Shoppe to buy her own projectiles several minutes later.

In between Cole’s shopping and her own shopping, Isabel joined Cole and others at the Pool Party. While there she learned how to identify Cole by his looks on Whyville (it is always a bit tricky to recognize your friends in a crowded room of avatars). The ability to recognize where people/avatars are in relation to oneself on Whyville is important for throwing projectiles because positioning in relation to one’s target is vital for accurate throwing. Cole demonstrated this when he threw something at Isabel but missed: “I tried to splat you but I splatted the person behind you.” It was after this attempted throw and watching Cole throw at a few other people that she declared, “Okay, I want to get something,” and went straight to the Projectile Shoppe, this time to shop for herself. On returning from the Shoppe, Isabel solicited Cole’s help in correctly spelling “throw.” While Cole did not explicitly help her, Isabel was able to look at Cole’s screen as he typed in his own command to throw a projectile.

The last section of transcript included in Table 3 is perhaps the most intriguing. With projectiles in her satchel and some knowledge of how to throw them, Isabel faced the task of deciding who her target should be, made evident in her question: “Who am I supposed to be throwing this at?” While Cole had invited her to join him in throwing projectiles at Zoe, another girl in the club, Isabel initially went along with his invitation but in the final moment decided to throw at someone else. Her statement, “No I’m doing this at somebody else,” was the first time since Cole’s invitation to meet at the Pool Party that she outrightly differentiated her activity from his. One interpretation of this is that having achieved some confidence in her ability to throw and in at least one purpose of throwing (i.e., a playful throwing war with club friends), Isabel decided to pursue a different social purpose in her own activity of throwing projectiles.

Interestingly enough, from chat records, we can see that Isabel did not actually succeed in throwing a projectile that day. While she made at least two attempts, they included too many words and made “mudball” into two words rather than one: “throw a mud ball at sunboy90.” Two days later, she made six more attempts to

Table 3. Isabel Learns to Throw

Cole	[Cole loudly invites people to meet at Pool Party]	Cole shops for projectiles, listing different kinds for different purposes.
Isabel	Four pies, four mudballs, four—No wait, go down? No get, um (pointing at projectiles on the screen)	
Cole	I need to get one pair of flowers for my girlfriend, a kiss for my girlfriend	

(continued)

Table 3 (continued)

Isabel	Oh I already have some hearts. Purple paintball, mudball, red paintball. Chocolate?	Isabel engages in exploring available projectiles
...
Isabel	Wait where are you?	Isabel learns what Cole looks like on Whyville
Cole	I don't know	
Isabel	Oh you're right there	
Cole	I splatted the person behind you. I tried to splat you but I splatted the person behind you Throw pie (typing) Webster where are you? Yoda (typing Webster's username) Webster—go inside the mall to the food court!	Cole throws something at Isabel but misses
Isabel	Okay I want to get something	After watching the projectile battle, Isabel decides to get some projectiles of her own
...	... [Isabel goes to Projectile Shoppe]
Isabel	Oh oh, I want—I want to throw a projectile That guy's freaky looking How you spell throw again? T-h-(looking over at Finn's screen) T-h-r. (goes to her own screen)	Later, after watching Cole throw more projectiles at club members, Isabel decides to throw herself. She asks for help on Mechanics of throwing.
...
Cole	Yes come on help me throw projectiles at Zoe [bluwave] (typing)	Cole invites Isabel into the projectile throwing war in the club
Isabel	I'm throwing it at this—oh man he's not there any more	
Cole	Oh I hit someone in front of you!	
Isabel	Yeah	
Cole	(giggles)	
Isabel	Who am I supposed to be throwing this at?	Isabel asks for Social instruction on who to throw at
Cole	Boom. Pied you with your own pie. Bluwave, okay?	Cole tells her to throw at a club member and gives her username
Isabel	Okay. Well no wait. What's her name?	
Cole	Bluwave	
Isabel	No I'm doing this at somebody else	Isabel determines to do her own thing

throw projectiles at people until she finally met up with Cole online while they were both at their own homes (i.e., not in a shared physical space). They met online where they chatted and then Cole threw a mudball at her. After going their separate ways on Whyville, they regathered at the Beach 6 min later where Isabel made some

improvement but still incorrectly tried to throw a mudball at Cole: “throw mud ball leo95.” Finally, after chatting about Cole’s girlfriend on Whyville Isabel made her first correct throw: “throw mudball leo95.” Cole greeted this success with a “haha” and retaliated by throwing a pie at Isabel. She, in return, retaliated back and a mini-throwing match ensued with several throws on each side. After this exchange, Isabel made several other correct throws at various Whyvillians, most particularly a boy she was trying to “Whydate.” So her path toward throwing projectiles involved social events at the club, private attempts on Whyville, and finally a meeting in Whyville with a club friend.

