

Kids and Simulation Games: Subject Formation through Human-Machine Interaction

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**Paper for the Annual Meeting of
The Society for the Social Studies of Science
October, 1997**

I'd like to start with a vignette as a way of framing the issues around computer games and subject formation which are the topics of this paper. A girl, maybe ten years old, an adept player of the two-player, bloody, hand-to-hand combat game, *Street Fighter*, told me about how she once went to the local pizza parlor, where the tough teenage boys hang out, and started playing games of *Street Fighter* against them. A few quarters later, she had beaten them all. Beaming, she described it as a great moment. Her dad, a young radical and a friend of mine, was also beaming at the retelling, and I found myself grinning as well.

I heard the story a number of years ago, before I had begun my fieldwork on kids and computer games. At the time, I reflected on the incident and felt ambivalent about the scene and our responses. Why should we be celebrating a young girl's precocious performance of some of the more violent aspects of male adolescent subjectivity, and the technology that enabled it, even if she did succeed in pushing back at a dominant gender and age hierarchy? Wasn't there something profoundly disturbing about the fact that computer games made action entertainment available for kids to not only see and hear, but to actually manipulate and identify with -- that the day to day competitive antagonisms between kids could now be embodied in a graphic and intensely violent form?

Through the course of my dissertation work, as I've observed more and more of kids' play with computer games, I've come to see this vignette as encapsulating many of the issues that have come to frame my work, and now feel that there are dimensions to the interaction between the girl, the teenagers, and *Street Fighter* that point to much more than a simple reproduction or escalation of

cultural codes embedded in dominant mass media. The reproductive aspects of the kids' game play is certainly one important part of the scene; the meanings embedded in the technical object were repetitively enacted, and thus reproduced meanings distressingly reminiscent of much of the most uninteresting of mainstream action entertainment media. At the same time, these dominant cultural idioms were being taken up and appropriated for means other than their unequivocal and transparent reproduction; the encounter had the interestingly unexpected outcome that certain gender and age stereotypes were challenged and subverted. Ironically enough, many of these stereotypes are represented in the very media at hand, an irony that brought instant smiles to our collective faces. Finally, and perhaps most importantly, this scene points to some of the processes through which kids' learning and subjectivity are being intertwined with new interactive media. It is important that the girl was occupying and enacting the subjectivity of an action hero, rather than simply encountering the image on a page or screen. Her cyborg identity is enabled by this techno-semiotic enhancement, as well as by the skill of her coupling with the technical apparatus. And unlike with other media, this coupling is not only or even primarily the result of interpretive virtuosity, but rather is the outcome of technical and interactive prowess, the ability to manipulate the machine as well as understand the narrative content.

Via ethnographic cases, this paper proceeds by integrating two levels of analysis made evident in this vignette. The first is the level of social structure and cultural code, or the ways in which durable sociocultural categories are reproduced and sometimes changed through the production and consumption of mass media commodities like computer games. The meanings encoded into computer games are not transparently or unproblematically reproduced at particular moments of game play, and yet the game does structure action at local sites of consumption. What are some of the relationships between the stabilized technology of the computer game and the local, idiosyncratic, and often unpredictable sites of consumption? And how do computer games both reproduce existing media content, and reshape it into new kinds of interactive resources? The second level is that of technically enabled subject formation. The subjectivity of the player, as she couples with the enabling technology, is a key nexus for the reproduction or change of media content. How are the consumption of these new media tied to the learning and subject formation of a new generation of techno kids? This paper works through ethnographic case

studies in order to address and integrate these levels of sociocultural structure and local action and subjectivity. This paper is a brief tour through these some of these issues as they emerged in my dissertation work, through the vehicle of two case studies.

The examples are drawn from two years of fieldwork with the Fifth Dimension (5thD) project, a network of afterschool clubs across the country and at a few sites in Mexico, Russia, Israel, Sweden and Australia. My work was primarily with two sites in Southern California, where I functioned as a participant observer, and where my research team collected videotape of kids' and adults' play with computer games. The clubs are located at community centers equipped with computers and educational games, and are staffed by undergraduate tutors who are taking a course at a local university.

The ways in which games in the 5thD produce certain subjectivities and cultural codes is complicated by the multivocal and polymorphous quality of interactive media, as well as by the diversity of kids and their ways of playing. The games draw from and invite reflection on varied aspects of social life, and any single game can produce unexpected sets of meaning through the course of everyday play. In the 5thD, and in interaction with the educational software used there, kids are encouraged by adults to orient toward successful completion of the games, in the service of intellectual development. At the same time, the kids are participating voluntarily, and are looking for fun activities to share with their peers and tutors. So while codes around education are dominant at the clubs, the activity system and games also offer ample entertainment opportunities.

