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Probing Interfaces: New Games, Spacewar!, and the Gamification of Complexity

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"Theory of Game Change," written by Stewart Brand in 1976 for the New Games movement, provides one of the earliest examples of digital game logics being brought into real-world use. This article focuses on this event to reconsider gamification's play on complexity. Applying Spacewar! to New Games, Brand sneaked in an epistemology of the computer interface, breaking real-world games down into parameters to modulate and probe complex systems. The result carried a utopian cybernetic imaginary: Changes in rules were meant to motivate spontaneous and harmonious adaptions to new situations. The black-boxing of complexity required of this process, however, carries the solutionist impulse that would later form the main critique of gamification. Yet, focusing on the critique neglects the relations that gamification has with complexity and limits the critical potential that the term presents as a demand for ethical accountability.

Keywords: gamification, complexity, AI ethics, New Games, Spacewar*, Stewart Brand, interface*

> When Gold writes that the toy blocks "really do sing and dance," I am struck by his careful use of the phrase "really do" . . . In the "really do" scenario, it is not therefore a complete surprise when the objects' performance begins. It is, instead, hoped for, wished for, and then confirmed. I find this final moment in Gold's essay to be an excellent example of magical thinking: a fantastic, imagined event seems to manifest in physical reality exactly as it was first conceived in mental space.
>
> —Jane McGonigal, 2006, "This Might Be A Game," p. 32

The section that gamification guru Jane McGonigal references in her 2006 dissertation comes from a thought piece authored by Rich Gold (1993), a member of the Xerox Palo Alto Research Center who contributed

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to the development of ubiquitous computing in the 1990s. His article, "This Is Not a Pipe," offers a philosophy of design that uncannily presages how gamification would gain prominence in mainstream culture nearly two decades later. Where game designer Jesse Schell (2010) used a smart toothbrush at the 2010 D.I.C.E conference to introduce how networked sensor technologies could detach ordinary objects from their expected use, Gold (1993) had relied on René Magritte's famous pipe. Objects are but "pelt" and "skin," Gold (1993) insists, open to any number of delightful digital functions. A pipe might be used for smoking, but embedded computing capabilities could easily make it a locative device, phone, and medical monitor.

From smart pipes to toothbrushes, this intellectual current reflects a genealogy to gamification that embeds hope in the possibility of design to enchant. But while Gold (1993) locates enchantment in the capacities of computing technologies to enrapture the passive user, McGonigal (2006) situates it in something more profound: a psychological transformation that enables radical material change. If design affordances work by following a dominant cultural conceptual model of use, then *unperceived* affordances—affordances that are rich for interaction but oppose normative expectations of use, like a locative pipe—provide an opportunity to challenge not just how the world functions, but what the world can be. "Unperceived affordances are in fact gameplay affordances" (McGonigal, 2006, p. 73), she writes; they are transformative devices that can make people playful and interested in using their untapped imaginations to rethink their reality.

I begin with the early work of McGonigal to identify a critical ambivalence that lies at the heart of well-established gamification debates. As Walz and Deterding (2014) have noted, much of the discussion around gamification can be categorized through a binary of good and bad—with the good being game culture and the bad, gamification, which has appropriated the former for corporate gain. Among other things, gamification is accused of encouraging exploitation at the expense of radical thinking (Kirkpatrick, 2015; Sicart, 2014); of surveilling (Schrape, 2014); and of having goals that are short term and didactic (Cassone, 2017)—all of which bastardize everything laudatory about games to make them simple and commodifiable (Bogost, 2014).

Various commentators recognize that the binary obscures the valences that lie between game mechanics and culture, the *ludus* and the *paidia* (Cassone, 2017; Walz & Deterding, 2014). Yet, even with this recognition, the binary continues to structure an idea of what "good" games should be. To take one example, in an attempt to heed the call to "rethink gamification," Ruffino (2014) draws from a New Materialist framework in arguing that we should think of games as agentic, as things that transform how we understand the world and that can offer experimentations with radical futures. Ruffino's (2014) emphasis on a more complex understanding of games responds generally to the purposes of critical design that I support. Still, the statement did seem inadequate as I read McGonigal's (2006) dissertation, which elaborates a prescient, object-centered framework that recapitulates *radicality as the basis* for what we conveniently dismiss today as "gamification." Similar to how Ruffino (2014) prized the repurposing of games to offer a different politics to worldmaking, McGonigal emphasized the potential of computing interfaces to bring forth an openness and inquisitiveness to how the world can be interfaced with and transformed.

The ambivalences charted here provide a useful space to interrogate the common object that underlies the good/bad binary of gamification—the computerized interface that forms the cultural unit for

accommodating both the radical potentiality and control of computing. To discuss this, I look into an early mass instantiation of gamification: the application of ur-videogame Spacewar! in the popular real-world movement of New Games beginning in the late 1960s. No historical account of gamification that I am aware of has pointed to the transformative conductivities of the digital and the analog with these two particular cases (Andersen, 2009; Deterding, 2014; Turco, 2014)—a lapse that is especially significant given that New Games is lauded in McGonigal's (2011) *Reality Is Broken* as a revolution with an "important and lasting legacy" (p. 143), significant to the influence on both games and society (Turner, 2006b). While attempts at gamification date further back—appearing, for instance, in "banana time" shopfloor resistance (Roy, 1960, p. 158) and Soviet productivity competitions (Nelson, 2012)—intersections between New Games and Spacewar! reveal specifically how early digital games had rendered thinkable the relationship between game rules and complex societal transformation.

