Race, Class, and Minecraft: The Microsociology of Diverse Videogame Players

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Introduction

Partnering with the 'Connected Camps' virtual Minecraft summer camp, we leverage the immense nationwide popularity of Minecraft, including among low-income/minority students, to teach pre-coding skills in a basic computational concepts ('computational thinking') to develop interest, experience, and confidence to take computer science courses in high school or college.

In summer 2015 we ran an affiliates camp in the low-income, ethnically-diverse area of Richmond, CA. This provided computer access, mentorship/advocacy, and the opportunity for open-ended play in Minecraft on a Connected Camps multiplayer server for a group of primarily Latino children ages 8-13, including both girls and boys. In summer 2016 we will expand this model to also offer a more directed coding camp for an older group of children, again targeting both boys and girls.

Throughout both, we have been attending to the ways in which the largely middle-class-oriented expectations of Connected Camps around campers' literacy, parental involvement, and at-home computer access differed from the realities of our campers, and how our own roles as 'power brokers' could mitigate these differences.

Related Work: Education, Games, and Diversifying Computer Science and Engineering

It is critical for the future of technology development that we broaden participation in computer science and engineering. This is for many reasons, including ethics (e.g. Dahlberg, 2012; NCSES staff, 2015), creativity (e.g. Kurtzberg, 2005), and including diverse viewpoints in design (e.g. Citron, 2014; Oudshoorn, Rommes, & Stienstra, 2004). Yet diversity in computer science and engineering has in fact *decreased* in the last 30 years, and today, a mere three percent of software engineers are Black or Hispanic and less than twenty percent are women (Google Diversity Team, 2014; NCSES staff, 2015).

Moreover, a growing body of research suggests that computer science education faces greater challenges in communities that are low-income or include large populations of immigrants or racial minorities. Margolis's work in Los Angeles high schools found that low-income schools disproportionately lacked computer science teachers, leading to a "preparatory privilege" in higher-income schools (Margolis, Estrella, Goode, Holme, & Nao, 2008) – a problem we have also seen in our research in Richmond, California. This reflects structural barriers in low-income communities generally (Eubanks, 2011).

In addition to lack of access (often called the "digital divide"), social and cultural factors can also exclude minorities and low-income individuals from computing. Sims's research of a high-tech charter school found that teachers' perceptions of what counted as technical skill rewarded white middle-class boys and devalued the technical skills of girls and ethnic minorities (Sims, 2014a, 2014b). These identities can also be self-reinforcing: DiSalvo and Bruckman found that African-American high-school boys they employed as videogame testers were careful to disclose enthusiasm for computers to some (such as parents) but not others (such as peers). They found that computing was so foreign to these boys' social worlds that it threatened their identities and reputation (DiSalvo et al., 2011).

This research shows that adopting technology and mastering computational thinking go beyond access to involve relevance of use, personal values, and self-identity – factors that are socially-influenced and socially-mediated (e.g. Eglash, Gilbert, & Foster, 2013). These, and our own approach, fit into the theoretical framework of *social learning theory*, which emphasizes how meaning and identity are critical to young people's self-concept as 'learners' and their engagement in learning (Lave & Wenger, 1991; Wenger, 1998).

With this approach we use students' existing interests and identities to shape their ideas of what computer science is and who 'belongs' in computer science classes and careers. In partnership with Connected Camps, we are accomplishing this using the Minecraft, which we have seen to be wildly popular in our target area.

There is growing evidence that videogames could leverage existing interests to engender interest in computers and computer science. They have become widely popular across ages, income levels and genders even while computer and Internet access remain skewed by income (Duggan, 2015). Looking at Minecraft in particular, Pellicone and Ahn (2015) have recognized the game's potential for engendering interest in computer careers through Minecraft play, but also note how online interaction between players can reinforce stereotypes about who belongs in this domain as defined by perceptions of race and gender. Attentive to these results, our research examines whether informal approaches to learning with in-person and in-game scaffolding can foster enthusiasm for computers as a platform for creativity and personal achievement *as well as* computational thinking among low-income and minority populations in order to broaden interest and participation in STEM careers, especially computer science and engineering.

Project Background and Research Site

With tens of millions of players, Minecraft, often described as 'virtual legos,' is reportedly the most played game of all time. Minecraft can teach a variety of skills which may vary by mode of play, including creativity (in creative mode), managing scarce resources (survival mode), or strategy and teamwork (player vs. player mode). Progressive educators have embraced the game as a learner-centered environment for developing problem-solving, creative, technical, social, and coding skills (e.g. Pellicone & Ahn, 2015; Yee, 2014).

In 2015, Connected Camps ran an online 'Summer of Minecraft' camp which was available to children ages 8-13 and which served 2194 campers. Connected Camps offered Minecraft play in 'multiplayer' mode, where campers shared space in the same online world and interacted with trained online moderators who supported them in leveling up their expertise. Collaborative building and play challenges and other forms of social interaction provided opportunities for learning design, engineering, teamwork, conflict resolution, and digital citizenship, with in-world moderators playing an active role in facilitating this.