Discussion

Our analysis points to the importance of paying attention to multiple settings of social play in virtual worlds, including overlapping social spaces like the club and Whyville. Whyville served as a continuation of friendships and play from the school just as the club served as an extension of participation in Whyville. This follows with the findings of Lindtner et al. (2008) that players in Internet cafés in China established meaningful connections between people and resources in the virtual worlds, Internet cafes, societal norms, and in-game goals. It also supports the findings of Stevens et al. (2008) that game play at home involved the marshaling of multiple resources, including people and game guides (physical and virtual). Yet beyond the blending of social spaces, we also discovered separations between social spaces, especially the notable difference in girls’ participation in projectile throwing in Whyville versus the club. Had we studied only the club or only Whyville, we would have missed this fascinating difference in girls’ play.

Our approach to connective ethnography, tracing a practice across a group of after school club members, allowed us to see the range of ways and the degrees to which members took up the practice of throwing projectiles. Our strategic choice of focusing on a practice rather than individuals (though we did some of that too as in the cases of Briana and Isabel) allowed us to leverage the record keeping facility of logfiles to focus our multimodal analysis on particular time points. Our study of projectile throwing went further than our prior analysis of teleporting by studying the range of ways club members used the practice to construct relationships and negotiate who they were among peers in the club and Whyville. Other analyses would also be interesting to pursue. Social network analyses would be excellent ways to further this sort of study of learning and play, though our particular set of data did not support this. We did not collect data that would have allowed us to trace signs of friendship systematically (such as Whyville address books). Furthermore, conversations in Whyville are difficult to reconstruct, though it is possible between participating individuals in the study when we know they share a particular Whyville location (such as between club members like Marissa and Leslie throwing the Frisbee). In further analyses, we are using the logfiles to reconstruct participation portraits of individual Whyville players revealing their trajectories of participation

and often surprising Whyville activities—surprising because they were neither captured in our field notes or video recordings or reported in interviews (see Fields & Kafai, in press). Yet these types of studies would miss the larger scale of interpretation possible by studying one practice across the 20 tween club members.

Of course, this is just one practice of socializing on Whyville. Some other ways of developing relationships and negotiating “who one is” in relation to others in Whyville are covered in other papers in this issue, such as customizing one’s avatar to look “good” or demonstrate potential common interests (see paper on avatar construction by Kafai, Fields, & Cook, 2010), affiliating with an ethnic group (see paper on race in avatar construction by Kafai, Fields, & Cook, 2010), or displaying knowledge by developing or contributing to a cheat site (Fields & Kafai, 2010). There are other aspects too that need further study, such as a broader analysis of how Whyvillians become friends, how they flirt and develop dating relationships (see Kafai et al., in press), and how newbies or others who stand out are mocked or welcomed. Furthermore, by studying a limited practice that we could trace in the logfiles, we were able to analyze an entire after school club’s uses of this tool across different social spaces in Whyville and in the club (Kafai & Fields, in press).

Regarding social play, the tween (9–12-year olds) members of the after school club used projectile throwing in many different ways to position themselves in relationship to others. In play spaces more traditionally studied by anthropologists, children use gestures, looks, and verbal language to show who is in or out of a group, to make friends, and to maneuver socially (see Goodwin, 2006). In virtual worlds like Whyville, gestures are limited to moving around a static 2-dimensional avatar, and innovative expressions written in text replace inflections and a range of volume in verbal exchanges. Projectile throwing is one more way to interact symbolically with others in Whyville, a new tool in the arsenal of self-expression. Whyvillians have developed many ways to use projectile throwing socially such as making friends, poking fun at people who stand out, flirting, playing a game, creating a spectacle, retaliating at an enemy, playing catch, and playing with gender (e.g., the homophobic signification of throwing hearts from boy to boy). The club members demonstrated a range of these kinds of social play through projectiles. In addition, besides simply taking up the play they observed around them, they adapted projectile throwing to their own social goals, as Isabel and Bryce did when they threw at different people than their neighbors suggested).