This article develops this argument in two directions. First, it draws from historical documents, newspapers, and archival documentary footage to explain how Spacewar! influenced New Games. The key document used to link these two commonly separate events—countercultural icon Brand's (1976) chapter titled "Theory of Game Change" in *The New Games Book*—shows how Brand's encounter with Spacewar! at Stanford AI Labs transformed the ways that New Games is understood.[2] Brand saw changes to the rules of New Games in a form that was analogous to the game parameters coded into Spacewar!: They were *interface probes*, adjustable parameters that enabled players to experiment, learn, and spontaneously evolve with complex systems, building blocks for a new world order that prioritized coevolution. This instance of early gamification was an epistemic approach that encouraged New Games players to think of themselves as systems programmers, flexibly adjusting and experimenting with parameters of the game to test changes in the system so that they might configure a better world to inhabit.

In the second part of the article, I bring this epistemic approach to discuss contemporary instantiations of gamification. Underlying both contemporary gamification and New Games is an epistemic approach that I call the "gamification of complexity." It relies on the black-boxing of complex system causalities to present systems as responsive to the experimental adjustments of parameters. This is particularly evinced in the crowded dashboards of contemporary gamification programs, whose gauges, checkboxes, and pulldown bars evoke an imaginary of smooth technocratic control. Troublesome, intractable issues are shielded from scrutiny, and the suggestion is that societal and organizational change can be easily achieved with the alteration of parameters. This would subsequently account for the critique of reductionism directed at gamification, and its wane from rhetorical use. But the disappearance in the use of the term "gamification" brings its own troubling consequences—for the epistemology that undergirds the gamification of complexity would continue into computational designs without the term "gamification" attached. And so, the suppression of gamification ironically reflects the deflection of care and accountability demanded in the early instance of gamification that we see with New Games.

[2] Stewart Brand was involved until the first New Games tournament in 1973. The success of this event would develop into the New Games Foundation, bringing together people such as Pat Farrington, Burton Naiditch, and Bernie de Koven. The argument presented in this article centers on Brand's particular influence, which constitutes an early and small part of the full impact of New Games. For a timeline of New Games, see Strong (2019).

New Games and the Vietnam War

New Games was born as an idea in 1966 when Stewart Brand was asked to stage a public event for the War Resisters League at San Francisco State College (Fluegelman, 1976). However, while organizers were interested in Brand showcasing the futility of war, he was more concerned with the atrophying consequences of pacificism. The protesters, he thought, had gone too far by denying aggression in all forms:

> All the peaceniks I was dealing with seemed very much out of touch with their bodies in an unhealthy way. Consequently, they were starting to project a heaviness on a personal level that was just as bad as the heaviness we were projecting in Vietnam. (as cited in Fluegelman, 1976, p. 8)

To change their views about physicality, Brand introduced a number of games under the provocative rubric of "softwar." These games were designed to have "fairly intense physical interaction between players" (Fluegelman, 1976, p. 8), putting them in close contact, pulling and pushing, but it also emphasized qualities of fun, fairness, cooperation, and care. Like traditional sports, the games were meant to elicit "maximum performance," but maximum performance does not mean the self-interested use of force, as in the case of most competitive games. Instead, the goal is to play in harmony with opposing forces, to never use more force than "what your opponent can handle," because the objective is to experience the joy of playing together: "If you and your opponent ever stop enjoying playing, you've lost the game" (Fluegelman, 1976, p. 102). This meant that players would have to creatively internalize a degree of flexibility with game rules. A popular example referenced to is the tug of war. Since the first New Games Tournament, onlookers have been known to spontaneously join the team losing ground to keep the game going for hours (Strong, 2015). Playing rather than winning was the goal. As such, New Games spoke to an ethic to play that exceeds any given stipulation—it was an experiment into how the subversion of game rules can produce personal bonds, physical closeness, and new societal imaginaries (Binkley, 2007).

The ideas derived from organizing the War Resisters League event were transposed years later onto the first public New Games Tournament in 1973, held on the grassy 22,000-acre rolling hills of the Gerbode Preserve north of San Francisco City and attended by about 6,000 people (Berlinger, 2008). One highlight, Slaughter, took place on a large wrestling mat with two teams of about 20, on knees and barefoot. The rules were simple: Players scored points either by dunking their team's ball into the opponent's basket or by tossing everyone from the opposing team off the edge of the mat. As expected, Slaughter turned out to be an intense, frenzied, physical game. As rock music played in the background, people rushed toward one another, got their bodies entangled, and wrestled to push others out and keep themselves in (TVTV, 1973).

These ideas, which began with Brand and continued in other New Games tournaments and spinoffs, are emblematic of the countercultural politics of the late 1960s and after. Turner (2006a) documents that while the New Left (of which the War Resisters League was a part) was involved in what we might formally understand as politics—turning toward protests and formal political action to oppose nuclearization and the Vietnam War—the countercultural New Communalists had reached instead to "questions of consciousness and interpersonal intimacy" (p. 31), believing that "the key to social change was not politics, but mind" (p. 36). This served a timely purpose. Recalling the New Games event decades later, Brand expressed that the

War Resisters League had mainly consisted of "young men who were facing the draft . . . and what they needed to do was bodily fight and not get killed and not be involved in a big stupid mission" (Long Now, 2010, 4:06). Experimenting with the expression of aggression, therefore, was a way for them to play around with the rules of games, to creatively seek room for maneuver in what they could do if they were enlisted.