We partnered with Connected Camps to co-organize an 'affiliates' camp in the 'Iron Triangle' region of Richmond, California, whose residents are predominantly low-income Latino and Black families. Many lack access to computing resources: a recent study by the Richmond Public Library and local nonprofit BBK found that computer and Internet access in this community were far below national averages (Matalon & Avant, 2014). We found that most of our campers likewise had limited computer and Internet access at home. However, all had played the 'pocket' version of Minecraft on mobile phones or game consoles.

We also found that the marginalization of this community influenced residents' perceptions of digital technologies and of opportunities in STEM and the high-tech world. Though the Iron Triangle is just across the San Francisco Bay from the high-tech hub of Silicon Valley, initial interviews with area families have found that 'Silicon Valley' is a remote world of which parents and children know little and cannot imagine themselves a part. Their engagements with digital technologies are often limited to computerized test-taking in school and media consumption at home, with few opportunities to develop computational thinking or STEM aspirations. As a result, these families often lack a vision of what benefits technology could provide. Projects aiming to increase access in the Iron Triangle (e.g. Phillips, 2014) are not always embraced: families have been reluctant to let students bring school laptops home due to fears about penalties for breakage, and many parents have legitimate concerns about children's unsupervised Internet access.

Study Design and Research Questions

Our 2015 summer Minecraft camp provided computer lab access at a fiber-connected computer lab in Richmond City Hall, as well as in-person guidance and mentoring. While most participants in the Connected Camps 'Summer of Minecraft' paid a $100-$150 fee to participate, all expenses were waived for our

campers. Partnering with local non-profit BBK, we also provided free lunches every day of camp. We ran two hours per day, five days per week, for the four weeks Connected Camps' servers were running.

A total of 28 campers participated, the full capacity of the lab. The majority of our campers were Latino and from families where Spanish was the language primarily spoken at home. A smaller number of African-American campers participated as well. We enrolled all girls who were interested, and had 11 girls and 17 boys, plus a waitlist of dozens more boys. Retention was high: 23 campers attended the last session.

We will be replicating and expanding our 2015 summer camp in summer 2016. Across both, we aim to develop a model for including underrepresented children that could be emulated in other disadvantaged communities. Our research has first focused on:

> **RQ1:** How do children from underrepresented groups 'play' in the Connected Camps Minecraft environment, in particular with other children of divergent backgrounds? What salient opportunities, differences, limitations, and conflicts surface? How can an affiliates camp help mitigate challenges and barriers to inclusion?

To address this research question, we draw upon daily ethnographic observation; logs of in-game camp activities recorded by Connected Camps; daily written logs from in-world Connected Camps moderators, including documentation of positive behaviors and behavioral problems; and follow-up interviews with campers and others involved (e.g. in-person and online moderators). We are in the process of analyzing our 2015 data to study barriers and supports related to campers' gender, race, and other socio-economic characteristics, and the role of us and other in-person moderators as 'power brokers' to bridge any gaps.

Initial Findings

On a very basic level, our 2015 campers learned basic technical literacy. Many campers who joined the camp had trouble with some basic keyboard skills, such as using the shift key, but quickly picked up the skills they needed. Campers who had not played Minecraft before picked up the use of keyboard and mouse (left clicking vs. right clicking) to navigate and accomplish tasks very quickly.

We believe this camp helped to engender a love of computers as powerful tools of creativity and play for our campers. Campers would rush to the computers at the beginning of each day and it was often hard to tear them away from them at the end of the two hours, which clearly demonstrated a passion for the camp's activities. In contrast, many campers reported that computers were primarily devices for test-taking at school or for more narrowly educational purposes, and few had regular access to a computer with an Internet connection at home. Under these conditions, we suspect kids may not develop the same kind of positive association with the computer that kids with better home access may develop. We hope this might plant a seed that could lead to consideration of STEM careers that involve the heavy use of computers. It may also plant the seed among parents that computers aren't as scary for children as is often portrayed in media, though this could be something we address more directly in future versions of this camp.

While most campers had played Minecraft (on console game systems, tablet devices, or smartphones), only a few had played it on a computer. Minecraft is richer and more fully featured and, in many ways, more challenging when played on the computer. By participating in a multi-player server, campers interacted with other campers, both in person and virtually. They could see others' creations, collaborate on projects, and read and respond to the often fast-scrolling chat window that connected them with the moderators and campers who were not in the room. This was one draw of the camp for campers. Our intention was to help campers transfer the enthusiasm and devoted interest many already had for video games to the computer.

Campers learned teamwork and communication skills. Working on group build projects required expressing their intentions. Only a few of our campers did this through the chat mechanism (which required good typing skills and ability to read quickly) but we saw more of it in frequent verbal discussion between campers. Campers who played in competitive modes (survival or PvP) joined forces to mine resources and

quickly found that when they teamed up and stayed focused, they quickly amassed quite a fortune. With time, we found campers also started to work with some of the other campers who were playing from home.