In my description of kids' subject formation and learning with computer games, I've introduced some descriptive terms which are motivated by an Althusserian notion of interpellation (Althusser, 1969) , augmented by some of Michel de Certeau's formulations (de Certeau, 1984). Althusser's now famous figure of a police officer hailing one in the street, and the subsequent turn in response, illustrates an act of recognition, where one's subjectivity is shaped in relation to a powerful and existing social formation (Althusser, 1969) . With mass media commodities like computer games, we might considered the stabilized text and technology as a similarly powerful formation, able to hail, interpellate, and construct subjects in relation to its preformulated content. At the same time that we recognize the powerful effect of reified systems of meaning and subject formation, we might also consider some of de Certeau's theorizing (de Certeau, 1984) , where he discusses that creative and ad hoc responses of readers to a

text, suggesting that consumers or audiences might reshape and appropriate given meanings for local and opportunistic ends, if not openly talking back to the authoritative text or figure. Depending on the consumer or subject's response, dominant, alternative, or contradictory sets of meanings may be reproduced, and different subject positions instantiated (Hall, 1993) .

While computer games and kids may not appear immediately analogous to police officers and potential offenders, the notion of interpellation, of being called, hailed, invited, or even cajoled into a preprogrammed, prestructured set of meanings and social locations, is one of the central features of kids play, especially when one focuses on how games participate in learning and development. The question of interpellation brings up not only questions around how kids form their subjectivities in relation to existing social and cultural formations, but also questions around how those same social and cultural formations are reproduced, reshaped, and challenged as kids play. With interactive media commodities, it is crucial to keep in view both the centrally produced and stabilized nature of its content, as well as its interactivity and malleability at sites of consumption. While a viewer of, say, a movie might be aware of the vast technical apparatuses that produce the effects on a movie screen, computer gamers are able to actually engage with and manipulate this technical substratum, moving fluidly between the narrative features of the game and technical and interactive layers that animate and support the fantasy environment. Some examples should bring this dynamic to light.

The two cases I would like to present are of two kids playing two different games, *The Island of Dr. Brain* and *SimCity 2000*. *The Island of Dr. Brain* and *SimCity 2000* form a contrasting set for looking at different subject positions made available through educational games. *The Island of Dr. Brain* involves solving a series of puzzles and math problems, embedded in a fantasy scenario of exploring an island. The game mobilizes a fairly traditional educational code, which frames the player as a test-taker, albeit couched in a playful idiom. Responding with the correct answer to a cognitive puzzle is always the necessary condition for moving ahead in the game, and continuing dialog with the machine. For every puzzle that is solved, the player gets an achievement "plaque" as well as points that are tallied at the end of the game. By contrast, *SimCity 2000* is an complicated simulation toolkit, which enables the player to build and administer a virtual city. The game constructs the player as the mayor of a city, and the game goals are open ended, and revolve around constructing and authoring a

simulated city. While still educational in the sense of fostering intellectual development, *SimCity 2000* does not mobilize a testing-oriented code, but rather hails a subject that is a builder and producer of meaning within a certain space of possibility. *SimCity 2000*'s educational ethos is thus closer to a constructivist orientation, where kids are encouraged to construct their own imaginings through a set of enabling tools.

As with *The Island of Dr. Brain*, players of *SimCity 2000* also need to spend substantial time decoding the structure of the game: figuring out how to use the toolbar, understanding how the game is sequenced, etc. What is different between the two games is that while the structure of *The Island of Dr. Brain* is based on procedures, problem solving and inputting correct answers, the structure of *SimCity 2000* is based on tools with particular functionalities, which can be used in a myriad of ways and toward different ends. In terms of subject formation, players of *SimCity 2000* are positioned as constructors of meaning within a given scenario. The point-of-view is of an omnipotent mayor, rather than a lab assistant that follows a trail of partial revelations constructed by the more powerful "Dr. Brain."

Given certain codes and subject positions embedded in the games, this content is only partially determining of what codes actually get taken up through the course of play, and how subjectivities are formed. The two cases of kids that I am calling "Andy" and "Ian" provide multifaceted examples of how certain game codes are taken up in processes of subject formation. Both of these kids, through the course of over nine months at the club, developed intense relationships with *The Island of Dr. Brain* and *SimCity 2000* respectively. Both of these kids use the games as vehicles for their own identity work, for building relationships at the club, and for reproducing and instantiating certain cultural codes. The case studies are specifically about these kids' relationships with these particular games, and are not meant as descriptions, in any complete sense, of either the kids identities or the inevitable outcomes of play with these games. The cases are a window into how culture and subjectivity is produced and reproduced through play with computer games, examples of the everyday processes enacted in innumerable contexts that sediment into durable cultural categories and social structure. They are also examples of the particular ways in which computational media interpellates its consumers, by presenting a resilient set of meanings and resources that are taken up and manipulated by the player. The cases are small examples that, in and of themselves, are not determining of either identity,

meaning, or structure. They are relatively insignificant events in the lives of the kids and in the production and consumption of the games. Instead, it is through the repetition of similar cases by multiple kids at multiple sites of consumption, that result in the durable effects of computer games in social life, and appearance of mass media as "facts of nature" in kids' lives.