Spacewar! and Parameters

But how exactly did Brand come to articulate and comprehend these possibilities to consciousness change? His chapter "Theory of Game Change" in *The New Games Book* suggests that his encounter with Spacewar! played a significant role. Brand formally came across Spacewar! in 1972, when *Rolling Stone* commissioned him to cover the "Spacewar Olympics" held at the Stanford AI Lab (Monnens & Goldberg, 2015). At that time, *Spacewar!* had undergone several iterations. The game was first coded in 1961 on the DEC PDP-1 minicomputer at the Massachusetts Institute of Technology by Steve Russell, Martin Graetz, and Wayne Wiitanen. Designed collaboratively, Spacewar! developed into a two-player competitive game in which two spaceships fought against the gravity field in the center, while trying to shoot down their opponents. This basic game structure created for an engaging game that would still play remarkably well today, emulated on the Web browser (Landsteiner, 2016).

The *Rolling Stone* article would be widely remarked on years later for its cultural impact. Its statement that "hundreds of computer technicians are effectively out of their bodies, locked in life-or-death space combat" while "wasting their employers' valuable computer time" (Brand, 1972, para. 4) is often used to highlight the early romantic imaginings enabled by the computer as something that employees more versed than their bosses could appropriate for their own subversive use (Streeter, 2011; Turner, 2006a). For Brand, the Spacewar! encounter likely reminded him of what tried to accomplish years earlier with the War Resisters League. "There was an athletic exuberance to their joyous mutual slaying" (as cited in Baker, 2016, para. 11), he explains, an image reminiscent of the affirmative, therapeutic competitiveness of softwar. Much can be said about the synergies between these two events, but for the purposes of developing links to gamification,[3] I will focus on a specific component—the interfaces that enabled what Brand (1972) described as the "live" and "intensely interactive" gameplay experience of Spacewar!.

To begin, Brand's encounter of Spacewar! in 1972 was a version heavily modified by Ralph Gorin—a graduate student at Stanford—who coded it to accommodate several gameplay variations (Monnens & Goldberg, 2015). These variations appeared in a text-based menu at the beginning, where players had to input choices for variables—up to five simultaneous players, options for mines, partial damage, score displays, torpedo tubes, and randomized starting positions—before the game would begin. The interactivity of this process likely left an impression with Brand; in recounting his experience of Spacewar!, Brand (1972) begins not at the level of gameplay, but at the user-friendly interactive console that asked the player to key his preferences for the variables. Brand lists this interactive process carefully: The monitor flashed a

[3] The bodily experience of play in Spacewar! was also significant to the inspiration of New Games. As Brand (1972) would go on to lament in the article, by 1970, much of counterculture had lost its initial exuberant luster. And so, the computer, with its energizing dimension, was also looked on as a model for awakening the intensity of effects of the human body.

question, like the number of space mines wanted, to which the player offered a response. This was followed by other questions and player responses. After all the options were selected, Spacewar! would automatically incorporate the player's choices to present different play experiences.

Notably, Brand's Spacewar! encounter was unusual for its time. Most programs of the early 1970s, Hu (2015) writes, still functioned through batch processing in which punch cards or magnetic tapes had to be delivered to technicians for programs to be run; the results returned minutes, if not hours or days, later. Running Spacewar! as an interactive game—in which "the position of each person's spaceship showed up on-screen in a split second" (Hu, 2015, p. 39)—could only happen with the time-sharing technology developed at the Stanford AI Labs specifically designed for Spacewar! The way that Brand went on to describe the game illustrates his fascination with the immediacy that the easy input of variables provided. "*Immediately* [emphasis added] the screen goes dark and then displays," he writes. "Five different space ships, each with a dot indicating torpedo tubes are loaded, five scores, each at zero, a convincing starfield, and four space mines orbiting around a central sun" (Brand, 1972, para. 27). The results on the screen, the five players, visibility of scores, and the number of space mines were directly related to options that had been set a moment before—constraints that could be revised to produce an instantly different game.

Brand understood this rule-setting process through the broad computing term of "parameters." The concept of parameters was introduced by Spacewar! designer Russell, who told Brand that he had to "fiddle with the parameters" of Spacewar! to get "a really good game" (Brand, 1972, para. 62). "By changing the parameters," Russell elaborated, "you could change it anywhere from essentially just random, where it was pure luck, to something where skill and experience counted above everything else" (as cited in Brand, 1972, para. 62). This simple statement actually condenses two possible definitions to "parameters." In computer science, "parameter" is defined as the variable used for an execution of a function, or what is also known as the "formal argument" of execution (Rossiter, 2016, p. 29). Here, parameters exist as code. Parameters are things that Russell and others had creatively programmed in to make up the different features of the game, such as the speed of ships, the strength of the gravity fields, and the randomness of appearance with hyperspace.