Along with general teamwork and communication, campers gained online citizenship skills. Some learned this the hard way, by breaking the rules and getting in trouble or by having the things they had built destroyed by others. Our presence in moderating this aspect of the camp was crucial, as we encouraged the campers to stand up for themselves or explain their concerns directly to the moderators. We also corresponded with the moderators on the campers' behalf throughout the camp, even prompting some changes to the rules of the server to make it more fair for everyone.

Minecraft and the Connected Camps servers promoted systematic or mathematical thinking. Through competitive activities in survival or PvP mode, campers had to practice the management of scarce resources, strategy, and problem solving. To create things to build with, eat, or defend themselves, they had to memorize recipes, use a crafting table, a stove, and an enchantment table. Sometimes crafting involved many steps, which they had to keep track of. We also created treasure hunts to give campers some exposure to the use of coordinates for plotting. This was an example of math skills taught very directly through Minecraft. This is a fifth-grade skill in the Common Core curriculum. A small number of campers were very enthusiastic about this activity and completed our treasure hunts, as well as designed their own.

While this camp did not directly teach campers how to write code, some of what they were exposed to entailed pre-coding skills. For example, typing commands (such as /tpa to teleport to another player or /w to whisper or /report to report a problem) required careful and precise typing of commands with correct spelling. This exposed campers to command-line entry interfaces which give a sense of how computer code works at a line-by-line level. Using a Minecraft substance called redstone gave campers some exposure to circuitry and how to build functioning mechanisms in the game environment.

In the first week and without our prompting, campers quickly discovered and taught each other how to change their player "skin" to give themselves a distinctive identity in the game. On the whole, campers picked skins that reflected their real-world identity. Girls wanted to look like girls. Latino and African-American campers wanted a more realistic skin color (not the white, male default Steve character) – which proved to be a challenge, as nobody could find existing Black or Latino skins and campers had to learn to modify the skins themselves. Many campers were more creative, picking animals, movie or video game characters, YouTube celebrities, and even foods such as a taco or bacon to represent themselves.

Overall, we found that campers' attention spans and the sheer number of activities in the camp led them to do what they found easiest or most aligned to their interests, which often did not include the more challenging projects that required long-term focus and dedication. At the same time, the confidence that campers exhibited in approaching the game could lay the foundation for more long-term exploration.

We also found that a few campers were very interested in exploring the limits of the server's rules, which in the game world is often called "griefing." While their actions struck us as more experimental than malicious, they nonetheless did kill other campers' virtual characters and destroy their creations, both unintentionally and intentionally. When this was directed at another camper in the room, that camper would often negotiate in-person with the "griefer" to get his or her creations repaired or the equipment back that they had lost upon dying. But, when it was directed at a camper not part of our affiliates camp, those campers often called on the moderators to punish the griefer. Again, our presence in the room was important for helping our campers understand what was happening, notice and respond to messages from moderators, and stand up for themselves when wrongly accused. Many situations of rule breaking were complicated. Some rules of the camp were changed and clarified after our feedback. Connected Camps asks parents to sit down and go over the rules in certain extreme cases (we had one such case). However, the parents of our campers — quite a few non-English speakers and not familiar with computers — were often not in a position to play this role. Instead, we played the role that Connected Camps expected parents to play of moderating behavior, and talked over our experiences with parents during pick-up.

These observations suggest that there was great value for our campers to be part of an in-person affiliates camp. Aside from access, campers learned from one another in-person, and we played a critical role in scaffolding language literacy and game skills needed to interact on a multiplayer server. This camp, and Minecraft itself, seemed to reward campers who were very fast and fluent with written language. Our presence was able to partially make up for this with the campers who didn't come in with very strong reading and writing skills but who brought many other skills and abilities to their Minecraft play.

Future Work

In addition to offering a similar camp to summer 2015, in 2016 we will also offer a camp that involves more directed development of computational thinking skills, specifically through coding and engineering challenges. Connected Camps has developed an innovative Minecraft coding and engineering camp and training program for its moderators, which we will test and adapt, leading to our second research question:

> **RQ2:** How can existing enthusiasms and interests among youth in this low-income community (focusing in particular on girls, ethnic minorities, and children from immigrant families) especially around *gaming* be transferred to develop forms of *computational thinking*, so that students feel prepared and motivated to take computer science courses in high school and college?

To address this second research question we will use our findings to develop culturally relevant, customized 'curriculum' for our three key underrepresented groups: girls, ethnic minorities, and children from immigrant families where English is not spoken at home and parents may not be willing or able to be involved as power brokers. Our findings will identify the configurations of affiliates camps that best support inclusiveness. This will include (a) findings on organizational practices to maximize accessibility, (b) best practices for in-game and in-person mentoring, and (c) activities and guides developed by online counselors for Minecraft activities that are specifically geared toward the interests of these underrepresented groups.

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