Andy and The Island of Dr. Brain

The first case is of Andy, a twelve year old who, through the course of a few month, becomes established at the club as an expert at *The Island of Dr. Brain*. The first set of examples is from the day when Andy completes the whole game sequence of *The Island of Dr. Brain* during one club period. He has played bits and pieces of the game previously with other kids, but this is the first day in which he gets sustained time with the game, and, with adult help, moves through puzzle after puzzle. Andy has a reputation at the club as academically competent, especially in the area of computer literacy. In fact, he sometimes is described by undergraduates as too smart for his own good, demanding recognitions of mastery, such as the completion of certain game levels, when they feel it is undeserved, or trying to trick new undergraduates into these recognitions. After his successful completion of the game, Andy becomes known at the club as an expert at *The Island of Dr. Brain*, and appears frequently in subsequent tapes of the game, helping or heckling other kids. Andy provides a good case for observing a child who orients quickly to the academic goals of the game, of subject formation in terms of a school-like educational code. Some strips of activity have been selected from our video record, as examples of interpellating moments in Andy's game play. While processes of interpellation are constant throughout everyday social life, certain kinds of interactions (such as Althusser's example with the police officer), exemplify and make visible the codes being mobilized (the hailing call), as well as the response to the mobilization (subjectification). The clips have been chosen with this in mind.

In this first example, Andy has just begun to work on a puzzle which involves identifying the chemical code for elements in a set of objects, a tin cup, a zinc bar, etc. [Figure 15]. When the puzzle pops up, he reads the instructions, and then tries clicking around to determine the nature of the task. The adults he has been working with have been temporarily discussing other matters, but he calls them back to the task with a question:

A = *Andy*

Am = *Amy (adult)*

N = *Nicole (adult)*

- 1 A: What am I supposed to do? I don't get this.
- 2 N: OK did you analyze it? It says: "These chemical elements..."
- 3 A: [pulls down another screen of directions and reads, moving pointer over lines]
- 4 N: Oh, you're doing Trace Elements OK, here.
- 5 A: Ahhhh! I see. [Starts to read the description of the element to find. The object under question is a zinc bar.]
- 6 Am: Oh, do you get the hints?
- 7 N: "Blank" -oxide. [referring to the description, which gives a hint that the answer is a "____ oxide"]
- 8 A: Carbon. Blank? Blank?
- 9 Am: See the blank here? (points to screen) They're saying fill in the blank.
- 10 A: Yeah, I know.
- 11 N: It's like the sunblock people put on their face....you know people put it on their nose...
- 12 A: Yeah what is it?
- 13 N: What is it called?
- 14 A: SPF.
- 15 N: No. There's a thing that completely blocks it out...
- 16 A: What? Blank?
- 17 N: Zinc-oxide, maybe?
- 18 A: Ziiiiinc...
- 19 N: Have you ever heard of that?
- 20 A: (nods)
- 21 N: It's the really white stuff...So you have to find that.
- 22 A: What's the "Z"? [pointing to "Z" in table of elements]
- 23 N: Go up one? That's the zinc, see it up on top?
- 24 A: [select Z for zinc, and gets the first element identified correctly] Allright.
- 25 N: OK, now you're doing the next one. It's two percent. It says "These chemicals are present only in minute amounts. The analyzer cannot trace them." So, that's the hint you got before, which is the Trace Element, which means there wasn't enough of them to pick up.

26 A: [selects "Trace Element" and successfully completes analysis of the first object]
Alllright. Zinc Bar...[places zinc bar to the side, and puts tin cup in the analyzer] This
is tin. I know it already. Tin...