There is, however, a different way that parameters may be understood. In this second instance, parameters are mediated through the interface of the screen more directly. For Brand, it happened with Gorin's text-based console, which required him to input options on gameplay decisions related to mines, randomized starting positions, and partial damage. However, earlier versions of Spacewar! had already set up options with sense switches on the PDP-1, which could load up code for processing if the switches were turned on. This idea of parameters—as interface features that delimit the range of actions available for execution by the software—aligns more closely to the common way that users understand parameters today. Parameters of action are often coded and designed into the graphical interface as icons, knobs, and sliders, which are delimited by the designer to facilitate understandability and actionability from the user's perspective (Manovich, 2013). In this sense, parameters can be read as integral parts of an interface—"a process or active threshold mediating between two states" (Galloway, 2012, p. 23) that both enable and limit the extent to which a software functions.

The slipperiness to which "parameter" is being deployed here (as code/interface; Russell/Gorin; programmer/user) makes more sense when it is seen within its historical context. Like many early complex technologies, Spacewar! was circulating within an elite community of hackers less intimidated by code. For them, playing and programming were more iterative processes. It is known, for instance, that Russell had left the source code of commonly changed parameters in the lab to encourage others to experience Spacewar! differently (Monnens & Goldberg, 2015). For him, source code *was* user-friendly—the gamer-hacker with the source code could change elements such as the speed of flight, or even add new features to the game. Levy (1984/2010) also takes this perspective with the classic text, *Hackers*, where he enjoins play and programming, noting how the early gamer-hackers could open an "endless" variations to Spacewar! by tweaking parameters: "By switching a few parameters you could turn the game into 'hydraulic *spacewar*,' in which torpedoes flow out in ejaculatory streams instead of one by one" (p. 53). Players could also "hack up a warping factor" that would force them to randomly teleport around the game area and "make adjustments every time they moved" (Levy, 1984/2010, p. 54). Parameters allowed games to remain mutable, even experimental, changing according to the player-programmer's will.

Probing Interfaces

My suggestion is that the ambiguous character of parameters—their requirement of coding expertise, but also their seemingly easy codification into the interface—had influenced Brand in the ways that the potential of New Games is understood. Writing the "Theory of Game Change" in *The New Games Book*, Brand (1976) returned to Spacewar!, dubbing it "one of the most compelling new games of the Twentieth Century" (pp. 137–138) and a point of inspiration for New Games. In the chapter, Brand (1976) repeats much of what Russell was said in the 1972 *Rolling Stone* article—namely, that the parameters could be adjusted to make for different gameplay experiences in Spacewar!. Brand praised this as "damned intelligent use of theory" and proceeded to explain that "Russell identified the attributes of a good computer game and tied them together. 'Tie them together' I think means assemble them in a dramatic story, open ended, starring the player" (Brand, 1976, pp. 138–139).

The parameters of Spacewar! were adapted into New Games as adjustable rules. Like Spacewar!, Brand took the idea of bringing different parameters together in an open-ended fashion, prioritizing the player's experience. The rules of games in New Games were broken down and modulated like parameters to suggest the varied outcomes that a combination of parameters could produce. As an example, when explaining the game Slaughter, Brand (1976) stated that he "wanted something violent and not harmful" (p. 139). This design problem was then broken down into a parameter and modulated—"bodily pulling is safer than pushing or hitting" (Brand, 1976, p. 139). And to ramp up the parameter of "intensity," players of Slaughter were introduced to a "life-death" metaphor: "Any part of your body over the line and you're dead" (Brand, 1976, p. 139). In another example, he explained how volleyball was a "forgiving" game because of its range of parameters—team sizes, court sizes, net heights—all of which could be easily adjusted to ensure that all players could have a good game. Parameters were handled like programmable game features that were to be tinkered with through the interface to yield different experimental outcomes. Brand expressed a characteristic nonchalance to his "theory" (the concepts were haphazardly applied), but this indifference also reflected a larger and more important point. At the end of the day, none of these

parameters was meant to stick. Parameters are less a fixed design solution than a perspective into the integrative ways in which players can come to understand the world.

Not enough is written about these accounts to show the extent to which New Games incorporated the theory that Brand proposed. But, as Lee (2013) suggests, what remains clear is that the "Theory of Game Change," inspired by Spacewar!, had consolidated a particular way of thinking about games: as "'laboratories' for conflict, a domestication of the social encounter thematized as a form of communal play" (p. 122). Put differently, by repositioning New Games as analogies of digital games, New Games was *gamified*, influenced by the digital logics of Spacewar!. Even though this was, at the moment, a creeping influence rather than one of a wholesale takeover, New Games would emerge as an early example of a gamified parametric laboratory, a scenario haunted with sliders and switches that could change rules to influence the experience of games and, presumably, society. Explaining Brand's vision for New Games, Turner (2006b) writes that the rules of the games—"the arrangement of players and observers on the field, the construction of rules (or the lack of them), the deployment of technologies and techniques in and around the space defined for play" (p. 108)—were of significant consequence. Turner (2006b) elaborates, "For the New Gamers, to rearrange these elements was to rearrange the structure of society itself" (p. 108). Parameters were imagined for experimentation; they provided the resources to simulate and test out the varied configurations possible to new world order.