Our observations of the club indicated that club members constructed the boundaries between the virtual and real spaces in different ways. For instance, some members such as Briana used projectile throwing almost solely with Whyvillians, not taking up opportunities to participate in throwing wars with club members. Others like Cole threw predominantly with friends from the club. In these ways, there were boundaries that some members created between the club and Whyville, while others carried out this type of play across both social groups. Interestingly, flirting was an activity almost solely directed at Whyvillians—we never saw instances of flirting

with projectiles between club members, though it was certainly a club activity that rallied an audience behind the flirter. Further study would be needed to understand whether this was the case with all flirting on Whyville or just in the case of throwing hearts and kisses.

It is impossible for us to say why certain members took up some aspects of projectile throwing and not others. Perhaps if we had been aware of the wide range of purposes in throwing projectiles beyond the predominant type of play in the club, we could have asked different members about their motivations and why they threw projectiles. Unfortunately, analyzing the logfiles took place long after the 9-week duration of the club and we did not think to ask many members about why they threw projectiles. However, even if we had, they might not have mentioned some aspects of throwing, such as flirting, a practice that the logfiles revealed but about which the girls kept quiet. Regardless, one thing this study has shown is the host of ways that players may take up a seemingly simple practice. Broad descriptions of boys versus girls or experienced versus inexperienced players do not capture the diversity among those players in social styles of play in virtual worlds (for further study on the diversity of girl and boy players, see Kafai, Fields, and Giang [2009] and Searle and Kafai [2009]).

Conclusion

As Leander and McKim (2003) point out, virtual spaces are now everyday spaces in the lives of many children and youth, yet we know little of how they use these spaces to negotiate identities and ways of being in them, much less how the interaction between multiple social spaces (both virtual and “real”) influences these ways of being. Our study of how one (and yet many) social practice on Whyville, throwing projectiles, was learned and adapted by tweens in an after school club provides one inroad to understanding how tweens learn to “be” in a virtual space and points to possibilities of future study in understanding their creative “improvisations” and agency in identity formation (Holland, Lachiotte, Skinner, & Cain, 1998). Furthermore, our unique access to an expansive set of tracking and chat data allowed us to go beyond other forms of connective ethnography, each of which is creative and adaptive in their own ways (Leander, 2008), to trace throwing projectiles across times and spaces across a group of tweens, something not easily done through more traditional forms of ethnography. This approach provided us with crucial insights into how tweens and children negotiate who they are in these worlds through interactive practices that bridge multiple spaces in their lives. Like Goodwin’s example of jump rope play, we found that play in virtual worlds functions as an extension of everyday activities.

Notes

1. All names of club players and their screen identities are pseudonyms.

2. Note that this is not necessarily the first *attempt* but rather the first throw with correct spelling and syntax.
3. We double checked the contexts of throws of sports objects by Kaitlyn, Leslie, and Marissa to be sure that they threw them back and forth.

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Declaration of Conflicting Interests

Numedeon, Inc., the company that owns and hosts Whyville.net, has no control over the publication of the results. The authors have no financial interest or any other official relationship with Numedeon, Inc.

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Bios

Deborah A. Fields has an MS from the University of Wisconsin-Madison's School of Education and is a doctoral candidate at the Graduate School of Education & Information Sciences at the University of California, Los Angeles. With extensive experience working in areas of informal education, her research focuses on learning across spaces, peer-to-peer learning and teaching, and play. These interests have guided her studies in virtual worlds, science, and math in both formal and informal contexts. Currently she is studying two sixth graders' intersecting identities from different social spaces in their lives. Her recent work has been published in the *International Journal of Computer Supported Collaborative Learning*, the *International Journal of Science Education*, and *On Horizon*.

Yasmin B. Kafai is professor of learning sciences at the Graduate School of Education at the University of Pennsylvania and Co-Executive Editor of the *Journal of the Learning Sciences*. Her research focuses on the design and study of new learning and gaming technologies in schools, community programs, and virtual worlds. Recent collaborations with MIT researchers have resulted in the development of Scratch, a media-rich programming environment for designers of all ages, to create and share games, art, and stories. Current projects examine creativity and IT in the design of computational textiles with urban youth. In partnership with industry, she has designed and studied learning opportunities in virtual epidemic outbreaks in Whyville.net. Kafai earned a doctorate from Harvard University while working at the MIT Media Lab.