In this strip of activity, Andy orients quickly to the suggested task structure of the overall game with a new problem: read the directions, determine what the problem is, get the correct answer to the problem, and display knowledge. The hail, or call to action by the game, is thus: process procedure, execute procedure, solve problem, record solution (fill in the blank). When Andy falters in determining the procedure, he enlists the help of the adults: "What am I supposed to do? I don't get this" (line 1). Andy and Nicole orient to the instructions, and then, the initial recognition occurs, "Ahhh. I see" (line 5), as he is able to decode the instructions and recognize the call for action. Both Andy and Nicole then shift their orientation toward the content domain and solving the problem,: What kind of oxide is it? (lines 7-10). They need to fill in the blank, the invitation by the game to respond to a pre-programmed structure of meaning. Nicole, then, tries to get Andy to fill in the answer, by providing some hints, though she eventually must give him the answer: zinc (lines 11-17). Alex responds with another act of recognition: "Ziinc," in an extended, low tone, and nodding to Nicole's confirmation that he understands the answer (lines 18, 20). He thus positions himself as the subject, who has responded to the call for a particular answer. For the remainder of the clip, Nicole guides him in locating zinc on the list of elements, and he inputs the answer: "Allright" (line 24).

This mode of interaction around the puzzles, where Andy decodes the instructions, executes them in solving the puzzle, completes the puzzle, and moves quickly on to the next, is typical of his engagement throughout most of the game. As he works through a puzzle, each successfully completed step is punctuated by an "Allright," or "Ahhh!" of recognition. In this way, he repeatedly enacts the subjectivity of one whose knowledge and competence is being tested. This mode of activity is clearly in line with many of the dominant and traditional codes of educational practice, including drill-and-practice forms of instruction. Andy's brief utterances of recognition are subtle but repeated frequently. On other occasions, Andy makes more explicit statements that point to his increasing subjectification in the terms of academic achievement as suggested by the game. In the following clip, from the same day as the previous clip, Andy has just completed the Tower of Hanoi problem in *The Island of Dr. Brain*. Amy has been

engaged with another child while he works on the puzzle, and he tries to draw her attention to the fact that he has solved the puzzle, self identifying himself as a "smooth" problem solver, displaying his competence:

A: Now I have it solved! (turning Amy who is still preoccupied with other child) I got it solved...

Computer: Congratulations! You've earned a bronze logic sequence prize!

A: (still trying to get Amy's attention) I did it...

Am: (turning back to Andy) Sweet.

A: I'm smoooooth

Am: How many moves did you do it in?

A: 17

The particularly singular and linear goal orientation of *The Island of Dr. Brain*, encourages kids to input correct answers, often at the expense of engaging with educational content. Andy is a particularly adept strategist in this regard. In many instances of his play, I have marveled at how he was able to quickly identify the minimal conditions for solving a task, delegating as much problem solving effort as possible to other helpers in the neighborhood, and getting through the problem. This next example is from one of the first instances of Andy's exposure to *Island of Dr. Brain*. Andy is working with another kid at site, who I will all Herbert, and they are just beginning "the rat-driven elevator" problem [Figure 16]. Nicole, the site coordinator, occasionally checks in on their play. This is the first time for either of them to encounter this problem, and they are exploring and trying to decode the problem space. The task is a complex one. They are asked to determine how many spokes, on two different gears, are required to balance a counterweight with the weight of the elevator. They spend quite some time inputting different answers and trying to figure out the nature of the problem, enlisting Nicole's help. They try various solutions, but the elevator continues to either fly into the ceiling or the floor, toppling the crash-test dummy inside. Eventually, they begin to enjoy simply watching the dummy crash time after time. After almost 10 minutes, in which they continue their trial and error tactics, they finally happen on the correct answer. This clip is of this concluding sequence:

A= Andy

H= Herbert

- 1 A: OK, 56. 51 and 17. you have 17 and 48. 48 OK lets try it.
- 2 H: Yeah
- 3 A: I love doing this
- 4 H: Yeah this is it. Yep. Nope. nope.
[elevator crashes]
- 5 A: Ahhh!! I love that
- 6 H: It must, it must be 51. Oh, man
- 7 A: This is so hard
- 8 H: 18 teeth. Watch this, watch this, watch this.
- 9 A: You think this is right? No, he got tired. [elevator crashes] Ahh!!! (laughs) I love this!!
- 10 H: 8, 21. Nooo!!!!
[elevator crashes]
- 11 A: I love doing this.
- 12 H: 13. yea. [elevator is lowered successfully] Oh my gosh, we got it, we got it!!! Yeah,
Nicole, we got it
- 13 N: Allright!
- 14 A: and we did it by guessing too!
- 15 H: I know, huh!
- 16 A: We're so good. Yeah, we can ride it.
- 17 H: Yeah.

This clip records a gleeful moment, with Herbert calling out to Nicole about their accomplishment, and the two boys mutually congratulating themselves (lines 12-16). While they are still proceeding along the sequential logic of the game, they have managed to claim a small space of achievement for themselves, which is not tied to the procedure for action as suggested by the game design. They are still, provisionally, heeding the call to action: working on decoding the instructions and getting the correct answer. Most importantly, they persevere and achieve mastery, at least in the technical terms defined by the game, which are exclusively around inputting the correct answer to a problem. In a subsequent day, Andy revisits the same problem, and mobilizes the guessing tactic that he developed with Herbert, abandoning any attempts to decode the nature of the problem and reproducing the guessing heuristic in another context.