Yet, if a new world order was being envisioned, it certainly was not planned—for the standpoint of New Games was not that of a system-level planner, but of a performative player. The designer was not meant to follow straightforward cause–effect relations to manipulate players to desired ends, but to create a setting where learning could be enhanced in a variety of directions. In this sense, New Games represented an application of Gregory Bateson's critique of the paranoid structures underlying John von Neumann's game theory (Long Now, 2010). In a letter to Norbert Wiener, Bateson offered that game theory had construed an artificially contained setting that refused the players' ability to rethink the rules of their engagement:

> What applications of the theory of games do is to reinforce the player's acceptance of the rules and conceptual premises and therefore make it more difficult for the players to conceive that there might be other ways of meeting and dealing with each other. (as cited in Poundstone, 1992, p. 168)

Hyperrational players of von Neumann's scenarios could only beat their opponents within the parameters of zero-sum games, creating a problematic propagation of what Bateson described as "the premises of distrust" (as cited in Lee, 2013, p. 131); players needed to anticipate that opponents would bluff or defect at any time, swaying based on self-preservation and interest (Lee, 2013).

This view of Bateson's was personally related to Brand, the latter taking it to engineer New Games as an antithesis to the paranoid scheme of Cold War containment (Long Now, 2010). New Games was a way to build trust, to bring integration rather than the binaries of conflict and consensus. If systems are invoked, the empowerment of New Games is still centered on the unique individual encouraged to freely change the rules set; if the programmer takes precedence, the goal is to change the user into the programmer. Recalling McGonigal, taking the digital as inspiration, rethinking tools as interfaces that probe real-world systems is

meant to make the subject curious and inquisitive, to encourage players to tamper and interact with reality as a programmer would.

To explain this better, I will briefly turn to media theorist McLuhan's (2001) concept of the "probe"; McLuhan's ideas had a significant influence on Brand (Turner, 2006a). In *The Medium is the Massage*, McLuhan (1967/2001) presents the probe as an "anti-environmental tool," something that deals with the "immediate experience," and that offers a guide for "what's really going on" (p. 92). McLuhan understood the "environment" as a negative kind of habituation, one that dulls its inhabitants to the "larger field of patterns, relationalities and structural homologies" (Marchessault, 2005, p. 203). Escape from environments for McLuhan came through the artistic deployment of technological media and language, things that probed the latencies of habituation, bringing what was unsensed into awareness for the individuals involved. Charting McLuhan's interest in architecture, for instance, Busbea (2020) notes that

> McLuhan began to see the conditioning aspects of environment not simply as negative form of brainwashing but as an opportunity to take control of the environment and turn it toward more productive, human ends. He maintained that humanity, instead of merely undergoing passive environmental conditioning, was now in a position to "modulate" space and time in such a way that their mechanisms could be designed. (p. 43)

Probes afforded penetrating new insight into previously dulled environments, such that these environments can also be modulated for the intended purposes of subjects. The reciprocal feedback structure in second-order cybernetics enabled this responsivity where lively interfaces could actively feed information to allow for active adaptive control and learning for the user (Busbea, 2020).

We now see how Spacewar! has helped Brand move New Games beyond the rationale of fun or cooperation. New Games is an interface probe, a "teaching machine" (a term McLuhan used) or "tool" (a term Brand favored) that was capable of prompting insight into the system, enabling coevolution of subjects with their environments. As Brand (1974) offers in *Cybernetic Frontiers*, "All I can articulate is that I'm following a hunch that relates somehow to Gregory's notion of evolving ideas. A game is an idea with its own life, growth, reproductive cycle, and adaptive response to other life" (p. 86). Games were likened to organic lifeforms that symbiotically developed with organisms around. Mutable and adaptive, they probed the systems they inhabited to find better zones of coexistence; players and games alike were thought to come out of this process better adapted to the world in which they lived, finding new ways of dealing with the constraints they found themselves in.

The process of understanding parameters, moving from Gorin and Russell to Brand, thus speaks of the transmutative influence of the digital. The interface logic of parameter change → experimental outcome that appeared with Gorin's 1972 version of Spacewar!, explained by Russell as a fluid experimental hacking tool that bridges play with programming, is finally understood by Brand as a way of mapping the potential found in the performative rule change. Parameter change tests the inscrutable complexity of systems, allowing players to vary parameters to experiment with and adapt to a variety of outcomes.

Gamification of Complexity

Looking retrospectively, it becomes clear how New Games differs from much of contemporary gamification. The mutable worldmaking potential in New Games comes out of a mix of counterculture and postwar exuberance (TVTV, 1973). Pitched against the containment of Cold War politics, the interface probes of New Games stressed freedom and a player-centered design. Players were encouraged to vary parameters, to observe the results, and spontaneously readjust accordingly (Turner, 2006b). On the other hand, gamification of the early 21st century is commonly used by corporations and governments for neoliberal, technocratic purposes of control and surveillance. The objectives here tend to be quantified and narrowly stipulated, exploiting human perceptual and neurological processes to increase the engagement of users with a product or service to arrive at predetermined goals (Bogost, 2014; Kirkpatrick, 2015; Sicart, 2014).