A= Andy

Am = Amy (researcher)

- 1 A: Now I can open it. [opens door to rat-driven elevator problem] I LOVE this puzzle! This is so funny. We just guess. Me and my friend did it and we just kept guessing.
- 2 Am: Oh really? It kept kicking me out...
- 3 A: Watch this...
- 4 Am: So what you do is (pointing to screen) you divide the elevator weight into the counterweight.
- 5 A: [inputs a solution, and the elevator crashes]
- 6 A: Oh no!
- 7 Am: Crash test dummy!
[game states correct answer, and then resets puzzle]
- 8 A: Oh! It was twelve and twenty four. Oh, I see. [Game has kicked him out of the puzzle and he re-enters the puzzle]
- 9 Am: How many times does 428 go into 1284?
- 10 A: I have no idea. I'm just guessing. It works. He eventually did it... Yeah! [elevator is lowered successfully]. Am I good or what?
- 11 Am: Pure luck.

In this clip, Andy begins by announcing to Amy his guessing tactic. While Amy, in turn, repeatedly tries to get him to orient to the procedure as suggested by the game and the subject position of problem solver: "So what you do is you divide the elevator weight into the counterweight" (line 4). "How many times does 428 go into 1284?"(line 9). This disjuncture, between the narrow definition of achievement called forth by the testing situation (input correct answer), and the more demanding definition of achievement called forth by Amy (follow the correct procedure before inputting the answer), points to a gap between the formal measure of achievement and the process that is meant to underlie the measure. The work by Andy to exploit this space between a formal recognition of mastery and an actual expenditure of personal effort, is similar to other test-taking tactics that are developed by kids who learn to "play the system." When interpellated by a testing formation, one tactic is to guess strategically.

A few months later, Andy is well established as the site expert on *The Island of Dr. Brain*. Fieldnotes contain frequent references to him checking in on other kids' play of the game, often displaying his knowledge and giving the

answers even when his presence was not invited by the other kids. In the following clip, Andy's help is being actively solicited by a younger child, an eight year old, Chris, who has also appeared in the previous chapter. During the course of a day's play, Andy makes frequent appearances over Chris's shoulder, giving him instructions on how to play. This brief clip illustrates a typical sequence of interaction in this tape, where Chris encounters a puzzle, Andy identifies himself as an expert, and Chris solicits help.

C= Chris

UG = undergraduate

A = Andy

C: Now we are here again.

UG: Oh that's hard.

A: This is hard. I'm pretty good at this though.

C: OK, I need some help.

A: Allright

Andy's sense of mastery of the game is thus documented in the video record through the repetition of moments of interpellation, recognition, and alignment with game codes, leading to increasingly public and open displays of game mastery to other kids and adults at the club. His play with this game can be understood almost entirely within the logic of achievement, competition, and game goals. I am not suggesting that this process is linearly progressive, but rather it is a sedimentation of repeated acts of social recognition. Andy is repeatedly hailed as a particular kind of learner by the game and others at the club, and repeatedly recognizes the hail, and subjectifies himself to this shared sociotechnical formation. His self-recognition as a knowledgeable subject is part and parcel of recognition by others of his subjectivity, a game and technology that produces the conditions for these recognitions, and an ongoing cycle of interpellation and knowledge display. These processes of interpellation, recognition, and alignment have the effect of producing Andy's subjectivity as well as reproducing the educational codes embedded in *The Island of Dr. Brain*.

Ian and SimCity 2000

The second case is of an eight year old, Ian, and his play with *SimCity 2000*. This case highlights the ways in which kids not only claim slivers of software functionality for non goal-directed play, but also the ways in which they substantially challenge basic educational premises. This kind of positioning resonates with what Stuart Hall has called an "oppositional code," which openly confronts and contradicts the meanings suggested by the mass media text and other authority figures (Hall, 1993) . I use the term disobedience to refer to these oppositional practices, strategies that actually challenge the space of "the proper" by constructing or referring to a counternarrative. This is importantly not an atomized practice of secretive appropriation, but is rather an attempt to claim an alternative social space that, in turn, interpellates others.

Certain games enable consequential disobedience to educational codes in the course of game play. With *The Island of Dr. Brain*, there is little space for challenging educational codes that still involves interaction with the piece of software. Since *The Island of Dr. Brain* offers little space for interaction outside of puzzle solving, it is not a space that is amenable to the performance of alternative or oppositional meanings. Kids might very well decide to play another game or engage in a different activity altogether, as a form of resistance to *The Island of Dr. Brain*. One might also imagine opposition to occur if a kid were to challenge the premise of the test-taking code, suggesting that it is irrelevant, boring, or unfair. We have not, however, recorded any instances of this kind of disobedience in the 5thD, most likely because kids are never forced to play any given game. By contrast, *SimCity 2000* is a game with very malleable functionality, which suggests a set of dominant constructivist and educational meanings as an urban planning simulation, but also calls forth the possibility of their disruption within the very space of the game.

In the 5thD, an orientation to entertainment (i.e., "fun") is actively encouraged, but ultimately in the service of a reformist educational project. "Entertainment" is clearly not a monolithic category within mass media forms. While some entertainment idioms are legitimized within the 5thD project, action gaming idioms are explicitly excluded as too patently non-educational. At the same time, action entertainment idioms are constantly lurking in the ambient culture that kids participate in. While dominant in the arena of interactive media at large, action entertainment idiom's exclusion in the 5thD as non-educational, makes them resources for subverting dominant (educational) codes in this local context. The case of Ian and *SimCity 2000* makes clear this relational dynamic

between educational and entertainment idioms, in ways particular to the 5thD, but which point to the pervasive fractures in US culture between wholesome educational norms, and violent entertainment idioms.

Ian, the 8 year-old who forms the basis of this case study of *SimCity 2000* use, is a veteran of the 5thD, and a Young Wizard's Assistant (YWA), which means that he has completed the all the games in the maze, and has earned the right to play the high-end games at site. It also means that he is responsible for teaching others. At school, Ian has been flagged as a problem child, and diagnosed with Attention Deficit Hyperactive Disorder, and at home, he is subject to a behavior modification schedule. At club, he is known as a game expert who can control the attention of both other kids and adults. Despite his recognition in the club as a game expert, undergraduate fieldnotes document how Ian doesn't think he is a smart kid. When an undergraduate compliments him as "smart" in relation to his game expertise, he reacts with surprise, saying that he doesn't think he is smart because he has been held back in school (Gack In Preparation).

Ian has a particular fascination with *SimCity* and *SimCity 2000*, and is known for his intense engagement with the game, usually at the expense of learning other games or working with others at the club. Fieldnotes and his letters to the 5thD wizard, the mythical entity that oversees the club, describe his constant negotiation, pleading, wheeling and dealing in order to play *SimCity*. *SimCity* was a game reserved for kids with special permission or Young Wizard's Assistants (YWAs), the kids who have completed the 5thD curriculum. Thus, before becoming a Young Wizard's Assistant YWA, Ian was largely excluded from playing. During this period, Ian barrages the wizard with special requests, and pleads with the site coordinator to be able to borrow the software to play at home. Video and fieldnotes document him lurking at machines while other kids play, tossing in suggestions, and futilely pleading to be able to play. After becoming a YWA, largely out of motivation for unrestricted play with *SimCity 2000*, the struggle is to disengage him from the game enough so he can teach others how to play. These kinds of struggles, where Ian emerges as a devoted and engaged member of the club, while persistently pushing against club rules and constantly demanding attention and creating trouble, is typical of Ian's 5thD identity.

One day of Ian's play with *SimCity 2000*, captured on video, is particularly illustrative of Ian's subjectivity at the club, and his play with *SimCity 2000* after becoming a YWA. The scene opens with Ian sitting in front of the computer,

interacting with a well-developed city marked by an enormous airport and waterfalls stacked in a pyramid formation. There is another boy sitting next to him, observing his play and making occasional suggestions, as well as an audience of other club participants including the videotaper, undergraduates, and other kids and adults walking in and out of the scene. He busily makes a railroad system, water pipes, buildings, and a power plant, and worries about such things as whether his people are getting enough water, or whether power plants need to be replaced. Soon, the director of the club appears, and tries to get Ian to teach others how to play (line 1), but Ian deftly deflects this accountability to the club norm of collaborative learning, with the support of another kid (line 2):

I = Ian

M = Mark (a younger boy)

D = site director

- 1 D: Because you're not going to be sitting here all day just doing it by yourself. So other people watch you, it's not fair to other people.
- 2 M: No, we, we, we, we're not supposed to be able to play. We're not supposed to play.
- 3 D: Why aren't you supposed to play?
- 4 I: They're not.
- 5 M: If you're not a young wizard's you can't play this.
- 6 D: But if you're a Young wizard's assistant and you're not teaching anybody else the game then you can't play it either.
- 7 M: He's teaching me
- 8 I: (unintelligible) said I could
- 9 D: OK good, alright, check it out then.
- 10 I: Anybody ask me any questions.