In this last section, I examine this distinction by emphasizing the continuity of epistemology that undercuts these archetypal examples of "good" and "bad" gamification. Underlying both is a tendency that I call the "gamification of complexity," a process that black-boxes complex causalities to present systems as manipulatable through the adjustment of parameters. To begin, Brand was developing these ideas in the 1970s, as complexity was starting to take off as a rubric for understanding and governing the world, influenced by neoliberal economic philosophy, cybernetics, and ecological thinking (Chandler, 2014; Davies, 2017; Hayles, 1990; Mirowski & Nik-Khah, 2017). Though the characteristics of complexity are varied and particular to the theories invoked, common to most theoretical approaches is the emphasis of nonlinearity and metastability. Complex systems are characterized by "relational ontologies" in which variables are related in a nonlinear fashion, making it difficult to predict the influence of any factor as they cascade through the system (Chandler, 2014). Such unpredictability also makes systems metastable. Systems are in constant flux, producing order from disorder by fluidity adjusting to new, emergent states of stability under changing conditions (Hayles, 1990). As a result, positivistic models often fail to account for the self-governing processes of complex systems. As Austrian economist Friedrich Hayek famously argued, it is hubristic to assume that complex systems can be known, planned, or calculated with any degree of accuracy—a premise that would have dramatic implications for governance (Mirowski & Nik-Khah, 2017). Instead of relying on planners who claim to know systems at a distance, managerial elites would come to rely on the live flow of feedback technologies, becoming "cybernetic intermediaries" who translate quantitative data to actionable, rapidly executed plans so that the adaptive qualities of systems can be instrumentalized (Davies, 2017).

This context makes clear how the computer would become a favored analogy for how one is to navigate the milieu of complexity. For one, computers are rendered operational through the same logic that complex systems are. The operation of computers depends on layers of screened hardware and software processes, requiring action to proceed from obfuscation. As software theorist Chun (2011) elaborates, icons like the "recycle bin" that appears on our desktop interface "are not something we can 'see beyond,' but rather things necessary to seeing" (p. 56). Even executing a function like "delete" covers from view the interactions of code, protocols, programming languages, memory, and electrical currents on transistor chips. Chun (2011) also said, "Software's vapory materialization and its ghostly interfaces embody—conceptually, metaphorically, virtually—a way to navigate our increasingly complex world" (p. 2). Such simulative selection and reduction of real-world phenomena is "problem solving technics," as Crogan (2011) writes. By

bracketing our ignorance—what we do not know and cannot know—we are able to cognitively map our decisions to results in ways more complicated and far-reaching.

The link between computers and complexity bears out in the digital influence of Spacewar!. As mentioned earlier, the impact of Spacewar! is related to the immediacy of the game, the capacity of parameters to yield a different game with the input of an option. This process comes from the screening of hardware and code processes (Hu, 2015)—a logic that Brand would carry into New Games. In New Games, systems are not meant to be known as much as they are to be experimented with. Instead of preempting and formatting a planned future (Crogan, 2011), the ludic simulations of New Games are meant to create a context in which people can experiment with mutable possibilities in the here-and-now. And like the icons on computers that elide the complex code, software, and hardware operations, parameters are the interface tools that allow for the playful probing of inscrutable systems. They provide the experimental condition to suggest how society should be reconfigured and how players may adapt better to others around.

Although contemporary gamification would differ significantly from New Games, the gamification of complexity is an epistemic stance that transverses both. Consider, for instance, the discussion of "points" in *Gamification by Design*, an introductory text to gamification (Zichermann & Cunningham, 2011). In the text, the numerical, gamified feature of points is not described as a single mechanic, but as a resource that can be split infinitely into different types, each tied to a different purpose. Gamification designs can use "experience points," "redeemable points," "skill points," "karma points," and "reputation points," each with unique characteristics tailored to elicit a particular behavior (Zichermann & Cunningham, 2011). Experience points are meant to serve as the overarching feature of the points system, one tied "to every activity in the system," and designed to "align your behavioral objectives with the player in a long-term way" (Zichermann & Cunningham, 2011, p. 28). Skill points are linked to the completion of specific activities, which are used to "direct the player to complete some key alternate tasks and sub-goals" (Zichermann & Cunningham, 2011, p. 29). Each type of point is connected to a system of parameter correlates that can interact to produce outcomes, and the designer is meant to intelligently put these parameters into play to create the outcomes desired.

This principle is illustrated in a demo provided by enterprise gamification platform Badgeville (2015). The demo begins by bringing viewer through the interface of pull-down bars and checkboxes. All organizational change needs, it suggests, is the clever editing of interface parameters: directing a mission toward specific individuals or groups, putting new conditions in place, adjusting the kinds of behavior desired and the points offered, or making the mission time-sensitive (see Figure 1). In the next part of the video, we witness the effects of these parameters. When the telemarketer enters a sales opportunity into the software, the interface immediately responds with a notification that he has received 6 points. Scheduling a sales contact scores 20 points, and 15 points are provided for doing it faster than the norm. In the demo, each act of the user is tracked and fed into algorithms that trigger changes on the interface based on the parameters set. The immediacy of this feedback, and the way it is structured to have one action lead to another with progressively greater rewards, suggests how the setting of parameters can motivate a productive workforce, easing the complex problem of supervisory control.