Ian's tactic is momentarily successful; he passes as a teacher, and resumes his game play. After about twenty minutes, however, he is interrupted by the director of the club again and asked to teach a new undergraduate how to play the game. "I'm not kidding either," the director stresses, "her grade depends on what you teach her, so she'd better do a good job, okay?" After a few moments, another boy suggests, "Show her a disaster. Do an airplane crash." Ian responds with enthusiasm, saves his city, and announces, "Ha ha ha disaster time!!"

Disaster time involves an escalating series of special effects in which the city is first invaded by a space alien, then flooded, set on fire and subjected to an earthquake and plane crashes. After the city is in flames, Ian begins to build large buildings within burning areas, to induce more and more spectacular explosions. He turns from blowing up the most expensive of the possible buildings to blowing up colleges, fusion plants, gas power plants, and microwave power plants. His final achievement is to blow up a row of fusion plants lined up in domino formation [Figure 17]. Despite interventions by multiple adults, trying to get him to teach the undergraduate how to *build* a city, Ian persists for over twenty minutes in disaster mode.

After Ian is finally displaced from his city at the repeated insistence of many adults, he starts a new city for the undergraduate, and they work on it, together with another kid, for the remaining forty minutes on tape. During this period, Ian returns to construction mode, building buildings, power plants, the mayor's house, a railroad, and a subway system. Significantly, however, he begins this new city by typing in a secret code that gives the player unlimited funds and opens access to all of the special rewards such as space-age buildings, the mayor's house, and all of the high tech power plants. By typing in the secret code, he can circumvent the game parameters that demand attention to fiscal responsibility and gradual urban growth. The game is transformed from an urban planning exercise to a palette for the free construction of any desired elements.

Ian uses the backdoor code as a way of expanding the space for personal agency, and he also works toward building a network of co-conspirators that will reproduce this alternative mode of game play. In this clip, he has just been working to build a subway system, but has difficulty, and needs to keep bulldozing and reconstructing. This leads to a discussion of how much money he has wasted, but how it doesn't matter, because of his secret code:

I = Ian

UG = undergraduate

- 1 I: We wasted hundreds and hundreds of dollars. I don't believe it, we just wasted about 500 thousand dollars trying to connect it, and it was already connected.
- 2 UG: whoops. oh well.
- 3 I: That was a big mistake.
- 4 UG: That's OK. we still have tons more money.

5 I: Yeah tell me when you want some more. More!

6 UG: Are you going to show me how. You're not going to show me the secret? Why not?

7 I: Promise you won't tell anybody?

8 UG: I won't tell anybody.

9 I: OK. Porntipsguzzardo.

10 UG: What did you push, what did you press, redtips?

11 I: porntipsguzzardo.

12 UG: Wait, I don't remember.

13 I: Then you keep pressing guzzardo

14 UG: Where'd you learn that?

15 I: Somebody taught it to me.

16 UG: So you go...

17 I: Every time you type that it gives you another 1/2 million dollars. [typing "guzzardo" which continues to add money, as citizens cheer]

18 UG: Oh, wow. I don't think I need any more. Wow, they're cheering up a storm on the screen. Uh, look at how much we have. I don't think we need anymore.

19 I: That's not very much.

20 UG: Not very much? So it's porntips, then how do you spell the last guzz --

21 I: Guzzardo.

22 UG: Guzzardo.

23 I: Guzzardo, double z

24 UG: Double z. Thanks. Now I won't be...

25 I: [continuing to type code] Is it changing right now?

26 UG: Yeah, totally.

27 I: How much do we have?

28 UG: Here, we have enough, we're at 20 million.

29 I: That's not very much. I had 28 million.

30 UG: 28 million?

31 I: [continues to type]

32 UG: You just hear them screaming and screaming. They're going to lose their voices they're screaming so much.

33 I: 29

34 UG: That's, that's plenty. You want to just go up to 30? That's good.

35 I: Good.

36 UG: We have so much money, that we won't even know what to do with it.

37 I: I know.

In this sequence, Ian has start run out of money from building his subway (line 1), and asks the undergraduate when she wants more money (line 5). The undergraduate had previously noticed him typing in a secret code to get free funds, so she takes this as an opportunity to ask him if he will show her (line 6). While showing some resistance at first, he tells her to promise not to tell anyone (line 7), takes a quick look at the video camera, and shows her the code (lines 9, 11, 12). He then continues to type the code until they reach thirty million dollars, a very large sum in the *SimCity 2000* economy (line 38).

Ian's (not so) secret transmission of illicit knowledge is not restricted to this one instance on tape. On another day, he has been asked to visit a neighboring afterschool club to teach kids how to play *SimCity 2000*. His first act, upon arriving at the club, is to teach the kids the secret code, thereby subverting the possibility that these kids might engage with the game as an educational urban planning simulation. He goes on to show them the coolest buildings, and they experiment together on pushing their city to extremes -- painting their initials in land formations, seeing if their city will survive various disasters, building a prison fortress reminiscent of Alcatraz, and building an enormous airport. He shows him various aspects of the game functionality, how to zoom in and out and rotate the grid, how to get information on various industries, or a description of the space age buildings. When one of the kids notices that the game has posted a suggestion that there be a transit system, Ian informs him that he doesn't need to worry about things like that. After all, with the secret code, there is no need to generate revenue, and hence no need to keep one's city happy and well populated.

Another twist to this story is the fact that the video ethnographers also learned of the secret code through observations of Ian's play, which have in turn transformed our practices of game play and research. Subsequent research on the World Wide Web revealed that *SimCity 2000*, as well as many other games have a number of what developers call "cheats" and "easter eggs." An easter egg, in contrast to other forms of cheats, is defined on one SimCity web page as "a pre-programmed, hidden and undocumented feature inserted by the programmer for their own enjoyment." One way or another, Ian was able to tap into this "oppositional" (vis-a-vis the educational encodings of the game) knowledge, and transform the game into a radically different space of possibility.

Instead of claiming slivers of time to construct, say, a frivolous freeway, before having to start over, Ian is able to freely construct and blow up as many fusion plants and large, space age buildings as he desires. He has wholly escaped the subjectivity of a responsible and constructive mayor, and instead, is able to smuggle in an entertainment-based code, while still passing as a *SimCity 2000* expert at the 5thD. Through these processes, Ian is still clearly learning, and constructing his subjectivity in relation to the game and as a recognized expert at the game. As he continues to play through the second year that we observed him at club, he begins to push the technical parameters of the game even further. For example, he will design experiments to test how many earthquakes different buildings could withstand, or repeatedly testing the flood function to see how they originate, spread, and whether they succeed in dousing fires.

The codes that Ian mobilizes are not individualistic or antisocial, but rather are part of an alternative community of practice (Lave & Wenger, 1991), one that includes other kids as well as *SimCity 2000* game developers and the action gaming industry. In contrast to the case of Andy, Ian's play largely ignores the goal structure of the game, and moves fluidly between the logic of the narrative (city administration), special effect (disaster time), and technical logic (cheat codes). Ian's subjectivity is not one of a "smart kid," an achiever and reproducer of a conventional educational code, but is one of a consummate hacker and game master, crucially invested in the specific and multi-layered aspects of a complex game, rather than seeing the game as a singular vehicle to "beat." His play is repetitive and depth oriented rather than sequential and goal oriented. As part of his play, he enacts and produces this disobedient but masterful subjectivity, and reproduces both codes of action entertainment and codes alignment with the practices of game production (i.e., expert knowledge and technical mastery).

In different ways, Andy and Ian are both working to produce their subjectivities, as well as reproduce and produce certain cultural codes, by using the malleable symbolic and technical resources offered by computer games. Beginning with the problem of how local action is related to stabilized sociocultural structure -- whether embedded in computer games or lurking in the ambient culture -- these cases have identified kids' ad hoc play and subject formation as a nexus through which meanings are both reshaped and reproduced. The dynamic interplay between stabilized and meaning-laden technologies, kids, with all their unpredictable idiosyncrasies, and particular

situations of consumption, produces effects that are often surprising or unpredictable, but are nonetheless part of the production and reproduction of durable cultural codes and social categories, whether they are about what constitutes educational or entertainment media, or a model or problem child. With respect to the particular technical and interactive features of computer games, I have also tried to suggest that the narrative content may be familiar and reproductive of other forms of media content, but the forms of engagement with the technical strata of games are unique to the new medium. Kids are not only reading, viewing, and hearing media content, but are actively locating themselves as agents or subjects within the fantasy environment, and shaping the progress of the game in ways that demand engagement with both technical strata and narrative content.

The cases are meant as an illustration of the links between the everyday processes of informal learning documented by the video record, and theories of culture and social structure posited by work in political economy and cultural studies. The challenge has been to manage the balance between describing the ways in which culture is systematically reproduced through educational games and interpersonal interaction, while at the same time taking seriously the tactics that kids mobilize to reclaim and reshape their possibilities for meaningful action. By drawing from both a theory of interpellation, that stresses the powerful effects of existing social structures, and theories of tactics and disobedience, that stress the possibilities for resistance to cycles of reproduction, this description has attempted to negotiate this balance.

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