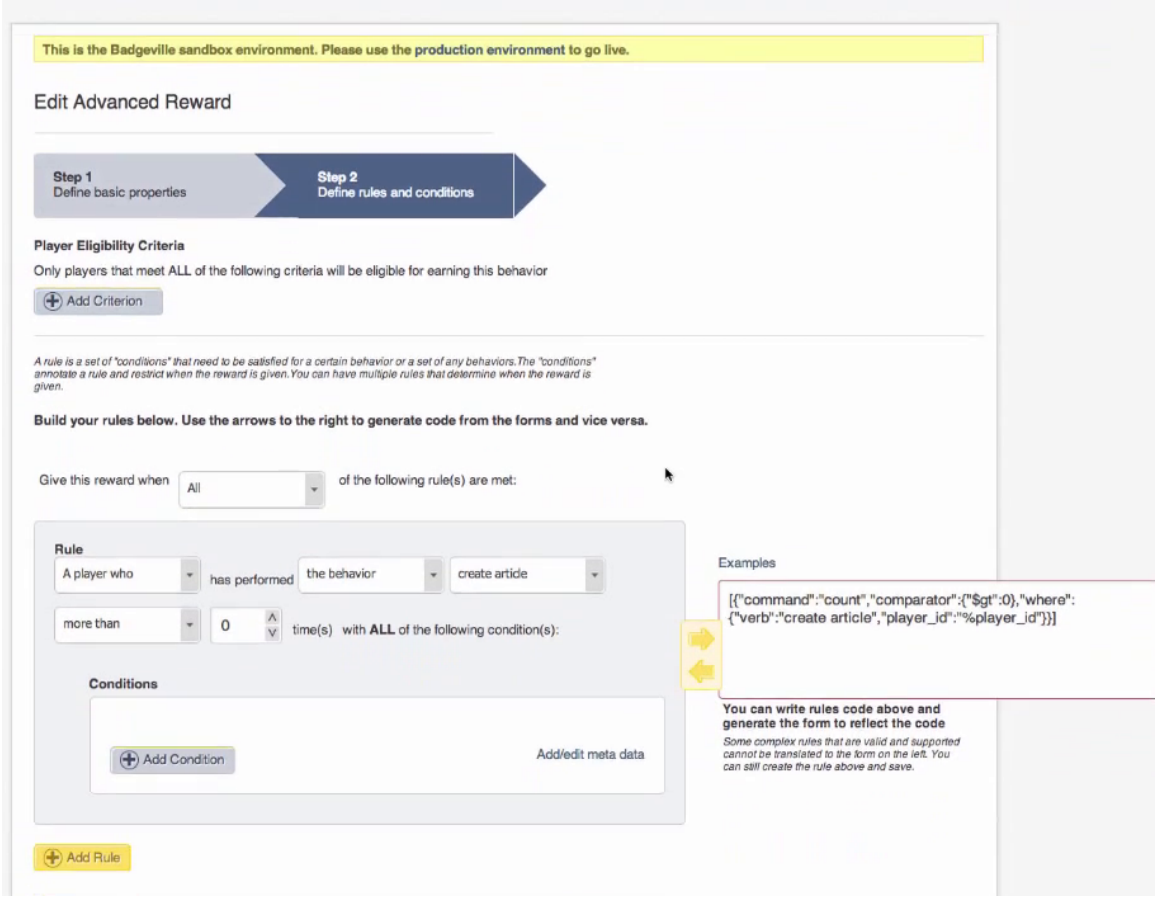

Figure 1. **Badgeville's *parameters for experimentation.***

The example provided by Badgeville reveals the ideological problem of complexity. As Dean (2013) warns, complexity is not merely a prescription of an objective reality that is hard to understand. Complexity can displace accountability. It can substantiate the argument that because something is too difficult to understand and too hard to deal with, it should be bracketed as something that we *should not* think about or worry about so that we can work on what is understood. Compartmentalizing complexity so that a situation can be made actionable can be understood as a process crucial to making things "gameful" (McGonigal, 2015), capable of being affected with transformational change, especially when this desire is met with an impasse. But this desire to make for change also tends to sideline the difficult issues that true transformation requires.

It is unsurprising, therefore, that the gamification of complexity tends to serve as an instrument for the privileged. We see this even in New Games, whose attendees were primarily young, educated, middle-upper-class Whites (Turner, 2006a). The discovery of body and mind makes more sense to someone who is not forced to work with the body, wealthy enough that the concern of consciousness change is more relevant than the daily grind. And by excluding those who are different, one can also screen the presence

of structural disparity, making it easier to construe a magic circle of transformative bonding. People could work within the bounds of their comfort to experiment with the world they hoped to produce without dealing with the messiness of difference.

The blindness to privilege built into the gamification of complexity would continue to mark the discourse of gamification. In the years following 2010, various works of gamification would deploy archetypes of exploited, unvalued workers—such as Target cashiers (Zichermann & Linder, 2013), assembly-line workers (Paharia, 2013), McDonald's servers (Werbach & Hunter, 2012), and Starbucks counter employees (Collins, 2015)—to rationalize the social good of gamification, directing psychological change toward the correction of labor injustice. But gamifying tedious work, gamification pundits argue, could conjure the dint of effort to overcome the bad odds that they have been dealt with in their jobs. "The introduction of 'game mechanics,'" Zichermann and Linder (2013) write, gives "people doing a repetitive job a sense of control," allowing them to recover their sense of "agency . . . the belief you are in control of your destiny" (p. 75). Problems of entrenched wage inequality, work conditions, and labor rights would be laid aside here as problems too deeply rooted and difficult to resolve, and psychological change raised as the surest route to transformative societal change.

This wish is not only naïve and exploitative; it is also sanitized, ignoring the complex, often uncomfortable work that transformation frequently requires. A promotional video for another enterprise gamification platform, Bunchball, reveals this fantasy. The video opens with a group of irate and helpless managers, frustrated with their inability to spur their bored, unproductive subordinates. "Let's fire someone! Let's send everybody a threatening email," (Bunchball, 2013, 00:25) they suggest, toward which a "better" and more efficient vision of managerial oversight appears. In the next scene, we see the previously bored workers happily at work, driven by the aesthetically pleasing flow of badges and points. Here, a worker who lacks tact can easily be changed by dropping a "Customer Etiquette" training requirement into the interface. No more confrontations required.

I do not think that people are naïve enough to fully trust in the fantasy. But the suggestion that "motivation" can now be experimented through parameters without emotionally draining pep talks and threats is one that makes for logical thinking in our neoliberal milieu. As Busch (2017) observes in his critique of big data, "Managers in both private companies and public offices" are increasingly outfitted with "'dashboards' that are alleged to include (virtual) gauges by which all the necessary decisions for good management can be made" (p. 658). Managers are to become like the players of both New Games and Spacewar!. They are hackers meant to test out systems by compartmentalizing the troublesome, reflexively tinkering with their parameters until they can reach a sweet spot of getting the outcomes they desire. Responsive interfaces do perhaps invoke the "magical thinking" that McGonigal (2006) had optimistically argued for more than a decade ago (p. 31). However, who magical thinking is made for and what must be sidelined for this process to emerge are important to consider in this process.

By 2015, the popularity of gamification had significantly declined. This is often attributed to the sullied brand of gamification, the way that the term is associated with a reductive, dehumanizing approach in management. This is accompanied by a range of disassociations. A leader of the movement, Gabe Zichermann, would move on to develop apps on technological wellness, claiming it as penance for his earlier

work on addiction. The CEO of Bunchball, Rajat Paharia, would turn to data science and proceed to bring his experience to develop augmented interfaces for Google. Mario Herger, who was a prominent speaker for gamification, now tackles engagement in organizations without the term "gamification" attached. In a sense, this shows that the critiques of gamification have "worked," or, as Bogost (2014) suggested back in his polemic in 2014, gamification is now stained with a "brown hue . . . such that even uttering the word will produce the kind of cautious skepticism and sanctioned revulsion" (p. 77).

But what does it mean for these critiques to be successful? As I have tried to argue with New Games and Spacewar!, the problem of gamification is not that it is reductive, but that it has taken an idea of complexity and compartmentalized it, making an empowerment only for some (Dean, 2013). This legacy, which Herger has also called "gamification design *thinking*" exceeds the critique of the simplistic use of game mechanics (derogatorily referred to points, badges, leaderboards, or PBLs) so often leveled at gamification (Bucholska, 2020, 18:01). It speaks of the long-standing tendencies of computational technologies to screen structural problems, to promote a lenticular vision that makes it hard for people to see the entanglement that makes empowerment dependent on suppression and oppression (McPherson, 2012). Such optimism runs deep, and it warrants deeper inquiry as gamification has become both diffused and embedded into things. No longer centered on leaderboards, gamification has given way to a total consideration of habit formation, all the way from the hyperludic deluge of vibrant, high-resolution colors and satisfying swipes and swooshes (Merrin, 2014), to calibrated choice architectures meant to nudge us toward supposedly good choices, containing the unhappy complexities of the world that can lead us to make wrong, irrational decisions (Sunstein, 2014). Gamification has expanded more broadly into digital culture as a way of thinking, extending beyond its definition of being an application of game mechanics and properties to nongame contexts.

With this, there might even be a counterintuitive reason to revive the term. The sullying of "gamification" has enjoined the potential of computational technologies with a demand for its accountability; nobody using the term "gamification" can do so without justifying the care that is necessary in developing the product. This demand can explain why marketers have turned away from this term. They have reason to confine and narrow the definition of gamification so as to distance themselves from it, avoiding the accountability expected of its use. But every algorithm works on partial knowledge to provide an experimental output. Or, as Amoore (2020) writes, algorithms are "geared to profit from uncertainty, or to output something that has not been spoken about or anticipated" (p. 111)—which means that they likely *do* exercise the gamification of complexity in some form. There is a ludic expression to computing that constantly makes it a form of gamification based on partial knowledge and experimental design (Amoore, 2020; Chun, 2011; Galloway, 2012). There are no PBLs here, but the parameter thinking that structured Brand's (1976) gamification did not rely on PBLs either: It centered on the playful tinkering of parameters, which is a routine part of computational design.

Bringing gamification back into our language may thereby fulfill the "cloud ethics" that Amoore (2020) has called for. Gamification here would ask not of transparent systems, but evidence to care in the use of partial knowledges, rationale for its black boxes, understanding too that resisting structural inequalities requires deliberate engagement. We can take a leaf from the early work in New Games and consider the ways that games can be made mutable, cooperative, and centered on players, keeping in mind that the "player" needs to be always more expansively considered than what counterculture leans toward

(Turner, 2006a). By democratizing the figure of the gamer-programmer, the problem of solutionism may also be better addressed. Structural problems cannot be bracketed simply as "complexity," and experiments with games can be prioritized as an ethic directed toward understanding the unequal conditions of livability. At its best, then, gamification would fulfill the promise it was set out to have: an idealized countercultural vision that admits to the integrated ways by which our world is structured, with all its messiness within.

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